



Freeway Landfill and Freeway Dump Investigation Report

Phase A

Prepared for
Minnesota Pollution Control Agency

June 2018

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Investigation Report
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Certifications

I hereby certify that this plan, document, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Geologist under the laws of the state of Minnesota.

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June 29, 2018

Date

1.0 Introduction

This report has been prepared by Barr Engineering Co. (Barr) on behalf of the Minnesota Pollution Control Agency's (MPCA) Closed Landfill Program (CLP). This report provides a summary of the Phase A Investigation's findings and results, an evaluation of data gaps, and recommendations for additional investigation at the Freeway Dump, Freeway Landfill, and Freeway Transfer Station (the Site).

The investigation was conducted in the spring of 2018 and generally followed the conceptual *Investigation & Sampling Plan*, written by MPCA (MPCA, 2017). The MPCA plan was informed by findings from previous investigations at both the Landfill and Dump and outlined a scope that included sampling of soil, waste material, and groundwater, as well as screening of landfill gas. Based on MPCA's conceptual plan, Barr developed a specific scope of work to complete the investigations (Barr, 2017).

The intent of the report is to provide a brief summary of the site history and a comprehensive summary of the site investigation activities. The report is organized as follows:

- 1.0 Introduction:** describes the content and objectives of this report.
- 2.0 Background:** provides general site background information including a description and brief history of each project area.
- 3.0 Site Investigation:** includes a discussion of the activities completed to evaluate the extent of waste material as well as solid media and water quality.
- 4.0 Investigation Results:** describes the results of the investigation conducted in the spring of 2018, including a description of the different solid media encountered as well as solid media and water quality results.
- 5.0 Site Conceptual Model:** provides a summary of the current understanding of the Site subsurface conditions.
- 6.0 Data Gaps and Recommendations:** identifies aspects of the Site that have not been fully characterized and provides brief recommendations for future investigative activities.
- 7.0 References:** includes a summary of references cited in the report.

2.0 Background

The Site comprises three project areas ([Figure 1](#)): the Freeway Dump (Dump), the Freeway Landfill (Landfill), and the Freeway Transfer Station (Transfer Station). All three areas are located in Burnsville, Dakota County, Minnesota and are owned by either the R.B. McGowan Company, Inc. or Freeway Transfer Company, Inc. This section provides a descriptive and historical summary of each project area.

2.1 Site Location and Description

The following paragraphs provide a brief description of each project area.

Freeway Dump

Freeway Dump is an unlined inactive dump located at 11937 Highway 35 W (Parcel ID: 02-03410-38-010), Burnsville, at the north end of the east service road for Highway 35W, north of the Cliff Road interchange. The Dump encompasses approximately 28 acres and has recently been used as a golf driving range. Two trailers and one small building are located on the Property. The surrounding properties include the wetlands of the Minnesota Valley Wildlife Refuge to the north and east, the Edward Kraemer and Sons quarry (Kraemer Quarry) to the west (west of Highway 35W), and commercial properties to the south, including storage facilities and a car dealership.

The Dump is a mostly flat-top mound that sits above the surrounding wetland to the north and east. The general topographic gradient of the Dump and the land near the Dump trends to the north towards Black Dog Lake and the Minnesota River. The surrounding wetland is located at an elevation ranging from approximately 700 feet above mean sea level (MSL) along the north perimeter to about 710 feet MSL to the southeast of the Dump. The elevation of the Dump ranges from approximately 720 feet MSL along the north boundary to 730 feet MSL in the south. The raised elevation of the Dump extends beyond the north and east boundaries of the Dump property.

Freeway Landfill

The Landfill consists of several parcels, totaling approximately 189 acres, 131 of which were used for placement of waste during landfill operation and approximately 58 of which include a quarry and undeveloped land ([Liesch, 1993](#)). The landfill is primarily located on the following Parcels: 02-15600-00-010; 02-15600-00-060; 02-15600-00-020, 02-15600-02-010; 02-15600-00-030; 02-15600-00-040; and 02-15600-00-050.

The landfill is an unlined, inactive landfill located just south of the Minnesota River ([Figure 1](#)). The surrounding properties include the U.S. Salt Company to the north and Highway 35W to the east. Kraemer Quarry is located to the south. The vacant land to the west is also owned by Kraemer Quarry.

The average water level for the Minnesota River located north of the Landfill is approximately 691 feet MSL ([USACE, 2018](#)). The 100-year flood elevation is 716 feet MSL ([FEMA, 2011](#)), and the recorded historical river level extremes at the nearby Savage river gage are 719.40 feet on April 15, 1965 and 687.05 feet on October 29, 1976 ([NWS, 2018](#)). It is recognized that river elevation sources are based on different

vertical datums (i.e., 1912 Mean Sea Level Datum, North American Vertical Datum 1929, and NAVD 1988). However, the difference between those datums for the Minnesota River elevation is only 0.54 feet.

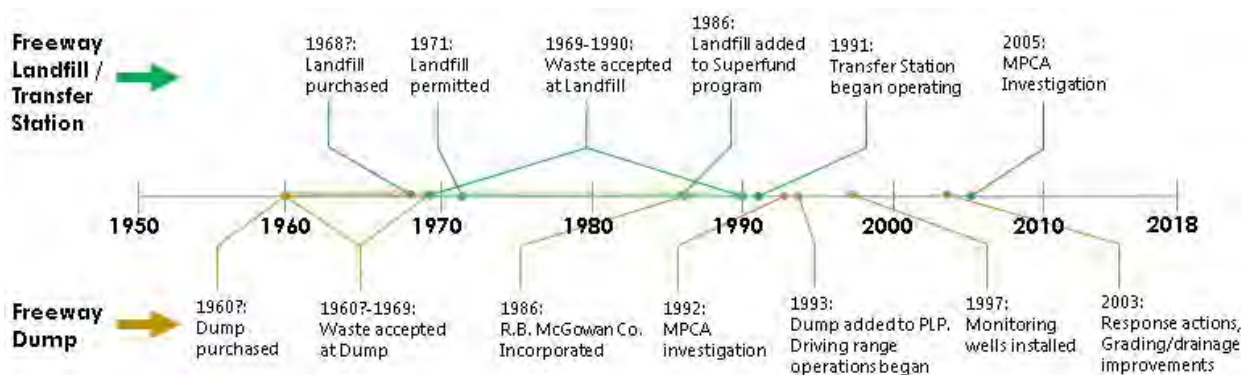
Prior to landfill operations commencing, the topography of the Landfill area likely varied from 696 to 705 feet MSL (Liesch, 1991). According to current Lidar survey data (Fugro and MDNR, 2011), the maximum elevation of the Landfill is approximately 750 feet MSL at its peak near the center of the property. The ground surface slopes downward in all directions to an elevation of approximately 700 feet MSL at the property limits. This slope is relatively gentle, generally ranging from 2% to 4%, with the exception of the east and south edges, where steeper 20-30 foot long slopes up to approximately 30% are present. The ridge on the east side of the Landfill is part of an intermittent surface water channel that runs north to the river, between the Landfill and Highway 35W.

Freeway Transfer Station

The Transfer Station is located at 11501 Embassy Road (Parcel ID: 02-15600-01010), Burnsville. The Transfer Station is located on the east side of the Landfill property, approximately 1,500 feet south of the Minnesota River, and currently operates as a waste processing, recycling, and hauling facility. Topographically, the Transfer Station is located in a depressed area at approximately 710 feet MSL. Surrounding the Transfer Station to the north, south, and east is a berm feature that rises to approximately 745 feet MSL, and to the west is the access road that rises out from the station to Landfill grade of approximately 735 feet MSL.

2.2 Site History

A background review was conducted that included reviewing historic landfill records and files and reviewing historic aerial imagery. The MPCA provided Barr with a list of archived project files available for the both the Dump and Landfill. Hundreds of files were available for review dating back to the early 1960's. In addition, historic aerial imagery was obtained from Historic Information Gatherers (HIG). These aerials were used to evaluate historic disturbance limits and approximate operational dates for the landfill (Appendix A). The disturbance limits shown on the aerial photography were evaluated to identify historic dumping as well as current waste limits. An approximate chronology of significant milestones is provided below.



Freeway Dump

The Dump property was purchased by Richard McGowan and his business partner Jim Vallez sometime around 1960. Although it is not certain exactly when the dump became active and started receiving waste, some reports indicate that dumping began as early as 1960. A review of historical aerial photographs indicate that the Dump was active between 1960 and 1969 (Figure 2). The Dump initially accepted ash from a nearby power plant and later accepted other refuse including municipal solid waste and construction waste (MPCA, 2017). After the Dump ceased operating in 1969, the property remained unused until 1993, when the driving range operations began.

Previous investigations of the site have been conducted, starting with the 1987 Preliminary Assessment (PA) by the MPCA (MPCA, 1987). The PA was prompted by concerns from the U.S. Fish and Wildlife Service (USFWS), whose property abuts the Dump to the east. USFWS had observed stressed vegetation, erosion, and waste materials at the eastern edge of the landfill. MPCA identified dichlorodiphenyltrichloroethane (DDT) and PAHs in soil samples collected from the perimeter of the Dump and concluded there were exposure risks from the Dump, including the groundwater and surface water migration pathways. Following the Preliminary Assessment, the Dump was placed on the CERCLA inventory of potentially hazardous waste sites.

A subsequent investigation was conducted in the early 1990's as documented in the Screening Site Inspection Report (MPCA, 1992). The investigation included soil and groundwater testing. Organic compounds and metals contamination were detected in soil and groundwater, and additional investigation was recommended. An additional investigation was conducted in 1997/1998 by the MPCA. Nine monitoring wells were installed around the perimeter of the Dump. Groundwater sample results indicated the presence of arsenic, boron, manganese and low levels of VOCs and PCBs. In the fall of 2003, response actions including the grading and drainage improvements were completed as noted in a correspondence between the MPCA and McGowan (MPCA, 2004).

Freeway Landfill

The Landfill property comprised multiple parcels that were purchased from several different owners sometime in 1968 by Richard McGowan. Prior to the Landfill operating, the area was mostly wetland and undeveloped, with the exception of farming activities visible in the 1937 aerial photo and a few small structures that were located north of the frontage road on the south bank of the Minnesota River, visible in the 1966 aerial photo.

The Landfill began accepting waste in July of 1969 under a conditional use permit issued by the City of Burnsville. In October of 1971, the MPCA issued the Landfill a permit (No. SW 57). From a review of historical aerial photos (Figure 3), it appears that Landfill operations began in the northeast corner of the property and then expanded to the south. In the late 1970s and 1980s, environmental regulations were significantly updated in response to evolving knowledge about environmental contaminants and associated risks to human health and the environmental. Landfill regulations were updated to require engineered liners and caps for new landfills. Based on concerns at the Site, the Landfill was added to the Superfund National Priorities List in 1986 (MPCA, 2015). Under the new regulations, landfill owners

were requested to either make necessary upgrades to their facilities or to stop accepting waste. In 1990, Freeway Landfill stopped accepting waste. It is estimated that approximately 5 million cubic yards of waste were deposited in the 131 acre area of the Landfill.

Previous investigations have been conducted at the Landfill, including remedial investigations conducted on behalf of the Landfill owner (CRA, 1988 and Liesch, 1991) and environmental assessments conducted on behalf of the MPCA. More recently, in 2005, a subsurface investigation was conducted on behalf of the MPCA throughout the Landfill site that included nearly 70 soil borings and detailed surveying to assess the topography and subsurface conditions (FES, 2005).

Freeway Transfer Station

The Transfer Station was constructed sometime in the late 1980s and operates on a 12 acre parcel bounded by the Freeway Landfill to the north, south, and west. The Transfer Station is currently in operation and has been since 1991 (Liesch, 1993).

3.0 Site Investigation

Site investigation activities were conducted to further characterize the site geology and hydrogeology and to evaluate the extent and magnitude of waste material and its potential impacts to soil and groundwater. The investigation results improve the understanding of site risks and will inform the evaluation of potential site remedies.

The tasks completed were outlined in the work plan dated October 26, 2017 (Barr, 2017). With the exception of the downhole geophysical survey, all planned tasks for Phase A were completed and are described below.

3.1 Pre-Investigation Activities

Site Access

The investigation was originally scheduled to begin in late 2017; however the work was delayed until an access agreement was completed at the end of December 2017. Access was not fully granted until March 2018.

Barr and the MPCA visited the Site on February 15, 2018 to plan investigation logistics. On March 5, 2018 Barr and the MPCA revisited the Transfer Station to assess boring locations and determine how to avoid interfering with the facility's operations.

Utilities

Underground utilities were marked by both a public and private locate prior to any intrusive activities. The utility locates were coordinated by the drilling and excavation contractors (Range Environmental Drilling and Bolander, respectively).

Property Boundary Survey

Identifying the extent of waste material was a major objective of the investigation at the Dump, therefore the planned location of most test excavations was near the property boundary at the Dump. The property boundary near these investigation locations was marked in the field by a licensed surveyor. The MPCA coordinated with the Minnesota Department of Natural Resources (MNDNR) to complete this task.

3.2 Summary of Investigation Activities

Investigation activities at the Site occurred during the spring of 2018.

- March 20 to March 27, 2018 – twenty-eight soil borings were completed at the Dump.
- April 11 and April 12, 2018 – seven soil borings were completed at the Dump.
- April 12 and April 13, 2018 – eight soil borings were completed at the Transfer Station.
- April 11 to April 18, 2018 – fourteen test excavations were completed at the Dump.
- April 18 and April 20, 2018 – nine test excavations were completed at the Landfill.

3.2.1 Soil borings

Borings at the Dump and the Transfer Station were advanced with a direct-push, tracked drill rig, and soil samples were collected with a dual-tube sampler. Soil borings were generally advanced to the top of bedrock. Soil borings were advanced at continuous vertical intervals from all locations. These samples were described in the field by Barr in accordance with the Unified Soil Classification System. Samples were screened in the field for volatile organic vapors using an MPCA-provided photoionization detector (PID) fitted with a 10.6 eV lamp. Additionally, the samples were inspected by Barr for other evidence of contamination such as staining, odors, discoloration, and/or sheen, and the observations were documented on the geologic log of each boring. Borings were sealed in accordance with Minnesota Department of Health rules. Boring logs are provided in [Appendix B](#). There were no major deviations from the planned work. Soil borings completed at the Site are described below:

Dump – 35 soil borings were completed at the Dump. The Dump soil borings were generally spaced over an approximate 180-foot by 180-foot grid. Locations of the soil borings at the Dump are shown on [Figure 4](#). A discussion of the results of these soil borings is presented in [Section 4.1](#).

Transfer Station – Eight soil borings were completed at the Transfer Station. The purpose of the borings at the Transfer Station was to assess the subsurface material directly under and adjacent to the operations building. For this purpose, two of the borings were completed within the building footprint and the remaining six borings were located surrounding the building. Locations of the soil borings at the Transfer Station are shown on [Figure 5](#). A discussion of the results of these soil borings is presented in [Section 4.2](#).

Soil Gas Screening

Soil gas was measured by Barr at each boring location, using an MPCA-provided multi-gas meter capable of measuring methane, carbon dioxide, and oxygen. Upon completion of a soil boring, soil gas was screened from a depth of approximately three feet below ground surface (bgs). A tube was fitted to the multi-gas meter and lowered down the hole. The hole around the tube was then backfilled, the meter allowed to equilibrate, and the readings was logged. Soil gas screening results are discussed in [Section 4.1](#) and [Section 4.3](#).

3.2.2 Test Excavations

Test excavations were completed at several locations at both the Dump and Landfill. The purpose of the majority of test excavations was to identify the edge of the waste boundary or to determine if waste appeared to extend beyond the property boundaries. Therefore, most of these test excavations were completed just inside the property boundary. In addition to identifying the extent of waste, the added benefit of exposing larger areas of the subsurface was to further classify the types of waste material present. Test excavations completed at the Site are described below:

Dump – Fourteen test excavations were completed at the Dump. Ten of the test excavations were completed along the property boundaries and four excavations were completed in the interior of

the dump. The interior borings were completed adjacent to previously completed boring locations to better classify the waste material overserved during the soil boring investigation. Locations of the test excavations are shown on [Figure 4](#) and field logs are presented in [Appendix C](#). A discussion of the results of the test excavations is presented in [Section 4.1](#). There were no major deviations from the planned work.

Landfill – Nine test excavations were completed at the Landfill. Eight of the test excavations were completed along the northeast property boundary and one was completed at the southeast corner of the property. Locations of the test excavations are shown on [Figure 5](#) and field logs are presented in [Appendix C](#). A discussion of the results of the test excavations is presented in [Section 4.2](#). There were two deviations from the planned work due to site conditions encountered:

- Only one test excavation was completed in the southeast corner of the property. Although two excavations were planned, the ground in that area was either under water at the time of the field work, or deemed too soft for the excavator to safely traverse due to snow melt.
- The test excavations along the north edge of the property were set back approximately 50-100 feet from the property boundary due to the presence of trees and utilities. One additional excavation (FL-TT-02a) was completed closer to the property boundary.

Test excavations were completed with a back-hoe in 1 to 2 foot lifts to depths of up to 15 feet bgs or to groundwater, whichever was encountered first. As the excavation proceeded, the operator segregated the soil and/or waste material by depth so that upon completion the leftover soil and/or waste material could be replaced back in the excavation in the order and approximate position from which it was removed. As the soil was replaced the excavator bucket was used to tamp in approximate one-foot lifts to re-compact the soil.

3.2.3 Sample Collection

Soil, waste, and groundwater samples from borings and test pits were collected from the investigation locations for laboratory analysis by a field representative of the MPCA laboratory contractor, Pace Analytical (Pace). A summary of the sample parameter lists are provided in [Table 1](#) and [Table 2](#). Samples were analyzed at Pace laboratories for all of the parameters listed, with the exception of a select group of groundwater sample parameters that were analyzed at Minnesota Department of Health's (MDH) laboratory. Laboratories were selected by MPCA from a list of state-contract laboratories or other state agency laboratories. A summary of samples collected is provided in [Table 3](#).

Upon receipt of the laboratory analytical data, Barr performed a data quality review. A summary of the data quality review is included in [Appendix F](#). Based on the review, some results were flagged as estimated values. A majority of the hexavalent chromium results in water samples did not meet the QA/QC criteria and were rejected. Otherwise, the review concluded that all data met the data quality objectives of the project and are deemed acceptable for the purposes of this project, as qualified in the tables. Results are discussed in [Section 4.0](#).

Solid Media

For solid media samples, Barr and MPCA collaborated to inform the Pace representative at what intervals samples would be collected. One sample of solid media was collected from nearly all of the soil boring and test excavation locations. Solid media at the Site is characterized as waste material (including ash and municipal solid waste/construction debris), fill, or native sediments (see [Section 4.1](#)). A majority of the samples were collected from the waste material, but other media were also sampled as summarized below:

Project Area	Number of Solid Media Samples Collected by Material Type			
	MSW/ Construction Debris	Ash	Fill	Native
Freeway Dump	36	7	1	4
Freeway Landfill	6	0	0	2
Freeway Transfer Station	6	0	2	0

Groundwater

Groundwater samples were collected from the borings using 1" PVC screen and riser. New screens and risers were used at each sample location. A peristaltic pump was used to recover the sample from the temporary wells. Purging was not conducted prior to sample collection due to the limited volume and recharge observe. Samples were generally turbid due to this lack of purging. If water was encountered in a test excavation, a sample was collected using surface water sampling techniques, which generally included filling a laboratory-cleaned container by lowering it into the water that had infiltrated the excavation. The sample was then transferred into the appropriate laboratory-provided sample container.

The full parameter list for groundwater samples is extensive and during the planning phase of the investigation it was assumed that water would be available at a majority of the locations. Therefore, the original plan was to collect groundwater samples from only half of the investigation locations and that samples would be collected for a group of prioritized parameters at each of these locations while samples would be collected for the remaining parameters at either half or one quarter of the locations. However, as the investigation proceeded, it was observed that groundwater was often not present above the bedrock (i.e., the base of the borings) and therefore groundwater samples could not be collected at many locations. Another issue arose at some locations where groundwater was present but there was insufficient recharge in the temporary well to allow for the collection of the full list of parameters in a timely manner (i.e., approximately 8 liters of sample volume is necessary for the full analytical list). Due to these issues, it was decided that the full list of parameters would be sampled for at any location that could provide the necessary volume, and a partial list would be sampled for at locations with limited recharge. A summary of groundwater samples collected is provided below:

Project Area	Location Type	Total Number of Locations	Number of Samples Collected	
			Full List	Partial List
Freeway Dump	Boring	35	3	7
Freeway Dump	Excavation	14	2	0
Freeway Landfill	Excavation	9	5	1
Freeway Transfer Station	Boring	8	1	3

3.2.4 Surveying

Final locations of all soil borings and test excavations were surveyed using a hand-held global positioning system (GPS) device. Elevations were approximated based off of existing topographic (LIDAR; [Fugro and MDNR, 2011](#)) information.

3.3 Site Restoration

Following investigation activities, MPCA coordinated with state contractors to perform restoration activities at the Dump. Restoration activities included minor grading to repair ruts and placement of seed mixes. Restoration activities at the Landfill included repair of minor asphalt damage near the entrance to the U.S. Salt facility.

4.0 Investigation Results

This section describes the results of the investigation conducted in the spring of 2018 (Phase A). Included in this discussion of results is the description of the different solid media encountered and their distribution across the Site. Additionally, solid media and water quality results are presented in comparison to relevant health-based risk criteria.

4.1 Solid Media Characterization

Unconsolidated materials (including waste material, fill, and native sediments) were described in the field by Barr. Materials were described using methods included in ASTM D-2488, Standard Practice for Description and Identification of Soils. General descriptions of the primary unconsolidated materials encountered at the Site are provided below.

4.1.1 Non-Native Material

4.1.1.1 Fill

Fill material used as cover soil was observed at all investigation locations. This fill material generally consisted of a few inches of root zone material (topsoil with a fine sandy loam texture) underlain by sand to silty sand with varying percentages of coarse-grained sediment. Fill material was also observed directly below the operations building at the Transfer Station.

4.1.1.2 Waste Material

For the purposes of this investigation, waste material was divided into two classifications: (1) municipal solid waste/construction debris (MSW/CD) and (2) ash, as described in the following paragraphs.



MSW/CD stockpile at FD-TT-01



Ash sidewall at FD-TT-03

Municipal Solid Waste/Construction Debris

MSW/CD was encountered across most of the site. Municipal solid waste consisted of paper, plastics, glass, wood, metal, and rubber and was sometimes mixed with fill material. Construction debris varied,

typically including bricks, concrete, wood, shingles, and insulation. The level of decomposition varied as well, with some areas appearing relatively dry and containing readable lines of newspaper, whereas other pockets of waste material were well degraded and had a noticeable odor of decomposition.

Ash

Ash was observed only at investigation locations at the Dump. Ash is generally described as gray, or black, non-plastic, silt to fine grained sand-size material and was differentiated from native sediments by strength and texture comparisons. The ash encountered at the Dump was mostly fine-grained and non-cemented, making it appear as a possible native gray silt except that it often was intermixed with waste material. The ash was generally observed either above and/or below the waste material.

4.1.2 Native Sediments

Native sediments encountered during the investigation included alluvial or glacial sediment deposits. In general, native sediments were encountered below the waste material. The most commonly observed native sediment was a dark brown fibrous peat, but lean to fat clays, organic clays, silts, and sandy soils were also present in some locations.

4.2 Freeway Dump

The subsurface conditions at Dump are based on the soil borings and test excavations that were completed as shown on [Figure 4](#). Boring logs and test excavation field logs are provided in [Appendix B](#) and [Appendix C](#), respectively, and the observations are summarized below:

4.2.1 Subsurface Conditions

Subsurface conditions at the Freeway Dump generally consist of non-native fill material overlaying waste material (MSW/CD and ash), which overlay native sediments and/or bedrock. Cross section locations are displayed on [Figure 6](#), and four cross sections of the Dump are included as [Figure 6A](#), [Figure 6B](#), [Figure 6C](#), and [Figure 6D](#).

4.2.1.1 Non-Native Material

Fill

Fill soil was encountered at all thirty-five soil borings and fourteen test excavations at the Dump. The fill soil cover thickness over the waste ranged from 0.5 to 12.5 feet, but generally was observed to be between two to five feet thick. The greatest thicknesses of fill soil were encountered along the west side of the Dump property, where several borings were positioned on top of landscaped berms.

Field screening of the fill soil did not identify evidence of contamination such as staining, odors, discoloration, and/or sheen. Soil headspace readings ranged between 0.0 and 6.9 parts per million (ppm).

Waste Material

Waste material encountered at the Dump consisted of a combination of MSW/CD and ash.

MSW/CD was encountered at 34 (of 35) soil borings and 11 (of 14) test excavations at the Dump. The top of the MSW/CD was generally observed below the fill soil layer and in some locations, below a layer of ash. MSW/CD was observed at varying thicknesses throughout the Dump, but was generally between 10 and 20 feet thick. The greatest thickness of MSW/CD observed was approximately 30 feet at FD-SB-A3 in the north-central portion of the Dump. The thinnest intervals of MSW/CD were identified at the westernmost borings (FD-SB-A1 through FD-SB-G1), where thicknesses averaged less than 2.5 feet. MSW/CD was sometimes observed intermixed with fill soil or ash. In general, this mixing occurred where the material layers contact.

Test excavations were completed around the perimeter of the Dump to determine the extent of the waste material. MSW/CD were not observed in any of the three test excavations along the west parcel boundary of the Dump. It appears that MSW/CD extends beyond the north, south, and east parcel boundaries, where it was observed in test excavations at thicknesses of up to 8 feet.

Field screening results varied greatly throughout the MSW/CD in the Dump. Decomposition, chemical-like, and/or petroleum odors were observed in varying degrees in the MSW/CD. Sheens were also encountered, ranging from trace to heavy rainbow sheen. PID soil headspace readings were generally elevated (above 10 ppm), and ranged from 0.0 to 343 ppm. Headspace readings above 100 ppm were observed at seven borings and two test excavations, all of which were generally located in the eastern portion of the Dump. Maximum headspace readings from investigation locations are displayed on [Figure 7](#). Field screening results are presented in the boring logs and test excavation field logs included as [Appendices B and C](#).

Ash was identified in 25 (of 35) borings and 13 (of 14) test excavations at the Dump. Ash was observed both above and below the MSW/CD, and its thickness ranged between 0 and 13 feet. In general, ash is more commonly observed above the MSW/CD on the east half of the property and below the MSW/CD on the west half of the property. Ash was occasionally encountered mixed with a minor amount of debris/plastic sheeting.

Field screening in the ash did not identify evidence of contamination such as staining, discoloration, odor, and/ or sheen. PID headspace readings ranged between 0.0 to 4.5 ppm.

4.2.1.2 Native Sediments / Bedrock

Native soil was identified beneath the waste and above bedrock in 22 (of 35) borings completed at the Dump. Native soil generally consists of alluvial deposits of peat overlaying a thin layer of organic silt/fat clay. Peat was present in 21 of the 22 soil borings at the Dump where native soil was observed above bedrock. Organic silt and/ or clay was present beneath the peat in 11 out of the 22 borings. Peat thickness ranged from 1 to 10 feet, but generally, peat layers were observed to be between two and five feet thick. The silts and clays underlying the peat were generally no thicker than one foot.

Poorly graded sand and clayey sand is present beneath the waste material at two boring locations in the northeast portion of the Dump (FD-SB-B5 and FD-SB-C5). Native sand was not observed in any of the other borings or test excavations completed at the Dump during this investigation.

Waste material was observed in direct contact with bedrock at 13 (of 35) boring locations. The uppermost bedrock beneath the Dump Site is a sandy dolostone of the Prairie du Chien Group. The depth to bedrock encountered during the investigation varied from 14 to 40 feet bgs. Bedrock was encountered at higher elevation (approximately 716 feet above MSL) in the southern portion of the site, and generally slopes downward to the north edge of the property (approximately 684 feet above MSL) towards the Minnesota River.

4.2.1.3 Groundwater

Water was observed at 2 (of 14) test excavations and in the temporary wells of 18 (of 35) soil borings and was most commonly observed on the eastern portion of the site ([Figure 4](#)). Although water was present at 18 of the temporary wells, the water level was just above the bottom of the screen and there was insufficient recharge to collect any sample at 8 of those 18 locations. Water samples were collected from the remaining 10 temporary wells and the 2 test excavations.

Groundwater observations generally align with previous investigations that describe the unconfined water table at the Dump as existing above and below the interface of the unconsolidated material and bedrock ([MPCA, 1992](#)). The variability of measurable groundwater observed during this investigation is likely due to low permeability soils that restrict the recharge of water to the temporary wells. For these reasons, true groundwater elevations and flow directions could not be ascertained during this investigation.

4.2.1.4 Soil Gas

Measurements made with the multi-gas meter indicated methane concentrations ranged from 0.0% to 36.9% across the Dump site. Carbon dioxide concentrations ranged from 0.0% to 28.6% and oxygen concentrations ranged from 0.0% to 21.6%. As would be expected, the concentrations of methane and carbon dioxide generally had an inverse relationship compared with the concentration of oxygen. Landfill gas concentrations are shown on [Figure 7](#) and in [Table 4](#).

4.2.2 Analytical Results

Analytical results for samples collected at the Dump are presented in [Appendix D](#) and laboratory reports are included in [Appendix E](#). Key analytical results are summarized in the subsequent sections.

Solid media were compared to the MPCA's soil reference values (SRVs) and soil leaching values (SLVs). The SRVs are conservative, risk-based criteria that are dependent on land use scenarios. Concentrations from solid media samples collected from the Dump were compared to both Recreational and Industrial SRVs. The SLVs provide a conservative estimate of the potential for contaminants detected in soil to leach to the groundwater. A summary of concentrations in soil samples at the Dump that exceeded the above mentioned values is provided as [Table 5](#).

For the purpose of results discussion in the subsequent sections, diesel range organics (DRO) and gasoline range organics (GRO) concentrations were compared to the criteria (100 mg/kg) included in the MPCA's Best Management Practice for Off-Site Reuse of Unregulated Fill (Unregulated Fill: MPCA, 2012). The applicability of these criteria have yet be determined and will depend on future land use decisions.

Concentrations detected in water samples were compared to drinking water (EPA maximum contaminant levels and MDH health-based guidance) and surface water (Class 2B) criteria. A summary of concentrations in water samples at the Dump that exceeded the above mentioned criteria is provided as [Table 6](#).

Background Concentrations of Select Metals

Previous investigations of the surrounding area have concluded that the background concentrations of arsenic, iron, manganese, and vanadium often exceed SRVs and SLVs. Therefore the range of background concentrations will be taken into account when discussing exceedances in the following sections. A comparison of criteria to background concentrations is provided in the following table:

Parameter	Criteria (mg/kg)			Dakota County Background Range*			
	SLV	Industrial SRV	Recreational SRV	Soil (0.2 – 0.5 m)		Soil Parent Material (1 – 2 m)	
Arsenic	5.8	20	11	7	12	12	17
Iron	NA	75,000	12,000	17,000	30,000	34,000	90,000
Manganese	130	8,100	5,000	498	1,284	NA	NA
Vanadium	4	250	40	72	93	93	115

*Data range from summary maps: OFR09-02, Minnesota Soil, Till, and Ground-Water Geochemical Data. Lively, R.S.; Thorleifson, L.Harvey (Minnesota Geological Survey, 2009) <http://conservancy.umn.edu/handle/11299/117364>

4.2.2.1 Non-Native Material

Fill

One sample of fill soil was collected from location FD-SB-G1 in the southwest corner of the Dump. Arsenic was detected above the recreational SRV and the SLV at this location and manganese and vanadium were detected above the SLV, however these metals were detected below or within their background range as discussed in [Section 4.1.2](#). DRO was detected at a concentration of 68.1 mg/kg, which is below the MPCA's Best Management Practice for Off-Site Reuse of Unregulated Fill (Unregulated Fill: [MPCA, 2012](#)).

Ash

Seven samples of ash were collected for chemical analysis from the Dump. Samples were collected from ash encountered both below and above the MSW/CD, as well as in some locations where MSW/CD were not present.

Parameter	Samples Analyzed	Number of Sample Locations with Exceedances		
		MPCA Tier 2 Recreational SRV	MPCA Tier 2 Industrial SRV	MPCA Screening SLV
Metals	7	7	5	7
B(a)P equivalent	7	1	1	1
Pentachlorophenol (SVOC)	7	0	0	1

Concentrations of vanadium were detected above the recreational SRV at all locations and above industrial SRVs at one sample location. Concentrations of vanadium were detected above background concentrations in five of the seven samples. Industrial SRVs as well as background concentrations were exceeded for arsenic in five of the seven samples. Manganese concentrations were detected above SLVs at all locations, but were below or within the background range at all locations. Iron concentrations were detected above recreational SRV at all locations, but were also below or within the background range at all locations. DRO was detected at a concentration of 33.7 mg/kg in one sample.

MSW and Construction Debris

Thirty-six samples of MSW/CD were collected for chemical analysis from the Dump. Samples were collected from locations where field screening results showed evidence of contamination. A summary of the constituents that exceeded SRVs or SLVs is provided below:

Parameter	Samples Analyzed	Number of Sample Locations with SRV Exceedances		
		MPCA Tier 2 Recreational SRV	MPCA Tier 2 Industrial SRV	MPCA Screening SLV
Metals	36	34	11	36
VOCs	36	2	1	18
PCBs	36	18	7	30
B(a)P equivalent	36	12	10	15
SVOCs	36	1	1	13

Metal constituents that exceeded SRV criteria most frequently were iron (36 locations, 4 above background), arsenic (27 locations, 9 above background), vanadium (24 locations, 5 above background), mercury (15 locations), lead (14 locations), and copper (11 locations). Antimony exceeded SRV criteria at two locations. Barium, cadmium, nickel, and zinc exceeded SRV criteria at only one location each. Manganese concentrations were detected above SLVs at all locations, but were below or within the background range at all but two locations.

DRO was detected at all 36 samples locations with concentrations ranging from 23.3 mg/kg to 6,590 mg/kg, with 13 locations exceeding 1,000 mg/kg. GRO was detected at 21 locations with concentrations ranging from 14.6 mg/kg to 854 mg/kg, with 9 locations exceeding 100 mg/kg. Although DRO and GRO do not have an SRV, elevated GRO/DRO concentrations typically indicate the presence of petroleum impacts.

4.2.2.2 Native Sediments

Four samples of native sediments were collected for chemical analysis from the Dump.

Parameter	Samples Analyzed	Number of Sample Locations with Exceedances		
		MPCA Tier 2 Recreational SRV	MPCA Tier 2 Industrial SRV	MPCA Screening SLV
Metals	4	2	0	4
B(a)P equivalent	4	1	0	1
Benzene	4	0	0	3
Bis(2-ethylhexyl)phthalate	4	0	0	1
PCBs	4	0	0	1

Arsenic, iron, manganese, and vanadium were detected above SLVs or SRVs at all locations, but reported the concentrations were below or within their background ranges as discussed in [Section 4.1.2](#). Boron was detected above SLVs at all locations. Lead was detected above the recreational SRV at one location ([Table 5](#)). DRO concentrations were detected at three locations ranging from 71.0 mg/kg to 409 mg/kg.

4.2.2.3 Groundwater

Twelve groundwater samples were collected for chemical analysis from soil borings and test excavations at the Freeway Dump. Five samples were analyzed for a full list of parameters, and seven were analyzed for a partial list, as noted in [Table 3](#). A summary of samples that exceeded criteria is provided in the table below:

Parameter	Samples Analyzed	Number of Sample Locations with Exceedances			
		EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance	MN Surface Water 2Bd (Chronic)	MN Surface Water 2Bd (Acute)
Metals	10	2	10	7	3
VOCs	12	6	9	7	0
1,4 Dioxane	11	NA	10	NA	NA
PFOA	11	NA	10	NA	NA
PFOS	11	NA	9	NA	NA
Chlorine Dioxide	5	3	NA	NA	NA
Nitrogen, ammonia, as N	10	NA	NA	10	NA
Cyanide	10	0	NA	9	1
Gross Beta (radiation)	6	4	NA	NA	NA

NA – not applicable, no criteria available

Metal detections above criteria were widespread, but the specific metals were generally sporadic, with the exception of the test excavation samples, though this is likely due to the high concentration of sediments in the samples ([Table 6](#)). Boron was the metal most commonly detected above drinking water standards, and exceeded standards at ten sample locations. Manganese was detected above drinking water standards at nine sample locations. As noted in [Section 3.2.3](#), the hexavalent chromium results did not meet QA/QC criteria and were deemed unusable.

Benzene was detected above drinking water standards at seven sample locations and was detected above surface water standards at a total of six sample locations. Vinyl chloride was detected above drinking water standards at four sample locations and was detected above surface water standards at three sample locations. Other than benzene and vinyl chloride, VOCs did not exceed drinking water standards from samples collected at any location at the Dump, except for FD-SB-B3 where nine VOCs were detected above drinking water standards and six VOCs were detected above surface water standards.

4.3 Freeway Landfill

Nine test excavations were completed at the Landfill to verify the subsurface conditions at the north and southeast property boundaries. Test excavation field logs are provided in [Appendix C](#). Investigation locations are shown on [Figure 5](#), and observations are summarized below:

4.3.1 Subsurface Conditions

The test excavation investigation conducted at the Landfill identified fill soil and waste material as well as native silt, sand, and clay. A description of each type of material encountered is provided in the following subsections.

4.3.1.1 Non-Native Material

Fill

Fill soil covering the waste materials ranged from one to five feet thick, with an average thickness of two feet. The fill soil typically included a top soil cover. Gray silty sand fill was identified below the cover soil at the three western-most excavations (FL-TT-01, FL-TT-02, and FL-TT-02a). The gray silty sand fill was one foot thick at all three locations and was mixed with small amounts of concrete, bricks, glass, plastic, and wood.

Field screening in the fill material did not identify evidence of contamination such as staining, odors, discoloration, and/or sheen. PID soil headspace readings ranged between 0.1 and 5.4 ppm.

Waste Material

Waste material encountered at the Freeway Landfill consisted of a combination of MSW/CD and was generally consistent with that observed at the Dump, with the exception that no ash was encountered. Waste material was encountered in seven of the nine borings completed at the Landfill. The top of the waste material was observed below fill soil between one and five feet bgs. Waste material was observed to be between six and twelve feet thick, with an average thickness of 8.5 feet. Waste material was not encountered in FL-TT-06 and FL-TT-07 in the northeast portion of the Landfill site.

Decomposition, chemical, and petroleum odors were observed throughout the waste material. Sheens were also encountered, ranging from trace to heavy rainbow. PID headspace readings in the waste material were generally below 10 ppm, with the exception of FL-TT-02 (20.5 ppm, 2-10 feet bgs) and FL-T-05 (29.2 ppm, 5-15 feet bgs). Maximum headspace readings from investigation locations are displayed on [Figure 8](#). Field screening results are presented in the test excavation field logs included as [Appendix C](#).

4.3.1.2 Native Sediments

Native sediment beneath the waste material at the Landfill consisted of gray silt with sand to silty sand. The top of this layer was present between 10 and 15 feet bgs at 5 out of the 9 excavations. Several of the excavations were terminated within the waste material and therefore the presence of underlying native sediments could not be assessed. No field screening impacts were observed in this layer, and PID headspace readings were below 1.1 ppm.

Alluvial deposits of silty sand, clayey sand, silt, and clay were identified at the two locations in the northeast portion of the site where no waste material was encountered (FL-TT-06 and FL-TT-07). No field screening impacts were observed at these locations, and PID headspace readings were below 0.5 ppm.

4.3.1.3 Groundwater

Measurable groundwater was observed in six of the eight test excavations completed at the Landfill (Figure 5). Depth to groundwater was measured from the ground surface of the excavation to the surface of the standing water at the base of the excavation. Groundwater depths are variable across the site, and were observed between 5 and 11 feet bgs. The variability of measurable groundwater observed during this investigation is likely due to low permeability soils that restrict the recharge of water within the test excavations

4.3.2 Analytical Results

Analytical results for samples collected at the Landfill are presented as a table in Appendix D and laboratory reports are included in Appendix E. Key analytical results are summarized in the subsequent sections.

Results from solid media and groundwater samples were compared to criteria as described in Section 4.1.2. A summary of concentrations in soil samples from the Landfill that exceeded the above mentioned criteria is provided as Table 7. A summary of concentrations in groundwater samples at the Landfill that exceeded the above mentioned criteria is provided as Table 8.

4.3.2.1 Waste Material

Waste samples were collected for chemical analysis from six test excavation locations at the Freeway Landfill. A summary of the constituents that exceeded SRVs and SLVs is provided below:

Parameter	Samples Analyzed	Number of Sample Locations with Exceedances		
		MPCA Tier 2 Recreational SRV	MPCA Tier 2 Industrial SRV	MPCA Screening SLV
Metals	6	5	2	6
B(a)P equivalent	6	1	1	1
Butyl benzyl phthalate	6	1	1	1
1,4-Dichlorobenzene	6	0	0	4
Benzene	6	0	0	1
Tetrachloroethylene	6	0	0	1
PCBs	6	2	1	4

Manganese and vanadium were detected above SLVs or SRVs at all locations, but their concentrations were below background ranges as discussed in [Section 4.1.2](#). Arsenic was detected above industrial SRVs and its background range at one location. Iron was detected above industrial SRVs and its background range at two sample locations. Cadmium was detected above recreational SRVs at one location. Copper was detected above recreational SRVs at four sample locations. Lead was detected above recreational SRVs at two sample locations.

DRO was detected at all six sample locations with concentrations ranging from 171 mg/kg to 3,370 mg/kg, with samples from two locations exceeding 1,000 mg/kg. GRO was detected in samples from two locations at concentrations of 40.2 mg/kg and 74.1 mg/kg ([Appendix D](#)). Although DRO and GRO do not have an SRV they can be indicators of petroleum impacts.

4.3.2.2 Native Sediments

Two samples of native soil were collected from the Landfill test excavations (FL-TT-06 and FL-TT-07).

Parameter	Samples Analyzed	Number of Sample Locations with Exceedances		
		MPCA Tier 2 Recreational SRV	MPCA Tier 2 Industrial SRV	MPCA Screening SLV
Metals	2	1	0	2

Arsenic, iron, manganese, and vanadium were detected above SLVs or SRVs at both locations, but their concentrations were below or within their background ranges as discussed in [Section 4.1.2](#).

4.3.3 Groundwater

Six groundwater samples were collected for chemical analysis from test excavations at the landfill. Five samples were analyzed for a full list of parameters, and one was analyzed for a partial list, as indicated in [Table 3](#). A summary of samples that exceeded criteria is provided in the table below:

Parameter	Samples Analyzed	Number of Sample Locations with Exceedances			
		EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance	MN Surface Water 2Bd (Chronic)	MN Surface Water 2Bd (Acute)
Metals	6	0	6	5	2
PFOA	6	NA	6	NA	NA
PFOS	6	NA	5	NA	NA
Benzene	6	0	1	0	0
1,4 Dioxane	6	NA	1	NA	NA
Chlorine Dioxide	5	3	NA	NA	NA
Nitrogen, ammonia, as N	6	NA	NA	6	NA
Cyanide	6	0	NA	2	0
Bis(2-ethylhexyl)phthalate	6	0	0	2	NA

NA – not applicable, no exceedance criteria available

Metal detections above criteria were generally sporadic, with the exception of the test excavation samples, though this is likely due to the high concentration of sediments in the samples. Aluminum, boron, and manganese were the metal constituents detected above drinking water standards at one or more test excavations. Aluminum, arsenic, cobalt, lead, and zinc were the metal constituents detected above surface water standards at one or more test excavations.

4.4 Freeway Transfer Station

Eight soil borings were completed at the Transfer Station to assess the subsurface conditions beneath and adjacent to the operations building. All eight soil borings were advanced to the top of bedrock. Soil samples were screened in the field using methods described in [Section 3.2.1](#). Investigation locations are shown on [Figure 5](#), and observations are summarized below:

4.4.1 Subsurface Materials

Subsurface materials at the Transfer Station generally consist of non-native fill material overlaying waste material, which overlay native sediments and/or bedrock. Waste material was not present at the two borings completed within the operations building (SB-TS-02 and SB-TS-07). Cross section locations are displayed on [Figure 6](#). Two geologic cross sections of the Transfer Station site are presented as [Figure 6E](#) and [Figure 6F](#).

4.4.1.1 Non-Native Material

Fill material

Cover soil at boring locations not completed within the operations building ranged from 2.5 to 7 feet thick. At soil borings completed within the operations building (SB-TS-02 and SB-TS-07), fill material was observed from below the building floor slab to bedrock at approximately 25 feet bgs ([Figure 6E](#)).

Trace sheen and moderate odor were observed in borings TS-SB-02 and TS-SB-05. No field screening impacts were identified in the fill material at any other boring locations at the Transfer Station.

Waste Material

Waste material consisting of MSW/CD was encountered beneath the surficial fill at all six borings completed outside of the operations building at the Transfer Station. The top of the waste material was identified between 2.5 and 7 feet bgs and extended to depths of up to 28 feet bgs. Waste material was observed to be between 6.4 and 25 feet thick, with an average thickness of 11 feet. The greatest waste thickness was observed at boring SB-TS-08 where the ground surface is approximately 14 feet higher than the rest of the soil borings.

Light to strong decomposition odors were identified throughout the waste material. Strong petroleum odor and moderate sheen were identified in the waste material at TS-SB-01. PID headspace readings in the waste material were generally elevated, and ranged from 0.5 to 36.7 ppm.

4.4.1.2 Native Sediments / Bedrock

Native soil was observed above the bedrock at 4 out of 8 borings completed at the Transfer Station. The primary native soil observed above bedrock at the Transfer Station was an alluvial deposit of high-plasticity organic clay, which was present at all 4 of the soil borings where native soil was observed. A thin layer of peat was observed above the organic clay at one soil boring location (TS-SB-01), and silty sand was present at one boring beneath the organic clay and above the bedrock (FD-SB-05). Waste material was observed in direct contact with bedrock at TS-SB-04 and TS-SB-08.

The uppermost bedrock beneath the Transfer Station is a sandy dolostone of the Prairie du Chien Group. The depth to bedrock encountered at the Transfer Station during the investigation varied from 16 to 28 feet bgs, and bedrock elevations vary from approximately 686 feet above MSL to 698 feet MSL.

4.4.1.3 Groundwater

Groundwater level data were collected from the temporary monitoring wells after groundwater stabilized and before groundwater sampling began. Measurable groundwater was observed in four of the eight soil borings at the Transfer Station (Figure 5). Groundwater elevations are variable across the site, and range from approximately 706 feet MSL to 690 feet MSL.

The variability of measurable groundwater observed during this investigation is likely due to low permeability soils that restrict the recharge of water within the temporary wells. Further, groundwater that was encountered during the investigation may be perched on top of bedrock or within the low permeability waste materials.

4.4.1.4 Soil Gas

Measurements made with the multi-gas meter indicated methane concentrations ranged from 0.0% to 65.6% across the Transfer Station. Carbon dioxide concentrations ranged from 0.0% to 35.9% and oxygen concentrations ranged from 0.9% to 21.6%. As observed at the Dump, and as would be expected, the

concentration of methane and carbon dioxide appeared to have an inverse relationship with the concentration of oxygen. Landfill gas concentrations are shown on [Figure 8](#) and in [Table 4](#).

4.4.2 Analytical Results

Analytical results for the Transfer Station are presented as a table in [Appendix D](#) and laboratory reports are included in [Appendix E](#). Results from solid media and water samples were compared to criteria as described in [Section 4.1.2](#). A summary of concentrations in soil samples at the Transfer Station that exceeded the above mentioned criteria is provided as [Table 7](#). A summary of concentrations in water samples at the Transfer Station that exceeded the above mentioned criteria is provided as [Table 8](#).

4.4.2.1 Non-Native Material

Fill material

Two samples of fill soil were collected from under the operations building at the Freeway Transfer Station.

Parameter	Samples Analyzed	Number of Sample Locations with Exceedances		
		MPCA Tier 2 Recreational SRV	MPCA Tier 2 Industrial SRV	MPCA Screening SLV
Metals	2	0	0	2

Manganese and vanadium were detected above SLVs at both locations, but the concentrations were below or within their background ranges as discussed in [Section 4.1.2](#). DRO was detected at location TS-SB-02 at a concentration of 12.4 mg/kg.

Waste material

Samples of waste material were collected from six locations at the Transfer Station. A summary of the constituents that exceeded the SRVs and SLVs provided below:

Parameter	Samples Analyzed	Number of Sample Locations with Exceedances		
		MPCA Tier 2 Recreational SRV	MPCA Tier 2 Industrial SRV	MPCA Screening SLV
Metals	6	3	0	5
B(a)P equivalent	6	2	1	3
Bis(2-ethylhexyl)phthalate	6	0	0	1
1,1,2,2-Tetrachloroethane	6	0	0	1
Benzene	6	0	0	1
1,4-Dichlorobenzene	6	0	0	1
Naphthalene	6	0	0	1
PCBs	6	0	0	1

Manganese and vanadium were detected above SLVs or SRVs at all locations, but the reported concentrations were below or within their background ranges as discussed in [Section 4.1.2](#). Iron was detected above the recreational SRV but below or within its background range at two locations. Arsenic

was detected above the recreational SRV but below or within its background range at one location. Lead was detected above its recreational SRV two locations and copper was detected above its recreational SRV one location. DRO was detected at all six locations at concentrations ranging from 371 mg/kg to 3,820 mg/kg. GRO was detected at locations TS-SB-01, TS-SB-05, and TS-SB-08 at concentrations of 53.6 mg/kg, 38.9 mg/kg, and 47.7 mg.kg, respectively.

4.4.2.2 Water

Four groundwater samples were collected for chemical analysis from the eight soil borings completed at the Transfer Station. One sample was analyzed for the full list of parameters, and three were analyzed for a partial list of parameters (Table 3). A summary of samples that exceeded health based criteria is provided in the table below:

Parameter	Samples Analyzed	Number of Sample Locations with Exceedances			
		EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance	MN Surface Water 2Bd (Chronic)	MN Surface Water 2Bd (Acute)
Metals	4	2	4	4	2
PFOA	4	NA	4	NA	NA
PFOS	4	NA	4	NA	NA
Benzene	4	0	1	0	0
1,4 Dioxane	4	NA	4	NA	NA
3,4-Methylphenol	4	NA	1	NA	NA
Nitrogen, ammonia, as N	4	NA	NA	1	NA
Cyanide	4	0	NA	1	0
Chloride	4	NA	NA	1	0

NA – not applicable, no exceedance criteria available

Twelve metal constituents were detected above surface water standards at one or more soil boring location. All twelve of these metal constituents were observed above surface water standards at TS-SB-07, seven were detected above surface water standards at TS-SB-05, four were detected above surface water standards in TS-SB-08, and one was detected above surface water standards in TS-SB-02 (arsenic).

Thirteen metal constituents were detected above drinking water standards at one or more soil boring location. All thirteen constituents were detected above drinking water standards at TS-SB-07, six were detected above drinking water standards at TS-SB-05, and two were detected above drinking water standards at TS-SB-02 and TS-SB-08.

5.0 Site Conceptual Model

This section summarizes the features of the Site including waste extent, geology and hydrogeology, and an initial assessment of the potential receptors that are at risk from the deposited waste material.

5.1 Waste Extent

The approximate extent of waste is depicted on Figures 9 and 10. The following paragraphs detail the information that was utilized in making the determinations. As noted below, the extent of waste has not been fully delineated.

Freeway Dump

The extent of waste material at the Dump appears to extend beyond the property boundaries in all directions. Test excavations were completed along the edges of the property during the most recent investigation, however, waste material and/or ash were encountered at each of these locations extending to the property line.

Along the north and east edges of the property, the presence of waste material beyond the property boundary was anticipated as the elevated ground surface of the Dump above the adjacent wetland can be observed. The elevated ground surface extends approximately 100 feet north of the property boundary. There are three monitoring wells (installed during the 1997 MPCA investigation) located just to the north of the toe of the slope. Boring logs from these wells indicate no waste present, therefore the northern extent of the waste can be assumed to be located somewhere between the toe of the slope and these wells. Along the east edge of the elevated Dump surface, the slope is more gradual and where it contacts the wetland less easily identified. At one test excavation (FD-TT-06), completed along the east edge of the property near what appeared to be the bottom of the slope, waste material was observed extending below the groundwater elevation. Additionally, the boring log for OFMW-1, located farther to the east, indicate ash was encountered in the boring.

Neighboring the property to the south and southeast is a storage unit facility. Test excavations along the south property boundary encountered waste material. Additionally, the boring log from monitoring well MW97-6, located just south of the property boundary indicated the presence of waste material. A review of historical aerial photographs also give some insight into the extent of waste material in this area. Photographs from 1966 and 1967 indicate that operations were occurring as far south as where the storage facility is now located. The area to the southeast of the property corner also appears disturbed in the 1969 photograph. In addition, a representative of the storage facility mentioned that they had encountered waste material during previous construction activities. It can be assumed that the waste material and possibly ash extend beyond the Dump property boundary to the south and southeast.

Interstate 35W is located west of the Dump property. Three test excavations were placed along the west edge of the property and although no MSW/CD was present, ash was observed at all three locations. The Minnesota Department of Transportation (MnDOT) conducted a Phase II investigation in 2014 ([MnDOT, 2015](#)) and a supplemental investigation in 2018 ([MnDOT, 2018](#)) along the right-of-way corridor adjacent to the property. The logs from borings conducted between the Dump and the Interstate indicated the

presence of a greyish silt with fine-grained sand, which is similar to the description of the ash encountered during this investigation. Additionally, historical aerial photographs from 1964 and 1967 indicate that operations were occurring close to the edge of the highway. Although MSW/CD do not seem to extend beyond the Dump property boundary, it is assumed that ash may extend into the right-of-way of Interstate 35W.

Freeway Landfill

An assumed waste footprint was presented in the Investigation & Sampling Plan (MPCA, 2017) based on data from previous investigations. Along the west edge of the Landfill, the 2005 soil boring investigation delineated the extent of waste material with a transect of borings (No. 1 – 8) where no waste was observed. Along the south edge of the Landfill, the extent of waste material is defined by the bottom of the slope running along the property boundary. The extent of waste is also defined by the bottom of the slope along the east edge of the Landfill. This is supported in historical aerial imagery, where there does not appear to be disturbance beyond landfill slopes as they exist today.

During the 2018 investigation, test excavations were conducted along the north edge of the Landfill and in the southeast corner to gain a better understanding of the extent of waste in these areas (Figure 10). In the southeast corner, waste material was observed in FL-TT-08, which was located on the slope due to soft ground conditions beyond the toe of the slope. No waste material was identified in borings WT-7 or DP-8, located beyond the toe of the slope. Historical aerial photos do not show any disturbance in this corner of the Landfill, with the exception of an access road in the 1990s. It is likely that the waste material extends no further than the bottom of the slope, but the exact location of the extent has yet to be identified.

Along the north edge of the property, waste material was observed in test excavations FL-TT-01 to FL-TT-05. Historical aerial photos show ground disturbance in the area of the US Salt property. During utility locate activities for the 2018 investigation, personnel from US Salt mentioned waste material had been encountered during past construction activities. Extent of waste material is not known, but likely extends north of the Landfill property boundary. There is also debris visible on the southern bank of the Minnesota River, but it has not been determined if this is related to the waste in the Landfill or a separate placement of debris to stabilize the river bank.

Waste material was not observed at locations FL-TT-06 and FL-TT-07. These test excavations were completed beyond the slope of the elevated landfill (Figure 10). Historical aerial photos also do not show evidence of ground disturbance beyond the toe of the slope as is located currently. This also is additional confirmation that the extent of waste material along the east edge of the landfill is likely defined by the base of the slope.

Freeway Transfer Station

No waste material was observed at locations TS-SB-02 and TS-SB-07, which were completed inside the operations building. Waste material was observed at every other boring location surrounding the operations building that was completed during the 2018 investigation. Therefore, it appears likely that

waste material extends throughout the Transfer Station area, with the exception of directly under the buildings and, possibly, the weighing stations.

5.2 Geology

Subsurface conditions at the Dump, Landfill, and Transfer Station generally consist of a thin layer of top soil overlaying non-native fill material overlaying waste, overlaying native sediments and/or bedrock. A description of these layers and detailed investigation observations are included in [Section 4.0](#).

5.2.1 Freeway Dump

Waste material at the Dump, which includes MSW/CD and ash, was observed to be between 10 and 30 feet thick. The waste material was identified to contain concentrations of various constituents that exceed criteria as discussed in [Section 4.0](#). Fill materials at the Dump were observed on top of waste material. The waste material overlays native sediment and/or bedrock. Bedrock generally slopes downward to the north edge of the property towards the Minnesota River. Available information indicates no liner is present under the waste material.

Previous investigations describe the unconfined water table at the Dump as existing above and below the interface of the unconsolidated material and bedrock ([MPCA, 1992](#)). In some areas the groundwater is in contact with waste material. Groundwater samples collected during the 2018 investigation exhibited concentrations of various constituents that exceed drinking water and surface criteria as discussed in [Section 4.0](#).

5.2.2 Freeway Landfill

Waste material encountered at the Landfill consisted of MSW/CD, with a slightly higher percentage of construction debris compared to the Dump and Transfer Station. Waste material encountered during this investigation had an average thickness of 8.5 feet. Data from a 2005 investigation indicate that waste material was commonly observed between 15 and 25 feet thick in the center portion of the landfill, and was observed to be as much as 49 feet thick ([FES, 2005](#)). Fill materials were observed on top of waste material. The waste material overlays native sediment and/or bedrock. The uppermost bedrock beneath the Landfill is a sandy dolostone of the Prairie du Chien Group. The bedrock elevation is generally higher in the south, and slopes to the north towards the Minnesota River.

Similar to the Dump, concentrations of various constituents in soil, waste material, and groundwater samples collected at the Landfill exceeded criteria as discussed in [Section 4.0](#).

5.2.3 Freeway Transfer Station

Waste material at the Transfer Station consisted of MSW/CD and was present beneath cover fill soil at all locations with the exception of borings completed within the operations building, where fill material was observed from the ground surface to bedrock at approximately 25 feet bgs ([Figure 6E](#)). At boring locations outside of the building the waste material overlays native sediment and/or bedrock and was observed to be between 6 and 25 feet thick.

Similar to the Dump and Landfill, concentrations of various constituents in soil, waste material, and groundwater samples collected at the Transfer Station exceeded criteria as discussed in Section 4.0.

5.3 Hydrogeology

The Site is located in close proximity to the Minnesota River channel. The Minnesota River is a regional groundwater discharge zone. Wetlands are adjacent to the north and east sides of the Dump. The Black Dog Preserve Calcareous Fen is to the east of the Dump. The water table in the vicinity of the Site is generally present in unconsolidated materials above the bedrock or in the uppermost bedrock. The waste in the dump is in contact with the bedrock and water table in some areas.

The uppermost bedrock beneath the site is the Prairie du Chien Group. Immediately below the Prairie du Chien is the Jordan Sandstone. The Prairie du Chien and Jordan are hydraulically interconnected and are the two most utilized and productive aquifers in the Twin Cities metropolitan area. Under natural conditions, groundwater in the Prairie du Chien and Jordan would discharge to the Minnesota River.

The Kraemer Mining and Materials quarry is located approximately 1,000 feet west of the Dump and immediately south and southwest of the Landfill. The resource being mined in the quarry is the Prairie du Chien. Dewatering in the quarry likely captures groundwater in the Prairie du Chien beneath the site, depressing the water table from what it would be under natural conditions.

Neither the Dump nor the Landfill operated as lined facilities. Waste is directly in contact with groundwater in portions of the Dump site. Except for near the edges, waste is generally not in contact with groundwater at the Landfill, but models predict that condition will change when Kraemer Quarry operations end and the pumping is eliminated (Barr, 2015). Water was encountered within the waste materials on the Transfer Station property.

5.4 Potential Receptors

The presence of waste in unlined facilities has the potential for negative impacts on human health and the environment. The following paragraphs provide a preliminary summary of some of the receptors and pathways that may be affected by the presence of the waste materials, both under current and expected future scenarios.

Direct Contact Receptors

Freeway Dump currently operates as a recreational facility (golf driving range). On the south end is a gravel parking lot. The majority of the land surface is vegetated by grass. Along the east, north and west edges the vegetation includes scrubs and the south edge is wooded. Cover soil is present over the waste material, but was observed in some locations at thicknesses of less than one foot. A metal chain link fence runs along Interstate 35W and between the Dump and the storage facilities to the south. The site is accessible to pedestrian and vehicular traffic.

Freeway Landfill is similarly vegetated with grasses over the majority of the land surface and the edges of the property having scrubs or wooded vegetative cover. The Landfill is no longer operational, however

the Transfer Station is operational and access roads through the Landfill are utilized as well as lay-down areas in the northern portion of the Landfill. Cover soil is present over the waste material and was observed at thickness of 2 feet or greater. The site is also accessible to pedestrian and vehicular traffic.

Drinking Water Supply

The City of Burnsville utilizes a surface water feature within the Kraemer Quarry as a drinking water supply. The City also operates water supply wells that are open to the Jordan Sandstone and are located approximately one-third mile to the southeast of the Dump. Based on past investigations and modeling, the current flow of groundwater beneath the Dump is generally towards Kraemer Quarry. However, when pumping at the quarry stops, the City's pumping wells could draw groundwater from the Dump to the south in the direction of Burnsville's drinking water supply wells (MPCA, 1992).

Surface Water Receptors

Freeway Dump is bounded both to the north and east by a wetland which lies between the Dump and the Minnesota River. The Minnesota River is directly north of the Landfill. An intermittent water course that flows to the river runs along the east side of the Landfill. A majority of the Dump is elevated above the 100-year flood plain of the Minnesota River. The same is true of the Landfill with the exception of the northern area where test excavations were conducted during the 2018 investigation. When Kraemer Quarry stops pumping, the resulting lake may be an additional potential surface water receptor.

Vapor Receptors

Elevated methane concentrations were detected throughout all portions of the Site. Any current buildings, including the Transfer Station and the driving range office, may be exposed to methane or other landfill gases. Similarly, future buildings located near the Dump or Landfill may be potentially be exposed to elevated concentrations of landfill gases.

6.0 Data Gaps and Recommendations

The Phase A investigation detailed in this report was intended to be the first of two phases of investigation, with a Phase B to be scoped based on the results of Phase A. A summary of data gaps that may be investigated as part of a future Phase B investigation is provided in this section.

6.1 Waste Extent

As noted in section 5, the lateral extent of waste has not been defined in all directions. The most notable data gaps with respect to waste extent include the following:

- The northern boundary of the Landfill, where the northernmost test trenches encountered waste and anecdotal evidence from the adjacent property owner suggested waste extended onto the U.S. Salt property
- The southern boundary of the Dump, where the southernmost test trenches encountered waste and anecdotal evidence from the adjacent property owner suggested waste extended onto the storage building property

The waste extent in other directions is also currently undefined; however, interpretation of previous investigations and reasonable assumptions based on topography result in a less significant data gap.

It is recommended that additional test excavations and/or soil borings be completed to determine the extent of waste.

6.2 Groundwater Quality

A limited groundwater investigation was completed at the Dump. A monitoring well network that allowed for adequate spacing and routine sampling would allow for a better understanding of the groundwater quality in the vicinity of the Dump. A more robust monitoring well network exists at the Landfill; however there may be opportunities to augment the monitoring well network to allow for a better understanding of groundwater quality in the vicinity of the Landfill.

Downhole geophysical logging of the existing monitoring well network was planned during the Phase A scope to gather additional hydrogeological data for the site. This work has not been completed and MPCA is continuing to work with the USGS or MGS to conduct that work in the future.

It is recommended that the downhole geophysical logging that was intended to be completed as part of Phase A be included in the Phase B scope. It is also recommended that additional monitoring wells be installed to better characterize the groundwater quality in the vicinity of the Dump and the Landfill.

6.3 Soil Cover Quality

Limited data has been collected on the quality of soil overlying waste materials. Its suitability as either a cover soil over current waste or its suitability for reuse is a data gap.

It is recommended that soil samples be collected as part of the Phase B investigation to evaluate the quality of the soil cover.

7.0 References

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Tables

Table 1
LABORATORY ANALYTICAL PARAMETER LIST
SOLID MEDIA

Site Investigation Report
Dakota County, Minnesota

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

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

Table 2
LABORATORY ANALYTICAL PARAMETER LISTS
WATER

Site Investigation Report
Dakota County, Minnesota

	Method
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Bromate, Chlorite	EPA 300.1
Chloride	EPA 300.00
Chlorine dioxide	SM4500CIO2
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Fluoride	EPA 300.0
Hardness, as CaCO3	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664A OG
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury	EPA 245.1
SVOCs	
	EPA 8270D

	Method
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM
DBCP & EDB	EPA 8011
Acrylamide	EPA 8316
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 A
Trihalomethanes, total (TTHMMss)	EPA 524.2
Halooacetic Acids	
	EPA 552.3
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081B
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
Aldicarb, Carbofuran	EPA 531.1
Endothall	EPA 548.1
PCBs	
	EPA 8082A
Dioxins / Furans	
	EPA 1613B
PFCs	
	EPA 537
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

-- Analysis by MDH Laboratory

Table 3
SAMPLING MATRIX
 Site Investigation Report
 Dakota County, Minnesota

Location ID	Soild		Water	
	Solid Media Type	Sample Interval (feet)	Depth to Water (feet)	Sampling Parameter List
FD-SB-A1	Ash	3-6		
FD-SB-A2	Ash	10 - 20	29.65	Partial
FD-SB-A3	Native	30 - 35	25.07	Partial
FD-SB-A4	Native	26 - 32	23.09	Partial
FD-SB-A5	Waste	15 - 17	22.53	Partial
FD-SB-B1	Waste	11 - 13		
FD-SB-B2	Waste	12 - 21		
FD-SB-B3	Waste	5 - 26	21.43	Full
FD-SB-B4	Waste	3 - 20	20.60	Partial
FD-SB-B5	Native	21.5 - 23	27.14	Partial
FD-SB-C1	Waste	5 - 8		
FD-SB-C2	Waste	5 - 17		
FD-SB-C3	Waste	5 - 20		
FD-SB-C4	Waste	5 - 20		
FD-SB-C5	Waste	15 - 17.5		
FD-SB-D1	Waste	11 - 16		
FD-SB-D2	Waste	3 - 12		
FD-SB-D3	Waste	4 - 16		
FD-SB-D4	Waste	5 - 20	20.13	Partial
FD-SB-D5	Waste	3 - 20	20.43	Full
FD-SB-E1	Waste	10 - 15		
FD-SB-E2	Ash	11 - 21		
FD-SB-E3	Ash	11 - 15		
FD-SB-E4	Waste	3 - 21		
FD-SB-E5	Waste	5 - 10	24.68	Full
FD-SB-F1	Ash	10 - 14.5		
FD-SB-F2	Waste	7 - 13		
FD-SB-F3	Waste	3 - 11		
FD-SB-F4	Waste	5 - 10		
FD-SB-F5	Waste	5 - 10		
FD-SB-G1	Fill	5 - 10		
FD-SB-G2	Waste	10 - 12		
FD-SB-G3	Waste	7 - 16		
FD-SB-G4	Native	15.5 - 17		
FD-SB-G5	Waste	5 - 14		

Location ID	Soild		Water	
	Solid Media Type	Sample Interval (feet)	Depth to Water (feet)	Sampling Parameter List
TS- SB-01	Waste	5 - 8		
TS- SB-02	Fill	7 - 9	18.69	Partial
TS- SB-03	Fill	1.5 - 4		
TS- SB-04	Waste	7 - 16		
TS- SB-05	Native	21 - 24	22.23	Partial
TS- SB-06	Waste	8 - 12.5		
TS- SB-07	Fill	15 - 18	20.59	Partial
TS- SB-08	Waste	10 - 20	20.3	Full
FD-TT-01	Waste	10 - 12		
FD-TT-02	Waste	7 - 9		
FD-TT-03	Ash	2 - 5		
FD-TT-04		NS		
FD-TT-05	Ash	4 - 9		
FD-TT-06	Waste	2 - 5	3.5	Full
FD-TT-07	Waste	6 - 11		
FD-TT-08	Waste	5 - 12		
FD-TT-09	Waste	4 - 12		
FD-TT-10	Waste	2.5 - 10	10	Full
FD-TT-11	Waste	4 - 12		
FD-TT-12	Waste	3 - 12		
FD-TT-13	Waste	3 - 12		
FD-TT-14	Waste	2 - 12		
FL-TT-01	Waste	3 - 11		
FL-TT-02	Waste	2 - 10.5	10	Full
FL-TT-02a		NS		
FL-TT-03	Waste	2 - 10	8	Full
FL-TT-04	Waste	2 - 14	7	Full
FL-TT-05	Waste	5 - 15	11	Full
FL-TT-06	Native	0 - 10		
FL-TT-07	Native	1 - 5	4	Full
FL-TT-08	Waste	1 - 7	8	Partial

Table 4
LANDFILL GAS SCREENING RESULTS
 Site Investigation Report
 Dakota County, Minnesota

Location ID	Date	Depth feet BGS	Landfill Gas Meter				Comments
			CH ₄ %	CO ₂ %	O ₂ %	Balance %	
FD-SB-A1	4/11/2018	3	0.0	0.1	20.8	79.1	
FD-SB-A2	3/27/2018	3	4.4	4.9	7.6	83.9	
FD-SB-A3	3/23/2018	3	14.5	18.7	0.1	66.4	
FD-SB-A4	3/22/2018	3	24.9	21.1	0.0	54.0	
FD-SB-A5	3/20/2018	3	14.9	22.9	0.0	62.1	
FD-SB-B1	4/11/2018	3	0.0	0.0	21.6	78.4	
FD-SB-B2	3/27/2018	3	7.1	13.2	1.9	77.7	
FD-SB-B3	3/23/2018	3	34.9	24.9	0.0	40.3	
FD-SB-B4	3/22/2018	3	36.9	28.6	0.0	34.5	
FD-SB-B5	3/21/2018	3	3.8	6.9	15.8	75.6	
FD-SB-C1	4/11/2018	3	0.0	0.1	21.0	78.9	
FD-SB-C2	3/27/2018	3	24.5	0.4	19.8	78.5	CH ₄ dropped to 0.0 after hole was purged
FD-SB-C3	3/23/2018	3	20.2	22.3	0.3	57.2	
FD-SB-C4	3/22/2018	3	5.4	3.2	16.9	75.1	
FD-SB-C5	3/21/2018	3	4.8	13.0	5.0	76.9	
FD-SB-D1	4/11/2018	3	0.0	0.0	21.5	78.5	
FD-SB-D2	3/27/2018	3	9.9	5.0	10.6	75.5	
FD-SB-D3	3/26/2018	3	15.3	10.6	7.0	66.4	
FD-SB-D4	3/22/2018	3	34.6	20.3	4.8	41.2	
FD-SB-D5	3/21/2018	3	24.4	16.9	3.1	55.6	
FD-SB-E1	4/11/2018	3	0.0	0.0	21.5	78.5	
FD-SB-E2	3/27/2018	3	32.3	15.3	0.0	52.5	
FD-SB-E3	3/26/2018	3	23.6	13.5	7.5	55.7	
FD-SB-E4	3/22/2018	3	18.5	17.0	3.6	66.1	
FD-SB-E5	3/21/2018	3	19.6	18.7	2.9	58.8	
FD-SB-F1	4/12/2018	3	0.0	0.0	21.3	78.7	
FD-SB-F2	3/27/2018	3	34.0	13.3	0.2	52.3	CH ₄ dropped, possible pressure differential
FD-SB-F3	3/26/2018	3	34.5	19.6	0.1	45.9	
FD-SB-F4	3/21/2018	3	28.2	17.8	2.5	53.9	
FD-SB-F5	3/21/2018	3	10.0	6.4	12.3	70.9	
FD-SB-G1	4/12/2018	3	0.0	0.0	21.2	78.8	
FD-SB-G2	3/26/2018	3	9.0	10.3	NM	NM	
FD-SB-G3	3/26/2018	3	30.8	23.8	0.0	45.4	
FD-SB-G4	3/26/2018	2	21.2	18.0	2.5	58.0	
FD-SB-G5	3/21/2018	3	18.4	13.0	3.4	65.0	
TS-SB-01	4/12/2018	3	0.0	0.0	20.1	79.9	
TS-SB-02	4/12/2018	3	0.3	0.8	16.9	82.2	
TS-SB-03	4/12/2018	3	0.0	0.0	20.2	79.8	
TS-SB-05	4/13/2018	3	0.0	0.0	21.6	78.3	
TS-SB-06	4/13/2018	3	65.6	28.3	0.9	4.9	
TS-SB-07	4/13/2018	3	24.6	7.1	4.2	63.5	
TS-SB-08	4/13/2018	3	60.9	35.9	3.2	32.0	

Table 5
 Summary of Exceedances
 Solid Media - Freeway Dump
 Site Investigation Report
 Dakota County, Minnesota

Parameter	Analysis Location	Units	MPCA Screening Soil Leaching Values	MPCA Tier 2 Industrial Soil Reference Values	MPCA Tier 2 Recreational Soil Reference Values	Location	FD-SB-A1	FD-SB-A2	FD-SB-A3	FD-SB-A4	FD-SB-A5	FD-SB-B1	FD-SB-B2	FD-SB-B3	FD-SB-B4	FD-SB-B5	FD-SB-C1	FD-SB-C2	FD-SB-C3	FD-SB-C4	FD-SB-C5	FD-SB-D1	FD-SB-D2	FD-SB-D3	FD-SB-D4	FD-SB-D5
						Date	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/20/2018	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/20/2018	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/21/2018	4/11/2018	3/27/2018	3/26/2018	3/22/2018	3/21/2018
Sample Description	Depth	3 - 6 ft	10 - 20 ft	30 - 35 ft	26 - 32.5 ft	15 - 17 ft	11 - 13 ft	12 - 21 ft	5 - 26 ft	3 - 20 ft	11.5 - 23 ft	5 - 8 ft	5 - 17 ft	5 - 20 ft	5 - 20 ft	15 - 17.5 ft	11 - 16 ft	3 - 12 ft	4 - 16 ft	5 - 20 ft	5 - 16 ft	5 - 16 ft	5 - 16 ft	5 - 16 ft	5 - 16 ft	
		Ash	Ash	Native Soil	Native Soil	Waste	Waste	Waste	Waste	Waste	Native Soil	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	
Effective Date			06/01/2013	06/22/2009	06/22/2009																					
Exceedance Key			Bold	<u>Underline</u>	<i>Italic</i>																					
Metals																										
Antimony	Lab	mg/kg	5.4	100	16	--	--	--	--	41.0 *	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	Lab	mg/kg	5.8	20	11	21.7	23.3	--	--	19.0	--	14.8	16.1	12.2	9.7	6.0	15.9	7.9	6.5	14.3	10.1	--	--	15.1	11.6	
Barium	Lab	mg/kg	1700	18000	1100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	Lab	mg/kg	2.7	230	75	3.1	3.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Boron	Lab	mg/kg	62	47000	8000	265	238	524	742	238 *	--	196	216	112	296	--	85.7	75.4	87.4	--	--	--	--	62.7	--	
Cadmium	Lab	mg/kg	8.8	200	35	--	--	--	--	--	--	--	--	--	--	--	--	--	46.2	--	--	--	--	--	--	
Cobalt	Lab	mg/kg	27	2600	800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	37.4 *	--	--	--	--	
Copper	Lab	mg/kg	700	9000	100	--	--	--	--	137 *	--	--	--	474	--	--	--	119	--	228	--	--	--	--	--	
Iron	Lab	mg/kg	75000	12000	23000	35100	15500 *	--	99500 *	--	27900	40200	32100	13600	16800	66500	47000	42300	15900 *	19200	--	23000	65700	17600		
Lead	Lab	mg/kg	2700	700	300	--	308 *	--	453 *	--	--	--	575	--	557	--	989	724 *	--	--	--	--	--	--	369	
Manganese	Lab	mg/kg	130	8100	5000	159	161	423	310	3260 *	238	250	141	270	435	264	520	951	645	249	594	277	353	532	263	
Mercury	Lab	mg/kg	3.3 MC	1.5	1.2 MC	--	--	--	--	9.4	--	--	--	--	--	--	--	--	8.6	--	--	--	--	--	--	
Nickel	Lab	mg/kg	180	2500	800	--	--	--	--	1480 *	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Selenium	Lab	mg/kg	2.6	1300	200	--	5.4	--	--	--	--	3.9	5.3	3.5	--	--	--	--	--	--	--	--	--	2.6	--	
Vanadium	Lab	mg/kg	4.0	250	40	224	124	15.0	7.1	22.6	29.8	135	239	44.6	19.2	28.8	54.5	30.5	16.5	27.4	37.5	19.2	28.5	64.1	25.7	
Zinc	Lab	mg/kg	3000	75000	12000	--	--	--	--	3030 *	--	--	--	--	--	--	--	--	--	86700 *	--	--	--	--	--	
Semivolatile Organic Compounds																										
3,4-Methylphenol (m,p cresols)	Lab	ug/kg	42 MP	59000 MP	11000 MP	--	--	--	--	--	--	--	1120	--	--	--	--	--	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl)phthalate	Lab	ug/kg	29000	2100000	690000	--	--	--	--	483000 *	--	--	--	--	--	--	--	--	--	247000	--	--	40000	--	--	
Butyl benzyl phthalate	Lab	ug/kg	29000	3700000	623000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Naphthalene	Lab	ug/kg	4500	28000	24000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7710	
Semivolatile Organic Compounds by Selected Ion Monitoring																										
B(a)P Equivalent, non-detects at 0, 2002 PEFs	Barr Calculation	ug/kg	1400 T	3000 I	2000 T	--	17000	--	--	--	--	--	3900	3500	2100	--	21000	--	--	2200	5500	1400	--	5600	--	
B(a)P Equivalent, non-detects at 1/2, 2002 PEFs	Barr Calculation	ug/kg	1400 T	3000 I	2000 T	--	17000	--	--	--	--	--	4100	3500	2100	--	21000	--	--	2400	5500	1400	--	6000	--	
B(a)P Equivalent, non-detects at 1x, 2002 PEFs	Barr Calculation	ug/kg	1400 T	3000 I	2000 T	--	17000	--	--	--	--	--	4200	3500	2200	--	21000	--	--	2600	5500	1400	--	6400	--	
Naphthalene	Lab	ug/kg	4500	28000	24000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8120	--
Volatile Organic Compounds																										
1,2,4-Trichlorobenzene	Lab	ug/kg	230	985000	290000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	298	--	
1,2,4-Trimethylbenzene	Lab	ug/kg	2700	25000	20000	--	--	--	--	4970	--	--	--	6930	--	--	--	--	5820	--	--	5000	5480	--	--	
1,2-Dichlorobenzene	Lab	ug/kg	11000	75000	63000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
1,2-Dichloroethylene, cis	Lab	ug/kg	210	22000	19000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
1,3,5-Trimethylbenzene	Lab	ug/kg	2700	10000	8000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
1,4-Dichlorobenzene	Lab	ug/kg	170	50000	72000	--	--	--	--	1690	--	--	--	810	--	--	--	--	590	469	--	--	17100	262	--	
Benzene	Lab	ug/kg	17	10000	14000	--	--	256	1370	981	--	--	--	--	277	--	--	--	70.9	--	--	199	--	--		
Chlorobenzene	Lab	ug/kg	1200	32000	23000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	26400	--	--		
Ethyl benzene	Lab	ug/kg	1000	200000	200000	--	--	--	--	6520	--	--	--	1380	--	--	--	--	3310	--	--	1210	--	--		
Naphthalene	Lab	ug/kg	4500	28000	24000	--	--	--	--	7650	--	--	--	--	--	--	--	--	5570	--	--	8480	--	--		
Tetrachloroethylene	Lab	ug/kg	42	131000	145000	--	--	--	--	741	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Toluene	Lab	ug/kg	2500	305000	260000	--	--	--	--	3680	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Trichloroethylene (TCE)	Lab	ug/kg	2.3	46000	82000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Xylene, total	Lab	ug/kg	5400 M	130000 M	110000 M	--	--	--	--	7840	--	--	--	--	--	--	--	--	6550	--	--	--	--	14900	--	
Polychlorinated Biphenyls																										
Polychlorinated biphenyls	Lab	ug/kg	130	8000	1400	--	--	--	--	686	--	--	551	4220	--	1410	178	144	45200	2350	--	--	2190	398	1160	
Herbicides																										
Pentachlorophenol	Lab	mg/kg	0.023	120	80	--	0.30	--	--	--	--	--	--	--	--	--	--	--	0.085	--	--	--	--	--	--	

Table 5
 Summary of Exceedances
 Solid Media - Freeway Dump
 Site Investigation Report
 Dakota County, Minnesota

Parameter	Analysis Location	Units	Location			FD-SB-E1	FD-SB-E2	FD-SB-E3	FD-SB-E4	FD-SB-E5	FD-SB-F1	FD-SB-F2	FD-SB-F3	FD-SB-F4	FD-SB-F5	FD-SB-G1	FD-SB-G2	FD-SB-G3	FD-SB-G4	FD-SB-G5
			MPCA Screening Soil Leaching Values	MPCA Tier 2 Industrial Soil Reference Values	MPCA Tier 2 Recreational Soil Reference Values	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date
Sample Description	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
Sample Description	Waste	Ash	Ash	Waste	Waste	Ash	Waste	Waste	Ash	Waste	Waste	Waste	Waste	Waste	Fill Soil	Waste	Waste	Native Soil	Waste	
Effective Date			06/01/2013	06/22/2009	06/22/2009															
Exceedance Key			Bold	<u>Underline</u>	<i>Italic</i>															
Metals																				
Antimony	Lab	mg/kg	5.4	100	16	--	--	--	--	--	17.1	--	--	--	--	--	--	--	--	--
Arsenic	Lab	mg/kg	5.8	20	11	--	<u>21.1</u>	16.9	9.7	11.3	<u>22.5</u>	<u>20.9</u>	<u>20.6</u>	12.1	<u>21.9</u>	13.3	<u>28.4</u>	13.8	--	--
Barium	Lab	mg/kg	1700	18000	1100	--	--	--	1510	--	--	--	--	--	--	--	--	--	--	--
Beryllium	Lab	mg/kg	2.7	230	75	--	--	2.9	--	--	3.2	--	--	2.7	--	3.0	--	--	--	--
Boron	Lab	mg/kg	62	47000	8000	--	439	188	99.3	89.4	802	157	163	128	120	--	1930	163	124	114
Cadmium	Lab	mg/kg	8.8	200	35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	Lab	mg/kg	27	2600	800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	Lab	mg/kg	700	9000	100	--	--	--	207	--	--	--	--	334	--	--	--	--	--	244
Iron	Lab	mg/kg		<u>75000</u>	12000	24800	31500	36000	28800	48700	34200	37700	43500	<u>162000</u>	31000	--	39400	42300	--	<u>168000</u>
Lead	Lab	mg/kg	2700	700	300	--	--	--	--	<u>1010</u>	--	--	352	424	--	--	--	--	311	--
Manganese	Lab	mg/kg	130	8100	5000	360	173	146	1640	521	185	330	230	1060	174	323	188	225	834	804
Mercury	Lab	mg/kg	3.3 MC	1.5	1.2 MC	--	--	--	--	--	--	--	1.5	--	--	--	--	--	--	1.5
Nickel	Lab	mg/kg	180	2500	800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	Lab	mg/kg	2.6	1300	200	--	5.1	5.6	--	--	5.7	4.9	4.2	--	6.2	--	7.4	3.5	--	--
Vanadium	Lab	mg/kg	4.0	<u>250</u>	40	24.4	<u>301</u>	86.8	50.3	39.0	117	121	76.5	14.9	83.8	17.6	120	54.0	12.0	20.2
Zinc	Lab	mg/kg	3000	<u>75000</u>	12000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Semivolatile Organic Compounds																				
3,4-Methylphenol (m,p cresols)	Lab	ug/kg	42 MP	59000 MP	11000 MP	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl)phthalate	Lab	ug/kg	29000	2100000	690000	--	--	--	--	--	118000	--	--	--	--	--	--	45300	--	--
Butyl benzyl phthalate	Lab	ug/kg	29000	3700000	623000	--	--	--	--	--	--	--	468000	--	--	--	--	--	--	--
Naphthalene	Lab	ug/kg	4500	<u>28000</u>	24000	--	--	--	--	10800	--	--	--	--	--	--	66500	--	--	--
Semivolatile Organic Compounds by Selected Ion Monitoring																				
B(a)P Equivalent, non-detects at 0, 2002 PEFs	Barr Calculation	ug/kg	1400 T	<u>3000 I</u>	2000 T	--	--	--	--	<u>20000</u>	--	--	1400	<u>3200</u>	--	--	--	110000	--	--
B(a)P Equivalent, non-detects at 1/2, 2002 PEFs	Barr Calculation	ug/kg	1400 T	<u>3000 I</u>	2000 T	--	--	--	--	<u>20000</u>	--	--	1400	<u>3700</u>	--	--	--	110000	--	--
B(a)P Equivalent, non-detects at 1x, 2002 PEFs	Barr Calculation	ug/kg	1400 T	<u>3000 I</u>	2000 T	--	--	--	--	<u>20000</u>	--	--	1400	<u>4200</u>	--	--	--	110000	--	--
Naphthalene	Lab	ug/kg	4500	<u>28000</u>	24000	--	--	--	--	19600	--	--	--	--	--	--	--	42700	--	--
Volatile Organic Compounds																				
1,2,4-Trichlorobenzene	Lab	ug/kg	230	985000	290000	--	--	--	--	--	--	4380	--	470	--	--	--	--	--	--
1,2,4-Trimethylbenzene	Lab	ug/kg	2700	25000	20000	--	--	--	--	--	--	17000	--	3200	--	--	--	--	--	--
1,2-Dichlorobenzene	Lab	ug/kg	11000	<u>75000</u>	63000	--	--	--	--	--	--	<u>79700</u>	--	--	--	--	--	--	--	--
1,2-Dichloroethylene, cis	Lab	ug/kg	210	22000	19000	--	--	--	--	--	--	--	--	--	--	263	--	--	--	--
1,3,5-Trimethylbenzene	Lab	ug/kg	2700	10000	8000	--	--	--	--	--	--	5920	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	Lab	ug/kg	170	50000	72000	--	--	--	192	433	--	--	32700	--	547	--	--	--	--	--
Benzene	Lab	ug/kg	17	10000	14000	--	--	--	211	--	--	--	142	--	--	--	--	--	--	--
Chlorobenzene	Lab	ug/kg	1200	32000	23000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethyl benzene	Lab	ug/kg	1000	200000	200000	--	--	--	--	--	--	12200	--	--	--	--	--	--	--	--
Naphthalene	Lab	ug/kg	4500	<u>28000</u>	24000	--	--	--	--	--	--	<u>41000</u>	--	11200	--	--	--	--	--	--
Tetrachloroethylene	Lab	ug/kg	42	131000	145000	--	--	--	125	--	--	--	5880	--	--	363	--	--	--	--
Toluene	Lab	ug/kg	2500	305000	260000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethylene (TCE)	Lab	ug/kg	2.3	46000	82000	--	--	--	82.5 *	--	--	--	--	--	--	--	--	--	--	--
Xylene, total	Lab	ug/kg	5400 M	130000 M	110000 M	--	--	--	--	--	--	13700	--	--	--	--	--	--	--	--
Polychlorinated Biphenyls																				
Polychlorinated biphenyls	Lab	ug/kg	130	<u>8000</u>	1400	231	--	--	421	<u>17900</u>	--	1740	2200	2570	<u>8510</u>	--	134	1750	1020	<u>15200</u>
Herbicides																				
Pentachlorophenol	Lab	mg/kg	0.023	120	80	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 5
 Summary of Exceedances
 Solid Media - Freeway Dump
 Site Investigation Report
 Dakota County, Minnesota

Parameter	Analysis Location	Units	MPCA Screening Soil Leaching Values	MPCA Tier 2 Industrial Soil Reference Values	MPCA Tier 2 Recreational Soil Reference Values	Location	FD-TT-01	FD-TT-02	FD-TT-03	FD-TT-05	FD-TT-06	FD-TT-07	FD-TT-08	FD-TT-09	FD-TT-10	FD-TT-11	FD-TT-12	FD-TT-13	FD-TT-14
						Date	4/11/2018	4/11/2018	4/11/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/17/2018	4/17/2018	4/17/2018	4/17/2018	4/17/2018	4/17/2018
Sample Description						Depth	10 - 12 ft	7 - 9 ft	2 - 5 ft	4 - 9 ft	2 - 5 ft	6 - 11 ft	5 - 12 ft	4 - 12 ft	2 - 10 ft	4 - 12 ft	3 - 12 ft	3 - 12 ft	2 - 12 ft
						Waste	Waste	Ash	Ash	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste
Effective Date			06/01/2013	06/22/2009	06/22/2009														
Exceedance Key			Bold	<u>Underline</u>	<i>Italic</i>														
Metals																			
Antimony	Lab	mg/kg	5.4	100	16	--	13.3	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	Lab	mg/kg	5.8	<u>20</u>	11	11.6	<u>22.8</u>	<u>24.9</u>	14.8	18.3	12.6	<u>37.0</u>	12.7	13.6	13.6	17.3	5.8	12.7	
Barium	Lab	mg/kg	1700	18000	1100	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	Lab	mg/kg	2.7	230	75	--	--	3.6	--	--	--	--	--	--	--	2.9	--	--	
Boron	Lab	mg/kg	62	47000	8000	134	114	145	106	192	95.1	138	75.3	74.9	65.4	198	167	99.2	
Cadmium	Lab	mg/kg	8.8	200	35	--	--	--	--	--	--	13.7	--	--	--	--	--	--	
Cobalt	Lab	mg/kg	27	2600	800	--	--	--	--	--	--	--	--	--	--	--	--	--	
Copper	Lab	mg/kg	700	9000	100	--	166	--	--	1660	507	193	--	--	--	--	--	--	
Iron	Lab	mg/kg		<u>75000</u>	12000	36800	<u>116000</u>	35900	26400	31800	61000	53400	33200	22800	27800	38800	72600	31700	
Lead	Lab	mg/kg	2700	<u>700</u>	300	--	578	--	--	--	338	558	--	--	<u>6520</u>	--	--	--	
Manganese	Lab	mg/kg	130	8100	5000	291	868	194	365	251	447	382	328	293	238	145	806	408	
Mercury	Lab	mg/kg	3.3 MC	1.5	1.2 MC	--	--	--	--	1.7	--	--	--	--	--	--	--	--	
Nickel	Lab	mg/kg	180	2500	800	--	--	--	--	489	--	--	--	--	--	--	--	--	
Selenium	Lab	mg/kg	2.6	1300	200	2.9	--	--	--	3.7	--	4.5	--	--	--	5.4	--	2.8	
Vanadium	Lab	mg/kg	4.0	<u>250</u>	40	132	44.9	121	76.5	69.5	41.4	96.5	42.0	63.3	49.0	81.3	22.1	63.1	
Zinc	Lab	mg/kg	3000	<u>75000</u>	12000	--	--	--	--	--	--	--	--	--	--	--	--	--	
Semivolatile Organic Compounds																			
3,4-Methylphenol (m,p cresols)	Lab	ug/kg	42 MP	59000 MP	11000 MP	--	--	--	--	--	--	--	--	--	--	--	--	--	
Bis(2-ethylhexyl)phthalate	Lab	ug/kg	29000	2100000	690000	--	--	--	--	--	--	--	--	--	--	--	125000	--	
Butyl benzyl phthalate	Lab	ug/kg	29000	3700000	623000	--	--	--	--	--	--	--	--	--	--	--	--	--	
Naphthalene	Lab	ug/kg	4500	<u>28000</u>	24000	--	--	--	--	--	--	--	--	--	--	--	--	--	12200
Semivolatile Organic Compounds by Selected Ion Monitoring																			
B(a)P Equivalent, non-detects at 0, 2002 PEFs	Barr Calculation	ug/kg	1400 T	<u>3000 T</u>	2000 T	--	--	--	--	--	1700	--	--	2200	<u>4300</u>	--	--	<u>36000</u>	
B(a)P Equivalent, non-detects at 1/2, 2002 PEFs	Barr Calculation	ug/kg	1400 T	<u>3000 T</u>	2000 T	--	--	--	--	--	1700	--	--	2200	<u>4300</u>	--	--	<u>36000</u>	
B(a)P Equivalent, non-detects at 1x, 2002 PEFs	Barr Calculation	ug/kg	1400 T	<u>3000 T</u>	2000 T	--	--	--	--	--	1700	--	--	2200	<u>4300</u>	--	--	<u>36000</u>	
Naphthalene	Lab	ug/kg	4500	<u>28000</u>	24000	--	--	--	--	--	--	--	--	--	--	--	--	--	14700
Volatile Organic Compounds																			
1,2,4-Trichlorobenzene	Lab	ug/kg	230	985000	290000	--	--	--	--	--	--	--	--	--	--	--	--	--	
1,2,4-Trimethylbenzene	Lab	ug/kg	2700	25000	20000	--	--	--	--	--	--	--	--	--	--	--	--	--	
1,2-Dichlorobenzene	Lab	ug/kg	11000	<u>75000</u>	63000	--	--	--	--	--	--	--	--	--	--	--	--	--	
1,2-Dichloroethylene, cis	Lab	ug/kg	210	22000	19000	--	--	--	--	--	--	--	--	--	--	--	--	--	
1,3,5-Trimethylbenzene	Lab	ug/kg	2700	10000	8000	--	--	--	--	--	--	--	--	--	--	--	--	--	
1,4-Dichlorobenzene	Lab	ug/kg	170	50000	72000	--	--	--	--	--	--	--	--	--	--	--	--	--	194
Benzene	Lab	ug/kg	17	10000	14000	--	--	--	--	--	--	818	--	37.4	--	73.8	--	--	
Chlorobenzene	Lab	ug/kg	1200	32000	23000	--	--	--	--	--	--	--	--	--	--	--	--	--	
Ethyl benzene	Lab	ug/kg	1000	200000	200000	--	--	--	--	--	--	--	--	--	--	--	--	--	
Naphthalene	Lab	ug/kg	4500	<u>28000</u>	24000	--	--	--	--	--	--	--	--	--	--	--	--	--	6210
Tetrachloroethylene	Lab	ug/kg	42	131000	145000	98.0	122	--	--	--	--	--	422	--	--	--	--	--	
Toluene	Lab	ug/kg	2500	305000	260000	--	--	--	--	--	--	--	--	--	--	--	--	--	
Trichloroethylene (TCE)	Lab	ug/kg	2.3	46000	82000	--	--	--	--	--	--	--	--	--	--	--	--	--	
Xylene, total	Lab	ug/kg	5400 M	130000 M	110000 M	--	--	--	--	--	--	--	--	--	--	--	--	--	
Polychlorinated Biphenyls																			
Polychlorinated biphenyls	Lab	ug/kg	130	<u>8000</u>	1400	864	<u>9040</u>	--	--	--	3780	2880	545	--	<u>61100</u>	759	<u>44200</u>	3290	
Herbicides																			
Pentachlorophenol	Lab	mg/kg	0.023	120	80	--	--	--	--	--	--	--	--	--	--	--	--	--	

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

--	Sample analyzed; result does not exceed criteria for this parameter
*	Estimated value, QA/QC criteria not met.

MPCA Screening Soil Leaching Values

CR6	Value represents the criteria for Chromium, hexavalent.
M	Value represents the criteria for mixed Xylenes.
MC	Mercury as Mercuric Chloride.
MP	Value represents the criteria for p-cresol.
T	Value represents a criteria for the total carcinogenic PAHs as BaP.

MPCA Tier 2 Industrial Soil Reference Values

CR6	Value represents the criteria for Chromium, hexavalent.
M	Value represents the criteria for mixed Xylenes.
MP	Value represents the criteria for p-cresol.
T	Value represents a criteria for the total carcinogenic PAHs as BaP.

MPCA Tier 2 Recreational Soil Reference Values

CR6	Value represents the criteria for Chromium, hexavalent.
M	Value represents the criteria for mixed Xylenes.
MC	Mercury as Mercuric Chloride.
MP	Value represents the criteria for p-cresol.
T	Value represents a criteria for the total carcinogenic PAHs as BaP.

Table 6
 Summary of Exceedances
 Water - Freeway Dump
 Site Investigation Reports
 Dakota County, Minnesota

Parameter	Total or Dissolved	Analysis Location	Units	Location Date				FD-SB-A2	FD-SB-A3	FD-SB-A3	FD-SB-A4	FD-SB-A5	FD-SB-B3	FD-SB-B4	FD-SB-B4	FD-SB-B4	FD-SB-B5	FD-SB-D4	FD-SB-D5	FD-SB-D5		FD-SB-E5	FD-TT-06	FD-TT-10
				Drinking Water Standards		Surface Water Standards		3/28/2018	3/26/2018	3/29/2018	3/26/2018	3/21/2018	3/28/2018	3/23/2018	3/26/2018	3/29/2018	3/21/2018	3/23/2018	3/21/2018	3/29/2018		3/22/2018	4/12/2018	4/17/2018
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FR	N
Effective Date				04/01/2012	04/23/2018	01/24/2012	01/24/2012																	
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	<i>Shade</i>																	
General Parameters																								
Chlorine dioxide	NA	Lab	mg/l	0.8 (11)				ns	ns	ns	ns	--	--	ns	ns	ns	ns	ns	ns	1.1 h	0.81 h	--	1.6 h	ns
Cyanide	NA	Lab	ug/l	200		<u>5.2 (5)</u>	<i>45 (5)</i>	ns	<u>17.3</u>	ns	ns	<i>52.0</i>	<u>26.8</u>	ns	<u>11.0</u>	ns	<u>12.4</u>	<u>26.0</u>	<u>20.6</u>	ns	ns	<u>13.2</u>	--	<u>13.4</u>
Nitrogen, ammonia, as N	NA	Lab	mg/l			<u>0.04 (3)</u>		ns	<u>46.9</u>	ns	ns	<u>72.7</u>	<u>32.8 *</u>	<u>32.4</u>	ns	ns	<u>8.1</u>	<u>99.2</u>	<u>15.5</u>	ns	ns	<u>2.0 *</u>	<u>5.4</u>	<u>0.11</u>
Nitrogen, unionized ammonia, as N	NA	Lab	mg/l			<u>0.04</u>		ns	ns	ns	ns	<u>0.052</u>	ns	ns	ns	ns	<u>0.15</u>	ns	ns	ns	ns	--	--	
pH	NA	Lab	pH units			<u>6.5 - 9.0</u>		ns	--	ns	ns	--	--	ns	ns	--	--	--	--	ns	ns	--	--	--
pH	NA	Field	pH units			<u>6.5 - 9.0</u>		ns	ns	ns	ns	--	--	ns	ns	--	--	ns	ns	ns	ns	--	<u>5.9</u>	
Turbidity	NA	Lab	NTU	5 (16)		<u>25</u>		ns	520	ns	ns	145	416	18400	ns	ns	200	309	302	ns	ns	5.0	315	388
Metals																								
Aluminum	Dissolved	Lab	ug/l			<u>125</u>	2145	ns	--	ns	ns	--	--	--	ns	ns	--	--	--	ns	ns	--	<u>1610</u>	--
Arsenic	Dissolved	Lab	ug/l	10		<u>2.0</u>	720	ns	--	ns	ns	--	--	<u>3.5</u>	ns	ns	--	<u>8.1</u>	<u>7.8</u>	ns	ns	--	<u>2.4</u>	--
Beryllium	Dissolved	Lab	ug/l	4	<i>0.08 HRL93</i>			ns	--	ns	ns	--	--	--	ns	ns	--	--	--	ns	ns	--	<u>0.21</u>	--
Boron	Dissolved	Lab	ug/l		<i>500 RAA17</i>			ns	33000	ns	ns	399000	51900	15200	ns	ns	10700	19500	15600	ns	ns	1690 *	6600	7030
Cadmium	Dissolved	Lab	ug/l	5	<i>0.5 HRL15 (1)</i>	2.8 HD CF	270 HD CF	ns	--	ns	ns	--	--	--	ns	ns	--	--	--	ns	ns	--	<u>0.65</u>	<u>0.93</u>
Chromium	Dissolved	Lab	ug/l	100	100 CR HRL93	<u>11 CF CR6</u>	31 CF CR6	ns	--	ns	ns	<u>22.2</u>	--	--	ns	ns	--	--	<u>14.2</u>	ns	ns	--	--	--
Cobalt	Dissolved	Lab	ug/l			<u>2.8</u>	872	ns	--	ns	ns	--	<u>3.8</u>	--	ns	ns	--	--	--	ns	ns	--	<u>4.6</u>	<u>4.1</u>
Copper	Dissolved	Lab	ug/l	1300 TT(12)		<u>21 HD CF</u>	110 HD CF	ns	--	ns	ns	--	--	--	ns	ns	--	--	--	ns	ns	--	<u>54.1</u>	<u>26.6</u>
Lead	Dissolved	Lab	ug/l	15 TT(12)		<u>13 HD CF</u>	6600 HD CF	ns	--	ns	ns	--	--	--	ns	ns	--	--	64.8	ns	ns	--	21.5	--
Manganese	Dissolved	Lab	ug/l		<i>100 HRL93 (1)</i>			ns	623	ns	ns	267	--	1300	ns	ns	361	351	801	ns	ns	719	738	496
Nickel	Dissolved	Lab	ug/l		<i>100 HRL93</i>	460 HD CF	8400 HD CF	ns	--	ns	ns	--	--	--	ns	ns	--	--	--	ns	ns	--	--	<u>159</u>
Selenium	Dissolved	Lab	ug/l	50	<i>30 HRL93</i>	<u>5.0</u>	<u>40</u>	ns	--	ns	ns	--	--	--	ns	ns	--	--	--	ns	ns	--	--	<u>44.0</u>
Thallium	Dissolved	Lab	ug/l	2	<i>0.6 HRL94</i>	<u>0.28</u>	128	ns	--	ns	ns	--	--	--	ns	ns	--	--	--	ns	ns	--	<u>0.61</u>	<u>0.57</u>
Vanadium	Dissolved	Lab	ug/l		<i>50 HRL94</i>			ns	--	ns	ns	102	--	--	ns	ns	--	--	--	ns	ns	--	--	--
Zinc	Dissolved	Lab	ug/l		<i>2000 HRL94</i>	<u>310 HD CF</u>	680 HD CF	ns	--	ns	ns	--	--	--	ns	ns	--	--	--	ns	ns	--	--	<u>509</u>
Chromium	Total	Lab	ug/l	100	100 CR HRL93	<u>11 CR6</u>	32 CR6	ns	--	ns	ns	--	--	<u>20.0</u>	ns	ns	ns	--	ns	ns	ns	ns	<u>14.6</u>	<u>22.7</u>
Chromium, hexavalent	Total	Lab	mg/l	0.1 (14)	0.1 HRL93	<u>0.011</u>	<u>0.032</u>	ns	--	ns	ns	--	--	<u>0.060 **</u>	ns	ns	--	--	--	ns	ns	--	<u>0.011 **</u>	--
Semivolatile Organic Compounds																								
1,4-Dioxane	NA	Lab	ug/l		<i>1 HRL13 (1)</i>			ns	37	ns	40	160	79	87	ns	ns	10	22	11	ns	ns	8.0	8.4	--
Volatile Organic Compounds																								
1,2-Dichloroethane	NA	Lab	ug/l	5	<i>1 HRL13 (1)</i>	<u>3.8</u>	90100 (1)	--	--	ns	--	--	<u>12</u>	--	ns	ns	--	--	--	ns	ns	--	--	--
Acrylamide	NA	Lab	ug/l	TT(2)	<i>0.2 HRL15 (1)</i>			ns	ns	ns	ns	--	--	<u>ns</u>	ns	ns	ns	ns	ns	<u>841</u>	--	--	--	--
Benzene	NA	Lab	ug/l	5	<i>2 HRL09 (1)</i>	<u>6.0</u>	8974 (1)	--	<u>9.8</u>	ns	<u>14</u>	<u>10</u>	<u>30</u>	<u>7.6</u>	ns	ns	--	<u>10</u>	--	ns	ns	--	<u>2.7</u>	--
Chlorobenzene	NA	Lab	ug/l	100	100 HRL93	<u>20</u>	846	--	--	ns	--	--	<u>20</u>	--	ns	ns	--	--	--	ns	ns	--	--	--
Ethyl benzene	NA	Lab	ug/l	700	<i>50 HRL11</i>	<u>68</u>	3717	--	--	ns	--	--	<u>1000</u>	--	ns	ns	--	--	--	ns	ns	--	--	--
Tetrahydrofuran	NA	Lab	ug/l		<i>600 HBV16</i>			--	--	ns	--	--	<u>4600</u>	--	ns	ns	--	--	--	ns	ns	--	--	--
Toluene	NA	Lab	ug/l	1000	<i>200 HRL11</i>	<u>253</u>	2703	--	--	ns	--	--	<u>1100</u>	--	ns	ns	--	--	--	ns	ns	--	--	--
Trichloroethylene (TCE)	NA	Lab	ug/l	5 (9)	<i>0.4 HRL15 (1)</i>	<u>25</u>	13976	--	--	ns	--	--	--	--	ns	ns	--	--	--	ns	ns	--	--	<u>1.0</u>
Vinyl chloride	NA	Lab	ug/l	2	<i>0.2 HRL09 (1)</i>	<u>0.18</u>	(1)	<u>0.68</u>	--	ns	--	<u>0.37</u>	<u>0.45</u>	--	ns	ns	--	--	--	ns	ns	--	--	--
Xylene, m & p	NA	Lab	ug/l	10000 (15)	<i>300 XYL HRL11 (1)</i>			--	--	ns	--	--	<u>3300</u>	--	ns	ns	--	--	--	ns	ns	--	--	--
Xylene, o	NA	Lab	ug/l	10000 (15)	<i>300 XYL HRL11 (1)</i>			--	--	ns	--	--	<u>870</u>	--	ns	ns	--	--	--	ns	ns	--	--	--
Radiochemical Parameters																								
Gross Alpha (radiation)	NA	Lab	pCi/l	15				ns	ns	ns	ns	--	--	ns	ns	ns	ns	ns	ns	--	--	--	--	29.2 +/- 8.77
Gross Beta (radiation)	NA	Lab	pCi/l	50(+)				ns	ns	ns	ns	142 +/- 26.9	98.4 +/- 18.0	ns	ns	ns	ns	ns	ns	48.2 +/- 9.69	57.2 +/- 10.7	--	--	--
Per- and Polyfluoroalkyl Substances																								
Perfluorooctanesulfonate (PFOS)	NA	Lab	ug/l		<i>0.027 HBV17</i>			ns	<i>0.48</i>	ns	<i>0.19</i>	<i>0.17</i>	<i>4.1</i>	<i>0.13</i>	ns	ns	--	<i>0.63</i>	<i>0.28</i>	ns	ns	--	<i>0.23</i>	<i>0.041</i>
Perfluorooctanoic acid (PFOA)	NA	Lab	ug/l		<i>0.035 HBV17</i>			ns	<i>1.5</i>	ns	<i>0.53</i>	<i>2.1</i>	<i>7.3</i>	<i>1.4</i>	ns	ns	<i>1.0</i>	<i>3.9</i>	<i>25</i>	ns	ns	<i>0.19</i>	<i>0.79</i>	--

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

--	Sample analyzed; result does not exceed the criteria for this parameter
FR	Sample Type: Field Replicate
N	Sample Type: Normal
NA	NA (not applicable) indicates that a fractional portion of the sample is not part of the analytical testing or field collection procedures.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
h	EPA recommended sample preservation, extraction or analysis holding time was exceeded.
ns	Sample not analyzed for this parameter.

EPA Maximum Contaminant Levels

TT(2)	When Acrylamide is used in drinking water systems, the combination (or product) of dose and monomer level shall not exceed that equivalent to a polyacrylamide polymer containing 0.05% monomer dosed at 1 mg/l.
TT(12)	Copper action level 1.3 mg/l; lead action level 0.015 mg/l.
(9)	Under review.
(11)	1998 Final Rule for Disinfectants and Disinfection By-products: MRDLG=Maximum Residual Disinfection Level Goal; and MRDL=Maximum Residual Disinfection Level.
(14)	Based on the criteria for chromium, total.
(15)	Based on the criteria for xylenes, total.
(16)	At no time can turbidity go above 5 NTU.
(+)	This MCL is no longer an official regulatory level, but is still in use as a trigger for EPA. The actual MCL for Beta is 4 mrem/year but there is no simple conversion between a curie and a rem.

MDH Human Health-Based Water Guidance Table

(1)	Value is representative of the lowest exposure duration published in the Minnesota Department of Health Human Health Advisory Table.
CR	Value represents the criteria for Chromium, hexavalent.
HBV16	Health Based Value 2016.
HBV17	Health Based Value 2017.
HRL09	Health Risk Limit 2009.
HRL11	Health Risk Limit 2011.
HRL13	Health Risk Limit 2013.
HRL15	Health Risk Limit 2015.
HRL93	Health Risk Limit 1993.
HRL94	Health Risk Limit 1994.
RAA17	Risk Assessment Advice 2008.
XYL	Value shown is for the sum of the mixed o,m and p Xylene isomers.

Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness*

(3)	Value represents the criteria for Ammonia, unionized as N.
(5)	Value based on the criteria for cyanide, free.
CF	Conversion Factor.
CR6	Value represents the criteria for Hexavalent Chromium.
HD	Hardness Dependent.

* Estimated concentrations based on same underlying assumptions of conservative transport mechanisms and same source area. Minnesota River hardness data from MPCA, 2006. Working Draft, Surface Water Pathway Evaluation user's Guide, Appendix E.

Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness*

(1)	Subpart 7, item E applies.
(5)	Value based on the criteria for cyanide, free.
CF	Conversion Factor.
CR6	Value represents the criteria for Hexavalent Chromium.
HD	Hardness Dependent.

* Estimated concentrations based on same underlying assumptions of conservative transport mechanisms and same source area. Minnesota River hardness data from MPCA, 2006. Working Draft, Surface Water Pathway Evaluation user's Guide, Appendix E.

Table 7
Summary of Exceedances
Solid Media - Freeway Landfill and Transfer Station
 Site Investigation Reports
 Dakota County, Minnesota

Parameter	Analysis Location	Units	Location																	
			FL-TT-01	FL-TT-02	FL-TT-03	FL-TT-04	FL-TT-05	FL-TT-06	FL-TT-07	FL-TT-08	TS-SB-01	TS-SB-02	TS-SB-03	TS-SB-04	TS-SB-05	TS-SB-06	TS-SB-07	TS-SB-08		
Effective Date	Date	Depth	Sample Description	Waste	Waste	Waste	Waste	Waste	Waste	Native Soil	Native Soil	Waste	Waste	Fill Soil	Waste	Waste	Waste	Waste	Fill Soil	Waste
Parameter	Location	Units	MPCA Screening Soil Leaching Values	MPCA Tier 2 Industrial Soil Reference Values	MPCA Tier 2 Recreational Soil Reference Values															
Effective Date			06/01/2013	06/22/2009	06/22/2009															
Exceedance Key			Bold	<u>Underline</u>	<i>Italic</i>															
Metals																				
Antimony	Lab	mg/kg	5.4			--	6.4	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	Lab	mg/kg	5.8	<u>20</u>	11	--	26.8	11.9	8.9	8.1	--	6.3	--	--	--	--	11.4	--	--	--
Boron	Lab	mg/kg	62			--	234	109 *	--	73.4	--	--	--	--	--	--	--	--	--	--
Cadmium	Lab	mg/kg	8.8		35	--	--	38.6	--	--	--	--	--	--	--	--	--	--	--	--
Copper	Lab	mg/kg			100	--	280	448 *	102	175	--	--	--	--	--	--	--	341	--	--
Iron	Lab	mg/kg		<u>75000</u>	12000	--	107000	166000	26700	22000	--	23300	22500	12500	--	--	--	27600	--	--
Lead	Lab	mg/kg			300	--	611	691 **	--	--	--	--	--	--	--	--	579	436	--	--
Manganese	Lab	mg/kg	130			402	994	596 *	531	522	498	999	470	455	258	282	318	723	247	300
Selenium	Lab	mg/kg	2.6			--	2.8	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	Lab	mg/kg	7.9			--	--	26.3	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	Lab	mg/kg	4.0		40	24.8	44.3	40.2	38.0	30.7	30.3	29.8	34.2	19.1	16.3	18.3	19.3	19.5	13.1	19.7
Semivolatile Organic Compounds																				
Bis(2-ethylhexyl)phthalate	Lab	ug/kg	29000			--	--	--	--	--	--	--	--	--	--	--	--	--	--	100000
Butyl benzyl phthalate	Lab	ug/kg	29000	<u>3700000</u>	623000	--	--	4230000	--	--	--	--	--	--	--	--	--	--	--	--
Semivolatile Organic Compounds by Selected Ion Monitoring																				
B(a)P Equivalent, non-detects at 0, 2002 PEFs	Barr Calculation	ug/kg	1400 T	<u>3000 I</u>	2000 T	15000	--	--	--	--	--	--	--	--	2900	--	--	4400	--	1900
B(a)P Equivalent, non-detects at 1/2, 2002 PEFs	Barr Calculation	ug/kg	1400 T	<u>3000 I</u>	2000 T	15000	--	--	--	--	--	--	--	--	2900	--	--	4400	--	1900
B(a)P Equivalent, non-detects at 1x, 2002 PEFs	Barr Calculation	ug/kg	1400 T	<u>3000 I</u>	2000 T	15000	--	--	--	--	--	--	--	--	2900	--	--	4400	--	1900
Volatile Organic Compounds																				
1,1,2,2-Tetrachloroethane	Lab	ug/kg	12			--	--	--	--	--	--	--	--	--	--	--	--	138	--	--
1,4-Dichlorobenzene	Lab	ug/kg	170			--	255	175	--	443	--	--	415	--	--	--	--	--	--	512
Benzene	Lab	ug/kg	17			--	54.0	--	--	--	--	--	--	--	--	--	--	58.1	--	--
Naphthalene	Lab	ug/kg	4500			--	--	--	--	--	--	--	--	--	--	--	--	--	--	4880
Tetrachloroethylene	Lab	ug/kg	42			--	--	178 *	--	--	--	--	--	--	--	--	--	--	--	--
Polychlorinated Biphenyls																				
Polychlorinated biphenyls	Lab	ug/kg	130	<u>8000</u>	1400	--	4990	11300	633	1230	--	--	--	--	--	--	150	--	--	--

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

--	Sample analyzed; result does not exceed the criteria for this parameter
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.

MPCA Screening Soil Leaching Values

CR6	Value represents the criteria for Chromium, hexavalent.
T	Value represents a criteria for the total carcinogenic PAHs as BaP.

MPCA Tier 2 Industrial & Recreational Soil Reference Values

T	Value represents a criteria for the total carcinogenic PAHs as BaP.
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Table 8
Summary of Exceedances
Water - Freeway Landfill and Transfer Station
 Site Investigation Reports
 Dakota County, Minnesota

Parameter	Total or Dissolved	Analysis Location	Units	Location Date		FL-TT-02	FL-TT-03	FL-TT-04	FL-TT-05	FL-TT-07	FL-TT-08	TS-SB-02	TS-SB-05	TS-SB-07	TS-SB-08	
				04/01/2012	04/23/2018	4/18/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/20/2018	4/12/2018	4/13/2018	4/13/2018	4/13/2018	
				Drinking Water Standards		Surface Water Standards										
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness									
Effective Date				04/01/2012	04/23/2018	01/24/2012	01/24/2012									
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade									
General Parameters																
Chloride	NA	Lab	mg/l			<u>230</u>	1720	--	--	--	--	ns	ns	ns	ns	<u>820</u>
Chlorine dioxide	NA	Lab	mg/l	0.8 (11)				--	0.83 h	0.88 h	1.5 h	--	ns	ns	ns	--
Cyanide	NA	Lab	ug/l	200		<u>5.2 (5)</u>	45 (5)	<u>22.0</u>	--	--	--	--	16.3	ns	ns	<u>41.3</u>
Nitrogen, ammonia, as N	NA	Lab	mg/l			<u>0.04 (3)</u>		<u>10.6</u>	<u>5.0</u>	<u>7.8</u>	<u>4.5</u>	<u>9.7</u>	<u>11.1</u>	ns	ns	<u>95.2</u>
Nitrogen, unionized ammonia, as N	NA	Lab	mg/l			<u>0.04</u>		--	--	--	--	--	--	ns	ns	<u>0.18</u>
pH	NA	Lab	pH units			<u>6.5 - 9.0</u>		<u>6.3 h</u>	--	--	--	--	--	ns	ns	--
pH	NA	Field	pH units			<u>6.5 - 9.0</u>		<u>5.9</u>	<u>5.6</u>	<u>5.9</u>	<u>6.3</u>	<u>6.2</u>	<u>6.0</u>	ns	ns	--
Turbidity	NA	Lab	NTU	5 (16)		<u>25</u>		<u>620</u>	<u>156</u>	<u>246</u>	<u>196</u>	<u>152</u>	<u>1460 *</u>	ns	ns	<u>260</u>
Metals																
Aluminum	Dissolved	Lab	ug/l			<u>125</u>	2145	--	--	--	--	358	<u>350 *</u>	--	<u>3810</u>	<u>92800</u>
Arsenic	Dissolved	Lab	ug/l	10		<u>2.0</u>	720	<u>7.3</u>	--	<u>3.7</u>	<u>3.4</u>	--	--	<u>3.1</u>	<u>4.4</u>	<u>71.2</u>
Barium	Dissolved	Lab	ug/l	2000	2000 HRL93			--	--	--	--	--	--	2750	2810	--
Beryllium	Dissolved	Lab	ug/l	4	0.08 HRL93			--	--	--	--	--	--	--	2.8	--
Boron	Dissolved	Lab	ug/l		500 RAA17			536	--	1090	--	1610	--	582	859	889
Cadmium	Dissolved	Lab	ug/l	5	0.5 HRL15 (1)	<u>2.8 HD CF</u>	270 HD CF	--	--	--	--	--	--	--	--	<u>3.8</u>
Cobalt	Dissolved	Lab	ug/l			<u>2.8</u>	872	<u>3.2</u>	--	<u>3.6</u>	<u>4.5</u>	--	<u>3.2</u>	--	<u>4.8</u>	<u>105</u>
Copper	Dissolved	Lab	ug/l	1300 TT(12)		21 HD CF	110 HD CF	--	--	--	--	--	--	--	<u>313</u>	--
Lead	Dissolved	Lab	ug/l	15 TT(12)		<u>13 HD CF</u>	6600 HD CF	--	--	--	--	--	--	--	<u>24.3</u>	<u>113</u>
Manganese	Dissolved	Lab	ug/l		100 HRL93 (1)			985	1120	1030	749	902	2290	722	2440	9940
Nickel	Dissolved	Lab	ug/l		100 HRL93	460 HD CF	8400 HD CF	--	--	--	--	--	--	--	215	--
Thallium	Dissolved	Lab	ug/l	2	0.6 HRL94	<u>0.28</u>	128	--	--	--	--	--	--	--	2.9	--
Vanadium	Dissolved	Lab	ug/l		50 HRL94			--	--	--	--	--	--	--	205	--
Zinc	Dissolved	Lab	ug/l		2000 HRL94	<u>310 HD CF</u>	680 HD CF	--	--	--	--	--	--	--	492	--
Semivolatile Organic Compounds																
1,4-Dioxane	NA	Lab	ug/l		1 HRL13 (1)			--	--	--	--	1.2	--	2.2	36	11
3,4-Methylphenol (m,p cresols)	NA	Lab	ug/l		3 MP HRL94			--	--	--	--	--	--	ns	232	--
Bis(2-ethylhexyl)phthalate	NA	Lab	ug/l	6	7 HRL15 (1)	<u>1.9</u>	(1)	<u>13.8</u>	--	--	264	--	--	ns	--	--
Volatile Organic Compounds																
Benzene	NA	Lab	ug/l	5	2 HRL09 (1)	6.0	8974 (1)	4.5	--	--	--	--	--	--	--	3.0
Radiochemical Parameters																
Gross Beta (radiation)	NA	Lab	pCi/l	50(+)				--	--	--	--	ns	ns	ns	ns	98.0 +/- 19.5
Per- and Polyfluoroalkyl Substances																
Perfluorooctanesulfonate (PFOS)	NA	Lab	ug/l		0.027 HBV17			0.051	--	0.14	0.12	0.048	0.14	0.042	0.30	0.50
Perfluorooctanoic acid (PFOA)	NA	Lab	ug/l		0.035 HBV17			0.12	0.041	0.22	0.15	0.27	0.21	0.084	0.35	0.24

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

--	Sample analyzed; result does not exceed the criteria for this parameter
N	Sample Type: Normal
*	Estimated value, QA/QC criteria not met.
h	EPA recommended sample preservation, extraction or analysis holding time was exceeded.
ns	Sample not analyzed for this parameter.

EPA Maximum Contaminant Levels

(11)	1998 Final Rule for Disinfectants and Disinfection By-products: MRDLG=Maximum Residual Disinfection Level Goal; and MRDL=Maximum Residual Disinfection Level.
TT(12)	Copper action level 1.3 mg/l; lead action level 0.015 mg/l.
(16)	At no time can turbidity go above 5 NTU.
(+)	This MCL is no longer an official regulatory level, but is still in use as a trigger for EPA. The actual MCL for Beta is 4 mrem/year but there is no simple conversion between a curie and a rem.

MDH Human Health-Based Water Guidance Table

(1)	Value is representative of the lowest exposure duration published in the Minnesota Department of Health Human Health Advisory Table.
CR	Value represents the criteria for Chromium, hexavalent.
HBV17	Health Based Value 2017.
HRL09	Health Risk Limit 2009.
HRL13	Health Risk Limit 2013.
HRL15	Health Risk Limit 2015.
HRL94	Health Risk Limit 1994.
MP	Laboratory reports 3-methylphenol and 4-methylphenol as co-eluting compounds. The criteria in the table represents 4-methylphenol which is the more stringent criteria.
RAA17	Risk Assessment Advice 2008.

Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness*

(3)	Value represents the criteria for Ammonia, unionized as N.
(5)	Value based on the criteria for cyanide, free.
CF	Conversion Factor.
CR6	Value represents the criteria for Hexavalent Chromium.
HD	Hardness Dependent.

* Estimated concentrations based on same underlying assumptions of conservative transport mechanisms and same source area. Minnesota River hardness data from MPCA, 2006. Working Draft, Surface Water Pathway Evaluation user's Guide, Appendix E.

Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness*

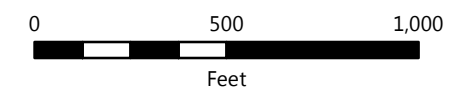
(1)	Subpart 7, item E applies.
(5)	Value based on the criteria for cyanide, free.
CF	Conversion Factor.
CR6	Value represents the criteria for Hexavalent Chromium.
HD	Hardness Dependent.

* Estimated concentrations based on same underlying assumptions of conservative transport mechanisms and same source area. Minnesota River hardness data from MPCA, 2006. Working Draft, Surface Water Pathway Evaluation user's Guide, Appendix E.

Figures



- Project Areas
- Parcel Boundary
- County Boundary



SITE OVERVIEW
Site Investigation Report
Dakota County, Minnesota

FIGURE 1



1957



May 1960



April 1962




October 1964



 Project Areas



0 225 450

Feet

Historic Aerial Imagery provided by
Historic Information Gatherers (HIG).
<http://www.historicalinfo.com/>

HISTORIC AERIAL PHOTOGRAPHS
FREWAY DUMP
Site Investigation Report
Dakota County, Minnesota

FIGURE 2 (1 of 2)

November 1966



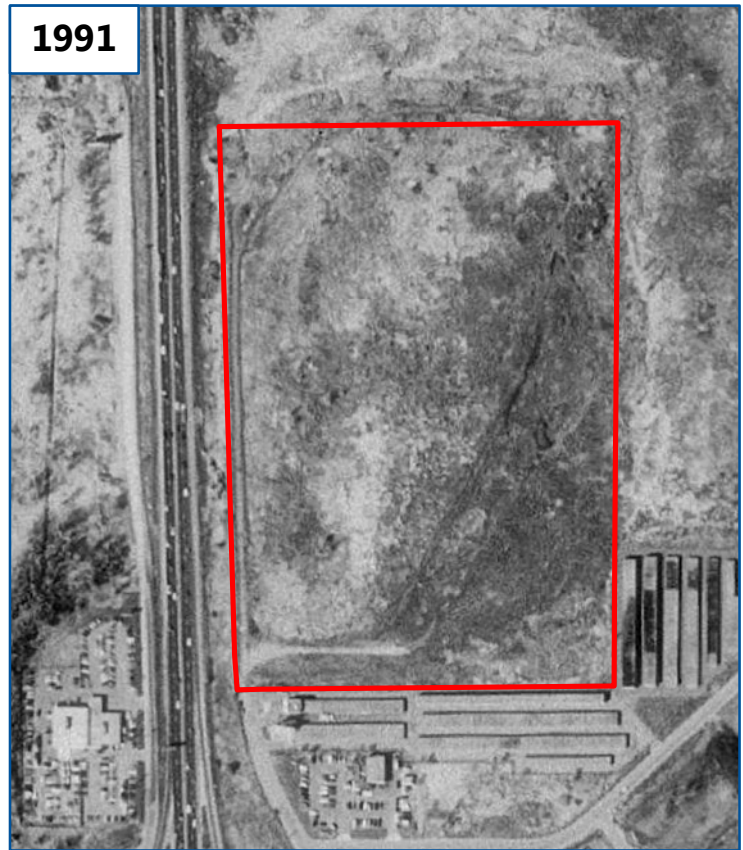
December 1967



December 1969



1991



 Project Areas



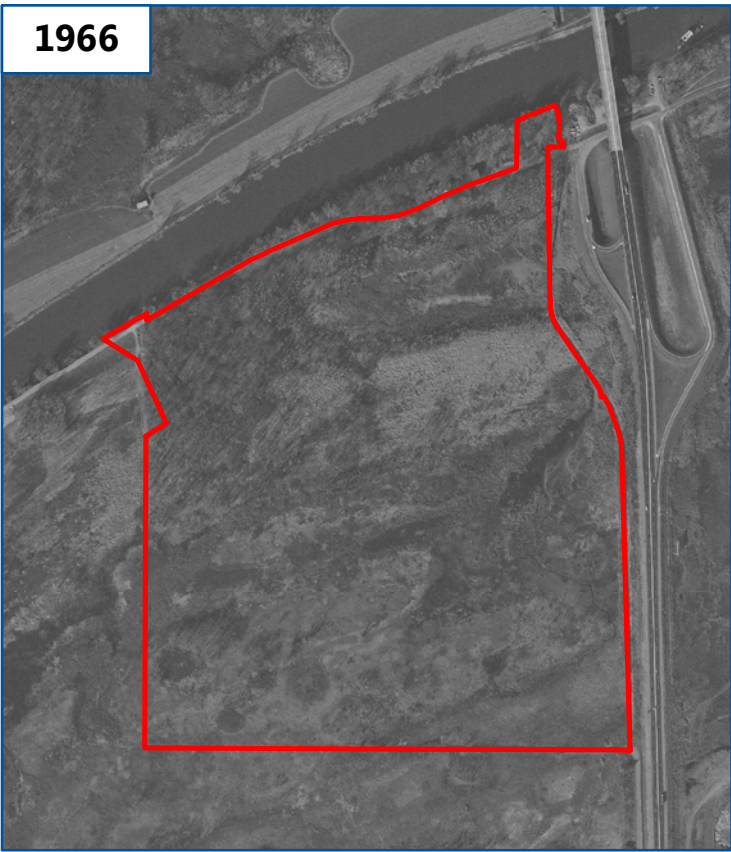
0 225 450
Feet

Historic Aerial Imagery provided by
Historic Information Gatherers (HIG).
<http://www.historicalinfo.com/>

HISTORIC AERIAL PHOTOGRAPHS
FREWAY DUMP
Site Investigation Report
Dakota County, Minnesota

FIGURE 2 (2 of 2)

1966



1969



1970

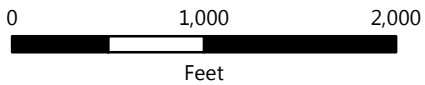


1971



 Project Areas

Historic Aerial Imagery provided by
Historic Information Gatherers (HIG).
<http://www.historicalinfo.com/>



HISTORIC AERIAL PHOTOGRAPHS
FREEWAY LANDFILL
Site Investigation Report
Dakota County, Minnesota

FIGURE 3 (1 of 2)

Barr Footer: ArcGIS 10.6, 2018-06-26 12:02 File: I:\Projects\2319\1372\Maps\Reports\Investigation Report\Fig 3.1 of 2 - Historic Aerial Photographs - Freeway Landfill.mxd User: RCS2

1974



1979



1984



1991



 Project Areas



0 1,000 2,000
Feet

Historic Aerial Imagery provided by
Historic Information Gatherers (HIG).
<http://www.historicalinfo.com/>

HISTORIC AERIAL PHOTOGRAPHS
FREEWAY LANDFILL
Site Investigation Report
Dakota County, Minnesota

FIGURE 3 (2 of 2)

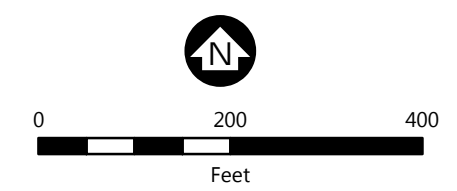
Barr Footer: ArcGIS 10.6, 2018-06-18 08:26 File: I:\Projects\23191372\Maps\Reports\Investigation_Report\Fig 4 - Investigation Locations - Freeway Dump.mxd User: RCS2



- Project Areas
- 2018 MPCA Investigation
 - Soil Boring
 - Soil Boring with Groundwater Sample
 - Test Excavation
 - Test Excavation with Groundwater Sample

- Parcel Boundary
- 10-Foot Contour
- 2-Foot Contour

Elevation Data Source:
 Fugro Horizons, Inc. and the Minnesota Department of Natural Resources. LiDAR Elevation, Twin Cities Metro Region, Minnesota, 2011. The Minnesota Elevation Mapping Project.



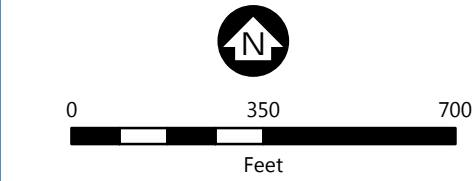
INVESTIGATION LOCATIONS
 Freeway Dump
 Site Investigation Report
 Dakota County, Minnesota

FIGURE 4





Barr Footer: ArcGIS 10.6, 2018-06-18 08:28 File: I:\Projects\23\19\1372\Maps\Reports\Investigation_Report\Fig 5 - Investigation Locations - Freeway Landfill and Transfer Station.mxd User: RCS2



INVESTIGATION LOCATIONS
 Freeway Landfill and Transfer Station
 Site Investigation Report
 Dakota County, Minnesota

FIGURE 5

BARR
 KRAEMER
 MINING &
 MATERIALS INC

U.S. FISH AND
 WILDLIFE SERVICE
 MCGOWAN
 MICHAEL B TSTE

NORTHERN
 STATES
 POWER CO

U.S. SALT INC

FREEWAY
 TRANSFER
 STATION

FREEWAY
 LANDFILL

Hennepin County
 Dakota County

Minnesota River

MCGOWAN
 MICHAEL
 B TSTE

TS-SB-01
 TS-SB-02
 TS-SB-03
 TS-SB-04
 TS-SB-05
 TS-SB-06
 TS-SB-07
 TS-SB-08

FL-TT-01

FL-TT-02

FL-TT-02a

FL-TT-03

FL-TT-04

FL-TT-05

FL-TT-07

FL-TT-06

FL-TT-08

FD-TT-02

FD-TT-01

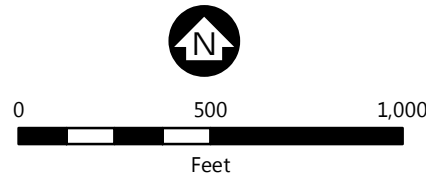
FD-SB-A1

FD-SB-A4

FD-SB-A3



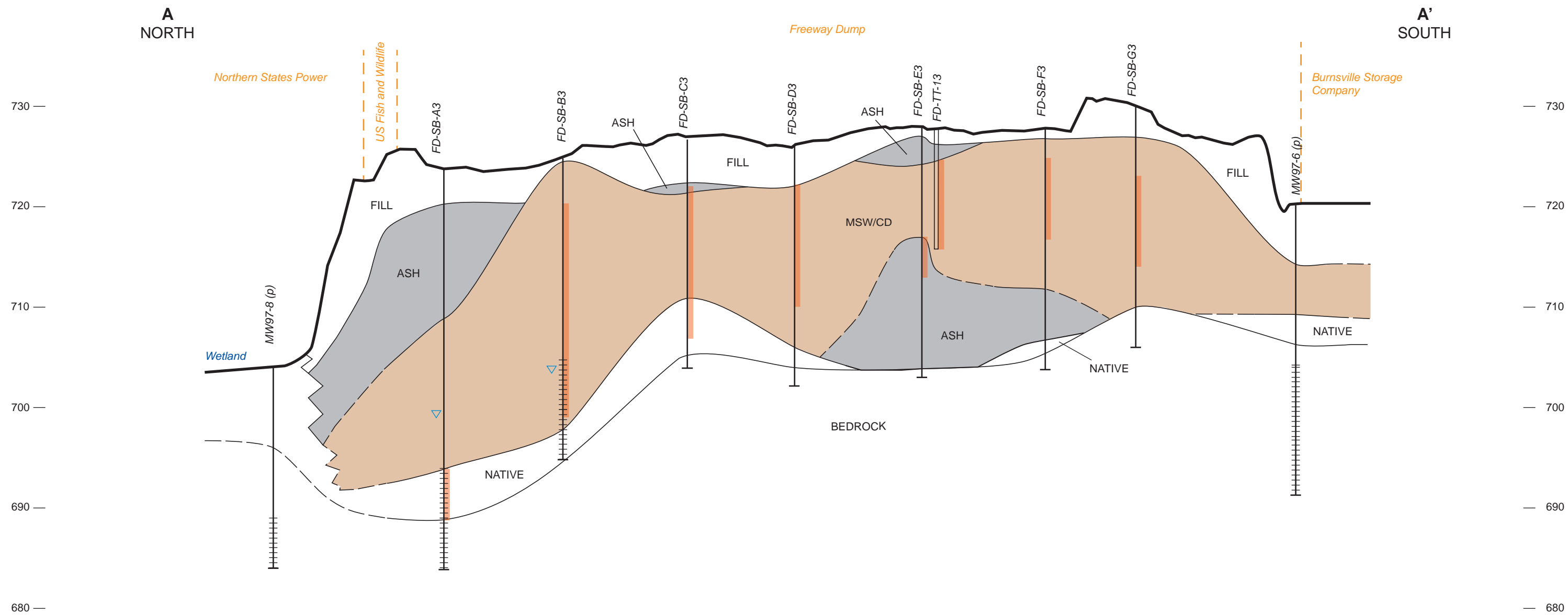
- Cross Section Location
- 2018 MPCA Investigation**
- Soil Boring
- Soil Boring with Groundwater Sample
- Test Excavation
- Test Excavation with Groundwater Sample
- Previous Investigations**
- MnDOT Borings (2014 / 2018)
- Existing Well Location
- Freeway Landfill Borings (Gorman, 2005)
- Project Areas
- County Boundary



CROSS SECTION LOCATIONS
Site Investigation Report
Dakota County, Minnesota

FIGURE 6





LEGEND

- Geologic Contact
- - - Inferred Geologic Contact
- ▽ Approximate Water Level
- ||| Monitoring Well Screen
- ┆ Soil Boring/Piezometer
- || Test Trench
- (p) Previous Investigation Location
- ||| Soil Sample Interval
- - - Parcel Boundary

0 150
 Approximate Horizontal Scale in Feet
 15X Vertical Exaggeration

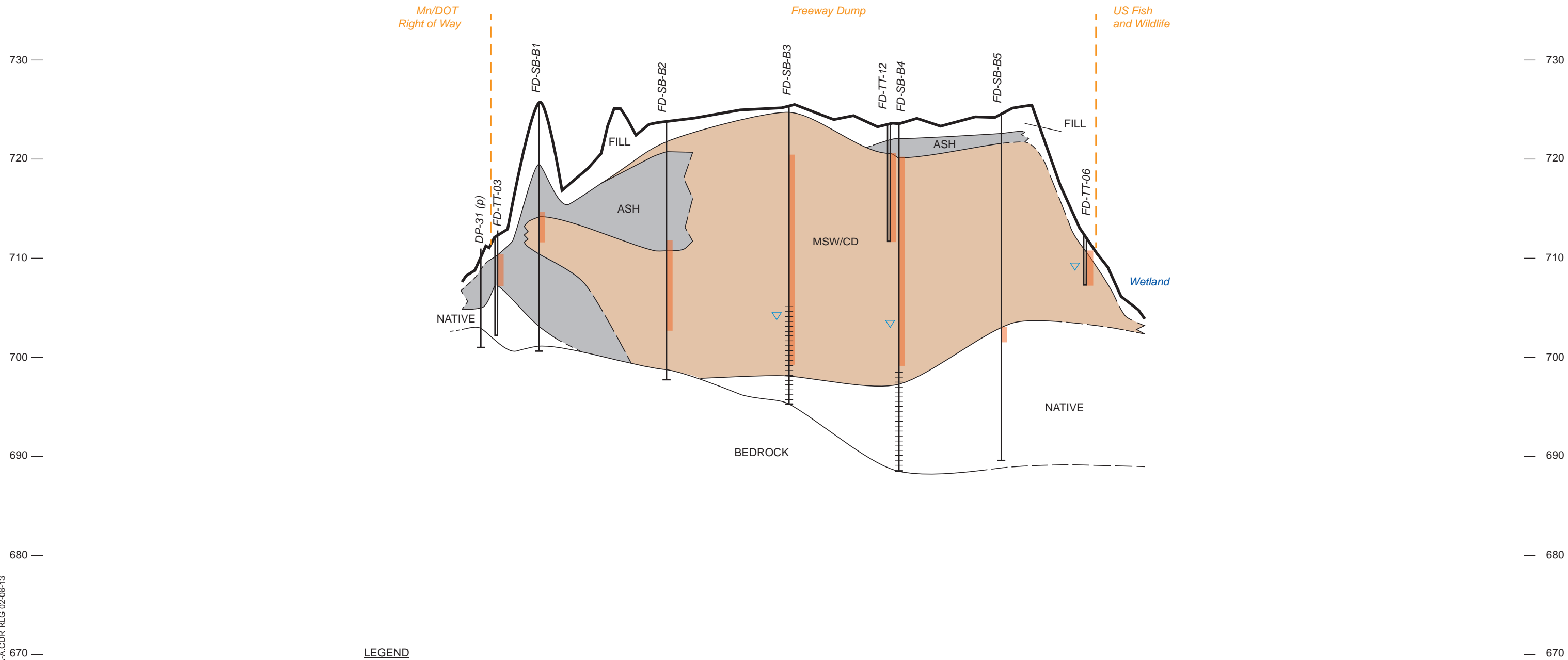
*MSW/CD - Municipal Solid Waste / Construction Debris



Figure 6A
CROSS SECTION A-A'
Freeway Dump
Site Investigation Report
Dakota County, Minnesota

B
WEST

B'
EAST



LEGEND

- Geologic Contact
- - - Inferred Geologic Contact
- ▽ Approximate Water Level
- ||| Monitoring Well Screen
- ⊥ Soil Boring/Piezometer
- || Test Trench
- (p) Previous Investigation Location
- || Soil Sample Interval
- - - Parcel Boundary

0 150
 Approximate Horizontal Scale in Feet
 15X Vertical Exaggeration

*MSW/CD - Municipal Solid Waste / Construction Debris

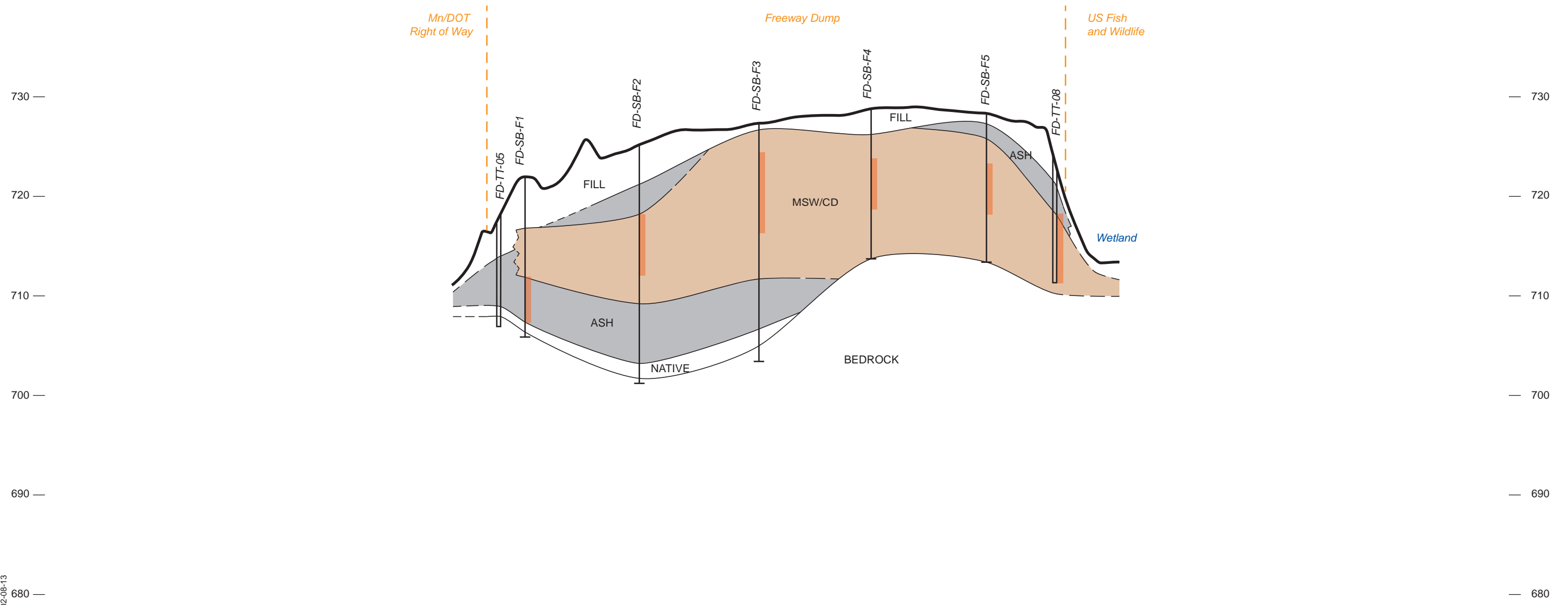


Figure 6B
 CROSS SECTION B-B'
 Freeway Dump
 Site Investigation Report
 Dakota County, Minnesota

P:\Mpls\23 MN\27\2327220\WorkFiles\Figures\Cross Section A-A.CDR RLG 02-08-13

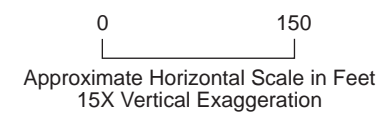
C
WEST

C'
EAST



LEGEND

- Geologic Contact
- - - Inferred Geologic Contact
- ▽ Approximate Water Level
- ||| Monitoring Well Screen
- ⊥ Soil Boring/Piezometer
- || Test Trench
- (p) Previous Investigation Location
- || Soil Sample Interval
- - - Parcel Boundary



*MSW/CD - Municipal Solid Waste / Construction Debris

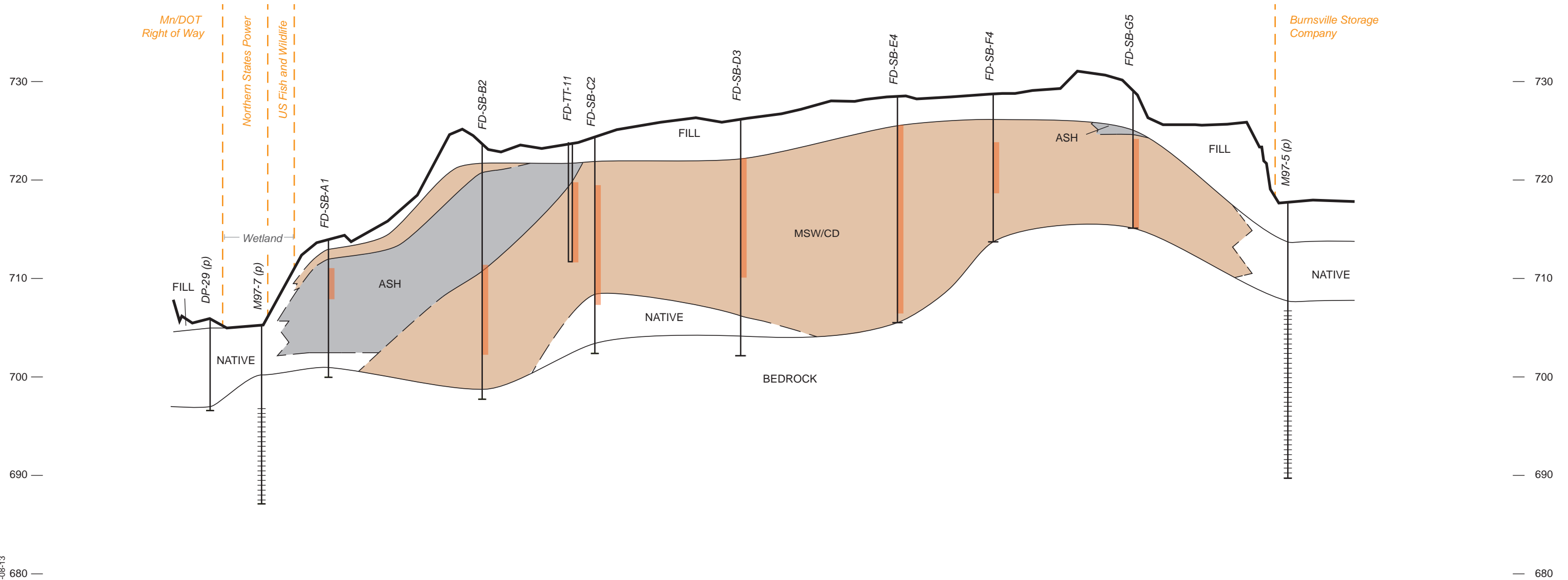


Figure 6C
CROSS SECTION C-C'
Freeway Dump
Site Investigation Report
Dakota County, Minnesota

D
NORTHWEST

D'
SOUTHEAST

Freeway Dump



LEGEND

- Geologic Contact
- - - Inferred Geologic Contact
- ▽ Approximate Water Level
- ||| Monitoring Well Screen
- ┆ Soil Boring/Piezometer
- || Test Trench
- (p) Previous Investigation Location
- ▬ Soil Sample Interval
- - - Parcel Boundary

0 150
Approximate Horizontal Scale in Feet
15X Vertical Exaggeration

*MSW/CD - Municipal Solid Waste / Construction Debris



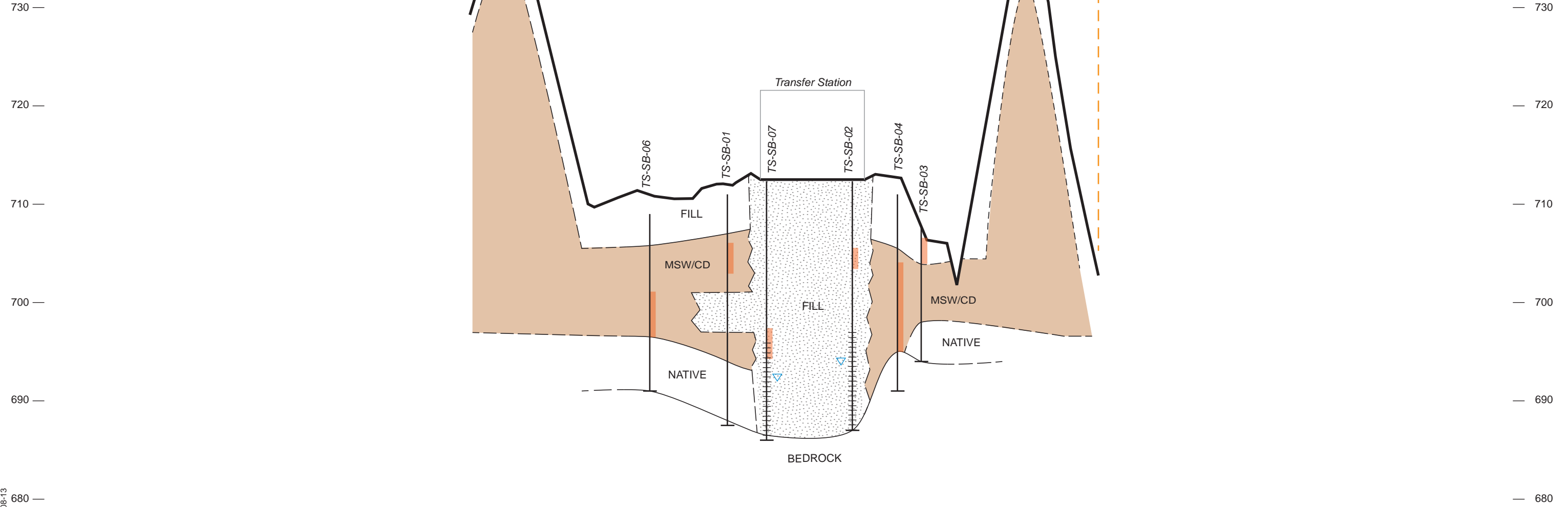
Figure 6D
CROSS SECTION D-D'
Freeway Dump
Site Investigation Report
Dakota County, Minnesota

E
NORTHWEST

E'
SOUTHEAST

Freeway Transfer Station

Mn/DOT
Right of Way



LEGEND

- Geologic Contact
- - - Inferred Geologic Contact
- ▽ Approximate Water Level
- ||| Monitoring Well Screen
- ┆ Soil Boring/Piezometer
- || Test Trench
- (p) Previous Investigation Location
- ▬ Soil Sample Interval
- - - Parcel Boundary

0 150
 Approximate Horizontal Scale in Feet
 15X Vertical Exaggeration

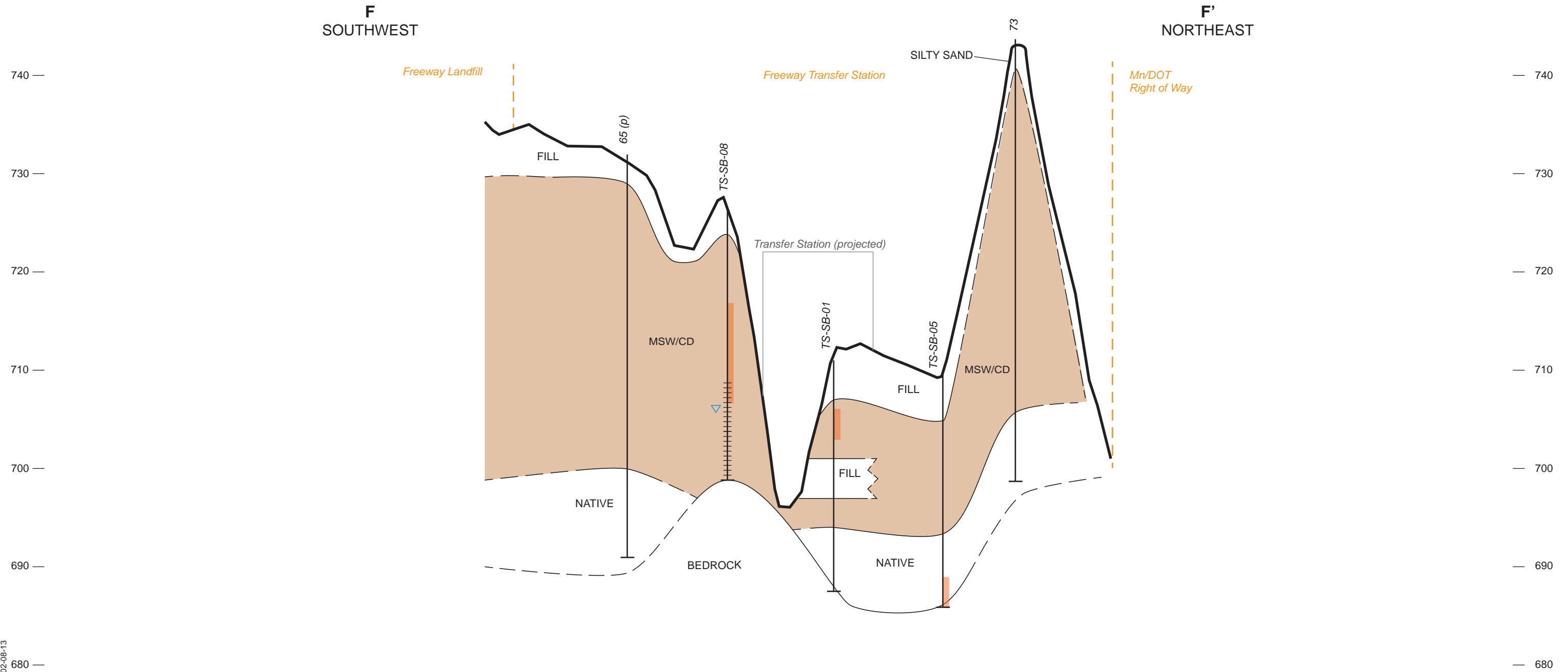
*MSW/CD - Municipal Solid Waste / Construction Debris



Figure 6E

CROSS SECTION E-E'
 Freeway Transfer Station
 Site Investigation Report
 Dakota County, Minnesota

P:\Mpls\23 MN\27\2327220\WorkFiles\Figures\Cross Section A-A.CDR RLG 02-08-13



LEGEND

- Geologic Contact
- - - Inferred Geologic Contact
- ▽ Approximate Water Level
- ||| Monitoring Well Screen
- ⊥ Soil Boring/Piezometer
- || Test Trench
- (p) Previous Investigation Location
- Soil Sample Interval
- Parcel Boundary

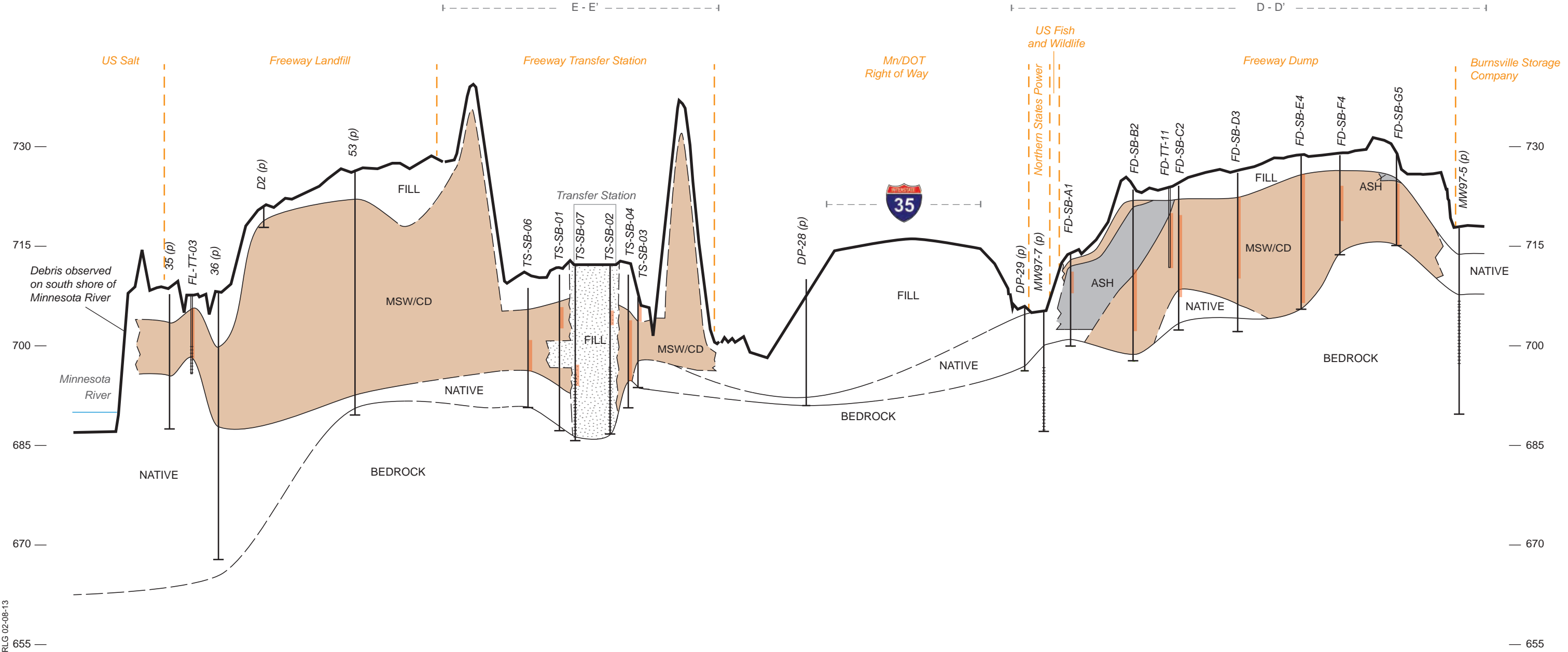
*MSW/CD - Municipal Solid Waste / Construction Debris



Figure 6F
 CROSS SECTION F-F'
 Freeway Transfer Station
 Site Investigation Report
 Dakota County, Minnesota

G
NORTHWEST

G'
SOUTHEAST



LEGEND

- Geologic Contact
- - - Inferred Geologic Contact
- ||||| Monitoring Well Screen
- ⊥ Soil Boring/Piezometer
- ||| Test Trench
- (p) Previous Investigation Location
- Soil Sample Interval
- - - Parcel Boundary

*MSW/CD - Municipal Solid Waste / Construction Debris



Figure 6G

CROSS SECTION G-G'
Freeway Dump, Landfill,
and Transfer Station
Site Investigation Report
Dakota County, Minnesota



Project Areas

2018 MPCA Investigation

- Soil Boring
- Soil Boring with Groundwater Sample
- Test Excavation
- Test Excavation with Groundwater Sample

Field Screening Results

21.6% CH₄

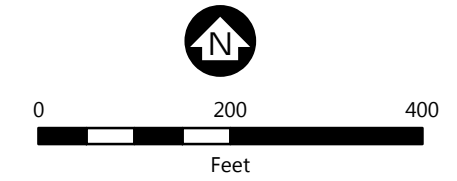
1.9 ppm Maximum Soil Headspace Reading (parts per million)

Parcel Boundary

10-Foot Contour

2-Foot Contour

*Elevation Data Source:
Fugro Horizons, Inc. and the Minnesota Department of Natural Resources. LiDAR Elevation, Twin Cities Metro Region, Minnesota, 2011. The Minnesota Elevation Mapping Project.*



FIELD SCREENING
Freeway Dump
Site Investigation Report
Dakota County, Minnesota

FIGURE 7





Project Areas

2018 MPCA Investigation

- Soil Boring
- Soil Boring with Groundwater Sample
- Test Excavation
- Test Excavation with Groundwater Sample

Field Screening Results

21.6% CH₄

1.9 ppm Maximum Soil Headspace Reading (parts per million)

Parcel Boundary

10-Foot Contour

*Elevation Data Source:
Fugro Horizons, Inc. and the Minnesota Department of Natural Resources. LiDAR Elevation, Twin Cities Metro Region, Minnesota, 2011. The Minnesota Elevation Mapping Project.*

Barr Footer: ArcGIS 10.6 - 2018-06-29 07:43 File: I:\Projects\23191372\Maps\Reports\Investigation_Report\Fig 8 - Field Screening - Freeway Landfill and Transfer Station.mxd User: RCS2

BARR

KRAEMER MINING & MATERIALS INC

FIELD SCREENING
Freeway Landfill and Transfer Station
Site Investigation Report
Dakota County, Minnesota

FIGURE 8



No waste material was identified in the boring logs for these wells. Extent of waste is likely between the toe of the slope and the wells.

Waste material observed at FD-TT-06. Possibly ash identified at in boring log of OFMW-1. Extent of the waste material is not known.

Ash observed at FD-TT-03, FD-TT-04, and FD-TT-05. Material described as a grey silt, likely ash, identified in the logs of MnDOT Phase II borings located between the Dump and highway. Historical aerial photos show ground disturbance in the area directly adjacent to the highway. Extent of the waste material is not known, but deposited ash likely extends to the east edge of the road surface.

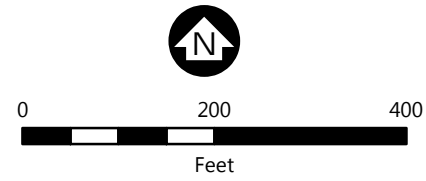
Waste material observed at FD-TT-08. No waste material was identified in the boring logs of MW97-4 and MW97-5, but continuous sampling was not conducted. Historical aerial photos show possible ground disturbance in the area. Extent of the waste material is not known, but likely extends into the storage facility.

Waste material observed at FD-TT-09, FD-TT-10, and identified in the boring log of MW97-6. Historical aerial photos show ground disturbance in the area where the storage facility is now located. Anecdote from storage facility employee mentioned waste material encountered during past construction activities. Extent of the waste material is not known, but likely extends into the storage facility.

- Inferred Waste Extent
- ▭ Project Areas
- No Ash¹
- No MSW/CD²
- 2018 MPCA Investigation
 - Soil Boring
 - Soil Boring with Groundwater Sample
 - ▭ Test Excavation
 - ▭ Test Excavation with Groundwater Sample
- Previous Investigations
 - MnDOT Borings (2014 / 2018)
 - Existing Well Location
- ▭ Parcel Boundary
- 10-Foot Contour
- 2-Foot Contour

Elevation Data Source: Fugro Horizons, Inc. and the Minnesota Department of Natural Resources. LiDAR Elevation, Twin Cities Metro Region, Minnesota, 2011. The Minnesota Elevation Mapping Project.

- 1 - MSW/CD was observed at investigation locations within this area, but no ash was observed
- 2 - Ash was observed at investigation locations within this area, but no MSW/CD was observed



WASTE EXTENT
 Freeway Dump
 Site Investigation Report
 Dakota County, Minnesota

FIGURE 9





Waste material was observed in test excavations completed along the north edge of the property (FL-TT-01 to FL-TT-05). Historic aerial photos show ground disturbance in the area of the US Salt property, and an anecdote from US Salt personnel mentioned waste material encountered during past construction activities. Extent of waste material is not known, but likely extends north of the Landfill property boundary. Additionally, shoreline debris has been observed at the Minnesota River bank. It is uncertain as to whether this material came from the Landfill or was placed as a measure of erosion control by another party.

Waste material was not observed at locations FL-TT-06 and FL-TT-07. These test excavations were completed beyond the slope of the elevated landfill. Historic aerial photos also do not show evidence of ground disturbance beyond the toe of the slope as is located currently. The extent of waste material along the east edge of the landfill is likely defined by the base of the slope.

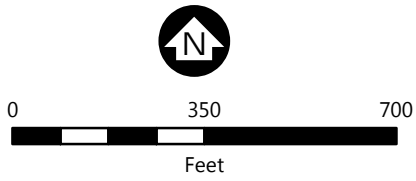
Waste material observed at boring locations surrounding the operation building. No waste material was observed at locations TS-SB-02 and TS-SB-07, which were completed inside the building. It is likely that waste material extends throughout the Transfer Station area with the exception of directly under the buildings and possibly the weighing stations.

Waste material observed at test excavation FL-TT-08, located on the slope of the landfill. No waste material was identified in the boring logs of WT-7 or DP-8. Historic aerial photos do not show any disturbance in this corner of the property, with the exception of an access road in the 1990s. It is likely that waste material extends to the bottom of the slope, however the exact location of the waste extent has yet to be identified.

The extent of waste material along the south, west, and northwest edges of the Landfill shown here are based on MPCA September 2017 Investigaiton and Sampling Plan. This assumed waste footprint boundary was informed by previous investigations.

- Inferred Waste Extent
- Project Areas
- 2018 MPCA Investigation**
- Soil Boring
- Soil Boring with Groundwater Sample
- Test Excavation
- Test Excavation with Groundwater Sample
- Previous Investigations**
- MnDOT Borings (2014 / 2018)
- Existing Well Location
- Freeway Landfill Borings (Gorman, 2005)
- Parcel Boundary
- 10-Foot Contour

Elevation Data Source:
Fugro Horizons, Inc. and the Minnesota Department of Natural Resources. LiDAR Elevation, Twin Cities Metro Region, Minnesota, 2011. The Minnesota Elevation Mapping Project.



WASTE EXTENT
Freeway Landfill and Transfer Station
Site Investigation Report
Dakota County, Minnesota
FIGURE 10

Barr Footer: ArcGIS 10.6, 2018-06-26 15:49 File: I:\Projects\23\19\1372\Maps\Reports\Investigation_Report\Fig 10 - Waste Extent - Freeway Landfill and Transfer Station.mxd User: RCSZ

Appendices

Appendix A

Historical Aerial Photographs



Burnsville, MN



2017

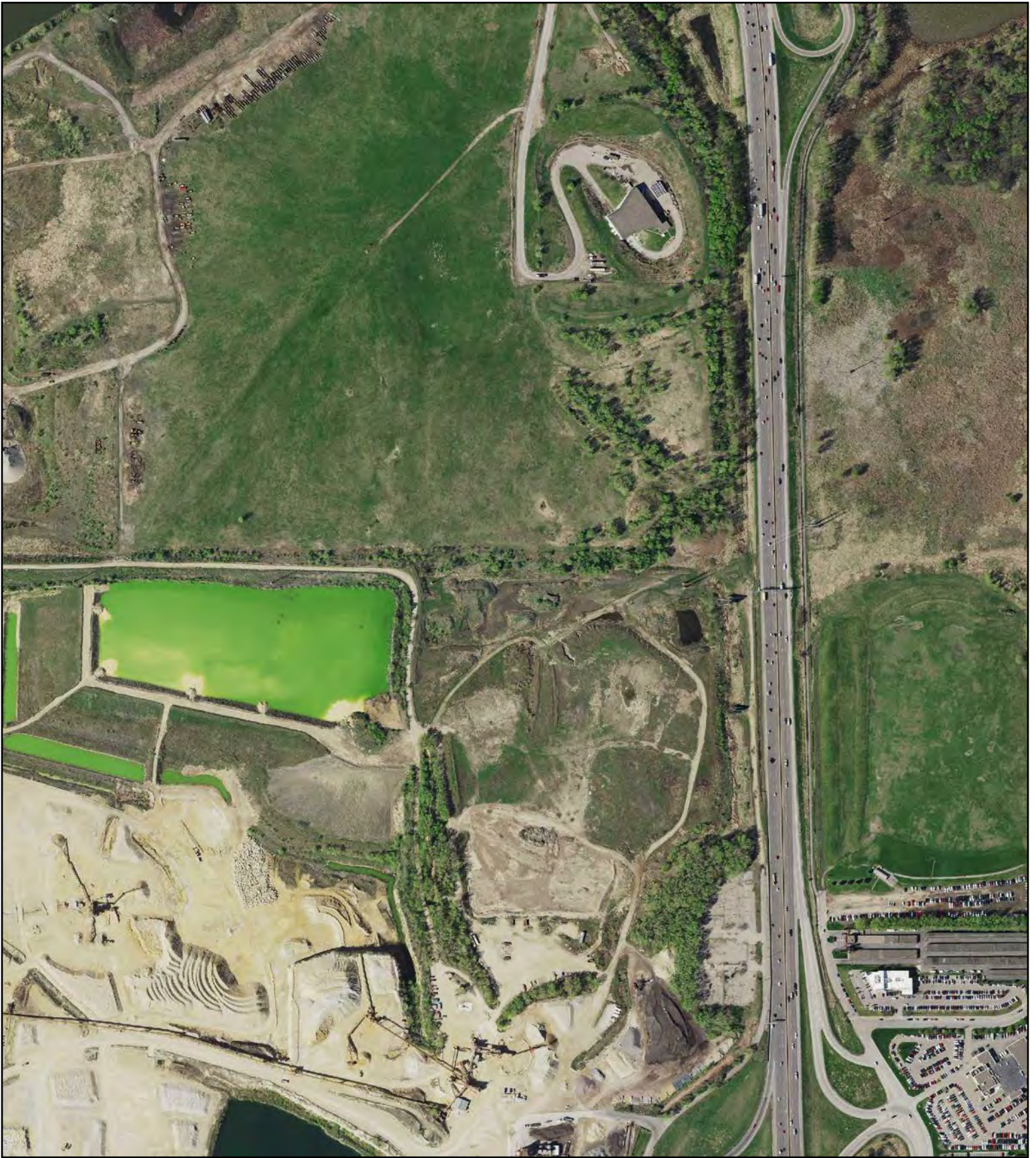
HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2016

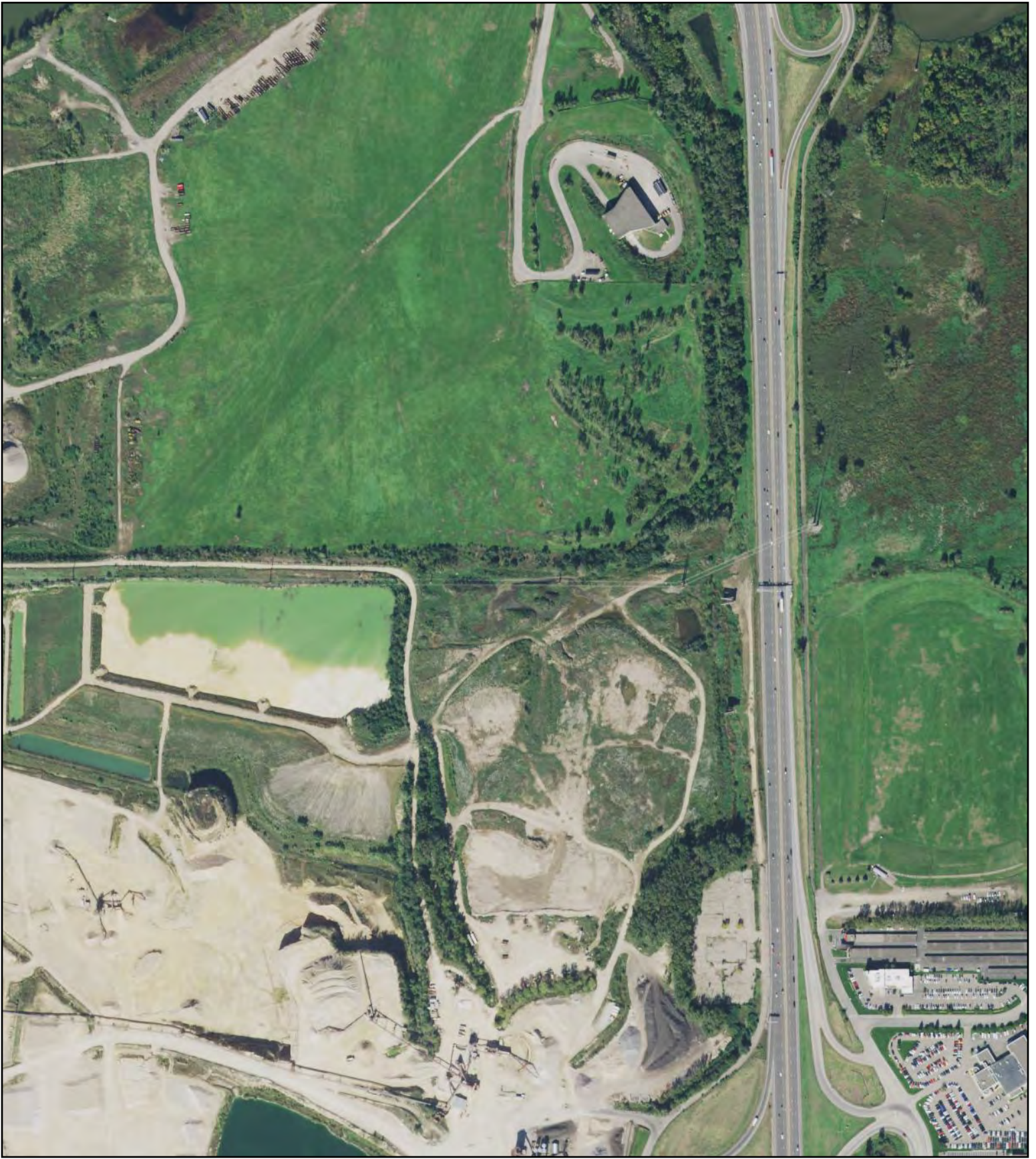
HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2015

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2013

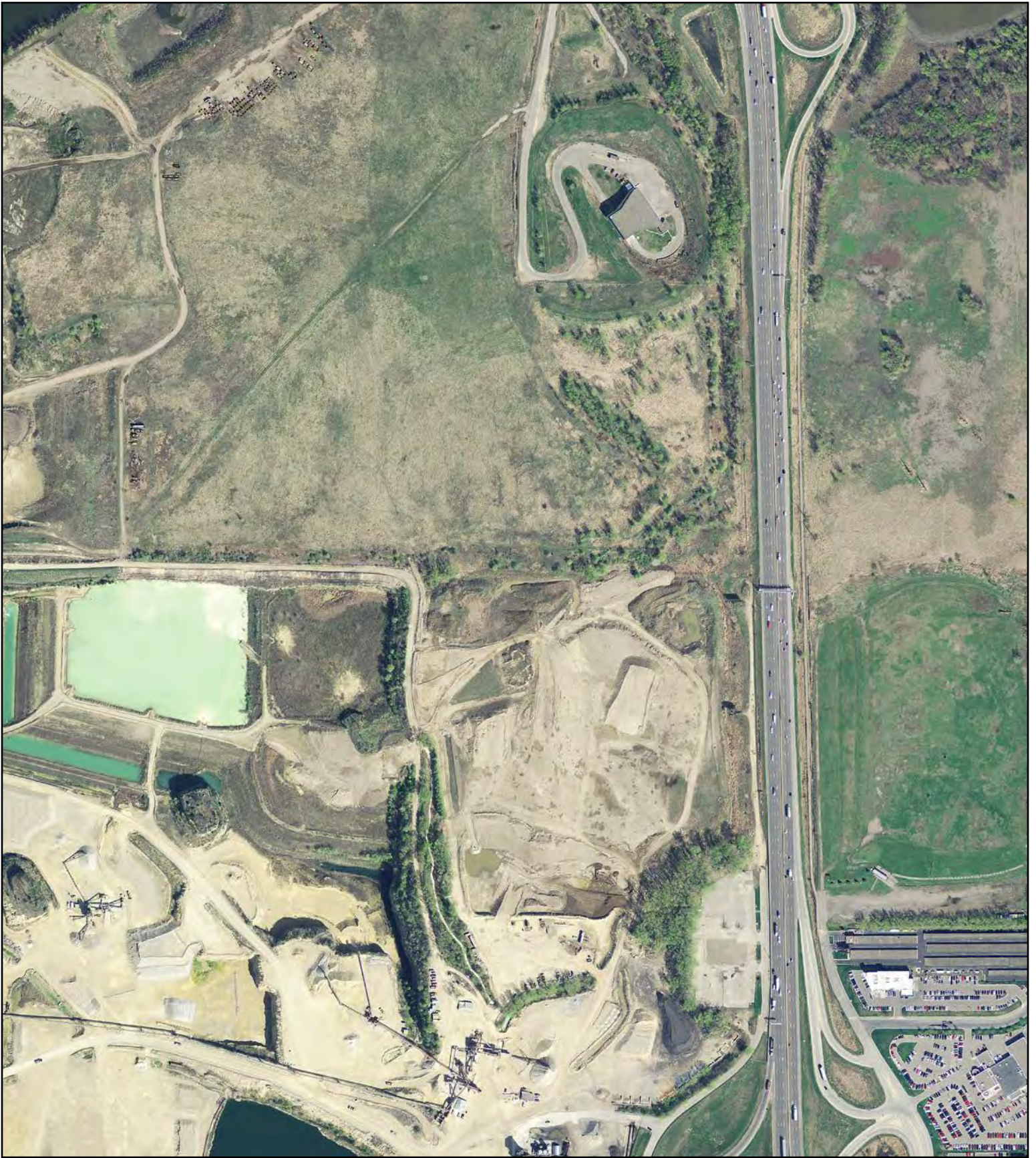
HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2012

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2009

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2008

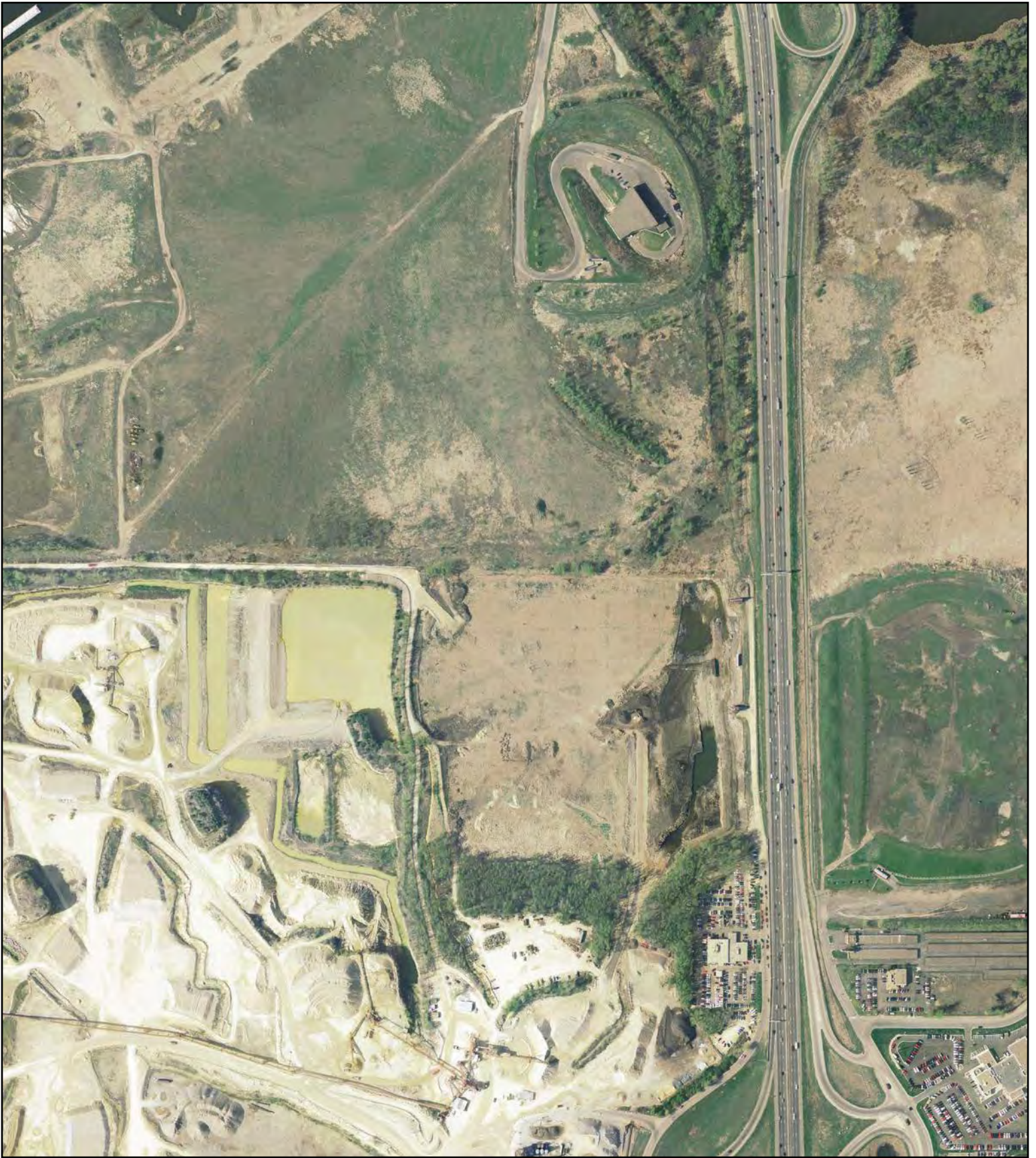
HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2004

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2003

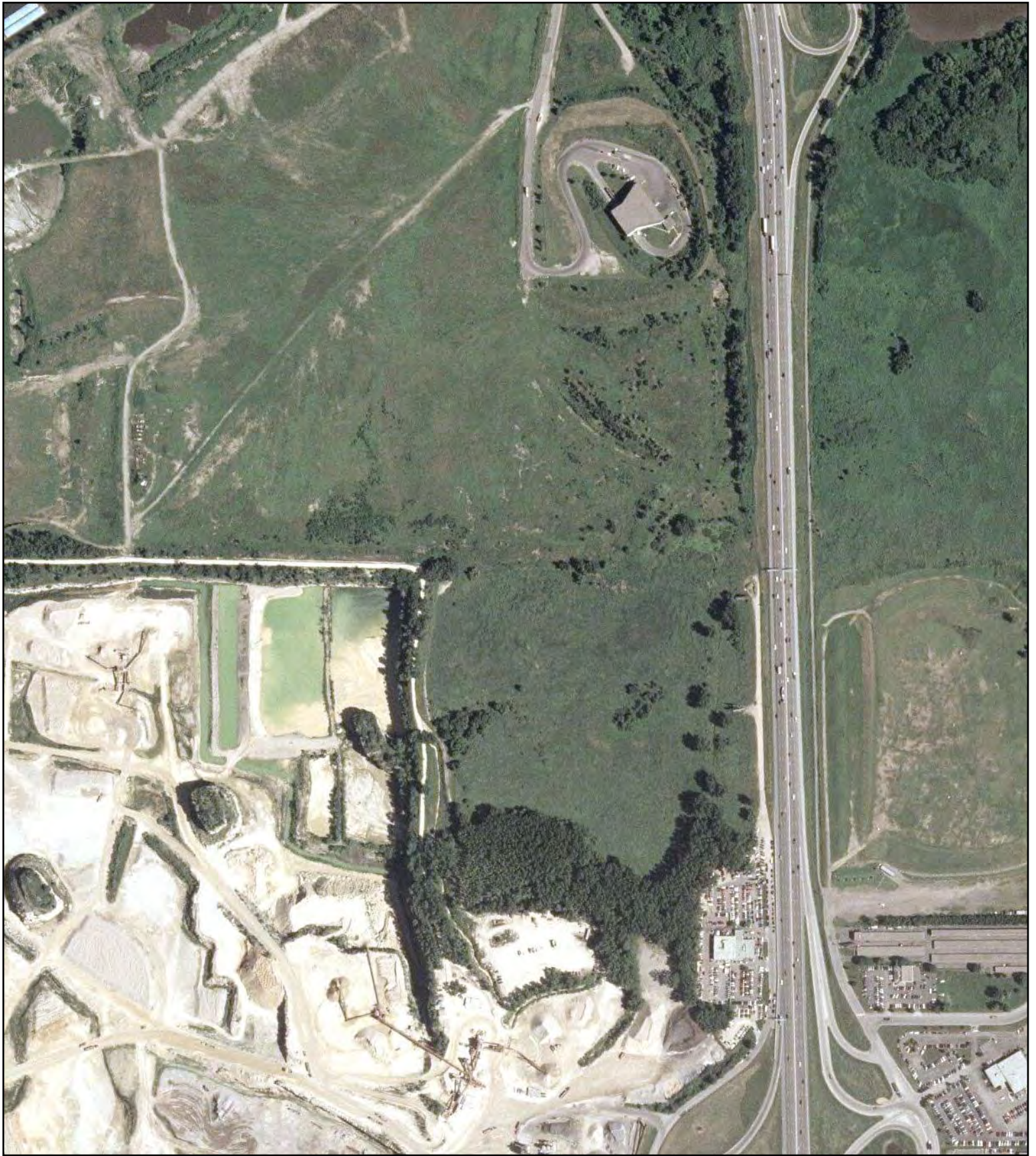
HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2002

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2000

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1997

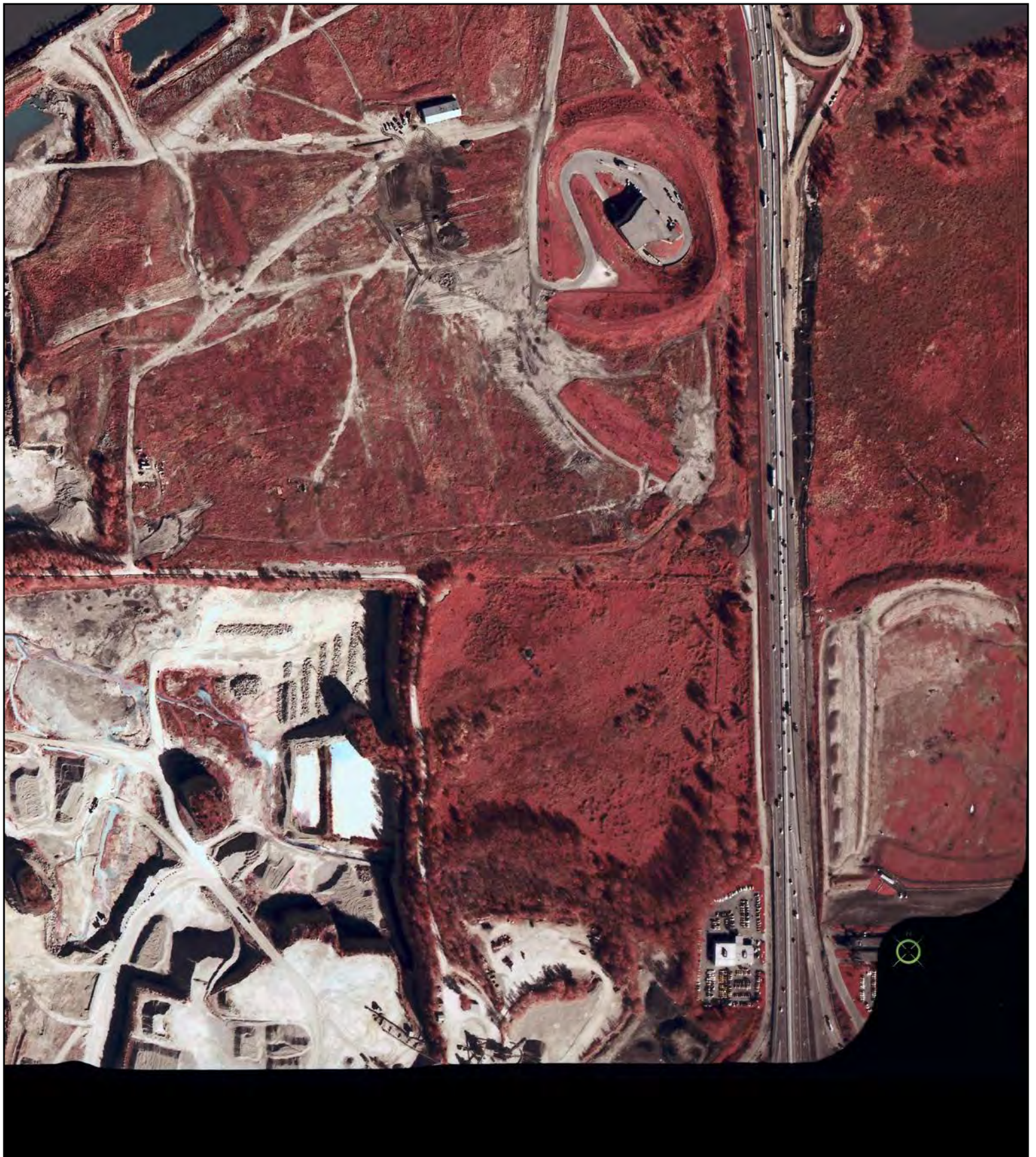
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Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1994

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1991

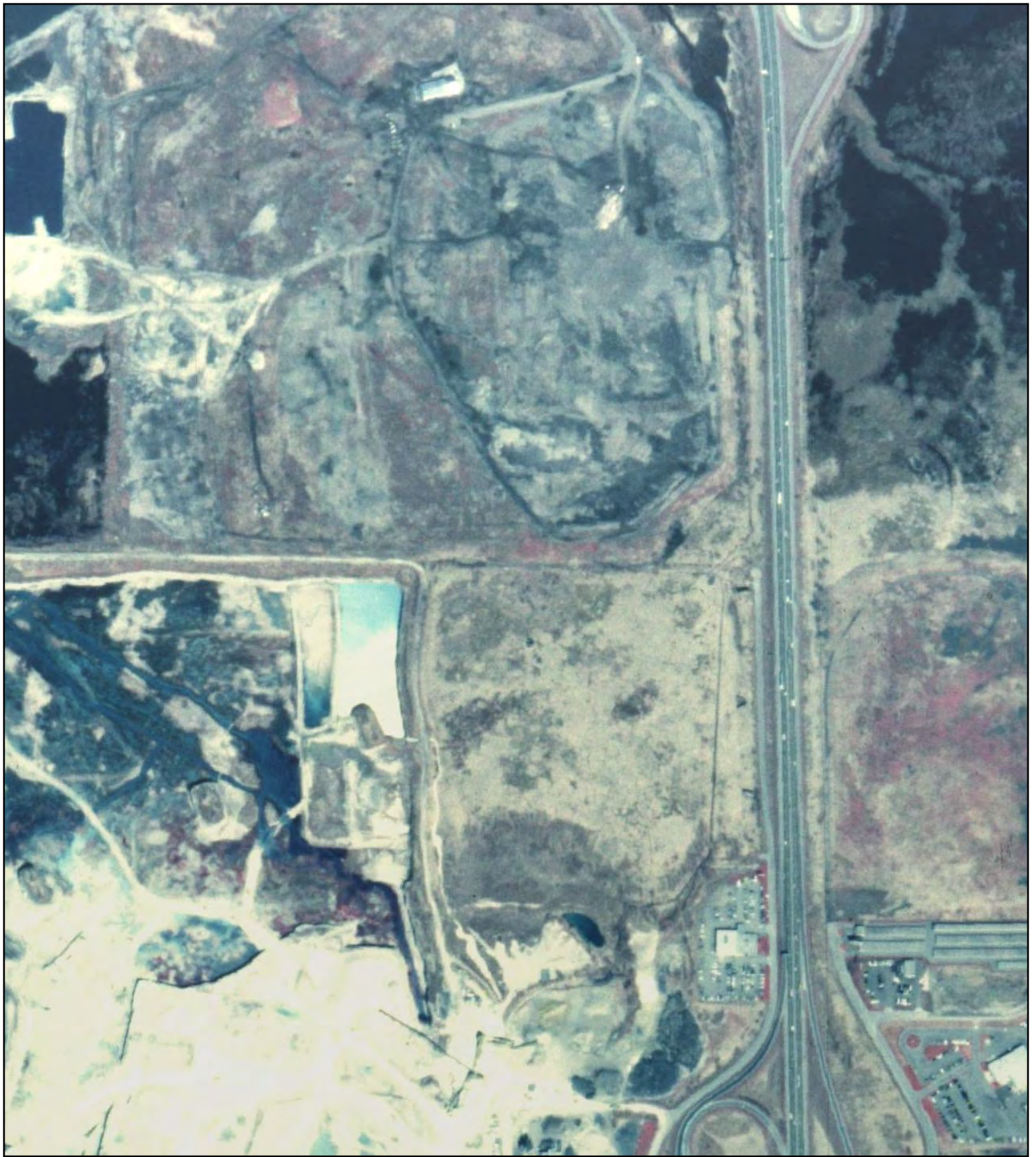
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Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1984

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1979

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1974

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1972

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1971

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1970

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1969

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1967

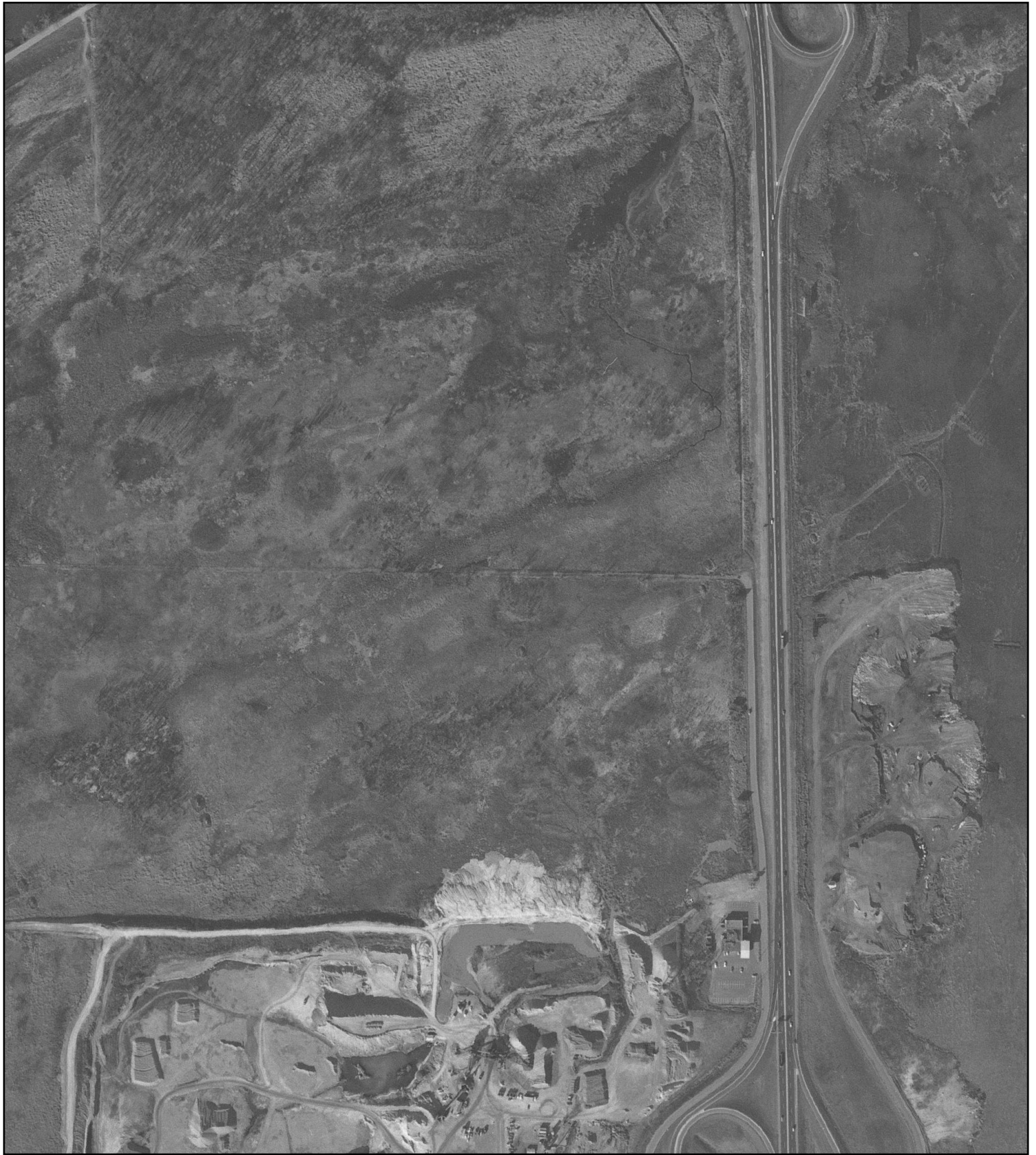
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Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1966

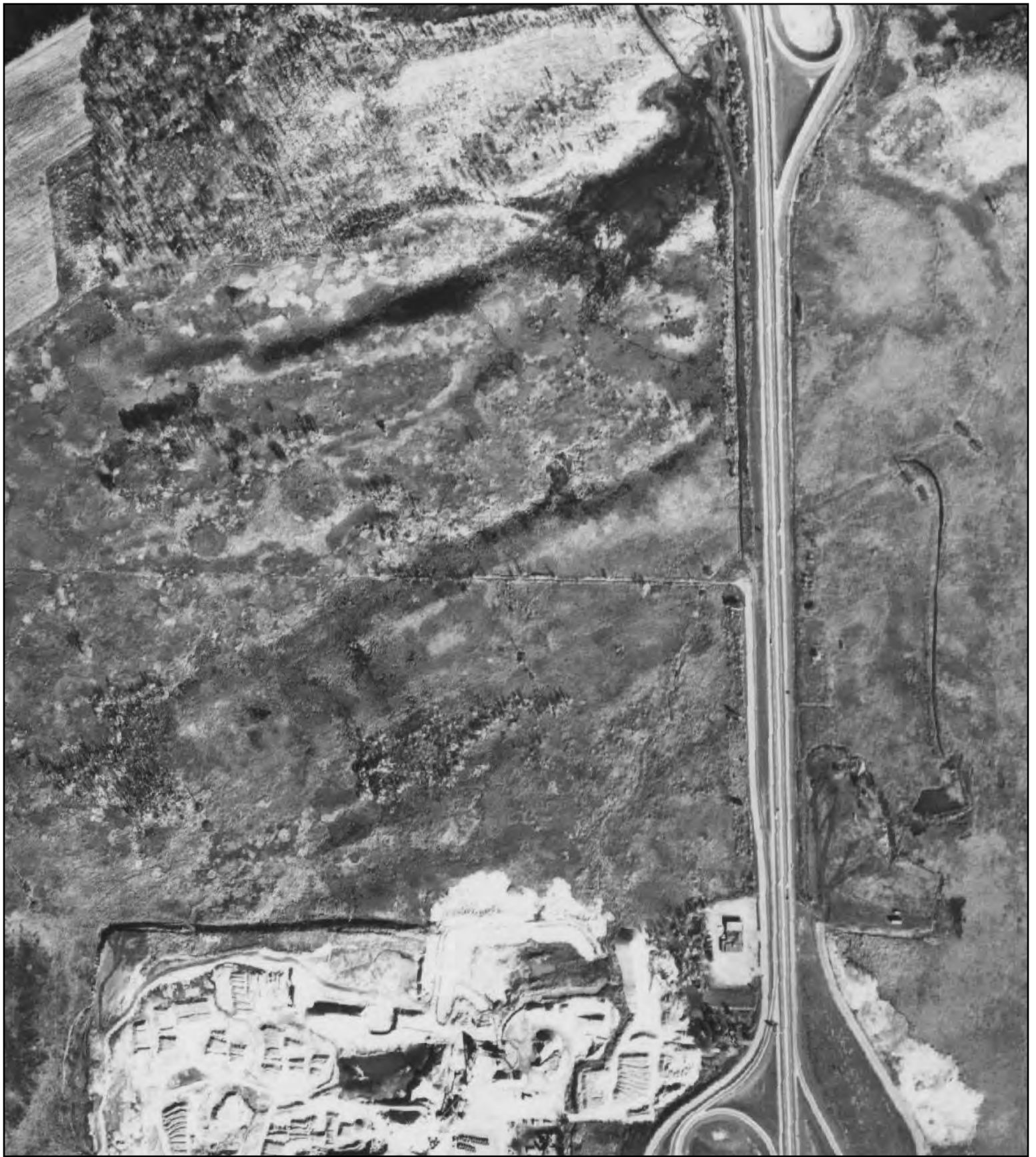
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Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1964

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1962

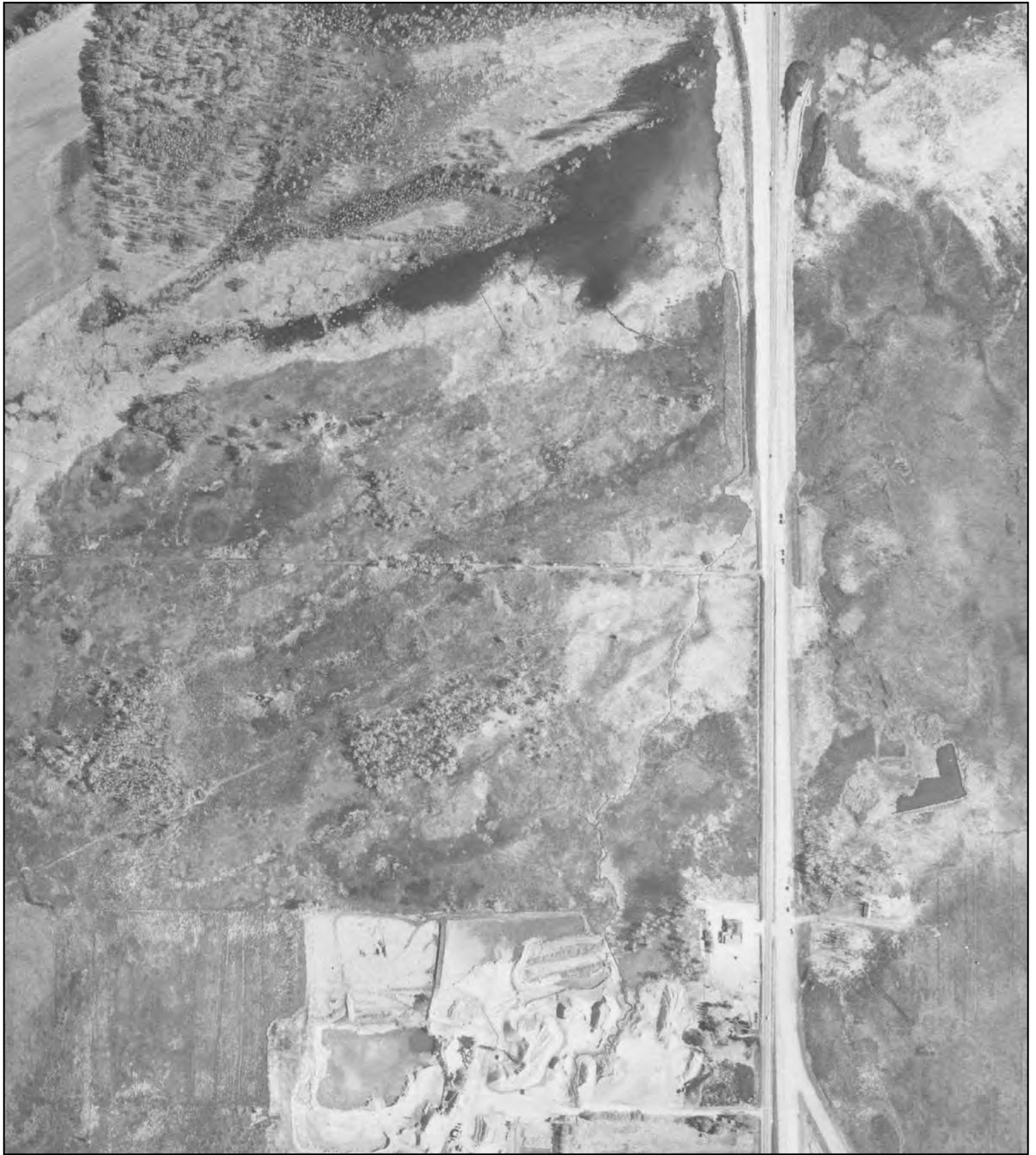
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Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1960

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1957

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1956

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1951

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1947

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1940

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1937

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2017

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2016

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2015

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2013

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2012

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2009

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2008

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2004

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2003

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2002

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2000

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1997

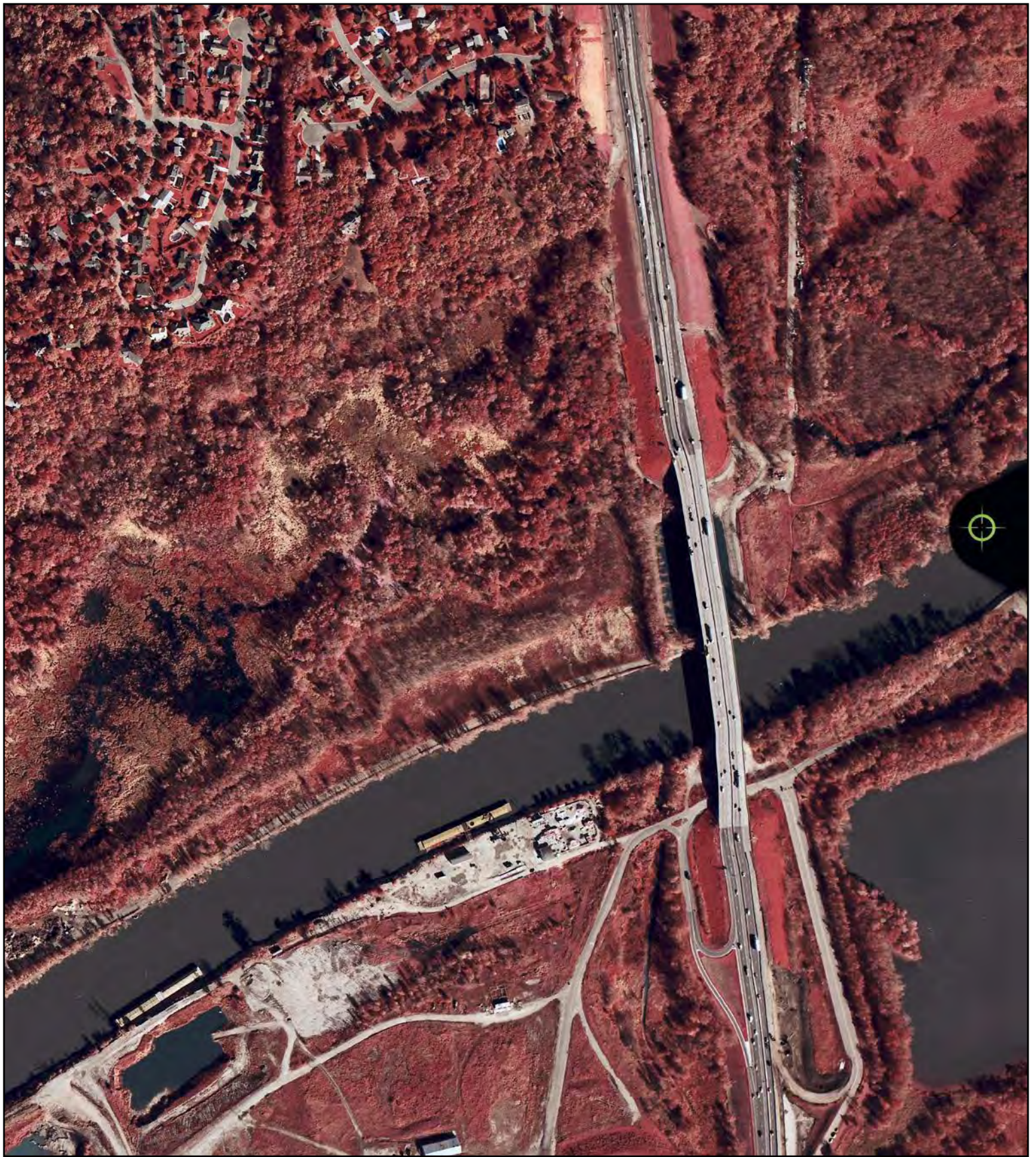
HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1994

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1991

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

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Burnsville, MN



1987

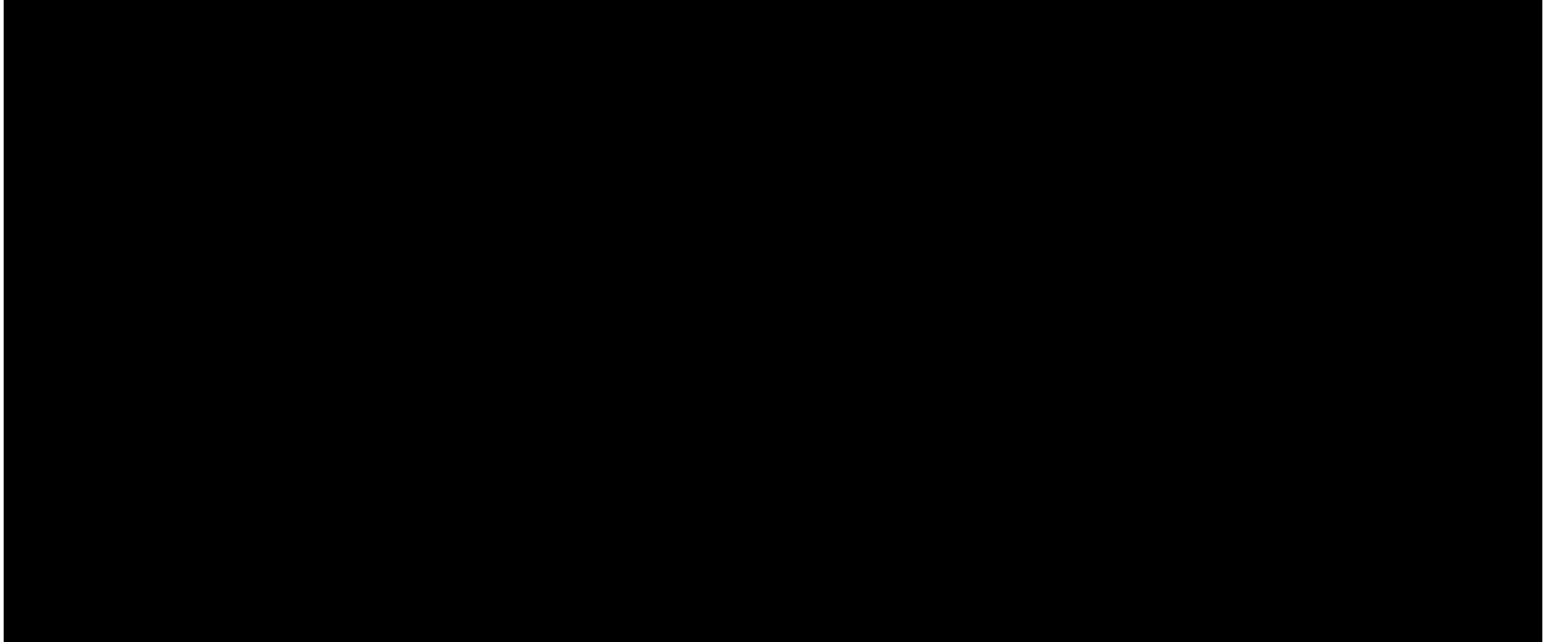
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Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

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Burnsville, MN



1984

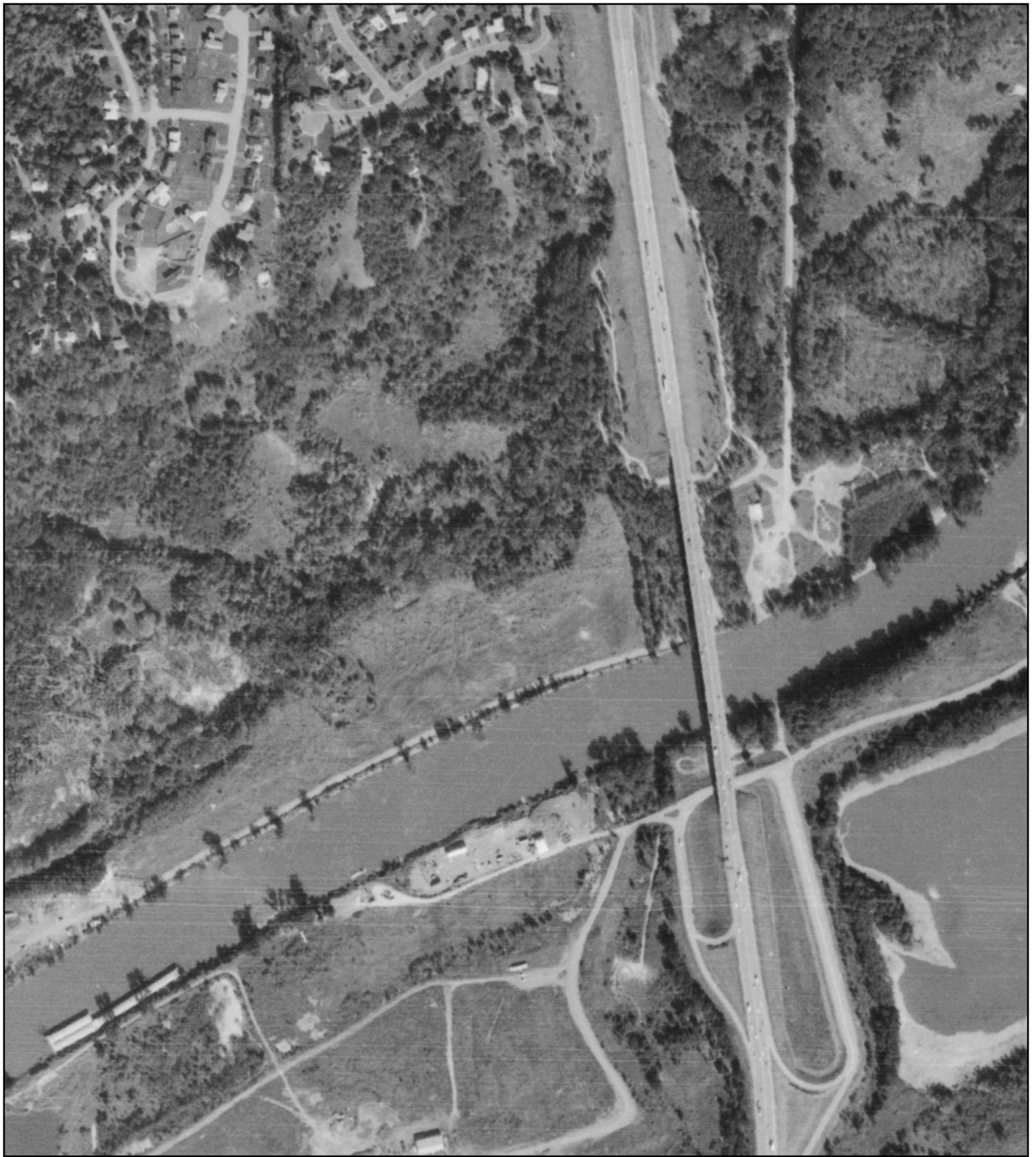
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Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1979

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1978

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1974

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1971

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1970

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1969

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1967

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1966

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1964

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1962

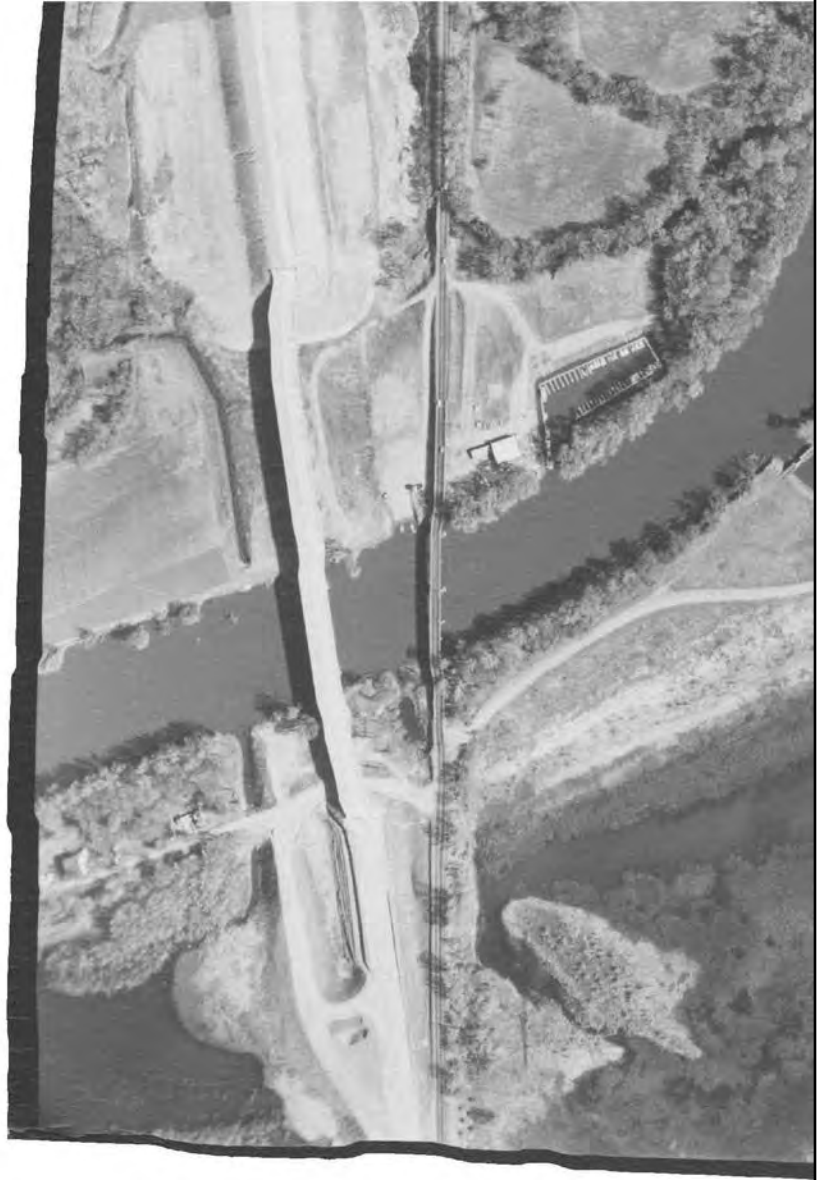
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Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1960

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1957

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1956

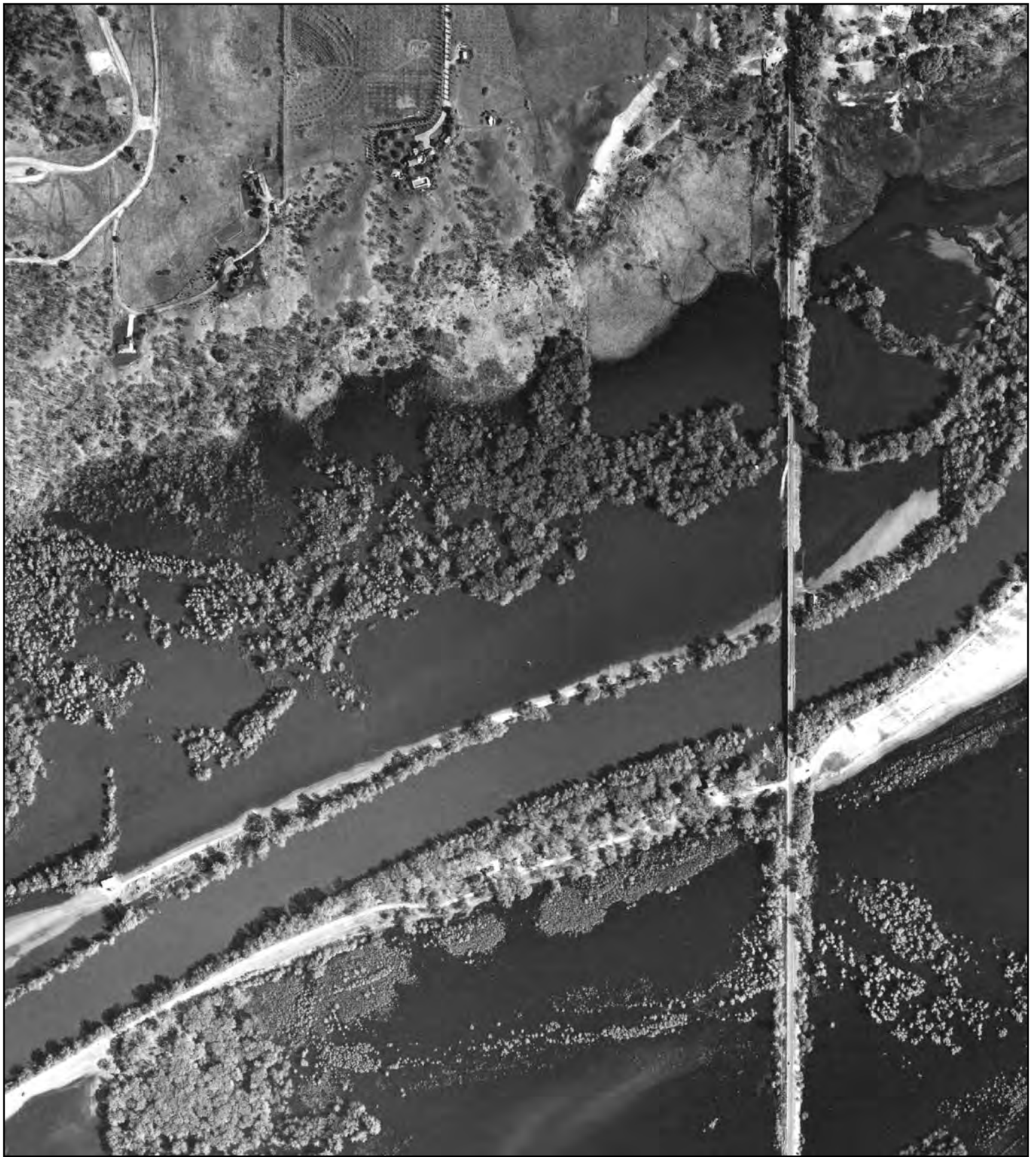
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www.historicalinfo.com





Burnsville, MN



1951

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1947

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

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Burnsville, MN



1940

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

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Burnsville, MN



1937

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2017

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2016

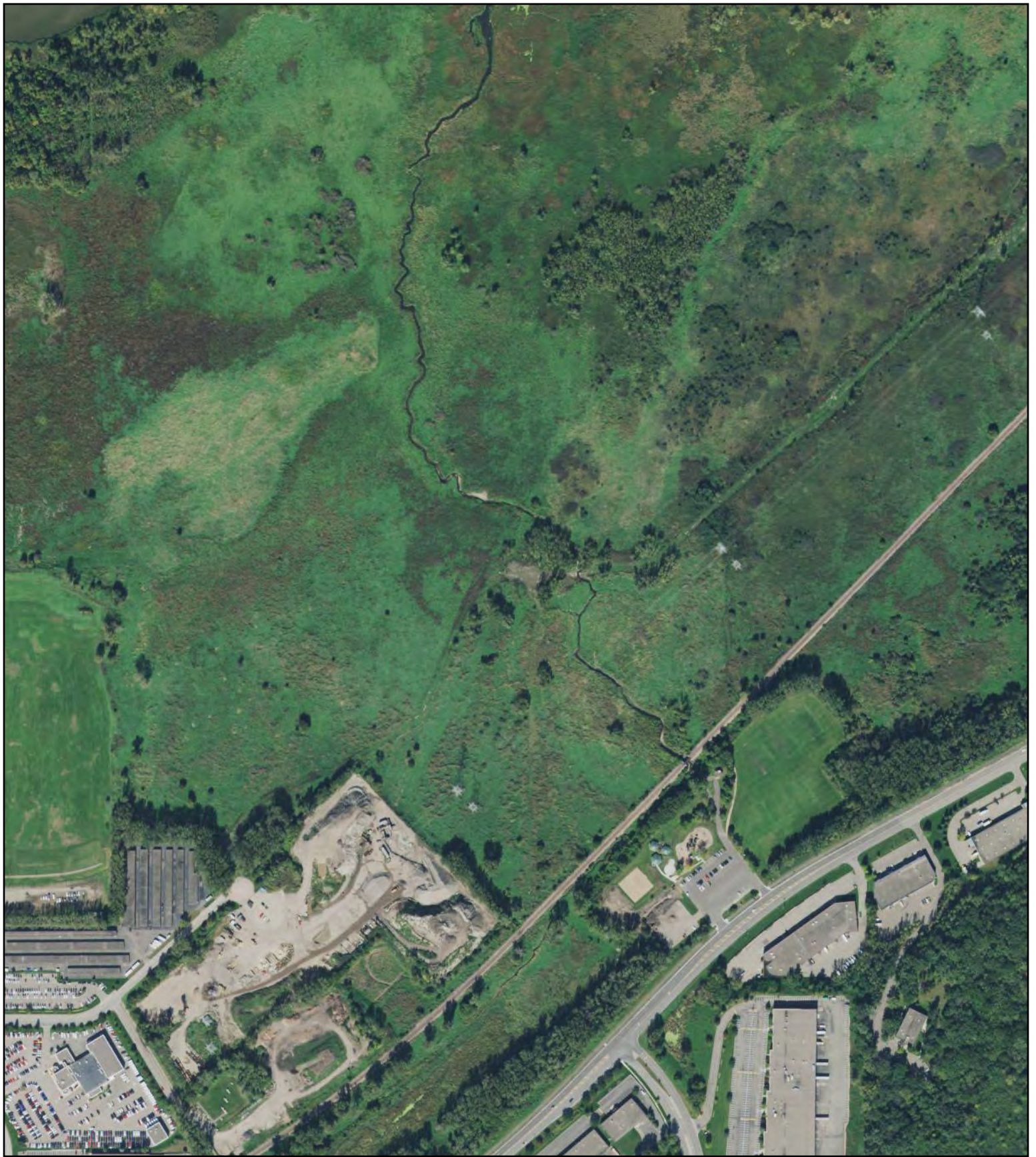
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www.historicalinfo.com





Burnsville, MN



2015

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

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Burnsville, MN



2013

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

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Burnsville, MN



2012

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

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Burnsville, MN



2009

HIG Project # 2016068

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Approximate Scale 1: 6,000 (1"=500')

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Burnsville, MN



2008

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Burnsville, MN



2004

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Approximate Scale 1: 6,000 (1"=500')

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Burnsville, MN



2003

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

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Burnsville, MN



2002

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Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



2000

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1997

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1991

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1984

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1979

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1974

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1972

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1971

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1970

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Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1969

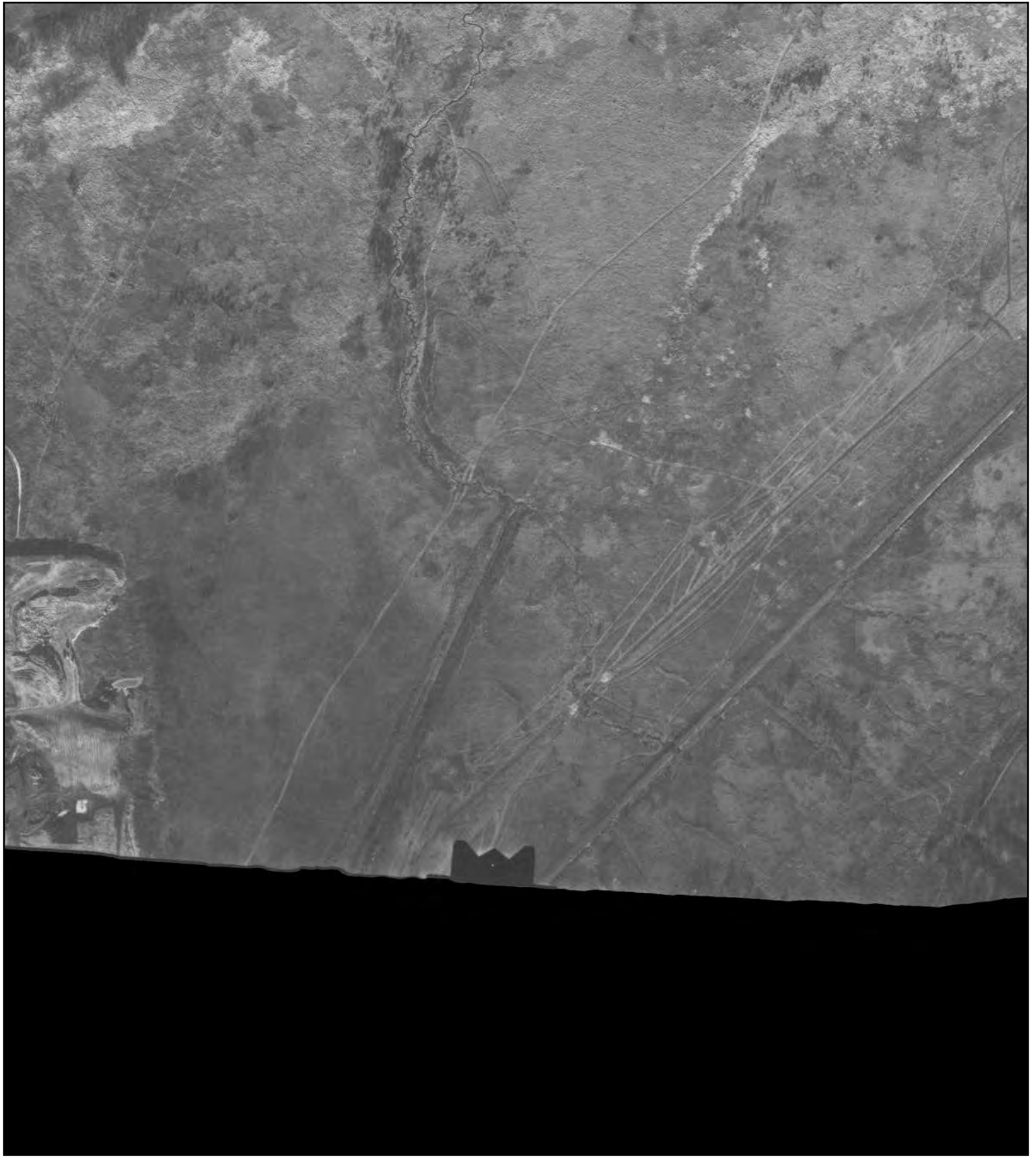
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Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1967

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1966

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1964

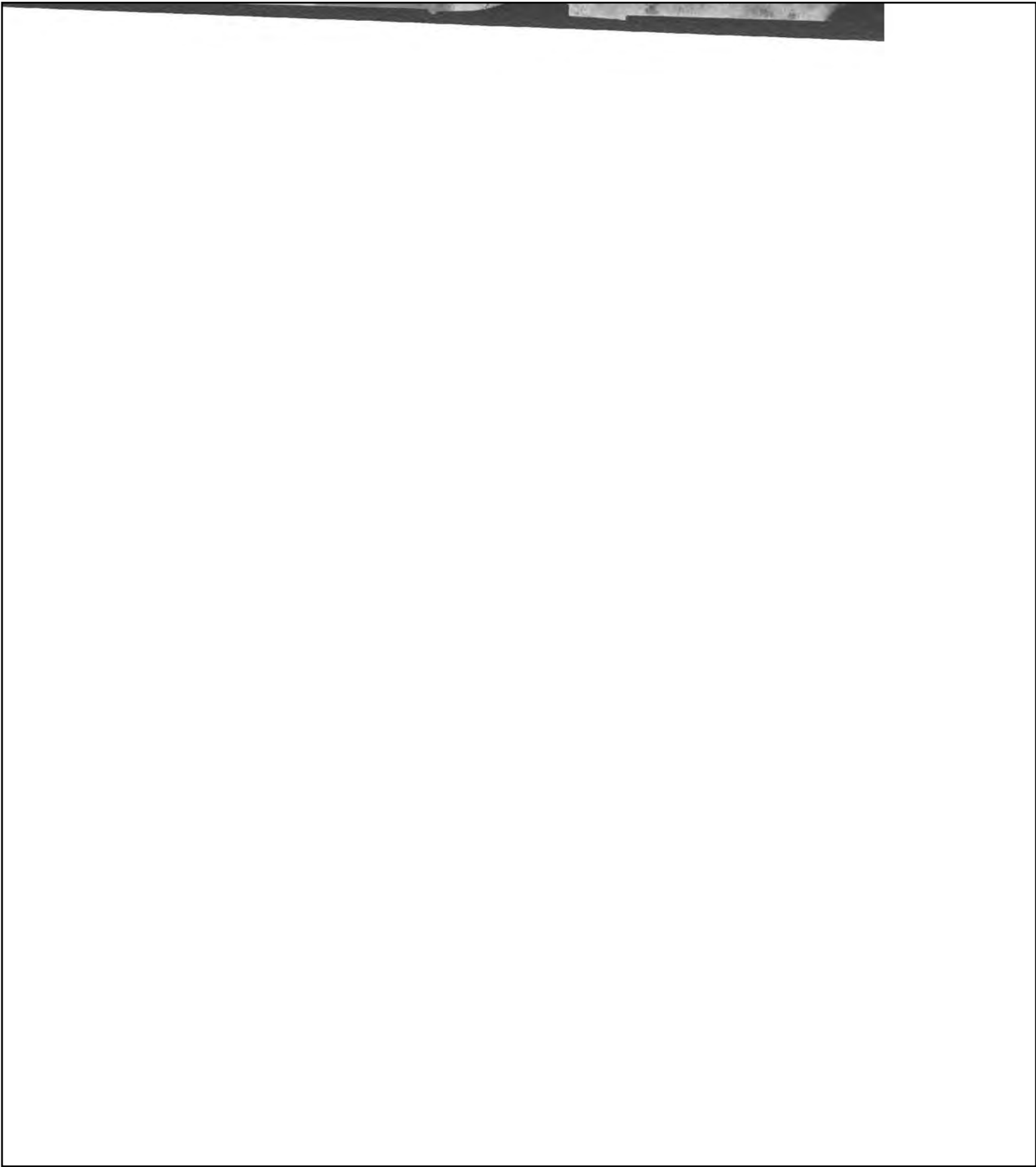
HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1960

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1957

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com



LAB. COPY

Burnsville, MN



1956

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1951

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1947

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1940

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com





Burnsville, MN



1937

HIG Project # 2016068

Client Project # 23/19-1372.00 1

Approximate Scale 1: 6,000 (1"=500')

www.historicalinfo.com



Appendix B

Boring Logs

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959649.943m, E:477228.009m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 714.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 14.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C C S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0		1	D/O/S: No/ None/ None PID:0.3 D/O/S: No/ None/ None D/O/S: No/ None/ None		SM WM ASH	(SM): SILTY SAND with GRAVEL; fine to coarse grained; brown; moist; homogeneous; fill. (WM): WASTE MATERIAL; gray; moist; with plastic, wood, glass, mixed with silty/ash matrix; [FILL]. (ASH): ASH; gray; moist to wet; with very fine grained sand, soft, homogeneous, nonplastic. At 7.5': wet.	710
5		2	PID:0.3 D/O/S: No/ None/ None D/O/S: No/ None/ None				705
10		3	PID:0.3 D/O/S: No/ Organic/ None D/O/S: No/ None/ None D/O/S: No/ None/ None		PT CH	(PT): PEAT; dark brown; moist; spongy, fibrous, organic odor; [NATIVE]. (CH): FAT CLAY; very dark gray; moist; high plasticity, soft; [NATIVE]. BEDROCK.	700
15						End of geoprobe 14.0 feet	
20							
25							
30							
35							
40							

M:\GINT\FREWAY LANDFILL_23191372.GPJ_BARR\LIBRARY.GLB_ENVIRO LOG_BARR TEMPLATE.GDT

Date Boring Started: 4/11/18
 Date Boring Completed: 4/11/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959645.42m, E:477280.64m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 27.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C S S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0		1	PID:0.7 D/O/S: No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; medium grained; brown; moist; homogeneous, stiff; 10% gravel, 70% sand, 20% fines, [FILL].	720
5		2	PID:6.0 D/O/S: No/ Light/ None	ASH WM		(ASH): ASH; gray; moist; homogeneous, soft, nonplastic; mixed with waste material. (WM): WASTE MATERIAL; with wood, shingles; light odor.	715
10		3	PID:0.9 D/O/S: Trace/ None/ None			(ASH): ASH; gray; moist to wet; homogeneous, soft, with sand and trace black discoloration.	710
15		4		ASH		From 15' - 20': No recovery.	705
20		5	D/O/S: Trace/ Trace/ None			From 20' - 26': wet, dark gray to black.	700
25		6	D/O/S: Black/ None/ None				
						BEDROCK.	
						End of geoprobe 27.0 feet	

M:\GINT\FREWAY LANDFILL_23191372.GPJ_BARR\LIBRARY.GLB_ENVIRO LOG_BARR TEMPLATE.GDT

Date Boring Started: 3/27/18
 Date Boring Completed: 3/27/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959648.941m, E:477345.063m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 40.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U S C S S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0		1	PID:0.4 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; fine to coarse grained; dark brown; moist.	
5		2	PID:1.2 D/O/S:No/ None/ None	ASH		(ASH): ASH; gray; moist; nonplastic, firm. From 5' - 8.5': soft to firm.	720
10		3	PID:3.2 D/O/S:No/ None/ None			From 10': wood debris observed.	715
15		4	PID:3.0 D/O/S:No/ Strong/ Slight			(WM): WASTE MATERIAL; wet; with wood, fabric, ash; strong odor and light sheen; [FILL].	710
20		5		WM		From 20' - 25': No recovery.	705
25		6	PID:7.9 D/O/S:No/ Strong/ Slight			From 25': wood and plastic; strong odor and light sheen.	700
30		7	PID:1.5 D/O/S:No/ Strong/ Medium	PT		(PT): PEAT; very dark brown; wet; very soft, fibrous, mixed with trace waste material; strong odor and sheen; [NATIVE]. From 33': no waste material.	695
35		8	PID:1.1			BEDROCK; tan; pulverized bedrock, with trace wood and plastic. Limestone clast in shoe.	690
40						End of geoprobe 40.0 feet	685

M:\GINT\FREWAY LANDFILL_23191372.GPJ_BARR\LIBRARY.GLB_ENVIRO LOG_BARR TEMPLATE.GDT

Date Boring Started: 3/23/18
 Date Boring Completed: 3/23/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959649.765m, E:477388.457m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 726.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 38.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U S C S S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0		1	PID:0.5 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; dark brown; moist; homogeneous, loose; 10% gravel, 70% sand, 20% fines, [FILL].	725
5		2	PID:2.1 D/O/S:No/ None/ None	WM		(WM): WASTE MATERIAL; gray; moist; with brick, wood, glass, mixed with ash and clay.	720
10		3	PID:170.4 D/O/S:No/ Moderate/ None			From 10': with wood and plastic; moderate odor.	715
15		4				From 15' - 20': No recovery.	710
20		5				From 20': with wood and plastic, wet, loose/soupy; light odor and light rainbow sheen.	705
25		6	PID:8.1 D/O/S:No/ Light/ Trace			From 25': with wood, rubber, plastic; moderate odor.	700
30		7	PID:11.3 D/O/S:No/ Light/ None	PT		(PT): PEAT; dark yellowish brown; moist; fibrous; light organic odor; [NATIVE].	700
35		8	PID:3.0			From 30': soft, with few shells.	695
40			PID:1.8 D/O/S:No/ None/ None			ML CH	
						End of geoprobe 38.0 feet	

Date Boring Started: 3/22/18
 Date Boring Completed: 3/22/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959648.285m, E:477442.506m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 33.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSCSU	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND; [FILL].	
1		1	PID:0.4 D/O/S:No/ None/ None			(CL): SANDY CLAY; gray, moist; with very fine grained sand, few roots.	720
5			PID:0.8 D/O/S:No/ None/ None			Frozen to 2.5' bgs.	
2		2	PID:4.9 D/O/S:No/ Moderate/ None	CL		From 5.4' - 6': mixed with paper, wood, plaster; moderate chemical/burnt odor.	715
10			PID:1.1 D/O/S:No/ None/ None			From 10': wet.	
3		3	PID:24.5 D/O/S:No/ None/ None			(WM): WASTE MATERIAL; moist.	710
15			PID:26.7 D/O/S:No/ Slight/ None			From 15': with canvas, glass, wood, plaster, plastic; slight organic/burnt odor.	
4		4	PID:26.7 D/O/S:No/ Slight/ None				
20			PID:2.5 D/O/S:No/ Slight/ None			From 20': wet, with black fine-grained material, plastic, wood, chalk; slight chemical odor.	705
5		5	PID:3.0 D/O/S:No/ Slight/ None				700
25			PID:0.4 D/O/S:No/ None/ None			(PT): PEAT; very dark brown; moist; fibrous; [NATIVE].	
6		6	PID:0.4 D/O/S:No/ None/ None				
30			PID:0.5 D/O/S:No/ None/ None			From 30': more clay, less fibrous, with some shells.	695
7		7	PID:0.5 D/O/S:No/ None/ None				
						End of geoprobe 33.0 feet	

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Date Boring Started: 3/20/18
 Date Boring Completed: 3/20/18
 Logged By: ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959595.631m, E:477220.286m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 25.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U S C S S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0 - 3		1	PID:0.3 D/O/S: No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; brown; moist; homogeneous, firm, with fine to coarse gravel; 5% gravel, 70% sand, 25% fines, [FILL].	720
3 - 8		2	PID:0.3 D/O/S: No/ None/ None	ASH		(ASH): ASH; gray; moist; alternating with layers of brown silty sand and waste material (brick and concrete).	715
8 - 13		3	D/O/S: No/ None/ None PID:9.0 D/O/S: No/ Moderate/ None	WM		From 10': with more waste material (wood and brick). (WM): WASTE MATERIAL; black; moist; with wood, plastic, concrete; moderate odor.	710
13 - 24		4	PID:0.3 D/O/S: No/ None/ None	ASH		(ASH): ASH; gray; wet; soft, nonplastic, homogeneous.	705
24 - 25		5	D/O/S: No/ None/ None	PT		(PT): PEAT; dark brown; fibrous, spongy; organic odor; [NATIVE].	700
25 - 25.5				CH		(CH): FAT CLAY; dark gray; high plasticity; [NATIVE].	
25.5 - 25.0						BEDROCK; Prairie du Chien. End of geoprobe 25.0 feet	

Date Boring Started: 4/11/18
 Date Boring Completed: 4/11/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959597.862m, E:477280.649m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 26.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C S S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0			D/O/S: No/ None/ None PID: 1.0	SM		(SM): SILTY SAND with GRAVEL; brown; moist; [FILL].	
1		1	D/O/S: No/ Trace/ None	WM		(WM): WASTE MATERIAL; with plastic, wood; trace odor.	
5		2	D/O/S: Trace/ None/ None PID: 0.3	ASH		(ASH): ASH; gray; with trace wood debris. From 8': wet.	720
10		3	D/O/S: No/ None/ None				715
15		4	PID: 3.7 D/O/S: No/ None/ None	WM		(WM): WASTE MATERIAL; with wood, bricks, plastic; light odor.	710
20		5	PID: 1.1 D/O/S: No/ Light/ None				705
25						BEDROCK.	700
26.0						End of geoprobe 26.0 feet	

Date Boring Started: 3/27/18
 Date Boring Completed: 3/27/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959595.385m, E:477337.108m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 725.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 30.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0				SM	(SM): SILTY SAND with GRAVEL; Topsoil; [FILL]. (WM): WASTE MATERIAL; with brick, concrete, wood.	725
1		1	PID:5.5 D/O/S:No/ None/ None		From 0.5' - 5': mixed with silty sand.	
5		2			From 5' - 10': No recovery.	720
10		3	PID:5.5 D/O/S:No/ Strong/ None		From 10': with ash, wood, plastic; strong treated wood odor.	715
15		4	PID:20.5 D/O/S:No/ Moderate/ None	WM	From 15': with wood, green plastic; moderate odor.	710
20		5			From 20' - 25': No recovery.	705
25		6	PID:150.6 D/O/S:No/ Strong/ None		From 25': soupy ash matrix, with some plastic.	700
30			D/O/S:No/ None/ None	PT	(PT): PEAT; dark brown; moist; fibrous, spongy, soft; organic odor; [NATIVE].	695
					End of geoprobe 30.0 feet	

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Date Boring Started: 3/23/18
 Date Boring Completed: 3/23/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959594.523m, E:477387.912m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 35.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C S S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0 - 1		1	PID:0.8 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; fine to coarse grained; brown; moist; homogeneous; [FILL].	
1 - 5			D/O/S:No/ Strong/ None	ASH		(ASH): ASH; gray; moist; homogeneous, nonplastic, with some fine grained sand.	
5 - 10		2	PID:222.8 D/O/S:No/ Strong/ None	WM		(WM): WASTE MATERIAL; dark gray; moist; sandy matrix, with wood and plastic. From 5': with treated wood; strong odor.	720
10 - 15		3	PID:175.6 D/O/S:No/ Strong/ None			From 10': with treated wood and plastic; strong odor.	715
15 - 20		4	PID:122.9 D/O/S:No/ Strong/ None			From 15': black silty sandy matrix, with treated wood and concrete.	710
20 - 25		5	PID:9.5 D/O/S:No/ Moderate/ None			From 20': wet, with wood and shingles; moderate odor.	705
25 - 30		6	PID:15.1 D/O/S:No/ Moderate/ Moderate			From 25': black granular matrix, with wood and glass; moderate odor and sheen.	700
30 - 35		7	PID:6.6 D/O/S:No/ Organic/ None	PT		(PT): PEAT; dark brown; moist; fibrous, firm; [NATIVE].	695
35 - 35.0				ML		(ML): SILT; dark grey to tan; wet; possibly pulverized limestone, very soft, homogeneous; sulfur/wetland odor; [NATIVE].	690
35.0						End of geoprobe 35.0 feet	

Date Boring Started: 3/22/18
 Date Boring Completed: 3/22/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

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Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959595.345m, E:477435.754m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 725.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 35.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C C S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0			PID:1.6 D/O/S:No/ None/ None	SM		(SM): SILTY SAND; fine to medium grained; moist; [FILL].	725
		1	PID:2.1 D/O/S:No/ None/ None	ASH		(ASH): ASH; gray; moist; stiff.	
5			PID:11.1 D/O/S:No/ None/ None	WM		(WM): WASTE MATERIAL; moist; with wood debris. From 5': with paper.	720
10		3	PID:26.3 D/O/S:No/ None/ None	WM		From 10': black fine grained matrix, with wood, glass, plastic.	715
15			PID:30.9 D/O/S:Black/ Slight/ Moderate	WM		At 12': refusal, offset ~10' south.	710
		4		WM		From 15': black fine grained matrix, with wood, plastic, granular blue/gray material (slight odor and moderate sheen).	710
20			PID:16.0 D/O/S:No/ None/ None	PT		From 20': wet, black fine grained matrix, with wood.	705
		5	PID:1.2 D/O/S:No/ None/ None	PT		(PT): PEAT; dark brown; moist; fibrous; [NATIVE].	700
25			PID:0.2 D/O/S:No/ None/ None	CL		From 27': black, less fibrous, more clay.	700
		6	PID:0.3 D/O/S:No/ None/ None	CL		(CL): SANDY LEAN CLAY; gray; moist; with fine grained sand, small to large round to subrounded gravel, increasing silt with depth; 25% gravel, 25% sand, 50% fines, [NATIVE].	695
30			PID:0.5 D/O/S:No/ None/ None	SC-SM		(SC-SM): CLAYEY SAND with SILT; fine to coarse grained; gray; wet; 5% gravel, 80% sand, 15% fines, [NATIVE].	695
		7		SC-SM		From 32' - 33': more coarse grained sand.	690
35						From 34' - 35': more silt.	690
						End of geoprobe 35.0 feet	690

Date Boring Started: 3/20/18
 Date Boring Completed: 3/20/18
 Logged By: ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959542.747m, E:477228.698m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 720.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 20.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0		1	PID:3.4 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; fine to coarse grained; brown; moist; firm; 5% gravel, 70% sand, 25% fines, [FILL].	720
5		2	PID:2.9 D/O/S:No/ Trace/ None D/O/S:No/ None/ None	WM		(WM): WASTE MATERIAL; moist; with paper, brick, wood, plastic.	715
10		3	PID:1.7 D/O/S:No/ None/ None	ASH		(ASH): ASH; gray; moist; soft, nonplastic. From 10': wet.	710
15		4	PID:0.9 D/O/S:No/ Organic/ None D/O/S:No/ None/ None D/O/S:No/ None/ None	PT		(PT): PEAT; moist; organic odor; [NATIVE].	705
20				CH		(CH): FAT CLAY; moist; [NATIVE].	700
						BEDROCK; moist. End of geoprobe 20.0 feet	

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Date Boring Started: 4/11/18
 Date Boring Completed: 4/11/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959537.967m, E:477282.676m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 22.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U S C S S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; brown; moist; [FILL].	
1		1	PID:21.7 D/O/S:No/ None/ None			(WM): WASTE MATERIAL; moist; with greenish gray clay, wood, brick, plastic.	720
5		2	PID:23.8 D/O/S:No/ None/ None			From 5': with cement and wood.	
10		3	PID:33.0 D/O/S:No/ Moderate/ Trace			From 10': No recovery (offset), with wood, brick, plastic; moderate odor and trace sheen.	715
15		4	PID:8.0			From 15': with plastic and wood; moderate odor.	710
20		5				(PT): PEAT; dark brown; moist; fibrous, spongy; [NATIVE].	705
						BEDROCK.	
						End of geoprobe 22.0 feet	

Date Boring Started: 3/27/18
 Date Boring Completed: 3/27/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

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Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959539.675m, E:477336.735m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 726.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 22.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C C S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0		1	PID:0.4 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; fine to coarse grained; brown; moist; 10% gravel, 70% sand, 20% fines, [FILL].	725
5		2	PID:11.0 D/O/S:No/ Moderate/ Trace	ASH		(ASH): ASH; gray; moist; soft, massive, nonplastic.	
10		3	PID:21.0 D/O/S:No/ Moderate/ None	WM		(WM): WASTE MATERIAL; with treated wood and brick; moderate odor and trace sheen. From 10': with brick, wood, concrete.	720
15		4	PID:14.6 D/O/S:No/ Moderate/ None	ML		From 15': with wood, glass, concrete; moderate odor. (ML): SILT; tan; moist; dense, spongy, nonplastic, with organic material; [NATIVE].	715
20		5	PID:3.5 D/O/S:No/ None/ None	PT		(PT): PEAT; dark brown; moist; fibrous, spongy, soft to firm; organic odor; [NATIVE].	710
22						BEDROCK. End of geoprobe 22.0 feet	705

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Date Boring Started: 3/22/18
 Date Boring Completed: 3/22/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959545.138m, E:477388.104m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 726.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 26.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C C S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0		1	PID:1.0 D/O/S: No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; medium to coarse grained; brown; moist; homogeneous; 10% gravel, 70% sand, 20% fines, [FILL].	725
0				ASH		(ASH): ASH; gray; moist; homogeneous, firm, nonplastic.	
5		2	PID:1.0 D/O/S: No/ Light/ None PID:23.7 D/O/S: No/ Moderate/ Trace			(WM): Waste Material; moist; black silty sandy matrix, with wood; light odor. From 5': with treated wood and metal; moderate odor and trace sheen.	720
10		3	PID:84.9 D/O/S: No/ Strong/ Trace			From 10': with wood, paper, concrete, metal, fabric; light to strong odor and trace sheen.	715
15		4	PID:60.4 D/O/S: No/ Moderate/ None			From 15': with treated wood; moderate odor.	710
20		5	PID:72.1 D/O/S: No/ Light/ None			From 20': light gray sandy matrix, with concrete and wood; light odor.	705
25		6	PID:2.1			BEDROCK; gray; weathered Prairie du Chien, positive HCl reaction.	700
						End of geoprobe 26.0 feet	

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Date Boring Started: 3/22/18
 Date Boring Completed: 3/22/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959541.842m, E:477441.886m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 727.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 30.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C C S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
1		1	PID:0.4 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; brown; moist; [FILL].	725
2		2	PID:0.4 D/O/S:No/ None/ None	ASH		(ASH): ASH; dark gray; moist; stiff.	
5		2	PID:18.3 D/O/S:No/ None/ None	WM		(WM): WASTE MATERIAL; moist. From 5': with wood, plastic, paper, fabric.	720
10		3	PID:16.0 D/O/S:No/ Slight/ Trace			From 10': with wood, plastic, rubber; slight odor and light/trace sheen.	715
15		4	PID:15.4 D/O/S:No/ Moderate/ Heavy			From 15': with wood, plastic, brick, concrete rubber; moderate odor and heavy sheen.	710
20		5	PID:5.0 D/O/S:No/ None/ None			From 20': black fine grained matrix, with wood and blue powder.	705
25		6	PID:1.1 D/O/S:No/ Organic/ None				
25				SP		(SP): POORLY GRADED SAND; fine grained; brown; wet; loose, homogenous [refusal at 23' bgs, offset]; 0% gravel, 95% sand, 5% fines, [NATIVE].	
30						End of geoprobe 30.0 feet	

Date Boring Started: 3/20/18
 Date Boring Completed: 3/21/18
 Logged By: ARP2/ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959487.867m, E:477223.484m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 25.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C C S S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0 - 4.5		1	PID:0.3 D/O/S: No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; fine to coarse grained; dark brown; moist; 5% gravel, 70% sand, 25% fines, [FILL]. From 3': no gravel, yellowish brown.	720
4.5 - 6.5		2	PID:1.4 D/O/S: No/ None/ None	SP		(SP): POORLY GRADED SAND; medium grained; yellowish brown; moist; homogeneous, some iron oxidation from 6.5'-7' bgs; 0% gravel, 95% sand, 5% fines, [FILL].	715
6.5 - 11.5		3	D/O/S: No/ None/ None PID:3.9 D/O/S: No/ Trace/ None	CL WM	 	(CL): SANDY LEAN CLAY; olive green/gray; moist; stiff, low plasticity, with fine to medium grained sand and trace fine gravel; 0% gravel, 30% sand, 70% fines, [FILL]. (WM): WASTE MATERIAL; moist; black silty matrix, with wood, concrete; trace odor.	710
11.5 - 19.5		4	PID:6.9 D/O/S: No/ Light/ None D/O/S: No/ None/ None	ASH		(ASH): ASH; gray; wet; soft, nonplastic.	705
19.5 - 24.5		5	PID:0.3 D/O/S: No/ None/ None PID:0.3 D/O/S: No/ Organic/ None	PT CH	 	(PT): PEAT; organic odor; [NATIVE]. (CH): FAT CLAY; [NATIVE].	700
24.5 - 25.0						BEDROCK. End of geoprobe 25.0 feet	

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Date Boring Started: 4/11/18
 Date Boring Completed: 4/11/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959489.374m, E:477282.117m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 23.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCSU	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; medium to coarse grained; brown; moist; homogeneous; [FILL].	
1		1	D/O/S:No/ None/ None PID:8.1 D/O/S:No/ Light/ None	SM			720
5		2	PID:26.1 D/O/S:No/ Strong/ None			(WM): WASTE MATERIAL; moist; with wood and plastic; light odor. From 5': sandy silty matrix, with wood, brick, plastic; strong odor.	715
10		3	PID:26.3 D/O/S:No/ Strong/ None	WM		From 10': with wood and fabric; strong odor.	710
15		4				From 15' - 20': No recovery.	705
20		5	PID:0.7 D/O/S:No/ None/ None			BEDROCK.	
23.0						End of geoprobe 23.0 feet	

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Date Boring Started: 3/27/18
 Date Boring Completed: 3/27/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959490.852m, E:477334.012m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 726.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 24.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCSU	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; brown; moist; homogeneous; 10% gravel, 70% sand, 20% fines, [FILL].	725
1		1	D/O/S: No/ None/ None	SM			
5		2	D/O/S: No/ Moderate/ None PID: 8.8 D/O/S: No/ Moderate/ None			WASTE MATERIAL; black; moist; with wood and fabric; moderate odor.	720
10		3	PID: 36.0 D/O/S: No/ Moderate/ None			From 10': shingles with wood.	715
15		4	PID: 15.9 D/O/S: No/ Moderate/ Trace			From 15': with wood and metal; moderate odor and trace sheen.	710
20		5	PID: 0.9 D/O/S: No/ None/ None	PT CH		(PT): PEAT; dark brown; moist; fibrous, spongy; [NATIVE]. (CH): FAT CLAY; dark gray; moist; soft, high plasticity, massive; [NATIVE].	705
						BEDROCK.	
25						End of geoprobe 24.0 feet	

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Date Boring Started: 3/26/18
 Date Boring Completed: 3/26/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959491.983m, E:477392.633m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 727.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 22.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSCSU	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0 - 4.5		1	D/O/S: No/ None/ None PID: 20.6 D/O/S: No/ Light/ None	SM		(SM): SILTY SAND with GRAVEL; medium to coarse grained; dark brown; moist; homogeneous; [FILL].	725
4.5 - 9.5		2	PID: 142.0 D/O/S: No/ Moderate/ Trace	WM		(WM): WASTE MATERIAL; moist; with wood; light odor. From 5': with wood, plastic, rubber; moderate odor and trace sheen.	720
9.5 - 14.5		3	PID: 29.2 D/O/S: No/ Moderate/ Trace			From 10': silty matrix, with wood and glass; moderate odor and trace sheen.	715
14.5 - 19.5		4	PID: 14.0 D/O/S: No/ Moderate/ None	PT		From 15': silty matrix, with wood and semi-cohesive white granular material; moderate odor.	710
19.5 - 20.0		5	PID: 19.5 D/O/S: No/ None/ None			(PT): PEAT; dark brown; moist; fibrous; [NATIVE].	705
20.0 - 22.0						BEDROCK; limestone.	
22.0 - 22.0						End of geoprobe 22.0 feet	

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Date Boring Started: 3/22/18
 Date Boring Completed: 3/22/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959490.67m, E:477440.97m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 728.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 23.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C S S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; brown; moist; [FILL].	
1		1	D/O/S:No/ None/ None PID:1.3 D/O/S:No/ None/ None		SM	(ASH): ASH; gray; moist; firm, massive, nonplastic.	725
5		2	D/O/S:No/ Light/ None PID:67.1 D/O/S:No/ Strong/ None		ASH	(WM): WASTE MATERIAL; dark gray fine grained matrix, with plastic; light odor. From 5': wet, black matrix, with wood, plastic; moderate to strong odor.	720
10		3			WM	From 10' - 15': No recovery (wood chunk jammed in liner).	715
15		4	PID:102.5 D/O/S:No/ Light/ None			From 15': with wood, plastic; light odor.	710
20		5	D/O/S:No/ Light/ None D/O/S:No/ None/ None			From 20': with metal, wood; light odor. BEDROCK; tan; moist; Prairie du Chien, friable, sandy.	705
23.0						End of geoprobe 23.0 feet	

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Date Boring Started: 3/21/18
 Date Boring Completed: 3/21/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959442.725m, E:477224.855m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 25.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C C S S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
1		1	PID:0.9 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; fine to medium grained; dark brown; moist; [FILL].	
5				CL/ML		(CL/ML): LEAN CLAY with SILT; gray; moist; soft, low plasticity, mixed with trace glass and ash.	720
5		2	PID:1.8 D/O/S:No/ None/ None	SM		(SM): SILTY SAND; brown; moist; with few coarse sand and trace clay.	
10				WM		(WM): WASTE MATERIAL; moist; gray silty sandy matrix, with concrete and brick. From 10': same; light odor. From 12': silty matrix, with wood, paper, plastic, glass; moderate odor.	715
15		3	PID:7.6 D/O/S:No/ Light/ None D/O/S:No/ Moderate/ None	WM			710
20		4	PID:4.6 D/O/S:No/ Light/ None D/O/S:No/ None/ None	ASH		(ASH): ASH; gray; wet; soft, nonplastic.	705
25		5		PT		(PT): PEAT; moist; fibrous; organic odor; [NATIVE].	
25				CH		(CH): FAT CLAY; moist; [NATIVE].	700
25						BEDROCK.	
25						End of geoprobe 25.0 feet	

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Date Boring Started: 4/11/18
 Date Boring Completed: 4/11/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959434.995m, E:477283.694m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 725.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 22.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	S C S S U	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; brown; moist; [FILL].	725
1		1	D/O/S:No/ None/ None PID:10.5 D/O/S:No/ Moderate/ None	SM			
5		2	PID:16.1 D/O/S:No/ Moderate/ None	WM		(WM): WASTE MATERIAL; dark gray; moist; with wood, plastic; moderate treated wood odor. From 5': sandy matrix, with wood; moderate odor.	720
10		3	PID:36.6 D/O/S:Yes/ Moderate/ None D/O/S:Black/ None/ None	ASH		From 10': with wood and plywood; moderate treated wood odor. (ASH): ASH; dark gray; moist to wet; soft, massive; black discoloration.	715
15		4		ASH		From 15' - 20': No recovery.	710
20		5	PID:6.6 D/O/S:No/ None/ None			From 20': wet.	705
22						At 22': Bedrock.	
22.0						End of geoprobe 22.0 feet	

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Date Boring Started: 3/27/18
 Date Boring Completed: 3/27/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959432.864m, E:477334.097m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 727.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 25.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C C S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
1		1	PID:0.4 D/O/S:No/ None/ None		SM	(SM): SILTY SAND with GRAVEL; brown; moist; homogeneous; [FILL].	725
2		2	PID:8.6 D/O/S:No/ Light/ None		ASH	(ASH): ASH; gray; moist; homogeneous, stiff, nonplastic.	720
5		2	PID:8.6 D/O/S:No/ Moderate/ None		WM	(WM): WASTE MATERIAL; with glass and wood. From 5': with wood and fibrous material; moderate odor.	720
10		3	PID:3.4 D/O/S:No/ Trace/ None			[offset, no recovery from 10'].	715
15		4	PID:1.9 D/O/S:No/ None/ None		ASH	(ASH): ASH; gray; moist to wet; soft to stiff, homogeneous, with trace wood; trace odor. From 15': no wood, no odor.	710
20		5	PID:1.9 D/O/S:No/ None/ None		ASH	From 18.5': wet.	705
25		5	PID:1.9 D/O/S:No/ None/ None			BEDROCK; limestone. End of geoprobe 25.0 feet	705

Date Boring Started: 3/26/18
 Date Boring Completed: 3/26/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959439.703m, E:477389.367m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 728.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 23.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C C S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
1		1	D/O/S: No/ None/ None PID: 4.5 D/O/S: No/ None/ None		SM	(SM): SILTY SAND with GRAVEL; brown; moist; with organic material; [FILL].	725
5			PID: 4.9 D/O/S: No/ Light/ None		ASH	(ASH): ASH; moist; with sand and waste material (plastic).	
10		2	PID: 14.5 D/O/S: No/ None/ None		WM	(WM): WASTE MATERIAL; moist; with wood, concrete, rock.	720
15		3	PID: 20.6 D/O/S: No/ Moderate/ None			From 15': with wood; moderate treated wood odor.	715
20		4	PID: 4.5 D/O/S: No/ None/ None			From 20': with wood.	710
23.0		5				End of geoprobe 23.0 feet	705

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Date Boring Started: 3/22/18
 Date Boring Completed: 3/22/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959445.53m, E:477442.964m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 727.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 23.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C C S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; dark gray; moist; firm, massive; [FILL].	
1		1	D/O/S:No/ None/ None PID:34.5 D/O/S:No/ None/ None		SM	(ASH): ASH; gray; moist; stiff, massive, nonplastic.	725
5		2	PID:342.8 D/O/S:No/ Strong/ None		ASH	(WM): WASTE MATERIAL; gray; moist; with wood, bricks, plastic. From 5': with wood, fabric, shingles; strong solvent/petroleum odor.	720
10		3			WM	From 10' - 15': No recovery.	715
15		4	D/O/S:No/ Moderate/ None			From 15': with wood and fibrous material.	710
20		5	PID:35.5 D/O/S:No/ None/ None			From 20': with plastic and wood.	
						BEDROCK; light yellowish brown; Prairie du Chien limestone.	705
						End of geoprobe 23.0 feet	

Date Boring Started: 3/21/18
 Date Boring Completed: 3/21/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959384.109m, E:477229.626m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 722.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 16.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U S C S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0 - 1		1	D/O/S:No/ None/ None PID:1.5 D/O/S:No/ None/ None	SP		(SP): POORLY GRADED SAND with SILT; medium grained; brown; moist; homogeneous, with trace fine gravel; trace% gravel, 90% sand, 10% fines, [FILL].	720
1 - 5				SM		(SM): SILTY SAND; fine to coarse grained; olive gray; moist; homogeneous; 0% gravel, 75% sand, 25% fines, [FILL].	
5 - 10		2	PID:3.5 D/O/S:No/ Trace/ None	WM		(WM): WASTE MATERIAL; sandy matrix, with wood, plastic; trace odor.	715
10 - 15		3	D/O/S:No/ None/ None	ASH		(ASH): ASH; gray; wet; soft, homogeneous, with few wood debris.	710
15 - 16		4	PID:0.6 D/O/S:No/ Organic/ None PID:0.3 D/O/S:No/ None/ None	PT CL	 	(PT): PEAT; dark brown; moist; fibrous, spongy; organic odor; [NATIVE]. (CL): LEAN CLAY; dark gray; moist; [NATIVE].	
16 - 16.0						BEDROCK. End of geoprobe 16.0 feet	

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Date Boring Started: 4/12/18
 Date Boring Completed: 4/12/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959375.135m, E:477282.735m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 726.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 24.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C C S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; brown; moist; compact, massive; 10% gravel, 70% sand, 20% fines, [FILL].	725
1		1	PID:6.5 D/O/S:No/ None/ None	SM			
5			D/O/S:No/ None/ None D/O/S:No/ None/ None	ASH		(ASH): ASH; dark gray; moist; nonplastic, stiff, more clay at 6' bgs.	720
2		2	PID:13.2 D/O/S:No/ Moderate/ None	WM		(WM): WASTE MATERIAL; moist; dark gray sandy matrix, with wood, glass, plastic; moderate treated wood odor.	
10			PID:16.2 D/O/S:No/ Moderate/ None	WM			715
3		3		WM			
15			PID:8.8 D/O/S:Black/ Moderate/ None D/O/S:No/ None/ None	ASH		From 15': wet, silty matrix, with green plastic and wood; black discoloration. (ASH): ASH; gray, wet; soft, sandy, massive.	710
4		4		ASH			
20			D/O/S:No/ None/ None	PT		(PT): PEAT; dark brown; moist; fibrous, spongy; organic odor; [NATIVE].	705
5		5		PT			
25						BEDROCK. End of geoprobe 24.0 feet	

Date Boring Started: 3/27/18
 Date Boring Completed: 3/27/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959377.367m, E:477335.344m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 727.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 24.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	S C S U	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0			D/O/S: No/ None/ None			(SM): SILTY SAND with GRAVEL; moist; [FILL].	
1		1	PID: 4.2 D/O/S: No/ Light/ None			WASTE MATERIAL; black sandy matrix, with paper, wood, plastic; light odor.	725
5		2	PID: 17.0 D/O/S: No/ Moderate/ None			From 5': silty matrix.	720
10		3	PID: 26.5 D/O/S: No/ Moderate/ None				715
15		4	D/O/S: No/ Moderate/ None PID: 3.5 D/O/S: No/ None/ None			(ASH): ASH; dark gray; wet; homogeneous, soft, nonplastic.	710
20		5	D/O/S: No/ None/ None PID: 0.9 D/O/S: No/ Organic/ None D/O/S: No/ None/ None			(PT): PEAT; moist; strong organic odor; [NATIVE]. (CH): FAT CLAY; moist; strong organic odor; [NATIVE].	705
24						BEDROCK; limestone.	
24						End of geoprobe 24.0 feet	

Date Boring Started: 3/26/18
 Date Boring Completed: 3/26/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



LOG OF Geoprobe FD-SB-F4

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959384.681m, E:477385.94m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 728.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 15.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSCSU	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0 - 4.5		1	PID:6.9 D/O/S:No/ None/ None D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; brown; moist; [FILL].	725
4.5 - 10		2	PID:56.9 D/O/S:No/ Moderate/ Slight	WM		(WM): WASTE MATERIAL; dark brown sandy matrix, with plastic and wood. From 5': brown sandy matrix, with wood, plastic, glass; moderate odor and light sheen.	720
10 - 15		3	PID:7.3 D/O/S:No/ Moderate/ None	WM		From 10': gray silty matrix, with wood; treated wood odor.	715
15 - 15.0						[offset due to refusal at 14', second refusal at 15']. End of geoprobe 15.0 feet	

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Date Boring Started: 3/21/18
 Date Boring Completed: 3/21/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959389.466m, E:477440.794m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 728.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 15.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U S C S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0				SM		(SM): SILTY SAND with GRAVEL; moist; compact; [FILL].	
		1	D/O/S: No/ None/ None PID: 9.0 D/O/S: No/ Moderate/ None	ASH		(ASH): ASH; gray; moist; homogeneous, stiff, nonplastic.	
5		2	PID: 119.8 D/O/S: No/ Moderate/ None	WM		(WM): WASTE MATERIAL; with plastic and wood; moderate odor.	725
						From 5': black/dark gray matrix, with plastic and wood; moderate odor.	
10		3	PID: 99.5 D/O/S: No/ Light/ None			From 10': black matrix, with wood and plastic; light odor.	720
15						Bedrock in shoe, refusal.	715
						End of geoprobe 15.0 feet	

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Date Boring Started: 3/21/18
 Date Boring Completed: 3/21/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959329.617m, E:477227.442m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 23.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U S C S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SP-SM): POORLY GRADED SAND with SILT; fine to coarse grained; brown; moist; homogeneous, with trace fine gravel; trace% gravel, 90% sand, 10% fines, [FILL].	
1		1	PID:0.6 D/O/S:No/ None/ None		SP-SM		720
5		2	PID:0.9 D/O/S:No/ None/ None		SM	(SM): SILTY SAND; very dark brown; moist; with fine gravel; 5% gravel, 75% sand, 20% fines, [FILL].	715
10		3	PID:0.9 D/O/S:No/ None/ None		SM		
15		4	PID:0.6 D/O/S:No/ None/ None		ASH	(ASH): ASH; gray; wet; soft, homogeneous, with few white very fine grained flecks.	710
20		5	PID:0.2 D/O/S:No/ None/ None		PT	(PT): PEAT; very dark brown; moist; fibrous, organic odor; [NATIVE].	705
23.0			D/O/S:No/ Organic/ None PID:0.0			BEDROCK.	
23.0						End of geoprobe 23.0 feet	

Date Boring Started: 4/12/18
 Date Boring Completed: 4/12/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959314.193m, E:477284.823m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 725.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 19.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C S S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							725
1		1	PID:0.2 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; brown; moist; compact, massive; [FILL].	
5		2	PID:0.2 D/O/S:No/ None/ None	ASH		(ASH): ASH; gray; moist; homogeneous, soft, nonplastic, with very little waste mixed.	720
10		3	PID:3.6 D/O/S:No/ Moderate/ None	WM		(WM): WASTE MATERIAL; moist to wet; black matrix, with plastic, paper, wood; moderate odor.	715
15		4	PID:0.1 D/O/S:No/ None/ None	ASH		(ASH): ASH; gray; wet; homogeneous, soft, nonplastic, increasingly granular.	710
			PID:0.1 D/O/S:No/ None/ None	PT		(PT): PEAT; moist; [NATIVE].	
			PID:0.1 D/O/S:No/ None/ None			BEDROCK; moist.	
20						End of geoprobe 19.0 feet	

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Date Boring Started: 3/26/18
 Date Boring Completed: 3/26/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959336.563m, E:477338.452m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 730.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 24.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	S C S U	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; brown; moist; [FILL].	730
1		1	PID:0.2 D/O/S:No/ None/ None		SM		
5		2	D/O/S:No/ None/ None PID:1.2 D/O/S:No/ Moderate/ Trace D/O/S:No/ None/ None			(WM): WASTE MATERIAL; moist; silty matrix, with brick, wood, light debris. From 5': silty matrix, with wood, paper, plastic.	725
10		3	PID:22.7 D/O/S:No/ Strong/ None		WM	[refusal at 9' bgs, offset]. From 10': with concrete and treated wood; strong odor.	720
15		4	PID:29.7 D/O/S:No/ Moderate/ Trace			From 15': with treated wood; strong odor and trace sheen.	715
20		5				BEDROCK.	710
25						End of geoprobe 24.0 feet	

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Date Boring Started: 3/26/18
 Date Boring Completed: 3/26/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959302.264m, E:477388.464m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 727.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 21.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C C S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
1		1	PID:0.4 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; brown; moist; compact, homogeneous; 10% gravel, 70% sand, 20% fines, [FILL].	725
5			D/O/S:No/ None/ None	ASH		(ASH): ASH; dark gray; moist to wet; compact, stiff, nonplastic.	
2		2	PID:51.0 D/O/S:No/ Strong/ None	WM		(WM): WASTE MATERIAL; moist; black sandy matrix, with paper, plastic, wood; strong treated wood odor.	720
10			D/O/S:No/ Strong/ None	WM		From 10': with concrete, glass, plastic, wood; strong odor.	715
3		3	PID:38.6 D/O/S:No/ Strong/ None	PT		(PT): PEAT; [NATIVE].	
15			D/O/S:No/ Strong/ None	CH		(CH): FAT CLAY; [NATIVE].	710
4		4	PID:1.1 D/O/S:No/ None/ None			BEDROCK; crushed/weathered.	
20		5					
						End of geoprobe 21.0 feet	

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Date Boring Started: 3/26/18
 Date Boring Completed: 3/26/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959341.95m, E:477443.476m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 730.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 14.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U S C S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; brown; moist; [FILL].	730
1		1	PID:2.5 D/O/S:No/ None/ None	SM			
5				ASH		(ASH): ASH; gray; moist.	
5		2	PID:16.0 D/O/S:No/ Light/ None			(WM): WASTE MATERIAL; black sandy matrix, with brick, slag, wood, plastic; light odor.	725
10				WM		From 10': black silty matrix, with wood and plastic; light odor.	720
10		3	PID:12.1 D/O/S:No/ Light/ None				
14						[Refusal at 14' bgs, metal on bedrock]. End of geoprobe 14.0 feet	

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Date Boring Started: 3/21/18
 Date Boring Completed: 3/21/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4960152.756m, E:476966.31m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 711.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 23.5 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	S C S S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0			PID:1 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; medium grained; dark grayish brown; moist; 5% gravel, 80% sand, 15% fines, [FILL].	710
1		1	D/O/S:No/ Slight/ None			WASTE MATERIAL; moist; black silty matrix, with plastic, wood; slight odor.	
5			PID:7.7 D/O/S:No/ Slight/ Trace			From 6.5': asphalt debris; strong petroleum odor and moderate sheen.	705
2		2	PID:23.6 D/O/S:No/ Strong/ Moderate				
10			PID:6.9 D/O/S:No/ None/ None	SP		(SP): POORLY GRADED SAND; medium grained; dark gray; moist; homogeneous, little fine gravel; [FILL].	700
3		3	PID:16.5 D/O/S:No/ None/ None				
15			PID:1.4 D/O/S:No/ None/ None	WM		(WM): WASTE MATERIAL; moist; silty matrix, with wood, concrete, brick.	695
4		4	PID:1.4 D/O/S:No/ None/ None	PT		(PT): PEAT; very dark brown; moist; fibrous, spongy; [NATIVE].	
20			PID:1.4 D/O/S:No/ None/ None	OH		(OH): ORGANIC CLAY; very dark gray; moist; homogeneous, soft, medium to high plasticity, with shells; [NATIVE].	690
5		5	PID:0.8 D/O/S:No/ None/ None				
						BEDROCK.	
						End of geoprobe 23.5 feet	

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Date Boring Started: 4/12/18
 Date Boring Completed: 4/12/18
 Logged By: ABW/ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4960110.853m, E:477006.688m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 712.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 25.5 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	S C S U	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							712.0
1		1	PID:0.7 D/O/S:No/ None/ None	SP		(SP): POORLY GRADED SAND; fine to medium grained; light to dark brown; moist; homogeneous, little fine gravel, [fill]; 5% gravel, 90% sand, 5% fines, [FILL].	710
5		2	PID:0.6 D/O/S:No/ None/ None PID:0.6 D/O/S:Black/ None/ None PID:0.6 D/O/S:Black/ None/ Trace			(SM): SILTY SAND with GRAVEL; grayish brown; moist; 10% gravel, 70% sand, 20% fines, [FILL]. From 7.5' - 8': few black discolorations, wood, trace sheen.	705
10		3	PID:6 D/O/S:No/ None/ None				700
15		4	PID:0.6 D/O/S:No/ None/ None PID:0.3 D/O/S:No/ None/ None	SM		From 16': moist to wet.	695
20		5	PID:0.5 D/O/S:No/ None/ None			From 20': gray.	690
25		6	PID:0.3 D/O/S:No/ None/ None D/O/S:No/ None/ None				
25.5						End of geoprobe 25.5 feet	

Date Boring Started: 4/12/18
 Date Boring Completed: 4/12/18
 Logged By: ABW/ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4960096.446m, E:477037m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 708.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 14.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C C S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0			PID:0.2 D/O/S:No/ None/ None			(SP-SM): POORLY GRADED SAND with SILT; light brown; moist; [FILL].	
1		1	PID:0.5 D/O/S:No/ Light/ Slight			(WM): WASTE MATERIAL; moist; black silty sandy matrix; light organic odor andn light sheen. From 5' - 10': No recovery.	705
5		2					700
10		3	PID:0.3 D/O/S:No/ None/ None			(OH): ORGANIC CLAY; dark gray; moist; high plasticity, with trace shells; [NATIVE].	695
15						End of geoprobe 14.0 feet	

Date Boring Started: 4/12/18
 Date Boring Completed: 4/12/18
 Logged By: ABW/ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4960095.736m, E:477010.702m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 711.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 20.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C C S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0 - 1		1	PID:0 D/O/S:No/ None/ None	SM		(SM): SILTY SAND; fine grained; brown to gray; moist; [FILL].	710
1 - 5			PID:0.9 D/O/S:No/ None/ None	SP-SM		(SP-SM): POORLY GRADED SAND with SILT; medium to coarse grained; black; moist; with some asphalt-like material; [FILL].	
5 - 7			PID:0.2 D/O/S:No/ None/ None	SM		At 5.5': large brick/concrete clast. (SM): SILTY SAND with GRAVEL; fine to coarse grained; gray; moist; [FILL].	705
7 - 10		2	PID:0.6 D/O/S:No/ None/ None	WM		(WM): WASTE MATERIAL; silty sand fill intermixed with waste material.	
10 - 15		3	PID:1.2 D/O/S:No/ None/ None	WM			700
15 - 16			PID:3.5 D/O/S:No/ None/ None			BEDROCK; weathered.	695
16 - 20		4					
20						End of geoprobe 20.0 feet	

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Date Boring Started: 4/13/18
 Date Boring Completed: 4/13/18
 Logged By: ABW/ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4960183.746m, E:477003.406m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 712.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 24.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	U C C S S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
1		1	PID:0.9 D/O/S:No/ None/ None D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; dark brown; moist; 10% gravel, 70% sand, 20% fines, [FILL]. At 1.5': crushed concrete.	710
5		2	PID:2.1 D/O/S:No/ None/ None D/O/S:Trace/ Trace/ None	ML		(ML): SILT; dark gray; moist; with fine grained sand, homogeneous, nonplastic.	
				SP		(SP): POORLY GRADED SAND; fine grained; gray; moist; homogeneous, few fine gravel; trace dark discoloration and odor at bottom of sample; [FILL].	
				WM		(WM): WASTE MATERIAL; moist; with wood, glass, plastic; moderate odor and trace sheen.	705
			PID:36.7 D/O/S:No/ Moderate/ Trace				
10		3	PID:9.8 D/O/S:No/ Moderate/ Slight D/O/S:No/ None/ None	OH		(OH): ORGANIC CLAY; dark gray; moist; few fine grained sand and silt, few shells, medium plasticity; [NATIVE].	700
15		4	PID:1.7 D/O/S:No/ None/ None PID:1.1 D/O/S:No/ None/ None			At 16.5 possible waste material observed, below 16.5' clay is black with increasing plasticity and shells.	695
20		5	PID:0.7 D/O/S:No/ None/ None PID:0.4 D/O/S:No/ None/ None	SM		At 20.5': few fine gravel. (SM): SILTY SAND; very fine to fine grained; gray; moist to wet; homogeneous, nonplastic fines; 0% gravel, 70% sand, 30% fines.	690
25						BEDROCK.	
24.0						End of geoprobe 24.0 feet	

M:\GINT\FREWAY LANDFILL_23191372.GPJ_BARR\LIBRARY.GLB_ENVIRO LOG_BARR TEMPLATE.GDT

Date Boring Started: 4/13/18
 Date Boring Completed: 4/13/18
 Logged By: ABW/ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4960177.95m, E:476939.906m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 708.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 18.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	S C S S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0			PID:0.5 D/O/S:No/ None/ None			(OL/OH): TOPSOIL; black; moist; silty/organic; [FILL].	
		1	PID:0.6 D/O/S:No/ None/ None			(SP): POORLY GRADED SAND; fine to medium grained; light brown; moist; 5% gravel, 90% sand, 5% fines, [FILL].	
			PID:2.6 D/O/S:No/ Light/ None			(SM): SILTY SAND with GRAVEL; gray; moist; 10% gravel, 60% sand, 30% fines, [FILL].	705
5		2	PID:9.4 D/O/S:No/ Light/ None			(WM): WASTE MATERIAL; moist; black sandy matrix, with wood; light odor. From 5': black sandy matrix, with wood, concrete, styrofoam, shingles, plastic; light odor and light 'film' (no sheen).	700
10		3	PID:15.2 D/O/S:No/ Light/ None				
			PID:1.4 D/O/S:No/ None/ None			(OH): ORGANIC CLAY; black; moist; with shells and few very fine sand, soft to firm, medium to high plasticity, less sand with depth; 0% gravel, 10% sand, 90% fines, [NATIVE].	695
15		4	PID:0.6 D/O/S:No/ None/ None				
18.0						End of geoprobe 18.0 feet	690

M:\GINT\FREWAY LANDFILL_23191372.GPJ_BARR\LIBRARY.GLB_ENVIRO LOG_BARR TEMPLATE.GDT

Date Boring Started: 4/13/18
 Date Boring Completed: 4/13/18
 Logged By: ABW/ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4960146.303m, E:476981.276m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 712.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 26.5 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	S C S C	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; gray; moist; homogenous, dense; 5% gravel, 70% sand, 25% fines, [FILL].	712.0
1		1	PID:0.5 D/O/S:No/ None/ None				710
5		2	PID:0.6 D/O/S:No/ None/ None				705
10		3	PID:0.4 D/O/S:No/ None/ None				700
15		4	PID:1 D/O/S:No/ None/ None	SM			695
20		5	PID:0.8 D/O/S:No/ None/ None			At 20': wet.	690
25		6	PID:1.3 D/O/S:No/ None/ None				
26.5			PID:0.5 D/O/S:No/ None/ None				
			PID:0.4 D/O/S:No/ None/ None				
			PID:0.2 D/O/S:No/ None/ None				
			PID:0.1 D/O/S:No/ None/ None				
						BEDROCK.	
						End of geoprobe 26.5 feet	

Date Boring Started: 4/13/18
 Date Boring Completed: 4/13/18
 Logged By: ABW/ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



LOG OF Geoprobe TS-SB-08

SHEET 1 OF 1

Project: Freeway Dump and Transfer Station
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4960113.988m, E:476934.666m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 726.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 28.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCSU	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							725
1		1	PID:0.1 D/O/S:No/ None/ None	SM	(SM): SILTY SAND with GRAVEL; gray; moist; homogenous, dense, with trace clay and fine gravel; 10% gravel, 50% sand, 40% fines, [FILL].		
5		2	PID:2.6 D/O/S:No/ Light/ None PID:7.6 D/O/S:No/ Strong/ Trace	WM	(WM): WASTE MATERIAL; black matrix, with wood, plastic; light odor. From 5': with wood, brick, plastic; at 6.8' soft, gooey, white substance with strong odor observed.		720
10		3	PID:24.8 D/O/S:No/ Strong/ Moderate		From 10': with wood, paper, plastic, insulating material; strong odor.		715
15		4	PID:27.9 D/O/S:No/ Moderate/ Moderate		From 15': with abundant paper.		710
20		5	PID:5.1 D/O/S:No/ Moderate/ None		From 20': sandy matrix, with wood and fabric.		705
25		6			From 25' - 28': No recovery.		700
30					End of geoprobe 28.0 feet		

Date Boring Started: 4/13/18
 Date Boring Completed: 4/13/18
 Logged By: ABW/ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Appendix C

Test Excavation Field Logs

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

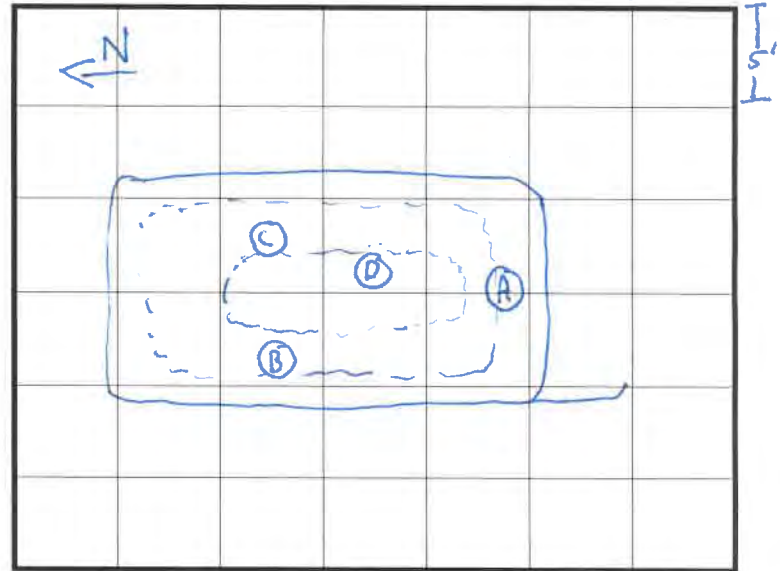
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FD-TF-01

Date: 04/11/18
 Time Started: 9:20
 Time Ended: 11:00

Sampler: ARP2 / Pucc
 Calibration Time: 8:50
 Background Headspace: 0.0 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-3	N/N	0.2	Sandy silty clay
B	3-5	N/N	1.8	Silt/Ash w/ debris + sand
C	5-8	N/N	0.8	Ash w/ little debris
D	8-12	mild chem + trace	97.6	Waste material

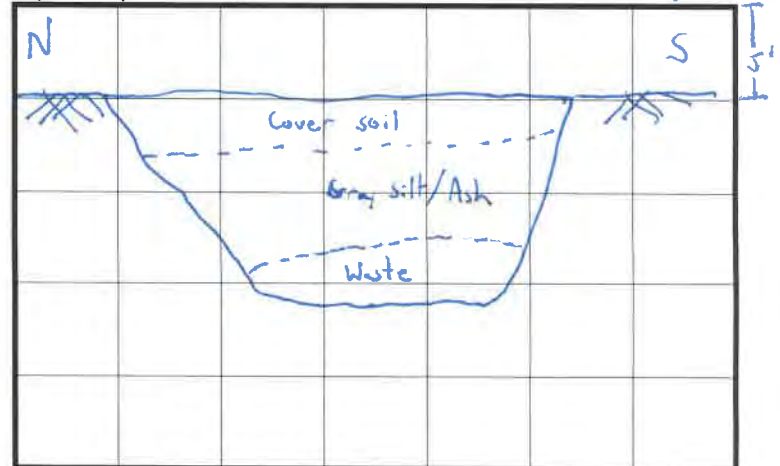
PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



General stratigraphy description / General notes

0-3: Cover soil - Sandy silty clay (10/46/50) w/ gravel, brown
 3-8: Silt/Ash - Gray, little debris throughout, w/fg sand from 3-5, ~~with~~ denser / darker color from 6-8.
 8-12: Waste Material - decomp. wood, metal wiring, plastic conduit, rubber tire, motor oil containers (empty, 1qt)
 Sample collected: FD-TF-01 (W, 10-12)

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations.



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

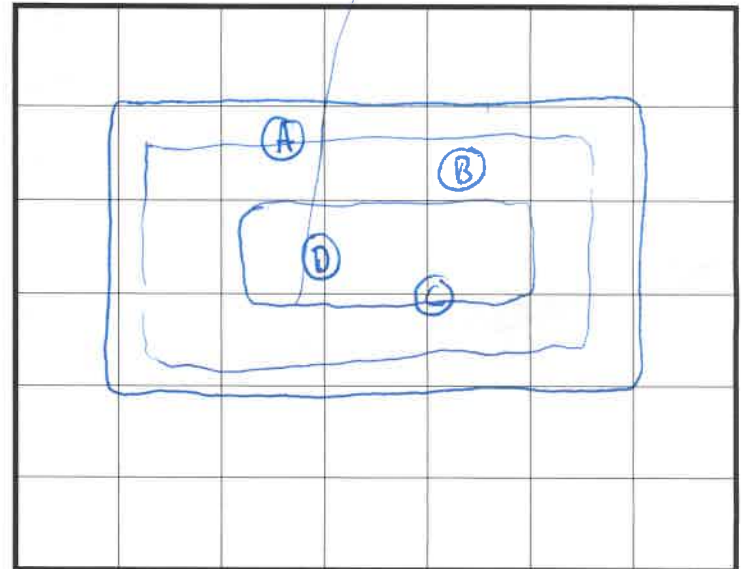
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FD-TT-02

Date: 04/11/18
 Time Started: 11:30
 Time Ended: _____

Sampler: ARP2 / Pace
 Calibration Time: 8:50
 Background Headspace: 0.0 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-3	N/N	1.0	Topsoil / Waste mat.
B	3-6	N/N	0.3	Waste Mat. * collected from
C	6-9	N/N	0.8	Waste Mat / Silt/Ash
D	9-12	N/N	0.7	Silt/Ash

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..

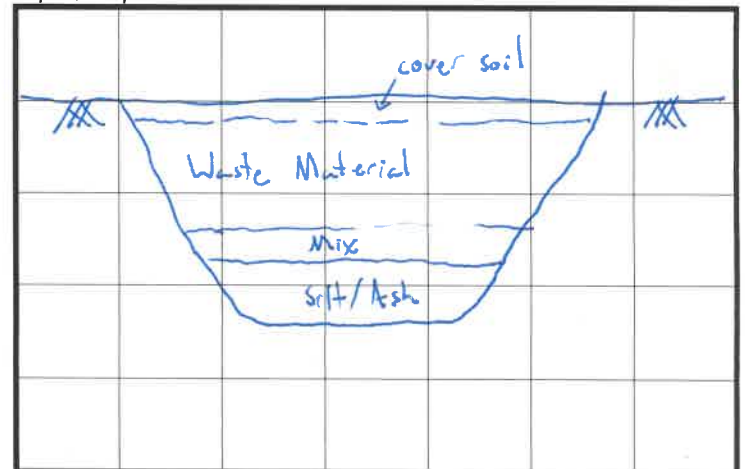


General stratigraphy description / General notes

0-1: Cover soil - sandy silty clay w/ gravel, brown
 1-7: Waste mat - MSW, tree trunks, building materials
 7-9: Waste mat mixed w/ silt/ash
 9-12: Gray silt/ash w/ some fly sand

Sample collected: FD-TT-02 (W, 7-9)

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

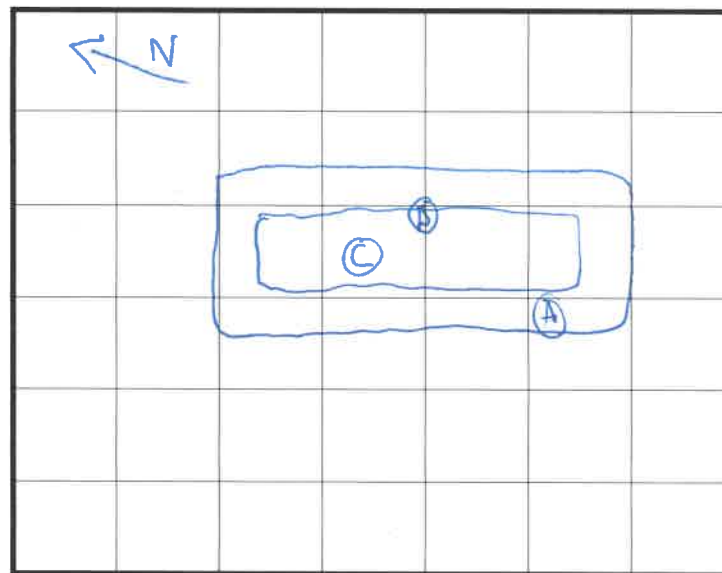
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FD-TF-03

Date: 04/11/14
 Time Stated: 14:05
 Time Ended: 15:10

Sampler: ARR2 / Pace
 Calibration Time: 8:50
 Background Headspace: 0.2 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-2	N/N	0.4	Clayey Sand * collected from stockpile
B	2-5	N/N	0.4	Gray Silt
C	5-10	N/N	0.4	Peat

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..

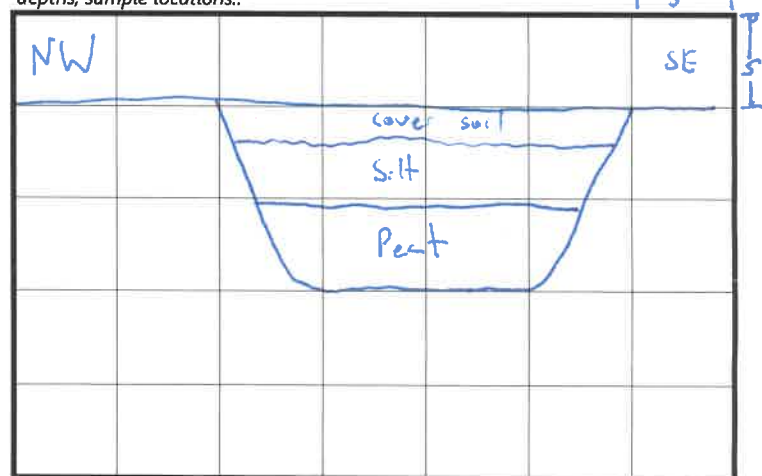


General stratigraphy description / General notes

0-2: Cover soil - Clayey sand w/ silt + gravel
 2-5: Silt, gray w/ some vfg sand
 5-10: Peat, very fibrous, black/brown

Sample collected FD-TF-03 (s, 2-5)

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

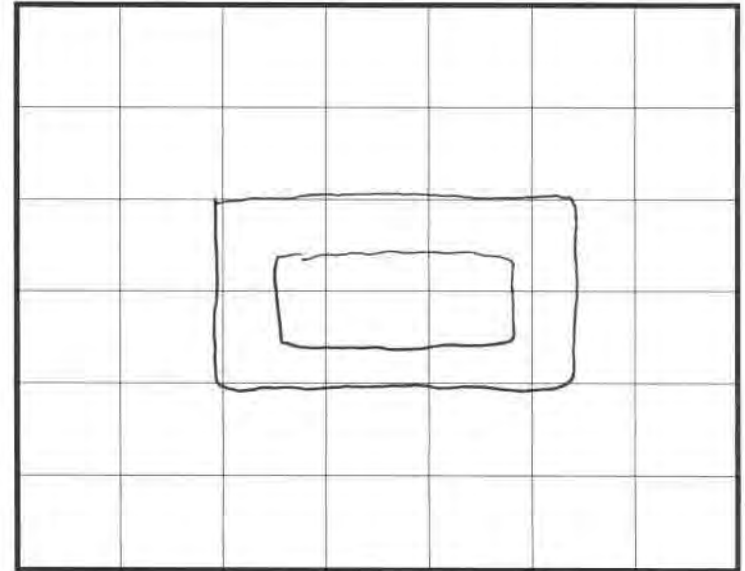
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FD-TT-04

Date: 04/11/18
 Time Started: 15:25
 Time Ended: 16:05

Sampler: ARP2
 Calibration Time: 8:56
 Background Headspace: 0.2 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-2	N/N	0.4	Cover soil
B	2-5	N/N	0.3	Silt/Ash
C	6-10	N/N	0.2	Silt/Ash
D	10-12	N/N	0.3	Peat

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..

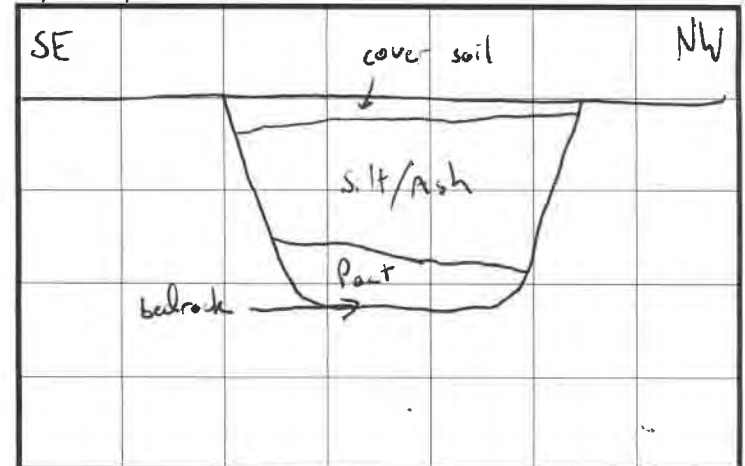


General stratigraphy description / General notes

0-1.5: Cover soil, clayey sand w/ silt + gravel, brown
 1.5-10: Silt/Ash, gray, random plastic sheeting observed from ~6-10, harder, partially solidified, very small white flecks observed ~~from~~ ^{during} sheen test
 10-12: Peat, very fibrous, black/brown
 Bedrock encountered @ ~12' logs

No sample collected

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FD-TT-05

Date: 4/12/18
 Time Started: 8:50
 Time Ended: 9:45

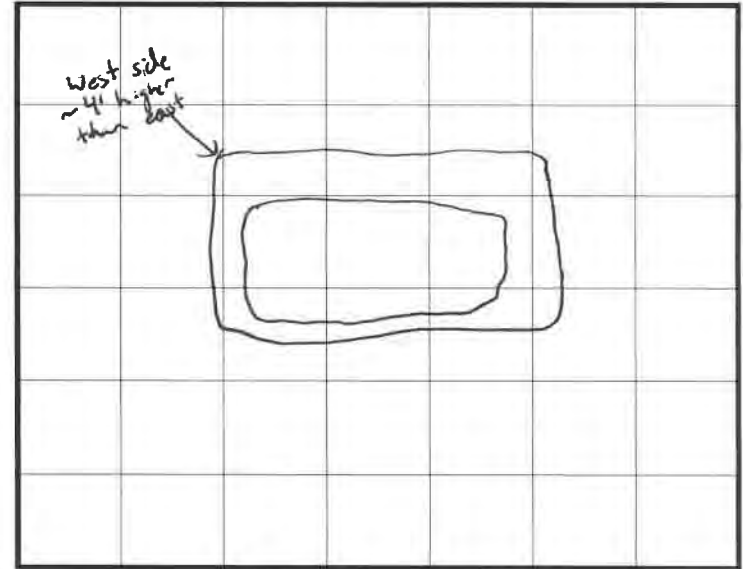
Sampler: ARP2/Pace
 Calibration Time: 8:50
 Background Headspace: 0.1 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-4	N/N	0.2	Cover soil
B	4-9	N/N	0.2	Silt/Ash
C	9-12	N/N	0.2	Peat / Weather BR

West face

} Collected from stratigraphies

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



General stratigraphy description / General notes

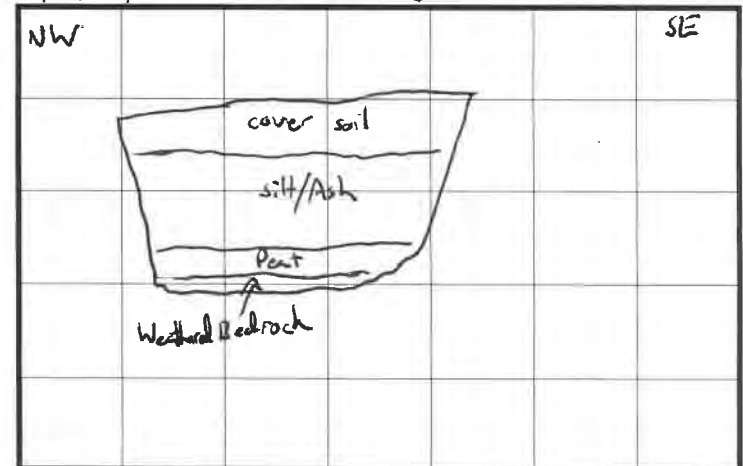
0-4: Cover soil - Clayey sand w/ silt + gravel, brown, shunks of asphalt observed (12"-18")

4-9: Silt/Ash - Gray, some rfy sand, white flecks observed from sheen test

9-10: Peat/organic clay, black, w/ some sand

10-11: Weathered bedrock

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations.. West face



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

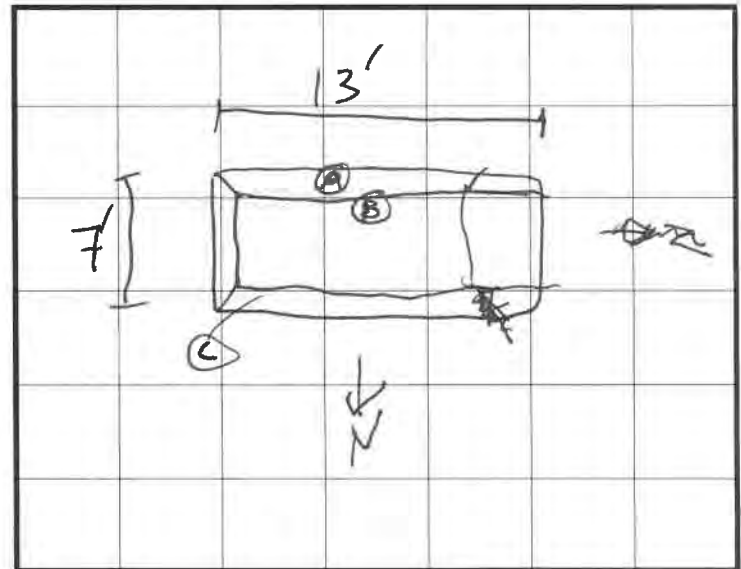
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FD-TT-06

Date: 4-12-18
 Time Started: 10:45
 Time Ended: 13:30 - backfilled

Sampler: JWJ/Pace
 Calibration Time: 8:50
 Background Headspace: 0.3 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0- ^{1.5} _{1.5}	org/N	0.4	Black silty fill w/ roots and some wood debris. (OL/OH)
B	1.5- ^{3.5} _{3.5}	ash/silt/N	1.0	Ash/silt w/ debris + sand (Trash 2.5'-3.5')
C	@3'	None/N	0.5	Green colored soils in ^{silty} Ashy layer

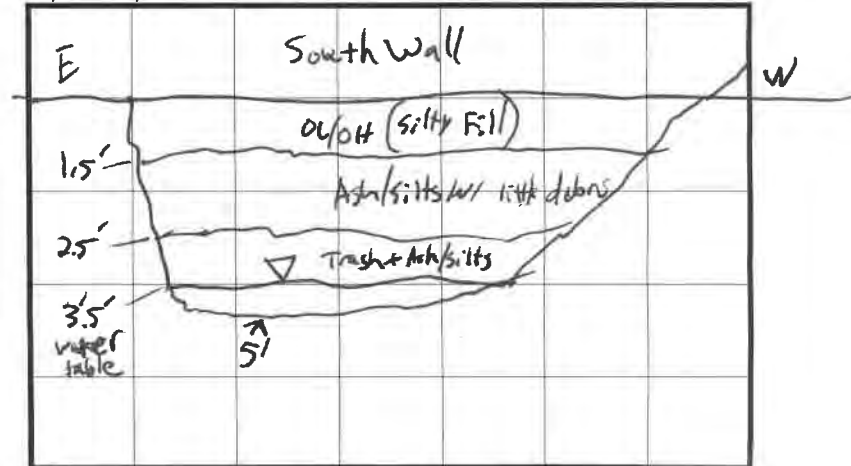
PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



General stratigraphy description / General notes

0'-1.5' = Black silty fill w/ some woody debris (45/15/80)
 1.5'-3.5' = Gray, little debris to 1.5'-2.5'. Trash from 2.5'-3.5' ^{glass bottles/ metal wood plastics}
 5' rusty coloration. grabbed green colored soils @ 3' ^{from NE corner} (C) on plan view
 water @ 3.5' light sheen noticed

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: FD-JT-07

Date: 4/12/18

Time Started: 11:30

Time Ended: 12:50

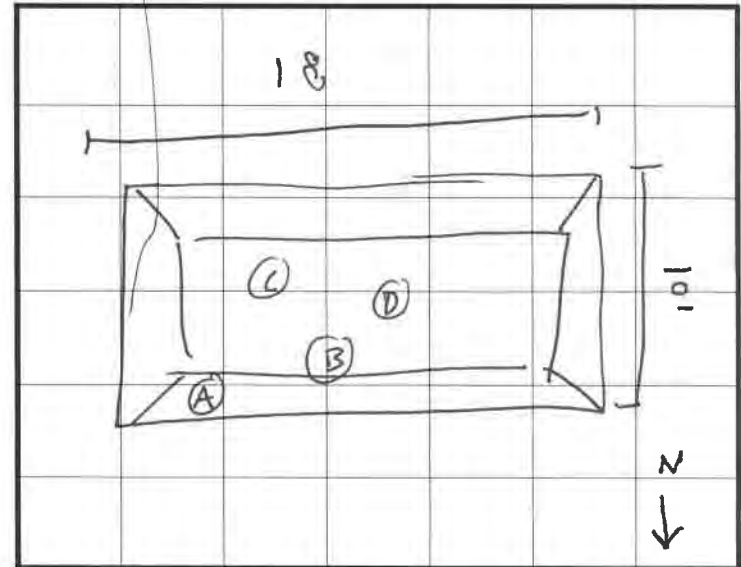
Sampler: ABW / Pace

Calibration Time: 8:58

Background Headspace: 0.3 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-4	N/N	0.4	upper fill, ^{sample} grabbed from stockpile
B	4-6	N/N	0.5	silt/ash sample grabbed from #0
C	6-11	H / Trace	6.0	from stockpile,
D	11-12	N/N	0.8	bucket taken from base of exc.

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



General stratigraphy description / General notes

0-4 - V. Dr. brn silt^{sand}/clay, few med-cg gravel, (5/60/35) [cover]

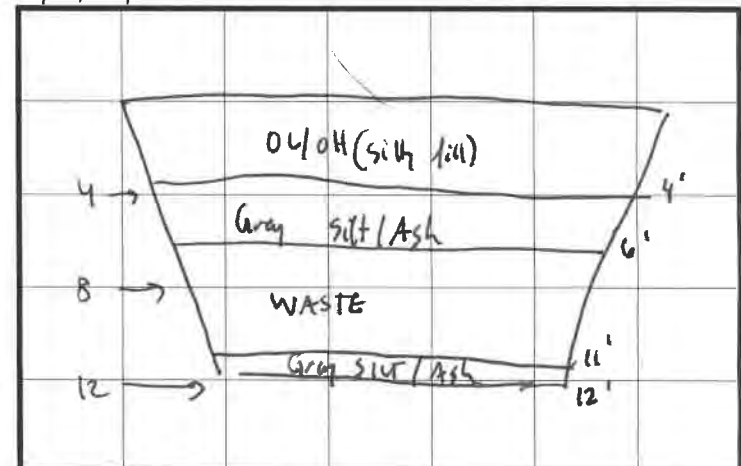
4-6 - Gray silt/ash, trace debris throughout

6-11 - WASTE MATERIAL - mixed - no defined layers [pipe (metal) plastic, wood (abundant wood), tires, brick, ash, silt fence, bottles] ^H odor

11-12 - Gray silt/ash, no debris noticed

Sample collected - FD-JT-07 (WM, 6-11)

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: FD-TT-08

From E edge

Date: 4/12/18

Time Started: 13:45

Time Ended: 15:00

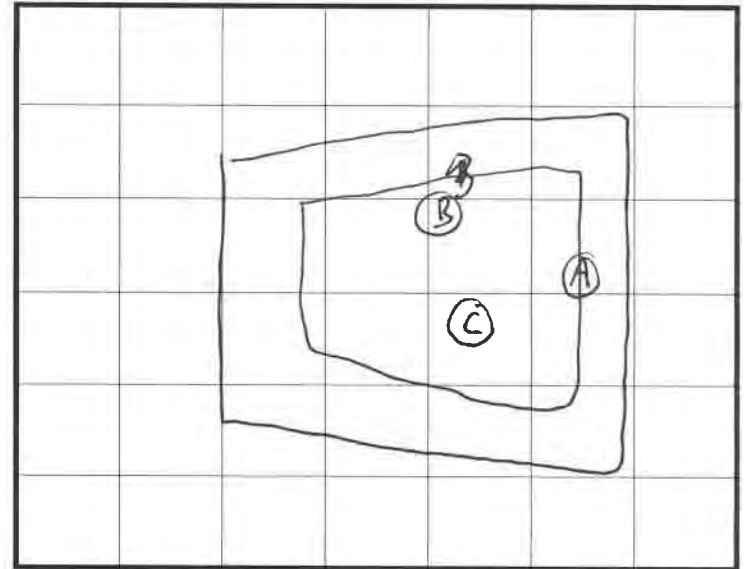
Sampler: ARP2 / Pucc

Calibration Time: 8:50

Background Headspace: 0.3 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-2	N/N	0.6	Cover
B	2-5	N/N	0.5	Silt/Ash
C	5-12	Wild decomp. N	2.3	Waste

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



From E edge

General stratigraphy description / General notes

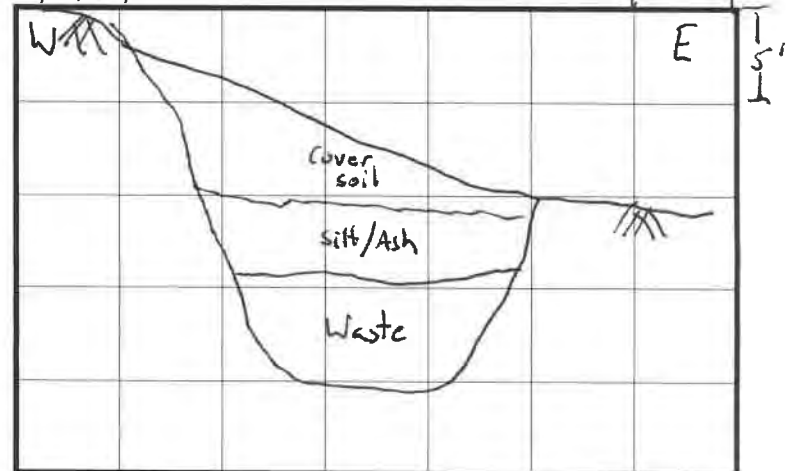
0-2: cover soil - silty sand w/ gravel, mg-cg, brown

2-5: silt/ash - Gray, w/ tiny white flecks

5-12: Waste material - MSW, steel container, tires, paper, plastic, metal wire

Sample collected: FD-TT-08 (W, 5-12)

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

* Soil Sample collected 4-12' bgs
(Waste Material)

* "Point" ggs location collected - could not walk
ground trench due to trees/slope
Sampler: ASW/PCC

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: FD-11-09

Date: 4/17/18

Time Started: 840

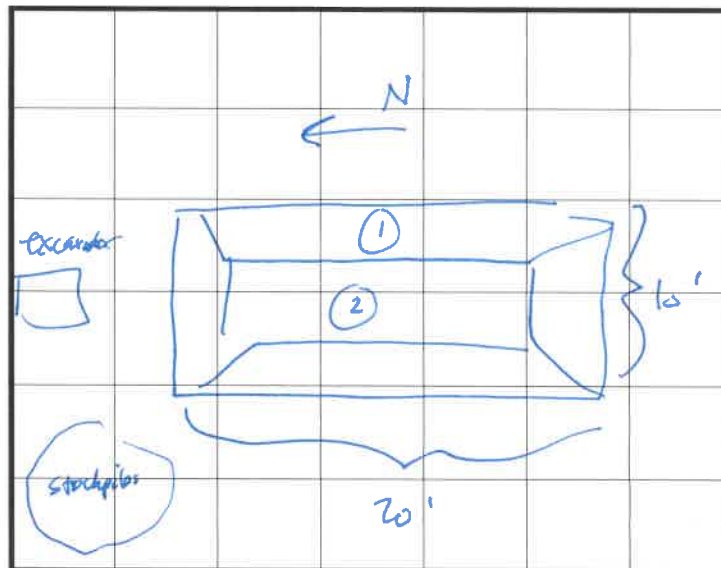
Time Ended: _____

Calibration Time: 815

Background Headspace: 0.1 - 0.3 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
0	4	None	0.5	Silty Sand topsoil/Fill, brown, from stockpile
4	12	NONE	2.2	Debris/Waste Material (from stockpile)

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



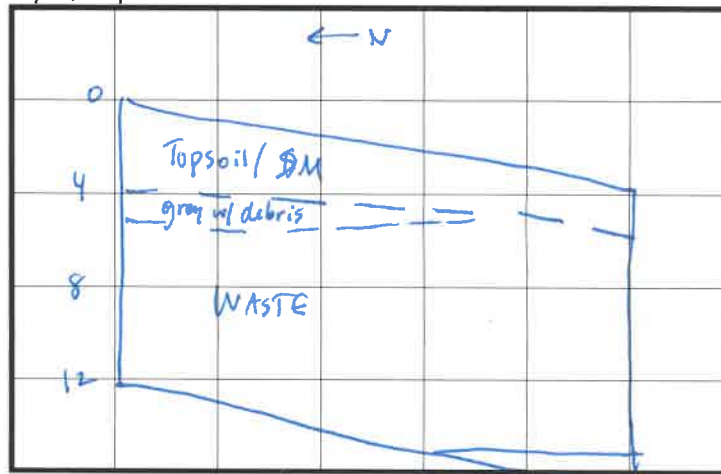
General stratigraphy description / General notes

0-3' : Dk brown topsoil/SM [b/70/80] loose, homogenous, organics/roots, M-W

3-4 : dk gray SM (S.A.A) w/ few construction debris (concrete), same as above, less wet w/ debris, thinner to south of excavation, (lumped in w/ 0-3 for screening)

4-12: WASTE Material : Moist, dk gray to black. Tires, plastic, wood, metal, rubber hose, few large concrete pieces

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

* Water Sampled ABC List

* WASTE Sampled 2.5-10'

* "Point" gps collected due to slope/stability

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: FD-TT-10

Date: 4/17/18

Time Started: 1015

Time Ended: _____

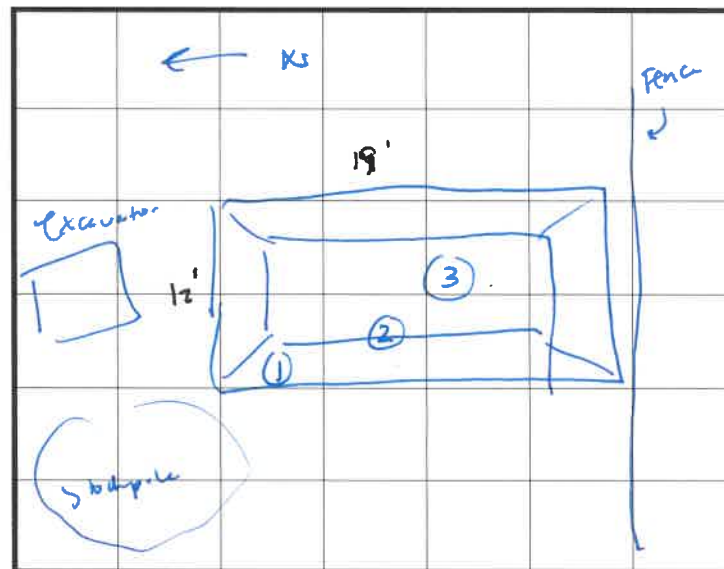
Sampler: ABW/Paw

Calibration Time: 815

Background Headspace: 0.3 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
1 0	2	NONE	3.0	SM Cover/FILL
2 2	2.5	NONE	0.4	ASH/ML -gray
3 2.5	10.5	Light/None	3.3	WASTE MATERIAL

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



General stratigraphy description / General notes

0-2: Dk brown SM fill/cover soil [*/70/30] organics, roots, M-W,
Partially frozen

2-2.5: very thin ML/Ash layer, soft, homogeneous, loose, ^{few} VF sands

2.5-10.5 WASTE MATERIAL: wood, bricks, bottles, rubber hose: tires,
Cinder blocks: construction material, wet @ 10' bgs

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



* accessed on foot

* Sample collected 4-12' bgs

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Landfill gas: CH₄ | CO₂ | O₂ | Bal | LEL

CH ₄	CO ₂	O ₂	Bal	LEL

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: ~~FD-11-U~~ FD-11-U

Date: 4/17/18

Time Started: 1245

Time Ended:

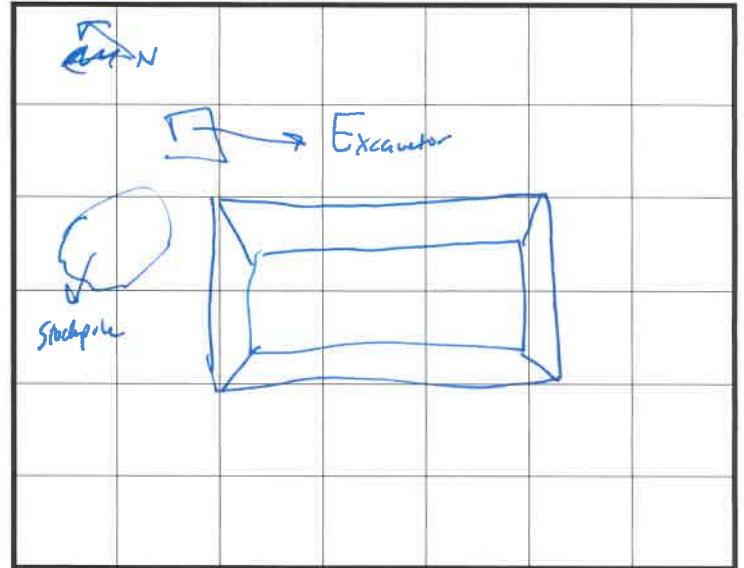
Sampler: AB w/ Pinner

Calibration Time: 815

Background Headspace: 0.1 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
0	2	None	0.2	Topsoil
2	4	None	0.18	Mixed Brown SM w/ McAsh : construction debris
4	12	Treated wood/light	21.9	WASTE MATERIAL

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



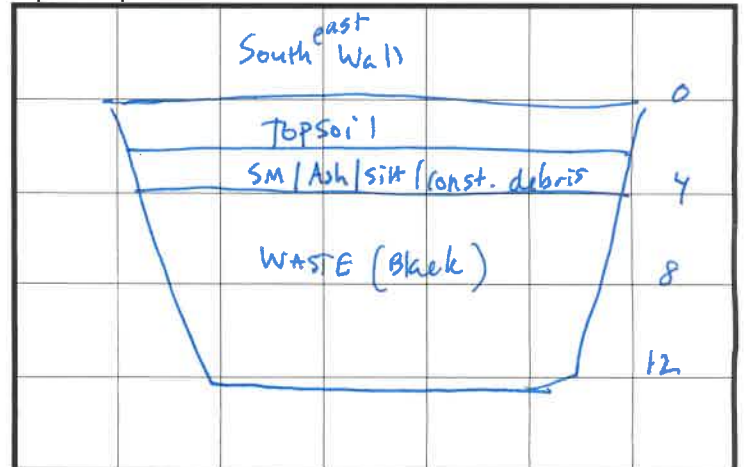
General stratigraphy description / General notes

0-2 : Dk gray topsoil : 0/20/30 SM, Organics, grass, lower soil, moist

2-4 : Mixed light brown SM w/ gray ash/silt : construction debris → wood, Bricks, concrete, moist

4-12 : WASTE material, moist, black silty sand matrix, heavy debris [wood, plastic, bottles, wire, rubber, newspapers, metal, Ash]

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



* Waste sample collected 3-12' br

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Landfill	CH ₄	CO ₂	O ₂	B ₂	LEL
	0	0	19.9	20.1	0%

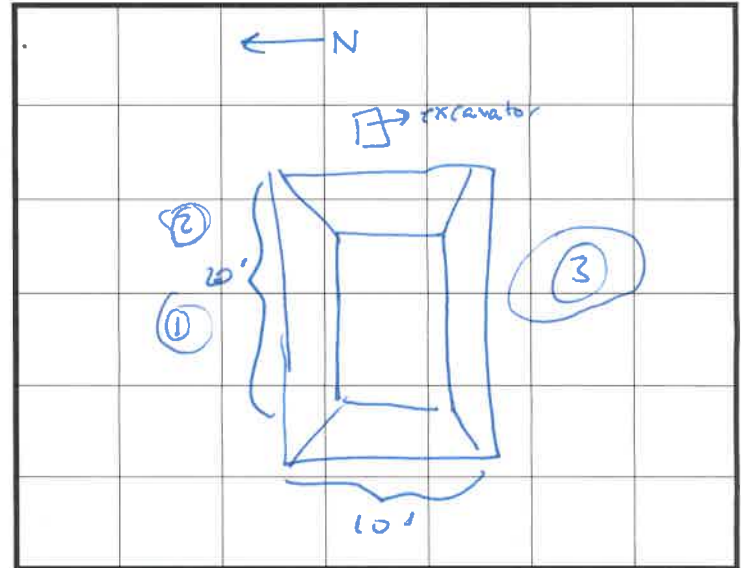
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FD-TT-12

Date: 4/17/18
 Time Stated: 1410
 Time Ended: _____

Sampler: ABW
 Calibration Time: 815
 Background Headspace: 0.0 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
0	1.5	NONE	1.0	Topsoil
1.5	3	NONE	0.5	hardened / solidified Ash/ML → difficult to break thru w/ excavator
3	12	Strong / Lt.	129.4	WASTE MATERIAL

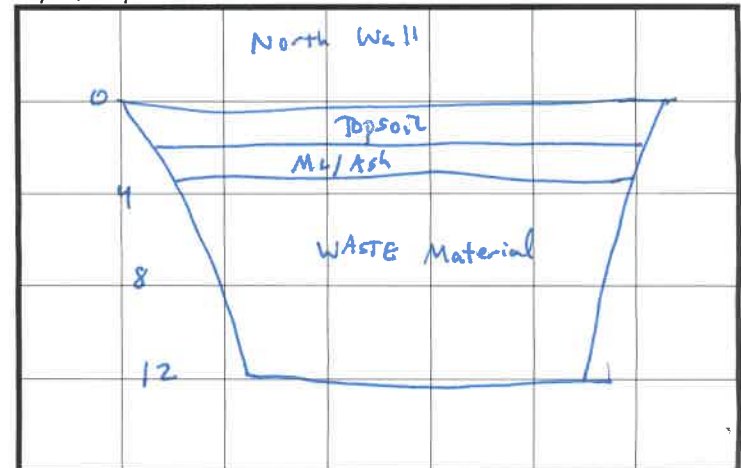
PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



General stratigraphy description / General notes

0-1.5: Topsoil, dk grey/brown, silt w/ organics (OL)
 1.5-3: gray Ash/silt → solidified/hard → very difficult to dig thru, fg siltor ash, 10% 1/4" gray, few conc. etc pieces mixed in
 3-12: WASTE MATERIAL: Very strong decomp. odor, light sheen, Assorted debris w/ black silty sand [bottles, wood, cardboard, paper, chard, tape, shingles, etc]

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



* WASTE SAMPLE collected 3-12'

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Landfill:

CH ₄	CO ₂	O ₂	Bul	LEL
0	0	21.3	78.7	0

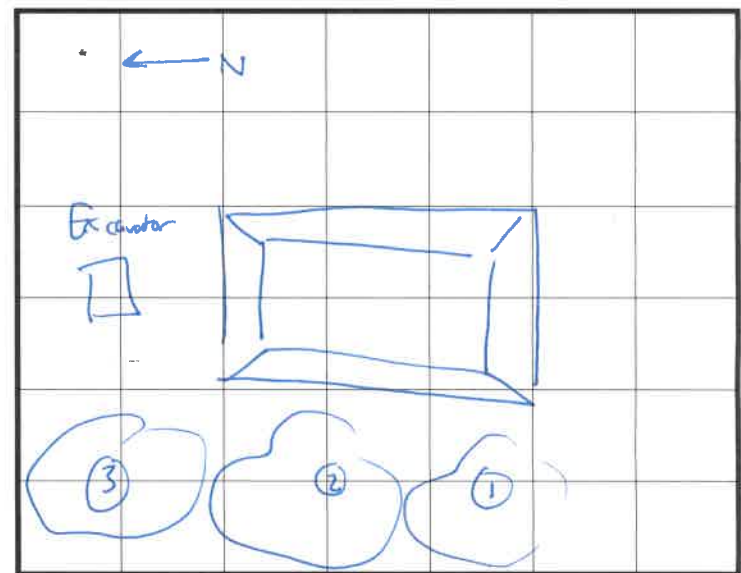
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FD-TT-13

Date: 4/17/18
 Time Stated: 1515
 Time Ended: _____

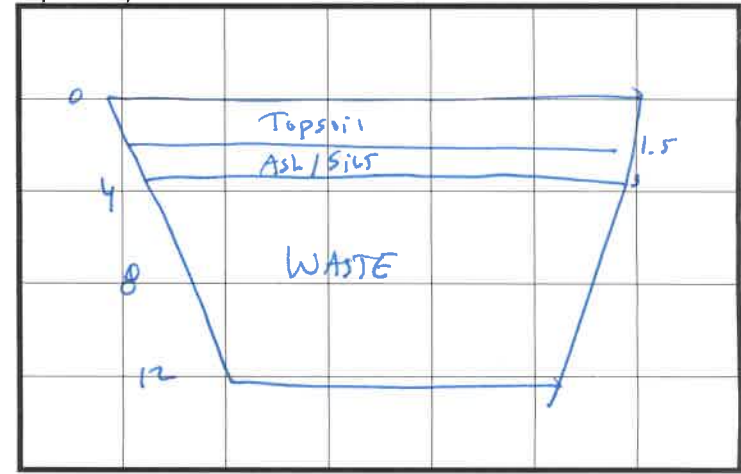
Sampler: ABW
 Calibration Time: 815
 Background Headspace: 0-0 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
① 0	1.5	NONE	4.5	Topsoil
② 1.5	3.0	NONE	0.9	Gray Solidified silt/Ash
③ 3.0	12	strong decomp. Lt	11.9	WASTE MATERIAL

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



General stratigraphy description / General notes

0-1.5 → Topsoil, dk brown OL w/ silty material
 1.5-3.0 → Ash/ML → hard, difficult to dig thru, compact, gray, very fine material 10% 2 1/4 gray
 3.0 → 12 → WASTE MATERIAL: Assorted waste → paper, wood, metal, insulation, dishwasher, metal, fencing, plastic, glass, etc

* waste sample collected 2'-12'

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

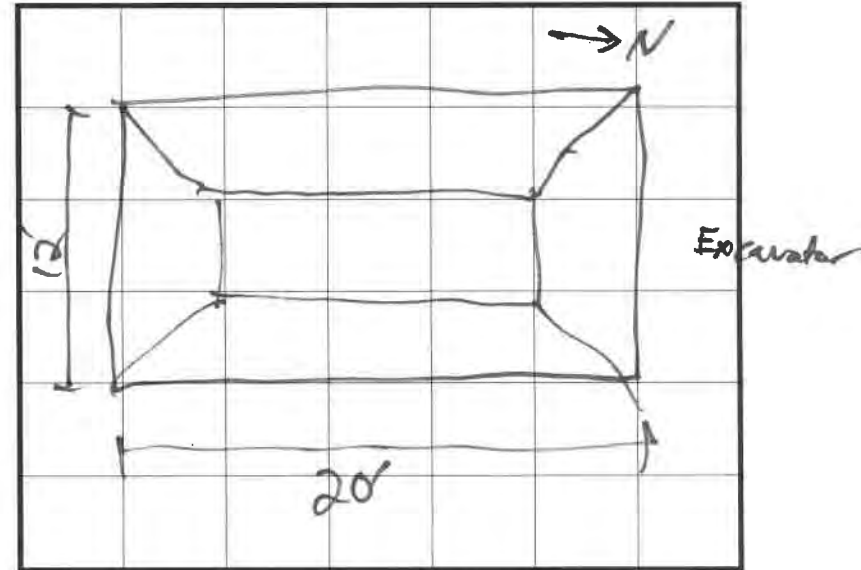
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FD-TT-14

Date: 4-18-18
 Time Started: 08:45
 Time Ended: 09:50

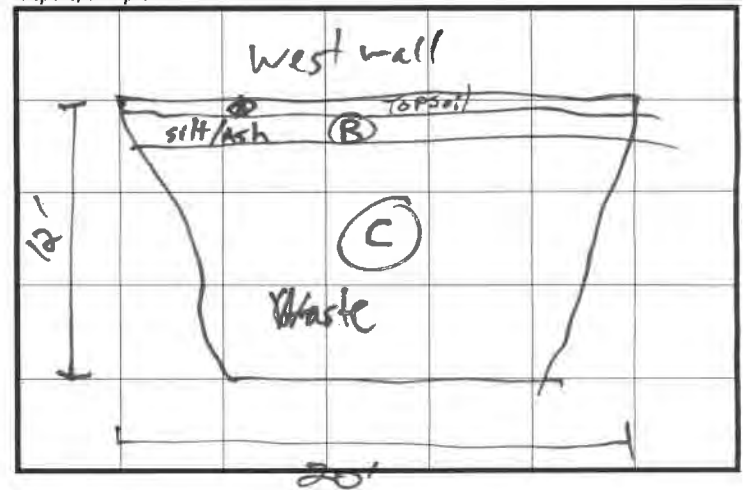
Sampler: JWT
 Calibration Time: 08:20
 Background Headspace: 0.3 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0'-0.5'	N/	1.5	Topsoil
B	0.5'-2'	N/	2.1	Gray solidified silt/Ash
C	2'-12'	strong chemical	28.5	Waste material

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



General stratigraphy description / General notes

0'-0.5' = Topsoil, Dk brown OL/OM w/ silty material
 0.5'-2' = Ash/MC(silty) compact gray very fine material
 10YR 4/1 gray
 2'-12' = Waste material: Assorted waste; paper, shingles
 insulation, wood, metal, plastic sheeting, concrete chunks, glass
 strong chemical odor

Waste Sample collected @ 3'-11"

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

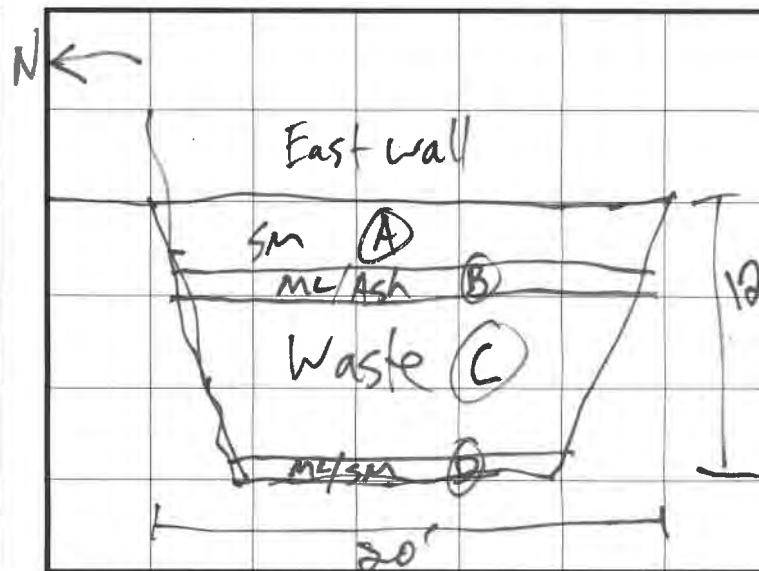
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FL-TT-01

Date: 4-18-18
 Time Started: 12:30
 Time Ended: _____

Sampler: JWS
 Calibration Time: 08:20
 Background Headspace: 0.3 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-2	N/N	0.4	Brown silty sands
B	2-3	N/M	0.7	Gray silt/Ash
C	3-11	N/N	1.6	Waste
D	11-12	N/N	1.1	Gray silts/sands ^{and silty}

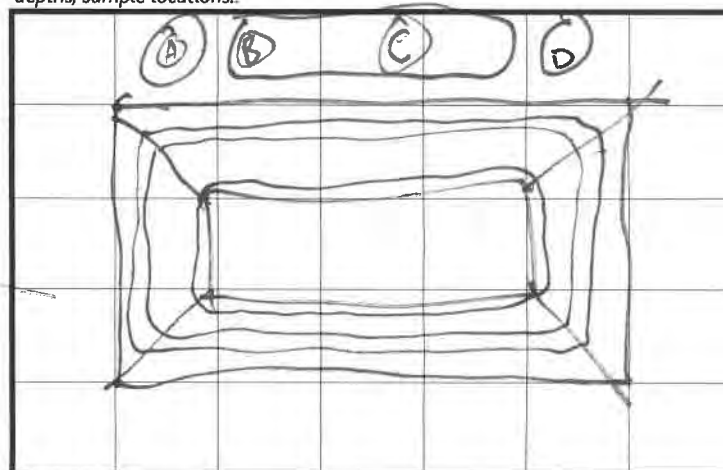
PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



General stratigraphy description / General notes

A 0'-2' = Brown silty sand + topsoil cover (SM)
 B 2'-3' = Gray silts/Ash (ML)
 C 3'-11' = Waste, glass, plastics, wood, bricks some concrete
 D 11'-12' = layers of gray silty sands (fg-mg) over Gray silts w/ some clay.

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



Face sampled water @ ~10' bgs TEST TRENCH FIELD SAMPLING AND SCREENING LOG

waste sample collected 2'-10.5'

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: FL-TT-02

Date: 4-18-18

Time Started: 13:30

Time Ended: 16:00

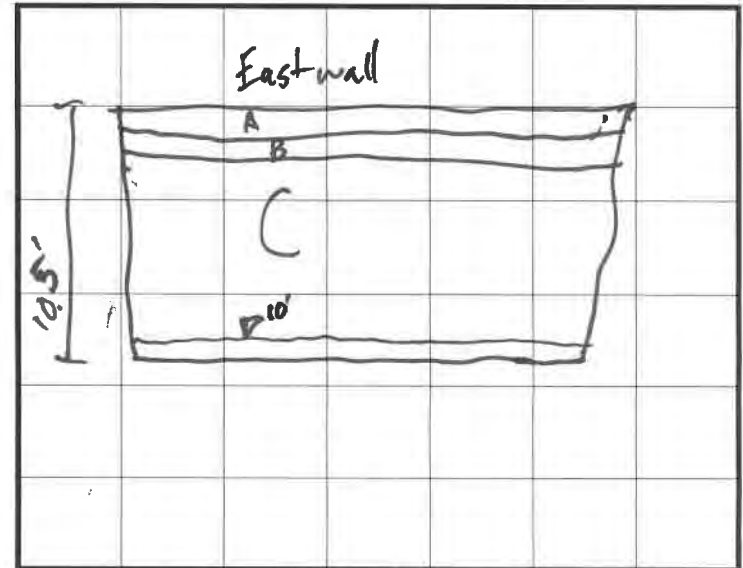
Sampler: JWS

Calibration Time: 08:20

Background Headspace: 0.3 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-1	N N	0.4	Dark Brown topsoil fill
B	1-2	M N	5.4	Gray silty/ash silty sand (sm) JWS
C	2-10.5	Lt. Lt.	20.5	Waste

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities.



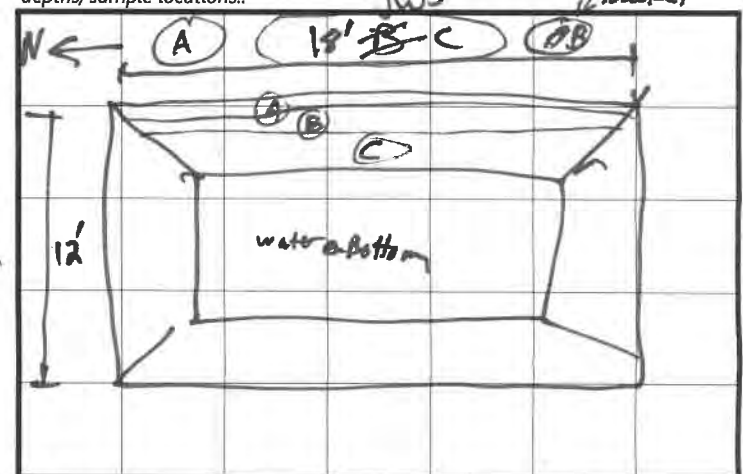
General stratigraphy description / General notes

A = Dark Brown topsoil fill 02/04

B = Gray silty/ash silty sand (sm) fill ~15% silts (Frozen)
JWS

C = Waste fill, wood, bricks, plastic, paper, glass, scrap metal
wet @ ~10' bgs Lt chemical odor, Lt. sheen
Face sampled water @ 10'

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations.



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: FL-TT-02a

Date: 4-20-18

Time Started: 08:45

Time Ended: 09:45

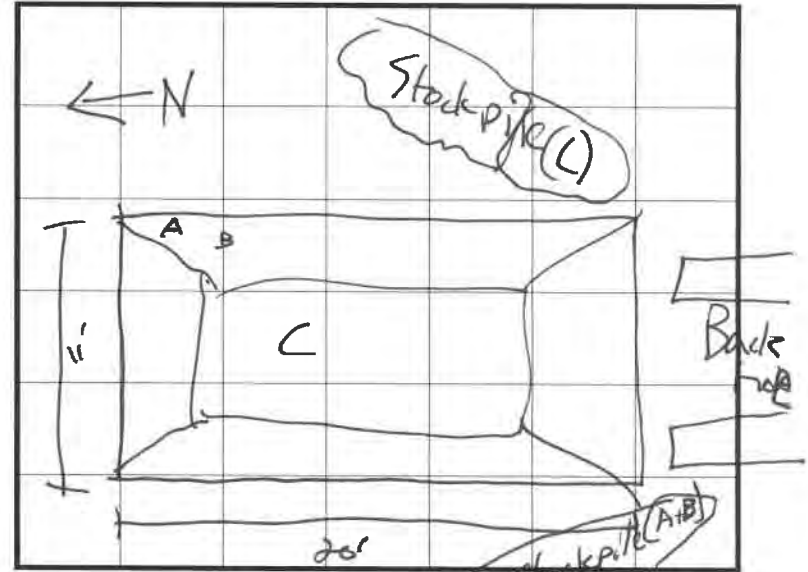
Sampler: JWJ

Calibration Time: 0740

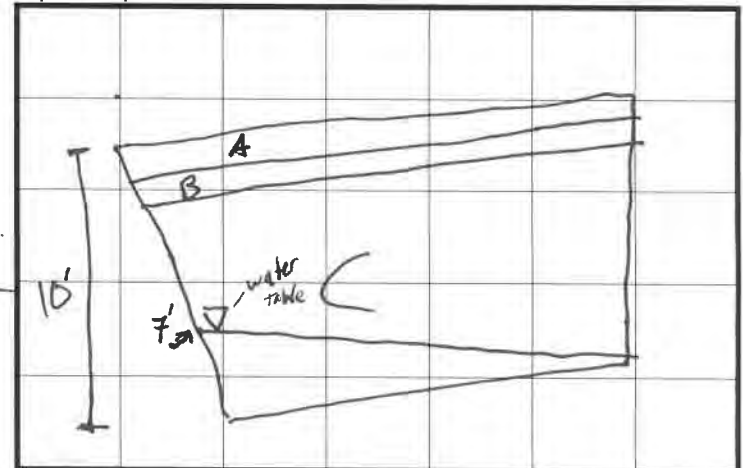
Background Headspace: 0.4 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-1	N/N	2.7	Dark brown topsoil + silty sand (SM)
B	1-2	N/N	0.5	Gray silty sand w some debris
C	2-10	4 / Rainbow	4.8	Waste

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



General stratigraphy description / General notes

A = Dark brown organic topsoil w/ silty sand (SM) tree roots present

B = Gray silty sand cover w/ some concrete blocks

C = Waste fill including wood, plastics, glass, paper, wiring, 1# chemical
 Odor, Rainbow sheen in darker colored soils
 water @ 7'

Soil Sample Collected [2-10]

* ABC WATER Sample

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Landfill =

CH ₄	CO ₂	O ₂	Bal	LFLC ₂
6.0	0.0	21.4 20.0	0.6	0.7

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: PL-11-03

Date: 4/19/18

Time Started: 7:30

Time Ended: _____

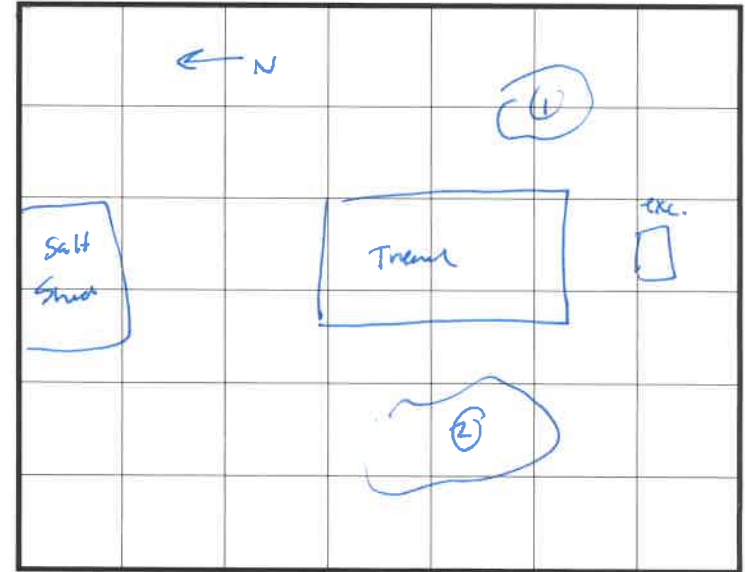
Sampler: ABW

Calibration Time: 7:30

Background Headspace: 0.0 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
0	2	None	0.5	Topsoil → org OL
2	10	lt. wood, None	4.0	WASTE MATERIAL
10	12	None	0.2	Gray silt

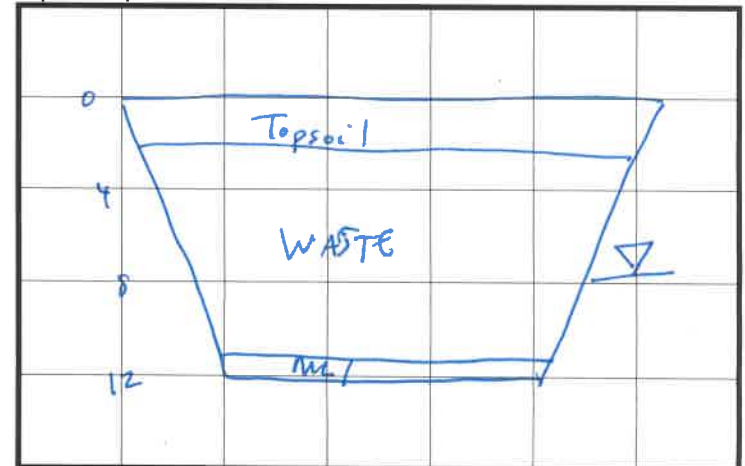
PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities.



General stratigraphy description / General notes

0-2: Dk brown OL (topsoil), abundant roots, silty, low line gravel
 2-10: Waste Material = wood, plastic, rubber, w/ silty sand, brown, moist to 5' bgs, wet below, [Industrial Waste]
 10-12: gray silt w/ sand, no plastic, fine sand, gray (107R4/1) wet, homogeneous, loose, [0/30/70]

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations.



* ABC water

* Waste 2-14

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: FL-TT-04

Date: 4/19/18

Time Started: 820

Time Ended:

Sampler: ABW

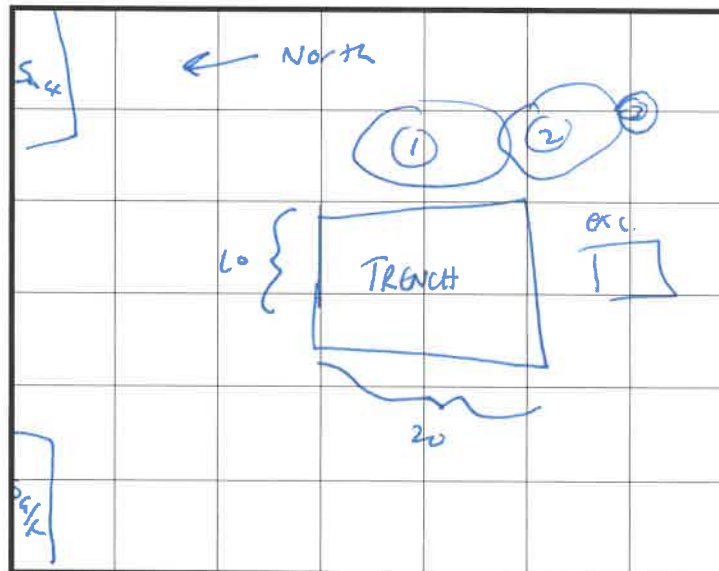
Calibration Time: 730

Background Headspace: 0.0 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
0	2	NONE	0.1	Topsoil (Brown)
2	14	Trace/ NONE	0.2	WASTE MATERIAL
14	15	NONE	0.1	Gray silt w/ sand

7'bes
N

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



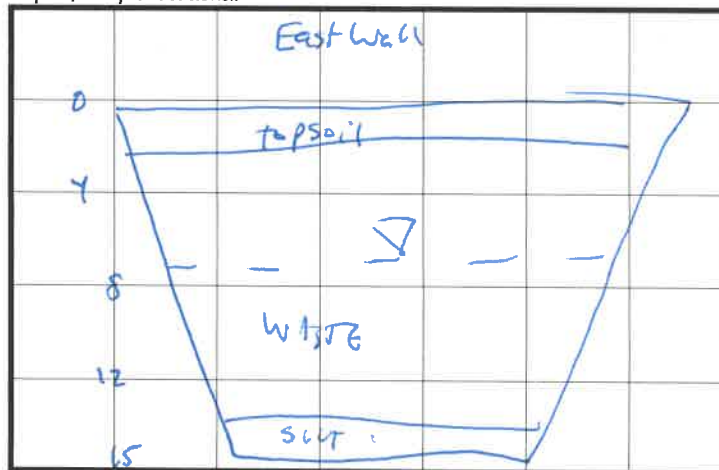
General stratigraphy description / General notes

0-2 Topsoil (OL) Brown-Dk brown, silty sand w/ organics

2-14: WASTE MATERIAL: Black silty sand, wood, plastic, Rubber, bricks, concrete, veto 7, see trace sheen, Lt. woody odor, insulation, glass (construction debris)

14-15: Sandy silt, gray (w/ r y₁₁), loose, homogenous f. vfy sand [Native]

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



Electrical

* Sample Waste S-15

* ABC list Waters

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

LF	Uth	CO ₂	O ₂	Bd	LEL2
0.0	0.0	20.0	80.0	0%	

Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FT-TT-05

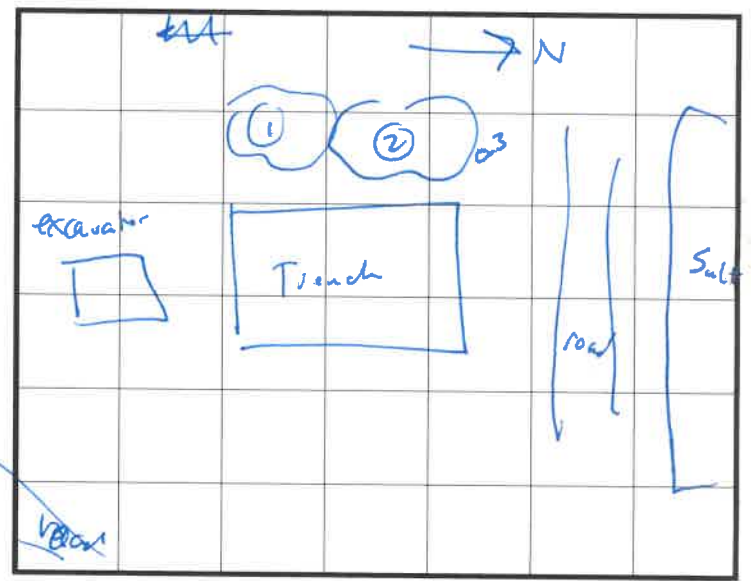
Date: 4/19/15
 Time Started: 9:30
 Time Ended: 10:15

Sampler: ABU/Pace
 Calibration Time: 730
 Background Headspace: 0.0 ppm

1
 1" bas
 2
 3

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
0	5	N/A/N	0.6	Topsoil → Black, organics
5	15	Strong decomp. trace	29.2	WASTE MATERIAL
15	-			@ 15 → Gray silty sandy silt

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



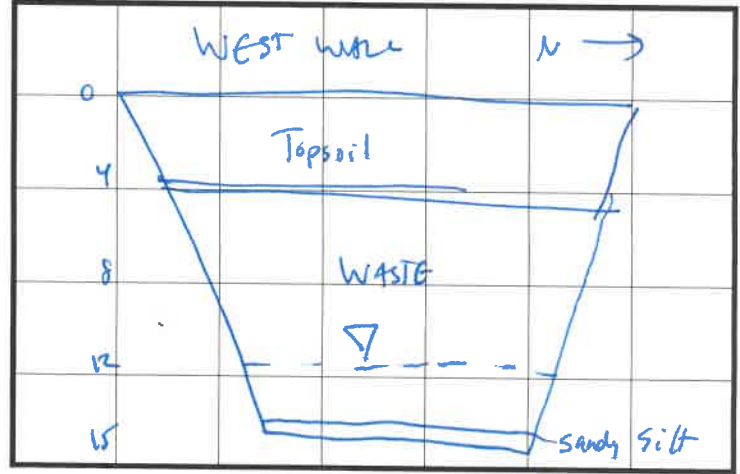
General stratigraphy description / General notes

0-5: Topsoil, Black, organic, silty silt (OL)(@ 50/50)

Waste 5-15: WASTE Material, Tires, metal, wood, plastic, glass, automotive
 ? construction debris, strong decomposition odor, trace sheen, Black
 Silty sand throughout

@ 15: last Bucket contained Sandy silt, gray, VF fused, homogeneous,
 loose, wet, (0/40/60) [Native]

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations.



Soil Sample 0-10' bgs

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

* No water Sample → ~~not seen~~ Only trickle of water entering trench

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: FL-11-06

Date: 4/15/18

Time Started: 1045

Time Ended: _____

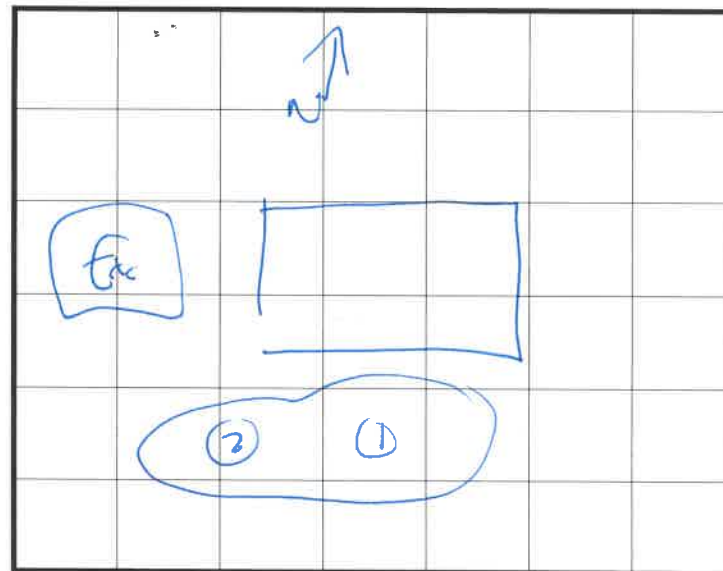
Sampler: ABW

Calibration Time: 750

Background Headspace: 0.0 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
0	10	None	0.4	Brown sandy silt Silty sand
10	13	None	0.4	gray sandy silt, few clay

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



General stratigraphy description / General notes

0-10: ^{Silty sand} Brown ~~sandy silt~~, 10% ^[0/00/40] $\frac{1}{3}$ Brown, organics 0-4' bgs
 f-mg sand (mostly fs), soft, loose, homogeneous, few clay,
 Soil forms "clumps"
 [x water entering trench @ 8' bgs
 (trickle, ~~not~~ no standing water)]
 10-13: Gray Sandy silt w/ clay, soft low plast, (few clay), dense,
 homogeneous, few thin laminations, iron ox. throughout, 10% $\frac{1}{1}$
 [0/30/70]

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



* Soil Sample from 1-5'
 A Water Add List

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Another small pothole (~6") dig just NW on toe of slope → contained water

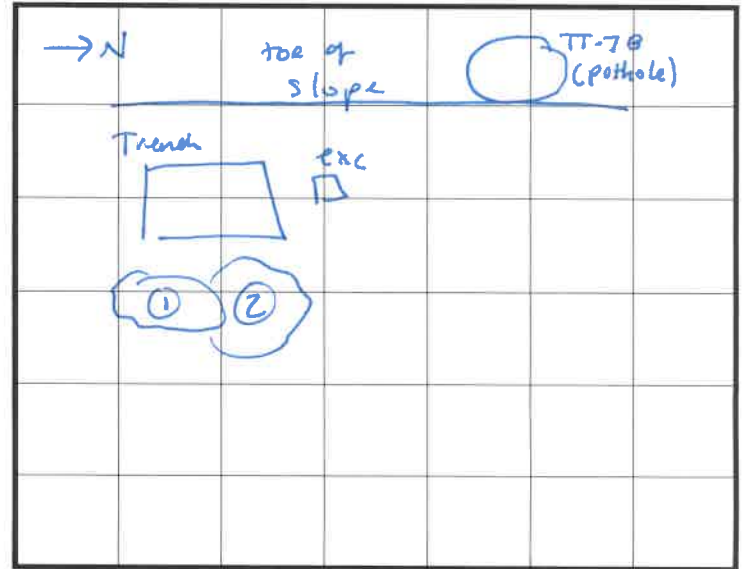
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FL-TT-07

Date: 4/19/18
 Time Started: 1245
 Time Ended: _____

Sampler: ABW/Pace
 Calibration Time: 730
 Background Headspace: 0.0 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
0	5	NONE	0.3	Clayey sand (Dk grayish Brown)
5	10	NONE	0.3	Fat clay (Dk gray)

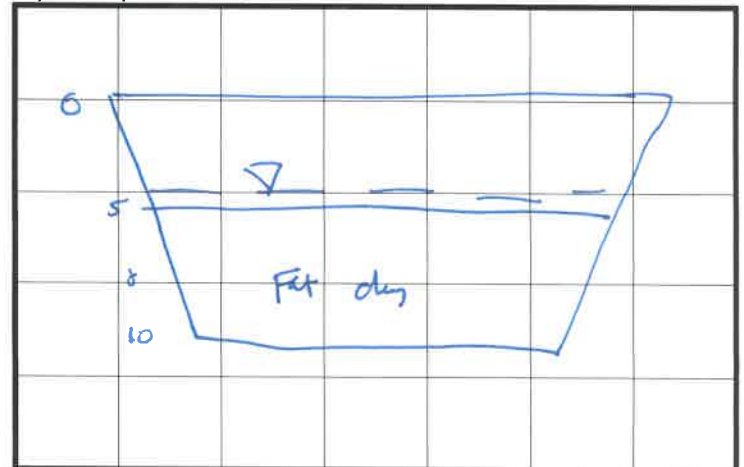
PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



General stratigraphy description / General notes

0-1 Topsoil: org. 0.4
 1-5: Clayey sand [0/70/30] Dk grayish Brown, fig sand, w/ gray and plast clay, forms small clumps ~1", iron oxidation 1.5-2' bgs, water entry trench @ 4' bgs
 5-10: Dk gray Fat clay, high plast [0/10/90] Thin bedding, shells, org odor, wet to moist

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

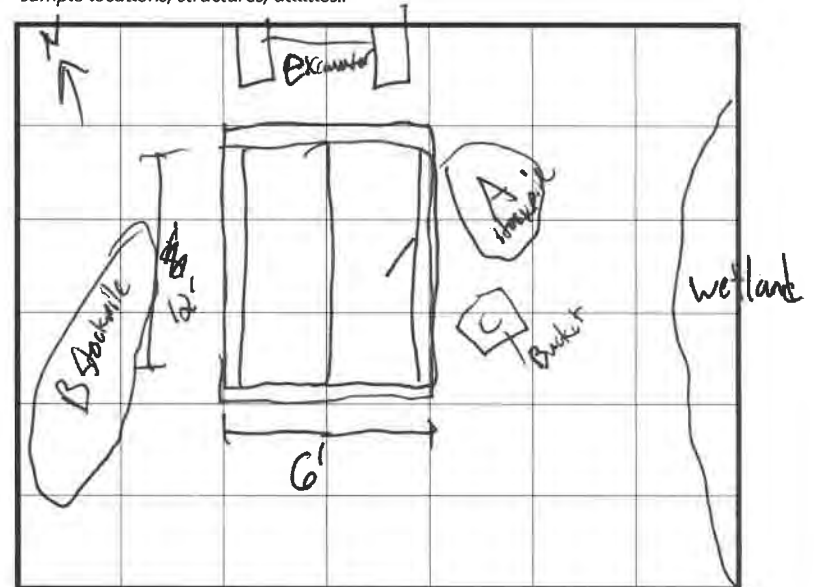
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FL-TT-08

Date: 4-20-18
 Time Started: 13:55
 Time Ended: _____

Sampler: JWS
 Calibration Time: 07:40
 Background Headspace: 0.2 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-1'	N N	2.8	Black topsoil + roots
B	1-7'	N org plastic	3.5	Black soils + WASTE
C	7-7.8'	Lt charcoal N	4.3	Black + Dk-brown Peat + OL/OH ^{Native}

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities.



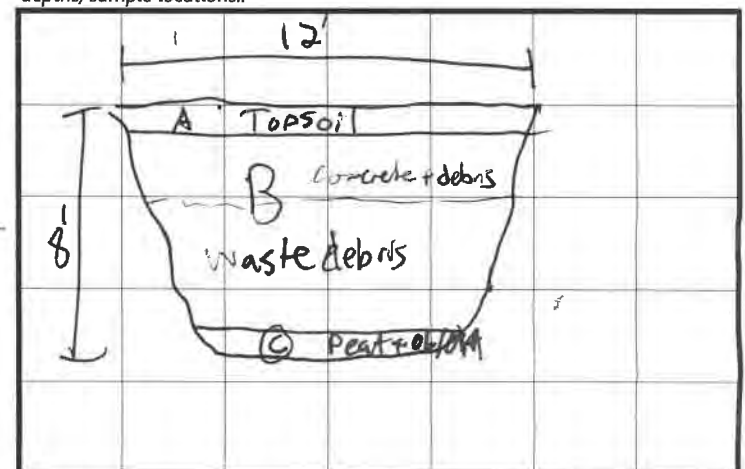
General stratigraphy description / General notes

A - Black topsoil + roots

B - Black organic soils + WASTE ^{plastic} 1-3' = concrete rubble + debris
 - plastics, rope, paper, fabric, wood, metal, metal piping

C - Black and dark brown peat +/- organic soils (OL/OH)
 Native

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations.



Appendix D

Laboratory Analytical Results Tables

Appendix D1
Solid Analytical Data Summary
Site Investigation Report
Dakota County, Minnesota

Parameter	Analysis Location	Units	Location	FD-SB-A1	FD-SB-A2	FD-SB-A3	FD-SB-A4	FD-SB-A5	FD-SB-B1	FD-SB-B2	FD-SB-B3	FD-SB-B4	FD-SB-B5	FD-SB-C1	FD-SB-C2	FD-SB-C3	FD-SB-C4	FD-SB-C5	FD-SB-D1	FD-SB-D2	FD-SB-D3	FD-SB-D4	FD-SB-D5	FD-SB-E1	FD-SB-E2	FD-SB-E3	FD-SB-E4	FD-SB-E5
			Date	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/20/2018	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/20/2018	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/21/2018	4/11/2018	3/27/2018	3/26/2018	3/22/2018	3/21/2018	4/11/2018	3/27/2018	3/26/2018	3/22/2018	3/21/2018
Depth	3 - 6 ft	10 - 20 ft	30 - 35 ft	26 - 32.5 ft	15 - 17 ft	11 - 13 ft	12 - 21 ft	5 - 26 ft	3 - 20 ft	11.5 - 23 ft	5 - 8 ft	5 - 17 ft	5 - 20 ft	5 - 20 ft	15 - 17.5 ft	11 - 16 ft	3 - 12 ft	4 - 16 ft	5 - 20 ft	5 - 16 ft	10 - 15 ft	11 - 21 ft	11 - 15.5 ft	3 - 21 ft	5 - 10 ft			
Sample Description	Ash	Ash	Native Soil	Native Soil	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Ash	Ash	Waste	Waste		
General Parameters																												
Cyanide	Lab	mg/kg	< 0.49	< 0.41	< 1.7	< 1.1	2.2 *	< 0.30	< 0.62	< 0.39	0.47	< 0.96	< 0.32	0.54	< 0.41	< 0.53 *	< 0.39	< 0.45	< 0.36	0.56	0.47	0.54	0.39	< 0.60	< 0.59	< 0.18	< 0.44	
Fluoride	Lab	mg/kg	4.6	2.3 *	< 0.99	< 0.98	< 1.0	2.1	3.3	1.7 *	< 1.0	< 0.98	2.2	< 1.0	3.9	< 1.0	< 1.0	2.1	< 0.99	< 1.0	1.1	< 0.98	< 0.99	1.9	3.5 *	2.9	< 0.98	
Moisture	Lab	%	31.3	27.3	79.9	67.6	32.2	14.8	31.0	28.4	34.7	71.5	21.5	23.0	23.1	19.9	29.0	17.3	12.6	33.6	24.4	18.0	14.3	27.4	31.9	23.0	30.4	
Solids, percent	Lab	%	71.6	--	--	--	--	80.6	--	--	--	--	83.5	--	--	--	--	85	--	--	--	--	86	--	--	--	--	
Metals																												
Aluminum	Lab	mg/kg	8780	11500	5600 *	2190	13600	4620	8890	9250	7510	3030	6440	4660	8090	3810	11900	6480	3640	12800	5710	7130	6100	9940	12900	7660	8650	
Antimony	Lab	mg/kg	1.1	2.0 *	< 2.3	< 1.5	41.0 *	< 0.58	1.9	1.1	5.0	< 1.7	1.1	1.7	0.96	1.5	3.0 *	1.6	< 0.56	< 0.75	1.1	2.0	< 0.55	2.0	1.1	2.1	0.91	
Arsenic	Lab	mg/kg	21.7	23.3	3.8	< 1.5	19.0	5.2	14.8	16.1	12.2	9.7	6.0	15.9	7.9	6.5	14.3	10.1	3.9	3.3	15.1	11.6	5.6	21.1	16.9	9.7	11.3	
Barium	Lab	mg/kg	100	130	252	140	547 *	72.7	129	84.4	194	174	114	198	235	227	292	132	57.0	167	177	191	60.1	144	104	1510	435	
Beryllium	Lab	mg/kg	3.1	3.1	< 0.94	< 0.60	< 0.29	0.51	2.3	2.2	1.6	< 0.67	0.48	0.81	0.43	0.31	0.36	0.56	0.33	0.61	1.3	0.45	0.42	2.6	2.9	0.96	0.77	
Boron	Lab	mg/kg	265	238	524	742	238 *	12.6	196	216	112	4.0	296	17.0	85.7	75.4	87.4	26.6 *	34.0	13.1	12.7	62.7	58.6	31.3	439	188	99.3	89.4
Cadmium	Lab	mg/kg	1.9	2.3	0.72	0.37	6.2	0.52	3.8	1.1	4.0	0.37	1.4	2.2	2.0	46.2	4.6	0.95	0.41	0.62	1.4	4.1	2.2	1.8	1.8	1.3	1.5	
Chromium	Lab	mg/kg	43.5 *	49.9 *	29.3 *	< 2.8 *	215 *	14.2	46.8 *	3.6 *	35.9 *	6.4 *	20.6 *	51.1 *	118 *	31.2 *	26.1 *	27.8 *	15.7 *	26.8 *	36.8 *	37.1 *	21.2 *	47.5 *	45.1 *	32.5 *	59.4 *	
Chromium, hexavalent	Lab	mg/kg	< 14.4	< 13.5	--	< 305	< 29.6	< 235	< 14.2	--	< 30.3	< 139	< 50.6	< 0.26	< 12.8	< 25.1	< 14.0	< 119	< 23.0	< 30.2	< 13.2	< 24.4	< 113	< 13.6	< 14.7	< 26.1	< 287	
Chromium, trivalent	Lab	mg/kg	43.5	49.9	--	< 1.0	215	14.2	46.8	--	35.9	6.4	20.6	51.1	118	31.2	26.1	27.8	15.7	26.8	36.8	37.1	21.2	47.5	45.1	32.5	59.4	
Cobalt	Lab	mg/kg	6.9	8.3	3.4	1.9	22.8	4.2	6.8	9.0	10	7.9	8.6	7.1	4.8	6.9	37.4 *	6.2	4.1	6.2	7.5	12.5	7.1	6.7	7.9	7.3	16.4	
Copper	Lab	mg/kg	18.0	26.1	24.2	4.3	137 *	12.5	20.7	24.7	474	11.4	61.2	53.4	119	51.6	228	25.3	18.5	36.4	64.6	23.7	74.7	20.1	25.2	207	55.0	
Iron	Lab	mg/kg	23000	35100	15500 *	3870	99500 *	9730	27900	40200	32100	13600	16800	66500	47000	42300	15900 *	19200	10100	23000	65700	17600	24800	31500	36000	28800	48700	
Lead	Lab	mg/kg	31.3	37.7	308 *	4.2	453 *	54.2	56.8	67.9	575	4.9	78.9	557	151	989	724 *	132	65.3	49.8	178	369	149	29.0	20.5	141	1010	
Lithium	Lab	mg/kg	10.2	14.9	4.6	3.9	5.1	5.0	12.1	8.5	10.3	2.5	5.4	7.7	4.2	4.4	6.7	5.1	4.8	7.2	11.8	5.0	3.8	10.7	10.4	8.4	7.7	
Manganese	Lab	mg/kg	159	161	423	310	3260 *	238	250	141	270	435	264	520	951	645	249	594	277	353	532	263	360	173	146	1640	521	
Mercury	Lab	mg/kg	< 0.028	0.070	0.12	< 0.058	9.4	0.037	0.056	0.072	0.52	< 0.066	1.1	0.38	0.44	8.6	0.76	0.060	0.063	0.089	0.97	0.13	0.13	0.033	0.075	0.21	0.65	
Methyl mercury	Lab	ng/g	< 13.6	< 11.0	< 43.9	< 26.3	22.5	< 11.8	< 10.9	< 10.1	< 17.1	< 39.4	< 10.3	< 8.93	< 9.57	< 11.1	< 14.5	< 11.1	< 8.53	< 10.8	< 9.68	< 14.2	< 11.2	< 10.4	< 15.7	< 10.0		
Nickel	Lab	mg/kg	41.6	26.9	11.3	3.6	1480 *	10.5	30.9	58.3	30.3	13.3	16.8	23.8	29.5	14.9	112 *	18.2	11.0	19.2	33.3	17.3	20.6	62.7	26.8	65.8	105	
Selenium	Lab	mg/kg	2.2	5.4	< 2.3	< 1.5	< 0.73	0.59	3.9	5.3	3.5	1.8	< 0.63	1.3	1.2	0.67	0.82	0.92	< 0.56	1.1	2.6	1.3	< 0.55	5.1	5.6	2.2	1.9	
Silver	Lab	mg/kg	< 0.72	< 0.66	< 2.4	< 1.5	< 3.6	< 0.56	< 0.70	5.5	2.0	< 1.7	< 0.62	< 0.65	1.0	< 0.59	1.8	< 0.60	< 0.57	< 0.75	2.4	< 0.60	< 0.57	< 0.64	< 0.71	< 0.63	< 0.70	
Strontium	Lab	mg/kg	57.0	47.6	47.6	65.9	68.5 *	38.6	63.2	49.6	176	47.7	38.1	59.1	31.8	53.0	106 *	40.4	21.2	42.5	70.1	53.8	42.3	60.9	69.7	50.7	92.8	
Tin	Lab	mg/kg	< 5.4	< 5.0	44.1	< 11.5	204 *	< 4.2	< 5.2	7.4	42.9	< 12.5	7.2	793	114	57.7	186 *	< 4.5	8.8	9.9	49.5	5.7	11.2	< 4.8	< 5.3	16.6	12.0	
Titanium	Lab	mg/kg	472	568	158	62.0	240 *	185	426	416	260	87.3	317	248	238	156	275 *	247	198	165	244	169	184	558	589	410	330	
Vanadium	Lab	mg/kg	224	124	15.0	7.1	22.6	29.8	135	239	44.6	19.2	28.8	54.5	30.5	16.5	27.4	37.5	19.2	28.5	64.1	25.7	24.4	301	86.8	50.3	39.0	
Zinc	Lab	mg/kg	127	173	232 *	12.7	3030 *	89.9	1050	215	692	38.0	223	237	799	450	86700 *	187	171	63.6	1360	268	154	149	565	249		
Semivolatile Organic Compounds																												
1,2,4-Trichlorobenzene	Lab	ug/kg	< 480	< 452	< 1640	< 2980	< 2420	< 387	< 475	< 2300	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
1,2-Dichlorobenzene	Lab	ug/kg	< 480	< 452	< 1640	< 2980	< 2420	< 387	< 475	< 460	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
1,2-Diphenylhydrazine	Lab	ug/kg	< 480	< 452	< 1640	< 2980	< 2420	< 387	< 475	< 460	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
1,3-Dichlorobenzene	Lab	ug/kg	< 480	< 452	< 1640	< 2980	< 2420	< 387	< 475	< 460	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
1,4-Dichlorobenzene	Lab	ug/kg	< 480	< 452	< 1640	< 2980	< 2420	< 387	< 475	< 460	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
1-Methylnaphthalene	Lab	ug/kg	< 480	539	< 1640	< 2980	< 2420	< 387	< 475	< 2300	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	484	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
2,2'-oxybis (1-chloropropane)	Lab	ug/kg	< 480	< 452	< 1640</																							

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Parameter	Analysis Location	Units	Location	FD-SB-A1	FD-SB-A2	FD-SB-A3	FD-SB-A4	FD-SB-A5	FD-SB-B1	FD-SB-B2	FD-SB-B3	FD-SB-B4	FD-SB-B5	FD-SB-C1	FD-SB-C2	FD-SB-C3	FD-SB-C4	FD-SB-C5	FD-SB-D1	FD-SB-D2	FD-SB-D3	FD-SB-D4	FD-SB-D5	FD-SB-E1	FD-SB-E2	FD-SB-E3	FD-SB-E4	FD-SB-E5
			Date	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/20/2018	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/20/2018	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/21/2018	4/11/2018	3/27/2018	3/26/2018	3/22/2018	3/21/2018	4/11/2018	3/27/2018	3/26/2018	3/22/2018	3/21/2018
Depth	3 - 6 ft	10 - 20 ft	30 - 35 ft	26 - 32.5 ft	15 - 17 ft	11 - 13 ft	12 - 21 ft	5 - 26 ft	3 - 20 ft	11.5 - 23 ft	5 - 8 ft	5 - 17 ft	5 - 20 ft	5 - 20 ft	15 - 17.5 ft	11 - 16 ft	3 - 12 ft	4 - 16 ft	5 - 20 ft	5 - 16 ft	10 - 15 ft	11 - 21 ft	11 - 15.5 ft	3 - 21 ft	5 - 10 ft			
Sample Description	Ash	Ash	Native Soil	Native Soil	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Ash	Ash	Waste	Waste		
Benz(a)anthracene	Lab	ug/kg	< 480	10800	< 1640	< 2980	< 2420	708	< 475	1780	< 504	< 1150	529	3590	< 428	< 412	< 4640	3460	1640	< 496	2230	< 4010	< 3840 *	< 454	< 484	< 428	12800	
Benzo(a)pyrene	Lab	ug/kg	< 480	8910	< 1640	< 2980	< 2420	578	< 475	1190	< 504	< 1150	463	2710	< 428	< 412	< 4640	2620	1450	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	10600	
Benzo(b)fluoranthene	Lab	ug/kg	< 480	11200	< 1640	< 2980	< 2420	772	< 475	2010	650	< 1150	617	3760	475	< 412	< 4640	3260	1840	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	14200	
Benzo(g,h,i)perylene	Lab	ug/kg	< 480	3930	< 1640	< 2980	< 2420	< 387	< 475	782	< 504	< 1150	< 420	1380	< 428	< 412	< 4640	1390	843	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	5660	
Benzo(k)fluoranthene	Lab	ug/kg	< 480	4830	< 1640	< 2980	< 2420	< 387	< 475	689	< 504	< 1150	< 420	1270	< 428	< 412	< 4640	1550	671	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
Bis(2-chloroethoxy)methane	Lab	ug/kg	< 480	< 452	< 1640	< 2980	< 2420	< 387	< 475	< 2300	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
Bis(2-chloroethyl)ether	Lab	ug/kg	< 480	< 452	< 1640	< 2980	< 2420	< 387	< 475	< 460	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
Bis(2-ethylhexyl)phthalate	Lab	ug/kg	< 480	< 452	< 1640	< 2980	483000 *	< 387	< 475	1660	7900	< 1150	< 420	1220	1490	1220	247000	< 398	< 377	40000	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	19700	
Butyl benzyl phthalate	Lab	ug/kg	< 480	< 452	< 1640	< 2980	2630	< 387	< 475	< 460	< 504	< 1150	< 420	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740		
Carbazole	Lab	ug/kg	< 480	2950	< 1640	< 2980	< 2420	< 387	< 475	< 460	< 504	< 1150	< 420	529	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
Chrysene	Lab	ug/kg	< 480	11200	< 1640	< 2980	< 2420	669	< 475	2180	558	< 1150	535	3290	449	< 412	< 4640	3400	1570	< 496	2250	< 4010	< 3840 *	< 454	< 484	< 428	12100	
Dibenz(a,h)anthracene	Lab	ug/kg	< 480	990	< 1640	< 2980	< 2420	< 387	< 475	< 460	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
Dibenzofuran	Lab	ug/kg	< 480	1590	< 1640	< 2980	< 2420	< 387	< 475	515	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
Diethyl phthalate	Lab	ug/kg	< 480	< 452	< 1640	< 2980	< 2420	< 387	< 475	< 460	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
Dimethyl phthalate	Lab	ug/kg	< 480	< 452	< 1640	< 2980	< 2420	< 387	< 475	< 460	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
Di-n-butyl phthalate	Lab	ug/kg	< 480	< 452	< 1640	< 2980	2450	< 387	< 475	< 460	516	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
Di-n-octyl phthalate	Lab	ug/kg	< 480	< 452	< 1640	< 2980	4800 *	< 387	< 475	< 460	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
Fluoranthene	Lab	ug/kg	< 480	27300	< 1640	< 2980	< 2420	1300	< 475	6860	1560	< 1150	1050	7680	747	< 412	< 4640	8050	4150	< 496	5620	< 4010	< 3840 *	< 454	< 484	< 428	35700	
Fluorene	Lab	ug/kg	< 480	3150	< 1640	< 2980	< 2420	< 387	< 475	933	666	< 1150	< 420	723	< 428	< 412	< 4640	< 398	650	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	5980	
Hexachlorobenzene	Lab	ug/kg	< 480	< 452	< 1640	< 2980	< 2420	< 387	< 475	< 460	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
Hexachlorobutadiene	Lab	ug/kg	< 480	< 452	< 1640	< 2980	< 2420	< 387	< 475	< 2300	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
Hexachloroethane	Lab	ug/kg	< 480	< 452	< 1640	< 2980	< 2420	< 387	< 475	< 460	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
Indeno(1,2,3-cd)pyrene	Lab	ug/kg	< 480	3610	< 1640	< 2980	< 2420	< 387	< 475	676	< 504	< 1150	< 420	1210	< 428	< 412	< 4640	1230	719	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	4980	
Isophorone	Lab	ug/kg	< 480	< 452	< 1640	< 2980	< 2420	< 387	< 475	< 2300	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
Naphthalene	Lab	ug/kg	< 480	< 452	< 1640	< 2980	2940	< 387	< 475	< 2300	< 504	< 1150	< 420	< 428	1710	< 412	< 4640	< 398	572	< 496	< 2180	7710	< 3840 *	< 454	< 484	< 428	10800	
Nitrobenzene	Lab	ug/kg	< 480	< 452	< 1640	< 2980	< 2420	< 387	< 475	< 2300	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
n-Nitrosodimethylamine	Lab	ug/kg	< 480	< 452	< 1640	< 2980	< 2420	< 387	< 475	< 460	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
n-Nitrosodi-n-propylamine	Lab	ug/kg	< 480	< 452	< 1640	< 2980	< 2420	< 387	< 475	< 460	< 504	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
n-Nitrosodiphenylamine	Lab	ug/kg	< 480	< 452	< 1640	< 2980	< 2420	< 387	< 475	< 460	759	< 1150	< 420	< 428	< 428	< 412	< 4640	< 398	< 377	< 496	< 2180	< 4010	< 3840 *	< 454	< 484	< 428	< 4740	
Pentachlorophenol	Lab	ug/kg	< 974	< 918	< 3320	< 6050	< 4920	< 785	< 965	< 935	< 1020	< 2340	< 853	< 870	< 868	< 836	< 9430	< 808	< 766	< 1010	< 4420	< 8150	< 7800 *	< 922	< 983	< 869	< 9620	
Phenanthrene	Lab	ug/kg	< 480	23700	< 1640	< 2980	< 2420	887	< 475	7060	2410	< 1150	777	6640	822	< 412	< 4640	4600	3680	< 496	5730	< 4010	< 3840 *	< 454	< 484	< 428	39900	
Phenol																												

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Parameter	Analysis Location	Units	Location	FD-SB-A1	FD-SB-A2	FD-SB-A3	FD-SB-A4	FD-SB-A5	FD-SB-B1	FD-SB-B2	FD-SB-B3	FD-SB-B4	FD-SB-B5	FD-SB-C1	FD-SB-C2	FD-SB-C3	FD-SB-C4	FD-SB-C5	FD-SB-D1	FD-SB-D2	FD-SB-D3	FD-SB-D4	FD-SB-D5	FD-SB-E1	FD-SB-E2	FD-SB-E3	FD-SB-E4	FD-SB-E5
			Date	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/20/2018	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/20/2018	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/21/2018	4/11/2018	3/27/2018	3/26/2018	3/22/2018	3/21/2018	4/11/2018	3/27/2018	3/26/2018	3/22/2018	3/21/2018
Depth	3 - 6 ft	10 - 20 ft	30 - 35 ft	26 - 32.5 ft	15 - 17 ft	11 - 13 ft	12 - 21 ft	5 - 26 ft	3 - 20 ft	11.5 - 23 ft	5 - 8 ft	5 - 17 ft	5 - 20 ft	5 - 20 ft	15 - 17.5 ft	11 - 16 ft	3 - 12 ft	4 - 16 ft	5 - 20 ft	5 - 16 ft	10 - 15 ft	11 - 21 ft	11 - 15.5 ft	3 - 21 ft	5 - 10 ft			
Sample Description	Ash	Ash	Native Soil	Native Soil	Waste	Waste	Waste	Waste	Waste	Native Soil	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Ash	Ash	Waste	Waste		
1,2,3-Trichloropropane	Lab	ug/kg	< 290	< 271	< 1650	< 1480	< 571	< 280	< 289	< 693	< 575	< 1240	< 261	< 299	< 274	< 275	< 367	< 258	< 235	< 458	< 329	< 248	< 293	< 293	< 316	< 300	< 330	
1,2,4-Trichlorobenzene	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	< 143	< 69.9	< 72.2	< 173	< 144	< 310	< 65.2	< 74.6	< 68.4	< 68.8	< 91.7	< 64.4	< 58.8	298	< 82.4	< 61.9	< 73.2	< 73.1	< 79.0	< 75.0	< 82.5	
1,2,4-Trimethylbenzene	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	4970	< 69.9	< 72.2	< 173	6930	< 310	< 65.2	95.0	< 68.4	5820	123	< 64.4	148	5000	5480	124	< 73.2	120	< 79.0	1060	390	
1,2-Dibromo-3-chloropropane (DBCP)	Lab	ug/kg	< 725	< 677	< 4120	< 3700	< 1430	< 699	< 722	< 1730	< 1440	< 3100	< 652	< 746	< 684	< 688	< 917	< 644	< 588	< 1150	< 824	< 619	< 732	< 731	< 790	< 750	< 825	
1,2-Dibromoethane (EDB)	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	< 143	< 69.9	< 72.2	< 173	< 144	< 310	< 65.2	< 74.6	< 68.4	< 68.8	< 91.7	< 64.4	< 58.8	< 115	< 82.4	< 61.9	< 73.2	< 73.1	< 79.0	< 75.0	< 82.5	
1,2-Dichlorobenzene	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	435	< 69.9	< 72.2	< 173	259	< 310	< 65.2	< 74.6	< 68.4	506	< 91.7	< 64.4	< 58.8	935	< 82.4	< 61.9	< 73.2	< 73.1	< 79.0	585	< 82.5	
1,2-Dichloroethane	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	< 143	< 69.9	< 72.2	< 173	< 144	< 310	< 65.2	< 74.6	< 68.4	< 68.8	< 91.7	< 64.4	< 58.8	< 115	< 82.4	< 61.9	< 73.2	< 73.1	< 79.0	< 75.0	< 82.5	
1,2-Dichloroethylene, cis	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	< 143	< 69.9	< 72.2	< 173	< 144	< 310	< 65.2	< 74.6	< 68.4	< 68.8	< 91.7	< 64.4	< 58.8	< 115	< 82.4	< 61.9	< 73.2	< 73.1	< 79.0	< 75.0	< 82.5	
1,2-Dichloroethylene, trans	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	< 143	< 69.9	< 72.2	< 173	< 144	< 310	< 65.2	< 74.6	< 68.4	< 68.8	< 91.7	< 64.4	< 58.8	< 115	< 82.4	< 61.9	< 73.2	< 73.1	< 79.0	< 75.0	< 82.5	
1,2-Dichloropropane	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	< 143	< 69.9	< 72.2	< 173	< 144	< 310	< 65.2	< 74.6	< 68.4	< 68.8	< 91.7	< 64.4	< 58.8	< 115	< 82.4	< 61.9	< 73.2	< 73.1	< 79.0	< 75.0	< 82.5	
1,3,5-Trimethylbenzene	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	1130	< 69.9	< 72.2	< 173	2230	< 310	< 65.2	< 74.6	< 68.4	1920	< 91.7	< 64.4	< 58.8	1570	1590	< 61.9	< 73.2	< 73.1	< 79.0	116	92.5	
1,3-Dichlorobenzene	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	< 143	< 69.9	< 72.2	< 173	< 144	< 310	< 65.2	< 74.6	< 68.4	< 68.8	< 91.7	< 64.4	< 58.8	2660	< 82.4	< 61.9	< 73.2	< 73.1	< 79.0	< 75.0	< 82.5	
1,3-Dichloropropane	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	< 143	< 69.9	< 72.2	< 173	< 144	< 310	< 65.2	< 74.6	< 68.4	< 68.8	< 91.7	< 64.4	< 58.8	< 115	< 82.4	< 61.9	< 73.2	< 73.1	< 79.0	< 75.0	< 82.5	
1,3-Dichloropropene, cis	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	< 143	< 69.9	< 72.2	< 173	< 144	< 310	< 65.2	< 74.6	< 68.4	< 68.8	< 91.7	< 64.4	< 58.8	< 115	< 82.4	< 61.9	< 73.2	< 73.1	< 79.0	< 75.0	< 82.5	
1,3-Dichloropropene, trans	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	< 143	< 69.9	< 72.2	< 173	< 144	< 310	< 65.2	< 74.6	< 68.4	< 68.8	< 91.7	< 64.4	< 58.8	< 115	< 82.4	< 61.9	< 73.2	< 73.1	< 79.0	< 75.0	< 82.5	
1,4-Dichlorobenzene	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	1690	< 69.9	< 72.2	< 173	810	< 310	< 65.2	< 74.6	< 68.4	590	469	< 64.4	< 58.8	17100	262	137	< 73.2	< 73.1	< 79.0	192	433	
2,2-Dichloropropane	Lab	ug/kg	< 290	< 271	< 1650	< 1480	< 571	< 280	< 289	< 693	< 575	< 1240	< 261	< 299	< 274	< 275	< 367	< 258	< 235	< 458	< 329	< 248	< 293	< 293	< 316	< 300	< 330	
Acetone	Lab	ug/kg	< 1450	< 1350	< 8250	< 7400	< 2860	< 1400	< 1440	< 3470	< 2870	< 6200	< 1300	< 1490	< 1370	< 1380	< 1830	< 1290	< 1180	< 2290	< 1650	< 1240	< 1460	< 1460	< 1580	< 1500	< 1650	
Allyl chloride	Lab	ug/kg	< 290	< 271	< 1650	< 1480	< 571	< 280	< 289	< 693	< 575	< 1240	< 261	< 299	< 274	< 275	< 367	< 258	< 235	< 458	< 329	< 248	< 293	< 293	< 316	< 300	< 330	
Benzene	Lab	ug/kg	< 29.0	< 27.1	256	1370	981	< 28.0	< 28.9	< 69.3	< 57.5	277	< 26.1	< 29.9	< 27.4	70.9	< 36.7	< 25.8	< 23.5	199	< 32.9	< 24.8	< 29.3	< 29.3	< 31.6	211	< 33.0	
Bromobenzene	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	< 143	< 69.9	< 72.2	< 173	< 144	< 310	< 65.2	< 74.6	< 68.4	< 68.8	< 91.7	< 64.4	< 58.8	< 115	< 82.4	< 61.9	< 73.2	< 73.1	< 79.0	< 75.0	< 82.5	
Bromochloromethane	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	< 143	< 69.9	< 72.2	< 173	< 144	< 310	< 65.2	< 74.6	< 68.4	< 68.8	< 91.7	< 64.4	< 58.8	< 115	< 82.4	< 61.9	< 73.2	< 73.1	< 79.0	< 75.0	< 82.5	
Bromodichloromethane	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	< 143	< 69.9	< 72.2	< 173	< 144	< 310	< 65.2	< 74.6	< 68.4	< 68.8	< 91.7	< 64.4	< 58.8	< 115	< 82.4	< 61.9	< 73.2	< 73.1	< 79.0	< 75.0	< 82.5	
Bromoform	Lab	ug/kg	< 290	< 271	< 1650	< 1480	< 571	< 280	< 289	< 693	< 575	< 1240	< 261	< 299	< 274	< 275	< 367	< 258	< 235	< 458	< 329	< 248	< 293	< 293	< 316	< 300	< 330	
Bromomethane	Lab	ug/kg	< 725	< 677	< 4120	< 3700	< 1430	< 699	< 722	< 1730	< 1440	< 3100	< 652	< 746	< 684	< 688	< 917	< 644	< 588	< 1150	< 824	< 619	< 732	< 731	< 790	< 750	< 825	
Butylbenzene	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	1950	< 69.9	< 72.2	< 173	989	< 310	< 65.2	243	< 68.4	1120	614	< 64.4	< 58.8	1360	1130	154	< 73.2	< 73.1	< 79.0	307	136	
Butylbenzene, sec	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	1510	< 69.9	< 72.2	< 173	663	< 310	< 65.2	192	< 68.4	520	372	< 64.4	< 58.8	1060	696	91.6	< 73.2	< 73.1	< 79.0	214	104	
Butylbenzene, tert	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	488	< 69.9	< 72.2	< 173	< 144	< 310	< 65.2	< 74.6	< 68.4	79.8	< 91.7	< 64.4	< 58.8	164	84.4	< 61.9	< 73.2	< 73.1	< 79.0	< 75.0	< 82.5	
Carbon tetrachloride	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	< 143	< 69.9	< 72.2	< 173	< 144	< 310	< 65.2	< 74.6	< 68.4	< 68.8	< 91.7	< 64.4	< 58.8	< 115	< 82.4	< 61.9	< 73.2	< 73.1	< 79.0	< 75.0	< 82.5	
Chlorobenzene	Lab	ug/kg	< 72.5	< 67.7	< 412	< 370	479	< 69.9	< 72.2	< 173	< 144	< 310	< 65.2	< 74.6	< 68.4	122	< 91.7	< 64.4	< 58.8	26400	< 82.4	< 61.9	< 73.2	< 73.1	< 79.0	< 75.0	< 82.5	
Chlorodibromomethane	Lab	ug/kg	< 290	< 271	< 1650	< 1480	< 571	< 280	< 289	< 693	< 575	< 1240	< 261	< 299	< 274	< 275	< 367	< 258	< 235	< 458	< 329	< 248	< 293	< 293	< 316	< 300	< 330	
Chloroethane	Lab	ug/kg	< 725	< 677																								

Appendix D1
Solid Analytical Data Summary
 Site Investigation Report
 Dakota County, Minnesota

Parameter	Analysis Location	Units	Location	FD-SB-A1	FD-SB-A2	FD-SB-A3	FD-SB-A4	FD-SB-A5	FD-SB-B1	FD-SB-B2	FD-SB-B3	FD-SB-B4	FD-SB-B5	FD-SB-C1	FD-SB-C2	FD-SB-C3	FD-SB-C4	FD-SB-C5	FD-SB-D1	FD-SB-D2	FD-SB-D3	FD-SB-D4	FD-SB-D5	FD-SB-E1	FD-SB-E2	FD-SB-E3	FD-SB-E4	FD-SB-E5	
			Date	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/20/2018	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/20/2018	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/21/2018	4/11/2018	3/27/2018	3/26/2018	3/22/2018	3/21/2018	4/11/2018	3/27/2018	3/26/2018	3/22/2018	3/21/2018	
Depth	3 - 6 ft	10 - 20 ft	30 - 35 ft	26 - 32.5 ft	15 - 17 ft	11 - 13 ft	12 - 21 ft	5 - 26 ft	3 - 20 ft	11.5 - 23 ft	5 - 8 ft	5 - 17 ft	5 - 20 ft	5 - 20 ft	15 - 17.5 ft	11 - 16 ft	3 - 12 ft	4 - 16 ft	5 - 20 ft	5 - 16 ft	10 - 15 ft	11 - 21 ft	11 - 15.5 ft	3 - 21 ft	5 - 10 ft				
Sample Description	Ash	Ash	Native Soil	Native Soil	Waste	Waste	Waste	Waste	Waste	Native Soil	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Ash	Ash	Waste	Waste			
Pesticides																													
4,4'-DDD	Lab	ug/kg	< 4.8	< 458	< 33.1	< 10.2	< 49.0	< 19.5	< 24.1	< 23.3	< 51.0	< 58.1	< 84.8	< 216	< 86.6	< 207	< 93.5	< 80.4	< 190	< 100	< 88.0 *	< 202	< 194	< 9.1	< 4.9	< 86.4	< 956		
4,4'-DDE	Lab	ug/kg	< 4.8	< 458	< 33.1	< 10.2	52.5 *	< 19.5	< 24.1	< 23.3	< 51.0	< 58.1	< 84.8	< 216	< 86.6	277	< 93.5	< 80.4	< 190	< 100	< 88.0	< 202	< 194	< 9.1	< 4.9	< 86.4	< 956		
4,4'-DDT	Lab	ug/kg	< 4.8	< 458	< 33.1	< 10.2	< 49.0	< 19.5	< 24.1	24.5 *	< 51.0	< 58.1	< 84.8	< 216	< 86.6	767	< 93.5	< 80.4	< 190	< 100	< 88.0	< 202	< 194	< 9.1	< 4.9	< 86.4	< 956		
a-BHC	Lab	ug/kg	< 2.4	< 230	< 16.6	< 5.1	< 24.6	< 9.8	< 12.1	< 11.7	< 25.6	< 29.2	< 42.5	< 108	< 43.4	< 104	< 46.9	< 40.3	< 95.4	< 50.2	< 44.1 *	< 102	< 97.4	< 4.6	< 2.4	< 43.3	< 479		
Aldrin	Lab	ug/kg	< 2.4	< 230	< 16.6	< 5.1	< 24.6	< 9.8	< 12.1	< 11.7	< 25.6	< 29.2	< 42.5	< 108	< 43.4	< 104	< 46.9	< 40.3	< 95.4	< 50.2	< 44.1 *	< 102	< 97.4	< 4.6	< 2.4	< 43.3	< 479		
b-BHC	Lab	ug/kg	< 2.4	< 230	64.3 *	< 5.1	35.0 *	< 9.8	< 12.1	< 11.7	< 25.6	< 29.2	< 42.5	< 108	< 43.4	159	< 46.9	< 40.3	< 95.4	< 50.2	< 44.1 *	< 102	< 97.4	< 4.6	< 2.4	< 43.3	< 479		
Chlordane, alpha & gamma	Lab	ug/kg	< 24.2	< 2300	< 166	< 51.4	< 246	< 97.6	< 121	< 117	< 256	< 292	< 425	< 1080	< 434	< 1040	< 469	< 403	< 954	< 502	< 441	< 1020	< 974	< 45.9	< 24.4	< 433	< 4790		
Chlordane, cis (alpha)	Lab	ug/kg	< 2.4	< 230	147 *	< 5.1	< 24.6	< 9.8	< 12.1	< 11.7	< 25.6	< 29.2	< 42.5	< 108	< 43.4	< 104	94.9	< 40.3	< 95.4	< 50.2	< 44.1 *	< 102	< 97.4	< 4.6	< 2.4	< 43.3	< 479		
Chlordane, trans (gamma)	Lab	ug/kg	< 2.4	< 230	129 *	< 5.1	< 24.6	< 9.8	< 12.1	< 11.7	< 25.6	< 29.2	< 42.5	< 108	< 43.4	161	57.2	< 40.3	< 95.4	< 50.2	< 44.1 *	< 102	< 97.4	< 4.6	< 2.4	< 43.3	< 479		
d-BHC	Lab	ug/kg	< 2.4	< 230	< 16.6	< 5.1	< 24.6	< 9.8	< 12.1	< 11.7	< 25.6	< 29.2	< 42.5	< 108	< 43.4	146	< 46.9	< 40.3	< 95.4	< 50.2	< 44.1 *	< 102	< 97.4	< 4.6	< 2.4	< 43.3	< 479		
Dieldrin	Lab	ug/kg	< 4.8	< 458	< 33.1	< 10.2	< 49.0	< 19.5	< 24.1	< 23.3	< 51.0	< 58.1	< 84.8	< 216	< 86.6	< 207	< 93.5	< 80.4	< 190	< 100	< 88.0 *	< 202	< 194	< 9.1	< 4.9	< 86.4	< 956		
Endosulfan I	Lab	ug/kg	< 2.4	< 230	< 16.6	< 5.1	< 24.6	< 9.8	< 12.1	< 11.7	< 25.6	< 29.2	< 42.5	< 108	< 43.4	< 104	< 46.9	< 40.3	< 95.4	< 50.2	< 44.1 *	< 102	< 97.4	< 4.6	< 2.4	< 43.3	< 479		
Endosulfan II	Lab	ug/kg	< 4.8	< 458	< 33.1	< 10.2	< 49.0	< 19.5	< 24.1	< 23.3	< 51.0	< 58.1	< 84.8	< 216	< 86.6	< 207	< 93.5	< 80.4	< 190	< 100	< 88.0	< 202	< 194	< 9.1	< 4.9	< 86.4	< 956		
Endosulfan sulfate	Lab	ug/kg	< 4.8	< 458	< 33.1	< 10.2	< 49.0 *	< 19.5	< 24.1	< 23.3	< 51.0	< 58.1	< 84.8	< 216	< 86.6	< 207	< 93.5	< 80.4	< 190	< 100	< 88.0	< 202	< 194	< 9.1	< 4.9	< 86.4	< 956		
Endrin	Lab	ug/kg	< 4.8	< 458	< 33.1	< 10.2	< 49.0	< 19.5	< 24.1	< 23.3	< 51.0	< 58.1	< 84.8	< 216	< 86.6	< 207	< 93.5	< 80.4	< 190	< 100	< 88.0 *	< 202	< 194	< 9.1	< 4.9	< 86.4	< 956		
Endrin aldehyde	Lab	ug/kg	< 4.8	< 458	< 33.1	< 10.2	56.5 *	< 19.5	< 24.1	< 23.3	< 51.0	< 58.1	< 84.8	< 216	< 86.6	< 207	< 93.5	< 80.4	< 190	< 100	< 88.0 *	< 202	< 194	< 9.1	< 4.9	< 86.4	< 956		
Endrin ketone	Lab	ug/kg	< 4.8	< 458	< 33.1	< 10.2	50.8 *	< 19.5	< 24.1	< 23.3	< 51.0	< 58.1	< 84.8	< 216	< 86.6	< 207	< 93.5	< 80.4	< 190	< 100	< 88.0	< 202	< 194	< 9.1	< 4.9	< 86.4	< 956		
g-BHC (Lindane)	Lab	ug/kg	< 2.4	< 230	< 16.6	< 5.1	< 24.6	< 9.8	< 12.1	< 11.7	< 25.6	< 29.2	< 42.5	< 108	< 43.4	< 104	< 46.9	< 40.3	< 95.4	< 50.2	< 44.1 *	< 102	< 97.4	< 4.6	< 2.4	< 43.3	< 479		
Heptachlor	Lab	ug/kg	< 2.4	< 230	< 16.6	< 5.1	< 24.6	< 9.8	< 12.1	< 11.7	< 25.6	< 29.2	< 42.5	< 108	< 43.4	< 104	< 46.9	< 40.3	< 95.4	< 50.2	< 44.1 *	< 102	< 97.4	< 4.6	< 2.4	< 43.3	< 479		
Heptachlor epoxide	Lab	ug/kg	< 2.4	< 230	< 16.6	< 5.1	< 24.6	< 9.8	< 12.1	< 11.7	< 25.6	< 29.2	< 42.5	< 108	< 43.4	< 104	< 46.9	< 40.3	< 95.4	< 50.2	< 44.1 *	< 102	< 97.4	< 4.6	< 2.4	< 43.3	< 479		
Methoxychlor	Lab	ug/kg	< 24.2	< 2300	< 166	< 51.4	< 246	< 97.6	< 121	< 117	< 256	< 292	< 425	< 1080	< 434	< 1040	< 469	< 403	< 954	< 502	< 441	< 1020	< 974	< 45.9	< 24.4	< 433	< 4790		
Toxaphene	Lab	ug/kg	< 72.6	< 6870	< 497	< 154	< 736	< 292	< 362	< 349	< 765	< 873	< 1270	< 3240	< 1300	< 3120	< 1400	< 1210	< 2860	< 1500	< 1320	< 3040	< 2910	< 137	< 72.9	< 1300	< 14400		
Polychlorinated Biphenyls																													
Aroclor 1016	Lab	ug/kg	< 47.9	< 44.9	< 164	< 105	< 48.6	< 38.7	< 47.7	< 45.8	< 50.5	< 116	< 42.0	< 42.8	< 42.5	< 41.2	< 46.3	< 39.8	< 37.4	< 49.6	< 43.5	< 40.1	< 38.5	< 45.4	< 48.3	< 42.7	< 47.4		
Aroclor 1221	Lab	ug/kg	< 47.9	< 44.9	< 164	< 105	< 48.6	< 38.7	< 47.7	< 45.8	< 50.5	< 116	< 42.0	< 42.8	< 42.5	< 41.2	< 46.3	< 39.8	< 37.4	< 49.6	< 43.5	< 40.1	< 38.5	< 45.4	< 48.3	< 42.7	< 47.4		
Aroclor 1232	Lab	ug/kg	< 47.9	< 44.9	< 164	< 105	< 48.6	< 38.7	< 47.7	< 45.8	< 50.5	< 116	< 42.0	< 42.8	< 42.5	< 41.2	< 46.3	< 39.8	< 37.4	< 49.6	< 43.5	< 40.1	< 38.5	< 45.4	< 48.3	< 42.7	< 47.4		
Aroclor 1242	Lab	ug/kg	< 47.9	122	< 164	< 105	< 48.6	< 38.7	< 47.7	< 45.8	3330	< 116	1240	< 42.8	< 42.5	39900	1120	< 39.8	< 37.4	1870	306	724	< 38.5	< 45.4	< 48.3	247	4460		
Aroclor 1248	Lab	ug/kg	< 47.9	< 44.9	< 164	< 105	394	< 38.7	< 47.7	< 45.8	< 50.5	< 116	< 42.0	< 42.8	< 42.5	< 41.2	< 46.3	< 39.8	< 37.4	< 49.6	< 43.5	< 40.1	104	< 45.4	< 48.3	< 42.7	< 47.4		
Aroclor 1254	Lab	ug/kg	< 47.9	< 44.9	< 164	< 105	293	< 38.7	< 47.7	551	887	< 116	170	178	144	5350	1100	< 39.8	45.2	322	91.8	436	127	< 45.4	< 48.3	174	< 47.4		
Aroclor 1260	Lab	ug/kg	< 47.9	< 44.9	< 164	< 105	< 48.6	< 38.7	< 47.7	< 45.8	< 50.5	< 116	< 42.0	< 42.8	< 42.5	< 41.2	< 46.3	< 39.8	< 37.4	< 49.6	< 43.5	< 40.1	< 38.5	< 45.4	< 48.3	< 42.7	< 47.4		
Aroclor 1262	Lab	ug/kg	< 47.9	< 44.9	< 164	< 105	< 48.6	< 38.7	< 47.7	< 45.8	< 50.5	< 116	< 42.0	< 42.8	< 42.5	< 41.2	< 46.3	< 39.8	< 37.4	< 49.6	< 43.5	< 40.1	< 38.5	< 45.4	< 48.3	< 42.7	< 47.4		
Aroclor 1268	Lab	ug/kg	< 47.9	< 44.9	< 164	< 105	< 48.6	< 38.7																					

Appendix D1
Solid Analytical Data Summary
Site Investigation Report
Dakota County, Minnesota

Parameter	Analysis Location	Units	Location																						
			FD-SB-F1	FD-SB-F2	FD-SB-F3	FD-SB-F4	FD-SB-F5	FD-SB-G1	FD-SB-G2	FD-SB-G3	FD-SB-G4	FD-SB-G5	FD-TT-01	FD-TT-02	FD-TT-03	FD-TT-05	FD-TT-06	FD-TT-07	FD-TT-08	FD-TT-09	FD-TT-10	FD-TT-11	FD-TT-12	FD-TT-13	FD-TT-14
Depth	Date		4/12/2018	3/27/2018	3/26/2018	3/21/2018	3/21/2018	4/12/2018	3/26/2018	3/26/2018	3/26/2018	3/21/2018	4/11/2018	4/11/2018	4/11/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/17/2018	4/17/2018	4/17/2018	4/17/2018	4/17/2018	4/17/2018
Sample Description			10 - 14.5 ft	7 - 13 ft	3 - 11 ft	5 - 10 ft	3 - 11 ft	5 - 10 ft	10 - 12 ft	7 - 16 ft	15.5 - 17.5 ft	5 - 14 ft	10 - 12 ft	7 - 9 ft	2 - 5 ft	4 - 9 ft	2 - 5 ft	6 - 11 ft	5 - 12 ft	4 - 12 ft	2 - 10 ft	4 - 12 ft	3 - 12 ft	3 - 12 ft	2 - 12 ft
			Ash	Waste	Waste	Waste	Waste	Fill Soil	Waste	Waste	Native Soil	Waste	Waste	Waste	Ash	Ash	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste
General Parameters																									
Cyanide	Lab	mg/kg	< 0.57	0.45	0.58	< 0.65	< 0.50	< 0.39	0.56	0.62	0.90	< 0.42	< 0.48	1.2	< 0.53	< 0.47	0.67	0.85	< 0.39	0.52	< 0.45	< 0.48	< 0.51	2.4	0.62
Fluoride	Lab	mg/kg	4.1	< 0.97	< 1.0	< 0.99	2.9 *	1.8	7.4	2.0	< 0.98	< 0.97	1.7	1.8	5.1	4.3	1.4 *	< 1.0	1.3	< 1.0 *	1.3	< 0.98 *	1.9	< 1.0	< 0.99
Moisture	Lab	%	32.6	26.6	24.1	25.9	31.3	10.6	31.8	23.1	26.9	9.5	34.3	40.7	33.8	28.0	39.7	28.0	21.8	22.0	20.4	20.8	27.9	66.6	24.2
Solids, percent	Lab	%	67.4	--	--	--	--	89.4	--	--	--	--	72.4	61.3	67.5	75.5	64.4	64.7	79	67.3	79.1	78.3	72.4	62.5	75.5
Metals																									
Aluminum	Lab	mg/kg	10700	11500	8730	3700	10500	4200	13200	10600	4370 *	4040	9190	9140	13000	7800	29600	7160	9940	10100	8740	9820	10900	7360	7110
Antimony	Lab	mg/kg	2.1	17.1	2.5	3.0	0.90	< 0.53	2.0	2.1	< 0.68	< 0.54	1.3	13.3	1.7	1.0	0.99	3.9	3.6	1.9	1.1	4.1	1.2	5.0	1.3
Arsenic	Lab	mg/kg	22.5	20.9	20.6	12.1	21.9	13.3	28.4	13.8	1.4	5.2	11.6	22.8	24.9	14.8	18.3	12.6	37.0	12.7	13.6	13.6	17.3	5.8	12.7
Barium	Lab	mg/kg	134	158	489	294	136	60.3	130	179	104	91.1	344	200	171	129	138	144	156	204	122	282	109	289	153
Beryllium	Lab	mg/kg	3.2	2.4	1.9	0.35	2.7	0.30	3.0	1.2	< 0.27	0.39	1.5	0.69	3.6	1.8	2.4	1.3	1.6	1.0	1.7	1.1	2.9	< 0.57	1.4
Boron	Lab	mg/kg	802	157	163	128	120	11.6	1930	163	124	114	134	114	145	106	192	95.1	138	75.3	74.9	65.4	198	167	99.2
Cadmium	Lab	mg/kg	2.4	2.9	3.4	1.3	2.3	0.18	3.1	4.8	0.14	0.64	2.3	2.5	2.2	1.4	2.1	2.7	13.7	2.5	1.6	1.9	1.9	2.4	2.2
Chromium	Lab	mg/kg	53.4 *	52.1 *	45.0 *	59.7 *	39.6	11.4 *	57.6 *	40.2 *	19.0 *	15.4 *	33.3	133	44.0	42.6	38.5 *	54.4 *	109 *	5.4 *	7.4	11.7 *	11.4	12.6 *	10 *
Chromium, hexavalent	Lab	mg/kg	< 14.5	< 27.0	< 13.0	< 27.2	< 288 *	< 44.9	< 14.6	< 12.8	< 273 **	< 22.0	< 61.4	< 67.5	< 14.6	< 14.0	< 66.9	< 54.0	< 50.4	< 49.3	< 25.3	< 49.5	< 27.4	< 60.6	< 25.7
Chromium, trivalent	Lab	mg/kg	53.4	52.1	45.0	59.7	39.6	11.4	57.6	40.2	19.0	15.4	33.3	133	44.0	42.6	38.5	54.4	109	5.4	7.4	11.7	11.4	12.6	10.0
Cobalt	Lab	mg/kg	6.9	8.1	8.3	8.2	8.5	5.2	7.4	6.7	3.2	5.2	5.6	10.1	8.2	5.2	7.2	8.4	8.5	7.5	6.6	7.7	7.2	3.5	8.9
Copper	Lab	mg/kg	20.2	55.8	47.2	334	26.2	8.0	29.1	66.2	38.1	244	36.7	166	25.1	16.9	1660	507	193	75.0	36.3	43.0	31.6	96.5	78.8
Iron	Lab	mg/kg	34200	37700	43500	162000	31000	8290	39400	42300	10600 I	168000	36800	116000	35900	26400	31800	61000	53400	33200	22800	27800	38800	72600	31700
Lead	Lab	mg/kg	30.4	88.7	352	424	23.2	19.2	40.8	311	5.7 *	44.3	150	578	30.9	18.2	75.8	338	558	173	89.5	6520	28.5	94.3	137
Lithium	Lab	mg/kg	10.2	11.5	7.6	4.5	9.2	3.6	13.0	7.0	1.9	4.7	6.5	4.0	12.0	8.6	9.9	9.4	7.8	6.8	8.1	6.8	10.8	2.1	7.9
Manganese	Lab	mg/kg	185	330	230	1060	174	323	188	225	834	804	291	868	194	365	251	447	382	328	293	238	145	806	408
Mercury	Lab	mg/kg	0.075	0.11	0.40	1.5	0.19	0.042	0.094	0.27	< 0.023	1.5	0.14	1.1	0.060	0.057	1.7	1.0	0.26	0.24	0.18	0.13	0.14	0.75	0.27
Methyl mercury	Lab	ng/g	< 13.7	< 11.0	< 9.70	< 15.6	< 10.8	< 11.0	< 9.03	< 8.04	< 12.2	< 6.94	< 12.9	< 15.2	< 14.4	< 12.2	< 14.6	< 14.2	< 11.5	< 10.3	< 10.5	< 10.6	< 14.1	< 30.3	< 12.4
Nickel	Lab	mg/kg	22.5	27.1	33.7	57.9	28.3	10.2	27.8	24.4	9.6	42.9	43.1	57.6	25.5	18.4	489	45.5	41.1	24.7	21.3	22.0	27.4	23.8	66.4
Selenium	Lab	mg/kg	5.7	4.9	4.2	< 0.66	6.2	< 0.53	7.4	3.5	< 0.68	0.95	2.9	1.2	1.6	2.0	3.7	2.4	4.5	2.3	1.7	1.7	5.4	< 1.4	2.8
Silver	Lab	mg/kg	< 0.73	2.3	< 0.62	< 0.67	< 0.73	< 0.54	< 0.69	0.66	< 0.65	< 0.53	< 0.72	0.94	< 0.76	< 0.67	< 0.81	1.0	< 0.62	< 0.63	< 0.62	< 0.59	< 0.66	< 1.4	< 0.65
Strontium	Lab	mg/kg	71.4	73.7	72.9	148	62.3	15.7	83.5	73.5	36.9	28.4	56.3	48.6	66.7	49.0	51.0	124	69.9	56.0	52.3	87.5	66.6	41.3	70.2
Tin	Lab	mg/kg	< 5.5 *	11.8	102	19.3	< 5.5	< 4.0	5.3	89.2	< 4.9	319	20.1	190	< 5.7	< 5.1	29.9	83.4	50.1	48.6	< 4.7	6.3	< 5.0	33.1	10.9
Titanium	Lab	mg/kg	589	450	340	219	509	147	597	408	206	148	415	311	653	432	405	312	327	333	335	411	478	193	263
Vanadium	Lab	mg/kg	117	121	76.5	14.9	83.8	17.6	120	54.0	12.0	20.2	132	44.9	121	76.5	69.5	41.4	96.5	42.0	63.3	49.0	81.3	22.1	63.1
Zinc	Lab	mg/kg	180	176	312	483	160	33.1	209	1540	35.7	150	1460	1010	171	117	320	553	365	214	235	209	171	553	205
Semivolatile Organic Compounds																									
1,2,4-Trichlorobenzene	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900
1,2-Dichlorobenzene	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900
1,2-Diphenylhydrazine	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900
1,3-Dichlorobenzene	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900
1,4-Dichlorobenzene	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900
1-Methylnaphthalene	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	30000	< 451	< 364	642	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900
2,2'-oxybis (1-chloropropane)	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900
2,4,5-Trichlorophenol	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900
2,4,6-Trichlorophenol	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900
2,4-Dichlorophenol																									

Appendix D1
Solid Analytical Data Summary
 Site Investigation Report
 Dakota County, Minnesota

Location	Date	Depth	Sample Description	FD-SB-F1	FD-SB-F2	FD-SB-F3	FD-SB-F4	FD-SB-F5	FD-SB-G1	FD-SB-G2	FD-SB-G3	FD-SB-G4	FD-SB-G5	FD-TT-01	FD-TT-02	FD-TT-03	FD-TT-05	FD-TT-06	FD-TT-07	FD-TT-08	FD-TT-09	FD-TT-10	FD-TT-11	FD-TT-12	FD-TT-13	FD-TT-14
				4/12/2018	3/27/2018	3/26/2018	3/21/2018	3/21/2018	4/12/2018	3/26/2018	3/26/2018	3/26/2018	3/21/2018	4/11/2018	4/11/2018	4/11/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/17/2018	4/17/2018	4/17/2018	4/17/2018	4/17/2018	4/17/2018
				10 - 14.5 ft	7 - 13 ft	3 - 11 ft	5 - 10 ft	3 - 11 ft	5 - 10 ft	10 - 12 ft	7 - 16 ft	15.5 - 17.5 ft	5 - 14 ft	10 - 12 ft	7 - 9 ft	2 - 5 ft	4 - 9 ft	2 - 5 ft	6 - 11 ft	5 - 12 ft	4 - 12 ft	2 - 10 ft	4 - 12 ft	3 - 12 ft	3 - 12 ft	2 - 12 ft
				Ash	Waste	Waste	Waste	Waste	Fill Soil	Waste	Waste	Native Soil	Waste	Waste	Waste	Ash	Ash	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste
Parameter	Analysis Location	Units																								
Benz(a)anthracene	Lab	ug/kg	< 904	1340	3470	10900	< 4800	< 369	< 484	162000	2900	< 364	41400	< 556	< 497	< 457	< 546	667	< 420	< 423	1010	4470	< 457	< 985	19200	
Benzo(a)pyrene	Lab	ug/kg	< 904	1200	2690	7440	< 4800	< 369	< 484	117000	3550	< 364	36300	< 556	< 497	< 457	< 546	667	< 420	< 423	974	3890	< 457	< 985	13400	
Benzo(b)fluoranthene	Lab	ug/kg	< 904	2060	3300	9450	< 4800	< 369	< 484	145000	4160	< 364	< 502	< 556	< 497	< 457	< 546	895	< 420	< 423	1370	4850	< 457	< 985	13900	
Benzo(g,h,i)perylene	Lab	ug/kg	< 904	707	< 2170	5870	< 4800	< 369	< 484	61700	2190	< 364	24800	< 556	< 497	< 457	< 546	459	< 420	< 423	711	2680	< 457	< 985	< 10900	
Benzo(k)fluoranthene	Lab	ug/kg	< 904	575	< 2170	< 4440	< 4800	< 369	< 484	64300	2010	< 364	18300	< 556	< 497	< 457	< 546	< 458	< 420	< 423	526	2190	< 457	< 985	< 10900	
Bis(2-chloroethoxy)methane	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900	
Bis(2-chloroethyl)ether	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900	
Bis(2-ethylhexyl)phthalate	Lab	ug/kg	< 904	118000	< 2170	10700	< 4800	< 369	< 484	< 21400	45300	830	2000	1020	< 497	< 457	< 546	5580	1020	< 423	< 413	< 416	< 457	125000	18400	
Butyl benzyl phthalate	Lab	ug/kg	< 904	3600	< 2170	468000	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	423	< 457	1490	< 10900	
Carbazole	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	74600	< 451	< 364	3270	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	984	< 457	1430	< 10900	
Chrysene	Lab	ug/kg	< 904	1580	3150	12800	< 4800	< 369	< 484	154000	3360	< 364	46400	< 556	< 497	< 457	< 546	715	< 420	< 423	1090	4660	< 457	993	19100	
Dibenz(a,h)anthracene	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	1920	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900	
Dibenzofuran	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	65300	< 451	< 364	2930	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	482	< 457	< 985	< 10900	
Diethyl phthalate	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900	
Dimethyl phthalate	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900	
Di-n-butyl phthalate	Lab	ug/kg	< 904	800	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	592	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900
Di-n-octyl phthalate	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	576	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900	
Fluoranthene	Lab	ug/kg	< 904	4360	7320	25000	< 4800	< 369	< 484	394000	3560	< 364	107000	< 556	< 497	< 457	< 546	996	< 420	565	2170	9750	< 457	2730	31300	
Fluorene	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	104000	< 451	< 364	5970	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	887	< 457	1390	< 10900	
Hexachlorobenzene	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900	
Hexachlorobutadiene	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900	
Hexachloroethane	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900	
Indeno(1,2,3-cd)pyrene	Lab	ug/kg	< 904	631	< 2170	< 4440	< 4800	< 369	< 484	56300	1970	< 364	21800	< 556	< 497	< 457	< 546	< 458	< 420	< 423	599	2290	< 457	< 985	< 10900	
Isophorone	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900	
Naphthalene	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	66500	< 451	< 364	614	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	792	< 457	1650	12200	
Nitrobenzene	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900	
n-Nitrosodimethylamine	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900	
n-Nitrosodi-n-propylamine	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900	
n-Nitrosodiphenylamine	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900	
Pentachlorophenol	Lab	ug/kg	< 1830	< 913	< 4400	< 9020	< 9740	< 748	< 982	< 43400	< 915	< 740	< 1020	< 1130	< 1010	< 928	< 1110	< 930	< 853	< 858	< 839	< 844	< 928	< 2000	< 22100	
Phenanthrene	Lab	ug/kg	< 904	3120	8430	14600	< 4800	< 369	< 484	545000	1020	< 364	76800	< 556	< 497	< 457	< 546	< 458	479	< 423	1250	6610	< 457	4060	36800	
Phenol	Lab	ug/kg	< 904	< 450	< 2170	< 4440	< 4800	< 369	< 484	< 21400	< 451	< 364	< 502	< 556	< 497	< 457	< 546	< 458	< 420	< 423	< 413	< 416	< 457	< 985	< 10900	
Pyrene	Lab	ug/kg	< 904	2920	6380	25000	< 4800	< 369	< 484	327000	3880	< 364	96700	< 556	< 497	< 457	< 546	955	< 420	511	2040	9500	< 457	1890	44500	
Semivolatile Organic Compounds by Selected Ion Monitoring																										
Acenaphthene	Lab	ug/kg	< 14.8	< 13.6	243	< 1350	< 29.1	< 22.3	< 14.6	45000	18.9	158	185	< 33.7	< 15.1	< 13.8	< 16.5	55.3	< 63.8	< 64.0	237	163	49.1 *	887	39700	
Acenaphthylene	Lab	ug/kg	< 14.8	< 13.6	< 65.7	< 1350	< 29.1	< 22.3	< 14.6	< 3240	< 13.7	< 110	< 76.0	< 33.7	< 15.1	< 13.8	< 16.5	< 27.7	< 63.8	< 64.0	< 62.8	444	< 13.9	< 149	390	
Anthracene	Lab	ug/kg	< 14.8	< 13.6	541	< 1350	< 29.1	< 22.3	< 14.6	105000	19.4	< 110	351	< 33.7	< 15.1	< 13.8	< 16.5	274	65.2	66.4	615	954	94.1 *	5550	30700	
Benzo(a)anthracene	Lab	ug/kg	< 14.8	30.7	936	5430	31.1	84.8	< 14.6	99600	197	< 110	750	67.3	< 15.1	< 13.8	< 16.5	1150	220	25.2	1430	3260	660	643	30500	
Benzo(a)pyrene	Lab	ug/kg	< 14.8	34.9	937	2310	< 29.1	107	< 14.6	73000	283	111	769	75.2	< 15.1	< 13.8	17.9	1150	185	300	1520	3110	680	317	25600	
Benzo(b)fluoranthene	Lab	ug/kg	< 14.8	48.4	1120	2470	33.5	147	< 14.6	85300	335	< 110	1100	452	< 15.1	16.7	23.1	1540	297	397	20					

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Parameter	Analysis Location	Units	Location	FD-SB-F1	FD-SB-F2	FD-SB-F3	FD-SB-F4	FD-SB-F5	FD-SB-G1	FD-SB-G2	FD-SB-G3	FD-SB-G4	FD-SB-G5	FD-TT-01	FD-TT-02	FD-TT-03	FD-TT-05	FD-TT-06	FD-TT-07	FD-TT-08	FD-TT-09	FD-TT-10	FD-TT-11	FD-TT-12	FD-TT-13	FD-TT-14
			Date	4/12/2018	3/27/2018	3/26/2018	3/21/2018	3/21/2018	4/12/2018	3/26/2018	3/26/2018	3/26/2018	3/21/2018	4/11/2018	4/11/2018	4/11/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/17/2018	4/17/2018	4/17/2018	4/17/2018	4/17/2018	4/17/2018
Depth	10 - 14.5 ft	7 - 13 ft	3 - 11 ft	5 - 10 ft	3 - 11 ft	5 - 10 ft	10 - 12 ft	7 - 16 ft	15.5 - 17.5 ft	5 - 14 ft	10 - 12 ft	7 - 9 ft	2 - 5 ft	4 - 9 ft	2 - 5 ft	6 - 11 ft	5 - 12 ft	4 - 12 ft	2 - 10 ft	4 - 12 ft	3 - 12 ft	3 - 12 ft	3 - 12 ft	2 - 12 ft		
Sample Description	Ash	Waste	Waste	Waste	Waste	Fill Soil	Waste	Waste	Native Soil	Waste	Waste	Waste	Ash	Ash	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	
1,2,3-Trichloropropane	Lab	ug/kg	< 304	< 284	< 866	< 292	< 510	< 216	< 331	< 377	< 479	< 211	< 338	< 376	< 315	< 287	< 359	< 350	< 345	< 278	< 332	< 290	< 296	< 606	< 264	
1,2,4-Trichlorobenzene	Lab	ug/kg	< 76.1	< 71.0	4380	< 73.0	470	< 54.0	< 82.7	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	< 65.9	
1,2,4-Trimethylbenzene	Lab	ug/kg	< 76.1	94.7	17000	< 73.0	3200	< 54.0	341	< 94.3	302	< 52.8	415	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	73.5	< 74.0	538 *	471	
1,2-Dibromo-3-chloropropane (DBCP)	Lab	ug/kg	< 761	< 710	< 2170	< 730	< 1270	< 540	< 827	< 943	< 1200	< 528	< 845	< 940	< 787	< 718	< 898	< 874	< 863	< 695	< 831	< 726	< 740	< 1520	< 659	
1,2-Dibromoethane (EDB)	Lab	ug/kg	< 76.1	< 71.0	< 217	< 73.0	< 127	< 54.0	< 82.7	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	< 65.9	
1,2-Dichlorobenzene	Lab	ug/kg	< 76.1	< 71.0	79700	< 73.0	173	< 54.0	< 82.7	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	169	
1,2-Dichloroethane	Lab	ug/kg	< 76.1	< 71.0	< 217	< 73.0	< 127	< 54.0	< 82.7	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	< 65.9	
1,2-Dichloroethylene, cis	Lab	ug/kg	< 76.1	< 71.0	< 217	< 73.0	< 127	< 54.0	263	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	< 65.9	
1,2-Dichloroethylene, trans	Lab	ug/kg	< 76.1	< 71.0	< 217	< 73.0	< 127	< 54.0	< 82.7	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	< 65.9	
1,2-Dichloropropane	Lab	ug/kg	< 76.1	< 71.0	< 217	< 73.0	< 127	< 54.0	< 82.7	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	< 65.9	
1,3,5-Trimethylbenzene	Lab	ug/kg	< 76.1	< 71.0	5920	< 73.0	774	< 54.0	172	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	156 *	< 65.9	
1,3-Dichlorobenzene	Lab	ug/kg	< 76.1	< 71.0	974	< 73.0	128	< 54.0	< 82.7	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	< 65.9	
1,3-Dichloropropane	Lab	ug/kg	< 76.1	< 71.0	< 217	< 73.0	< 127	< 54.0	< 82.7	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	< 65.9	
1,3-Dichloropropene, cis	Lab	ug/kg	< 76.1	< 71.0	< 217	< 73.0	< 127	< 54.0	< 82.7	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	< 65.9	
1,3-Dichloropropene, trans	Lab	ug/kg	< 76.1	< 71.0	< 217	< 73.0	< 127	< 54.0	< 82.7	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	< 65.9	
1,4-Dichlorobenzene	Lab	ug/kg	< 76.1	< 71.0	32700	< 73.0	547	< 54.0	< 82.7	132	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	194	
2,2-Dichloropropane	Lab	ug/kg	< 304	< 284	< 866	< 292	< 510	< 216	< 331	< 377	< 479	< 211	< 338	< 376	< 315	< 287	< 359	< 350	< 345	< 278	< 332	< 290	< 296	< 606	< 264	
Acetone	Lab	ug/kg	< 1520	< 1420	< 4330	< 1460	< 2550	< 1080	< 1650	< 1890	< 2400	< 1060	< 1690	< 1880	< 1570	< 1440	< 1800	< 1750	< 1730	< 1390	< 1660	< 1450	< 1480	< 3030	< 1320	
Allyl chloride	Lab	ug/kg	< 304	< 284	< 866	< 292	< 510	< 216	< 331	< 377	< 479	< 211	< 338	< 376	< 315	< 287	< 359	< 350	< 345	< 278	< 332	< 290	< 296	< 606	< 264	
Benzene	Lab	ug/kg	< 30.4	< 28.4	142	< 29.2	< 51.0	< 21.6	< 33.1	< 37.7	< 47.9	< 21.1	< 33.8	< 37.6	< 31.5	< 28.7	< 35.9	< 35.0	818	< 27.8	37.4	< 29.0	73.8	< 60.6	< 26.4	
Bromobenzene	Lab	ug/kg	< 76.1	< 71.0	< 217	< 73.0	< 127	< 54.0	< 82.7	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	< 65.9	
Bromochloromethane	Lab	ug/kg	< 76.1	< 71.0	< 217	< 73.0	< 127	< 54.0	< 82.7	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	< 65.9	
Bromodichloromethane	Lab	ug/kg	< 76.1	< 71.0	< 217	< 73.0	< 127	< 54.0	< 82.7	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	< 65.9	
Bromoform	Lab	ug/kg	< 76.1	< 284	< 866	< 292	< 510	< 540	< 331	< 377	< 479	< 211	< 338	< 376	< 315	< 287	< 359	< 350	< 345	< 278	< 332	< 290	< 296	< 606	< 264	
Bromomethane	Lab	ug/kg	< 76.1	< 710	< 2170	< 730	< 1270	< 540	< 827	< 943	< 1200	< 528	< 845	< 940	< 787	< 718	< 898	< 874	< 863	< 695	< 831	< 726	< 740	< 1520	< 659	
Butylbenzene	Lab	ug/kg	< 76.1	< 71.0	3350	< 73.0	889	< 54.0	< 82.7	< 94.3	137	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	542	
Butylbenzene, sec	Lab	ug/kg	< 76.1	< 71.0	4440	80.4	440	< 54.0	< 82.7	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	343	
Butylbenzene, tert	Lab	ug/kg	< 76.1	< 71.0	412	< 73.0	< 127	< 54.0	< 82.7	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	< 65.9	
Carbon tetrachloride	Lab	ug/kg	< 76.1	< 71.0	< 217	< 73.0	< 127	< 54.0	< 82.7	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	< 65.9	
Chlorobenzene	Lab	ug/kg	< 76.1	< 71.0	487	< 73.0	< 127	< 54.0	< 82.7	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	< 65.9	
Chlorodibromomethane	Lab	ug/kg	< 304	< 284	< 866	< 292	< 510	< 216	< 331	< 377	< 479	< 211	< 338	< 376	< 315	< 287	< 359	< 350	< 345	< 278	< 332	< 290	< 296	< 606	< 264	
Chloroethane	Lab	ug/kg	< 76.1	< 710	< 2170	< 730	< 1270	< 540	< 827	< 943	< 1200	< 528	< 845	< 940	< 787	< 718	< 898	< 874	< 863	< 695	< 831	< 726	< 740	< 1520	< 659	
Chloroform	Lab	ug/kg	< 76.1	< 71.0	< 217	< 73.0	< 127	< 54.0	< 82.7	< 94.3	< 120	< 52.8	< 84.5	< 94.0	< 78.7	< 71.8	< 89.8	< 87.4	< 86.3	< 69.5	< 83.1	< 72.6	< 74.0	< 152	< 65.9	
Chloromethane	Lab	ug/kg	< 304	< 284	< 866	< 292	< 510	< 216	< 331	< 377	< 479	< 211	< 338	< 376	< 315	< 287	< 359	< 350	< 345	< 278	&					

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Parameter	Location		FL-TT-01	FL-TT-02	FL-TT-03	FL-TT-04	FL-TT-05	FL-TT-06	FL-TT-07	FL-TT-08	TS-SB-01	TS-SB-02	TS-SB-03	TS-SB-04	TS-SB-05	TS-SB-06	TS-SB-07	TS-SB-08
	Date	Depth	4/18/2018	4/18/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/20/2018	4/12/2018	4/12/2018	4/12/2018	4/13/2018	4/13/2018	4/13/2018	4/13/2018	4/13/2018
	Sample Description	Units	3 - 11 ft	2 - 10.5 ft	2 - 10 ft	2 - 14 ft	5 - 15 ft	0 - 10 ft	1 - 5 ft	1 - 7 ft	5 - 8 ft	5 - 10 ft	1.5 - 3 ft	7 - 15 ft	5 - 7.5 ft	8 - 12 ft	15 - 18.5 ft	10 - 20 ft
	Analysis Location	Units	Waste	Waste	Waste	Waste	Waste	Native Soil	Native Soil	Waste	Waste	Fill Soil	Waste	Waste	Waste	Waste	Fill Soil	Waste
General Parameters																		
Cyanide	Lab	mg/kg	0.61	0.78	4.0	0.61	< 0.47	< 0.51	0.78	< 1.4 *	< 0.24	< 0.37	< 0.42	< 0.37	< 0.38	< 0.30	< 0.32	1.1
Fluoride	Lab	mg/kg	< 0.99	< 0.98	< 1.9	< 0.99 *	< 0.99	3.0	< 0.99	< 1.0	1.1	< 0.99 *	6.1	2.8	4.1	< 1.0	0.99	< 1.0
Moisture	Lab	%	17.9	38.3	71.2	26.1	35.6	25.3	48.2	64.0	10.4	7.6	12.1	11.4	31.9	20.5	7.2	39.4
Solids, percent	Lab	%	80.3	41.5	31.5	59.5	67.6	74.6	51.1	47.9	86.4	92.8	90.3	86.5	74.5	82.7	92.7	56.6
Metals																		
Aluminum	Lab	mg/kg	4360	14900	24900	9530	23100	5520	8590	9180	3840	2940	3290	3310	4730	8830	2680	1030
Antimony	Lab	mg/kg	< 0.58	6.4	3.7	1.3	1.3	< 0.66	< 0.90	< 1.4	< 0.52	< 0.54	< 0.55	< 0.56	0.78	3.1	< 0.53	< 0.78
Arsenic	Lab	mg/kg	5.4	26.8	11.9	8.9	8.1	3.4	6.3	5.6	2.7	2.9	2.3	3.9	11.4	5.5	2.1	< 0.78
Barium	Lab	mg/kg	636	443	428 *	177	246	78.6	240	383	75.4	49.5	47.1	47.3	174	118	40.0	83.2
Beryllium	Lab	mg/kg	0.34	0.69	< 0.69	0.89	0.68	0.61	0.67	0.73	0.25	< 0.21	0.28	< 0.22	0.31	< 0.24	< 0.21	< 0.31
Boron	Lab	mg/kg	9.0	234	109 *	12.2	73.4	9.3	27.0	47.3	12.2	< 8.0	< 7.9	< 8.2	18.4	23.6	< 7.6	22.3
Cadmium	Lab	mg/kg	0.61	7.0	38.6	1.0	2.5	0.34	0.47	2.0	0.26	0.10	0.21	0.14	3.4	1.3	0.12	0.13
Chromium	Lab	mg/kg	4.0 *	29.0 *	54.7 *	5.0 *	3.6 *	3.3 *	7.5 *	14.4 *	14.0 *	8.8 *	9.4 *	12.0 *	38.2 *	24.3	8.3	110
Chromium, hexavalent	Lab	mg/kg	< 24.7	< 31.8	< 34.1	< 13.2	< 15.8	< 13.4	< 190	< 281	< 44.5	< 10.6	< 11.3	< 11.1	< 57.1	< 48.4	< 2.1	< 65.2
Chromium, trivalent	Lab	mg/kg	4.0	29.0	54.7	5.0	3.6	3.3	7.5	14.4	14.0	8.8	9.4	12.0	38.2	24.3	8.3	110
Cobalt	Lab	mg/kg	8.0	10.4	8.4	10.6	7.0	7.1	8.3	11.4	4.3	3.3	3.7	4.6	5.2	4.0	3.4	0.79
Copper	Lab	mg/kg	20.7	280	448 *	102	175	8.9	17.5	30.6	11.3	6.5	9.1	8.8	18.2	341	6.3	6.0
Iron	Lab	mg/kg	9410	107000	166000	26700	22000	10000	23300	22500	12500	7500	7440	7490	27600	11500	7710	5320
Lead	Lab	mg/kg	275	611	691 **	273	284	8.9	16.2	88.4	43.4	4.5	199	14.2	579	436	4.8	56.1
Lithium	Lab	mg/kg	5.3	6.0	2.4	8.6	7.4	10.2	9.8	7.8	4.4	4.4	5.0	4.8	5.6	3.5	4.5	0.84
Manganese	Lab	mg/kg	402	994	596 *	531	522	498	999	470	455	258	282	318	723	247	300	75.7
Mercury	Lab	mg/kg	0.38	0.82	0.72	0.20	0.55	0.026	0.065	0.12	0.044	< 0.021	0.034	0.14	0.14	0.23	< 0.020	0.15
Methyl mercury	Lab	ng/g	< 11.6	< 14.9	29.1	< 9.16	< 11.5	< 7.33	< 12.3	< 18.3	< 10.6	< 8.81	< 9.41	< 11.3	< 13.8	< 11.3	< 9.58	< 15.2
Nickel	Lab	mg/kg	10.9	39.1	62.5	27.5	16.3	11.7	16.4	19.6	10.8	8.7	9.0	8.0	11.3	21.2	7.6	2.3
Selenium	Lab	mg/kg	0.89	2.8	1.8	0.84	0.90	0.69	2.2	1.9	< 0.52	< 0.54	< 0.55	< 0.56	< 0.73	< 0.59	< 0.53	< 0.78
Silver	Lab	mg/kg	< 0.57	0.82	26.3	< 0.64	< 0.73	< 0.62	< 0.96	2.6	< 0.53	< 0.54	< 0.53	< 0.55	< 0.73	< 0.59	< 0.50	< 0.80
Strontium	Lab	mg/kg	44.3	114	31.2	54.8	32.0	52.8	102	81.7	19.8	25.0	22.7	24.9	72.7	45.4	27.3	64.2
Tin	Lab	mg/kg	8.6	52.3	406 *	16.6	25.8	< 4.6	< 7.2	16.2	< 4.0	< 4.0	< 3.9	< 4.1	10.5	< 4.5	< 3.8	< 6.0
Titanium	Lab	mg/kg	196	313	208 *	181	277	155	170	163	186	204	148	208	172	228	182	131
Vanadium	Lab	mg/kg	24.8	44.3	40.2	38.0	30.7	30.3	29.8	34.2	19.1	16.3	18.3	19.3	19.5	13.1	19.7	2.5
Zinc	Lab	mg/kg	412	1890	831	364	463	31.2	62.5	776	65.9	26.9	38.6	58.5	999	519	16.1	137
Semivolatile Organic Compounds																		
1,2,4-Trichlorobenzene	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
1,2-Dichlorobenzene	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
1,2-Diphenylhydrazine	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
1,3-Dichlorobenzene	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
1,4-Dichlorobenzene	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
1-Methylnaphthalene	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	5860	< 357	< 374	607	< 483	< 4150	< 355	< 2710
2,2'-oxybis (1-chloropropane)	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
2,4,5-Trichlorophenol	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
2,4,6-Trichlorophenol	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
2,4-Dichlorophenol	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
2,4-Dimethylphenol	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
2,4-Dinitrophenol	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
2,4-Dinitrotoluene	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
2,6-Dinitrotoluene	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
2-Chloronaphthalene	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
2-Chlorophenol	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
2-Methyl-4,6-dinitrophenol	Lab	ug/kg	< 10300	< 2750	< 582000	< 2300	< 2630	< 2270	< 3280	< 4720	< 18900	< 1840	< 1930	< 1910	< 2490	< 21400	< 1830	< 13900
2-Methylnaphthalene	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	8050	< 357	427	826	< 483	< 4150	< 355	< 2710
2-Methylphenol (o-cresol)	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
2-Nitroaniline	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
2-Nitrophenol	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
3,3'-Dichlorobenzidine	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710
3,4-Methylphenol (m,p cresols)	Lab	ug/kg	< 4010	< 1070	< 226000	< 893	< 1020	< 881	<									

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Parameter	Analysis Location	Units	Location	FL-TT-01	FL-TT-02	FL-TT-03	FL-TT-04	FL-TT-05	FL-TT-06	FL-TT-07	FL-TT-08	TS-SB-01	TS-SB-02	TS-SB-03	TS-SB-04	TS-SB-05	TS-SB-06	TS-SB-07	TS-SB-08		
			Date	4/18/2018	4/18/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/20/2018	4/12/2018	4/12/2018	4/12/2018	4/13/2018	4/13/2018	4/13/2018	4/13/2018	4/13/2018
			Depth	3 - 11 ft	2 - 10.5 ft	2 - 10 ft	2 - 14 ft	5 - 15 ft	0 - 10 ft	1 - 5 ft	1 - 7 ft	5 - 8 ft	5 - 10 ft	1.5 - 3 ft	7 - 15 ft	5 - 7.5 ft	8 - 12 ft	15 - 18.5 ft	10 - 20 ft		
Sample Description	Waste	Waste	Waste	Waste	Waste	Native Soil	Native Soil	Waste	Waste	Fill Soil	Waste	Waste	Waste	Waste	Waste	Waste	Fill Soil	Waste			
Benz(a)anthracene	Lab	ug/kg	14800	< 535	< 113000	< 446	< 511	< 441	< 636	1060	< 3670	< 357	2580	527	< 483	13800	< 355	3330			
Benzo(a)pyrene	Lab	ug/kg	13200	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	2040	423	< 483	12700	< 355	< 2710			
Benzo(b)fluoranthene	Lab	ug/kg	17100	< 535	< 113000	< 446	< 511	< 441	< 636	1160	< 3670	< 357	2440	497	< 483	18000	< 355	3570			
Benzo(g,h,i)perylene	Lab	ug/kg	9010	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	1160	< 371	< 483	8300	< 355	< 2710			
Benzo(k)fluoranthene	Lab	ug/kg	6680	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	1240	< 371	< 483	6380	< 355	< 2710			
Bis(2-chloroethoxy)methane	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710			
Bis(2-chloroethyl)ether	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710			
Bis(2-ethylhexyl)phthalate	Lab	ug/kg	< 2000	27300	< 113000	488	2200	< 441	< 636	8130	< 3670	< 357	< 374	< 371	6560	< 4150	< 355	100000			
Butyl benzyl phthalate	Lab	ug/kg	< 2000	< 535	4230000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710			
Carbazole	Lab	ug/kg	2920	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	550	< 371	< 483	< 4150	< 355	< 2710			
Chrysene	Lab	ug/kg	15000	< 535	< 113000	< 446	< 511	< 441	< 636	1090	< 3670	< 357	2430	727	< 483	14800	< 355	3700			
Dibenz(a,h)anthracene	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710			
Dibenzofuran	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	1300	< 371	< 483	< 4150	< 355	< 2710			
Diethyl phthalate	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710			
Dimethyl phthalate	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710			
Di-n-butyl phthalate	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710			
Di-n-octyl phthalate	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710			
Fluoranthene	Lab	ug/kg	29100	< 535	< 113000	< 446	874	< 441	< 636	2280	< 3670	< 357	5120	997	718	31200	< 355	8330			
Fluorene	Lab	ug/kg	2660	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	2040	< 371	< 483	< 4150	< 355	< 2710			
Hexachlorobenzene	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710			
Hexachlorobutadiene	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710			
Hexachloroethane	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710			
Indeno(1,2,3-cd)pyrene	Lab	ug/kg	7810	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	1040	< 371	< 483	7520	< 355	< 2710			
Isophorone	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710			
Naphthalene	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	632	< 371	< 483	< 4150	< 355	< 2710			
Nitrobenzene	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710			
n-Nitrosodimethylamine	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710			
n-Nitrosodi-n-propylamine	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710			
n-Nitrosodiphenylamine	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710			
Pentachlorophenol	Lab	ug/kg	< 4070	< 1090	< 229000	< 906	< 1040	< 895	< 1290	< 1860	< 7450	< 725	< 760	< 754	< 981	< 8420	< 721	< 5500			
Phenanthrene	Lab	ug/kg	20000	< 535	< 113000	< 446	< 511	< 441	< 636	1700	< 3670	< 357	4900	1440	815	19500	< 355	7550			
Phenol	Lab	ug/kg	< 2000	< 535	< 113000	< 446	< 511	< 441	< 636	< 916	< 3670	< 357	< 374	< 371	< 483	< 4150	< 355	< 2710			
Pyrene	Lab	ug/kg	27800	< 535	< 113000	< 446	790	< 441	< 636	2050	< 3670	< 357	4820	1320	618	27200	< 355	8120			
Semivolatile Organic Compounds by Selected Ion Monitoring																					
Acenaphthene	Lab	ug/kg	1740	< 81.0	< 173	< 27.0	< 77.6	< 13.4	< 19.3	< 27.7	< 558	11.9	1030	< 56.4	167	367	< 10.8	674			
Acenaphthylene	Lab	ug/kg	308	< 81.0	< 173	< 27.0	154	< 13.4	< 19.3	< 27.7	< 558	< 10.8	< 283	< 56.4	< 73.2	< 62.9	< 10.8	< 82.2			
Anthracene	Lab	ug/kg	3890	< 81.0	< 173	< 27.0	169	< 13.4	< 19.3	29.6	< 558	17.8	2200	< 56.4	217	1210	< 10.8	1270			
Benz(a)anthracene	Lab	ug/kg	11100	179	< 173	98.8	748	< 13.4	< 19.3	66.4	< 558	37.9	2360	132	373	3210	< 10.8	1640			
Benzo(a)pyrene	Lab	ug/kg	10700	112	< 173	124	788	< 13.4	< 19.3	69.7	< 558	36.5	2040	124	307	3060	< 10.8	1240			
Benzo(b)fluoranthene	Lab	ug/kg	14600	209	< 173	135	997	< 13.4	< 19.3	98.3	< 558	46.4	2540	167	398	3850	< 10.8	1560			
Benzo(g,h,i)perylene	Lab	ug/kg	6720	< 81.0	< 173	121	503	< 13.4	< 19.3	58.5	< 558	19.0	963	82.4	190	1690	< 10.8	730			
Benzo(k)fluoranthene	Lab	ug/kg	4760	< 81.0	< 173	45.7	391	< 13.4	< 19.3	81.8	< 558	20.5	950	69.8	112	1390	< 10.8	760			
Chrysene	Lab	ug/kg	10000	228	< 173	96.3	764	< 13.4	< 19.3	98.1	< 558	40.1	2040	138	356	2910	< 10.8	1940			
Dibenz(a,h)anthracene	Lab	ug/kg	1630	< 81.0	< 173	27.8	123	< 13.4	< 19.3	< 27.7	< 558	< 10.8	357	< 56.4	< 73.2	511	< 10.8	220			
Fluoranthene	Lab	ug/kg	23800	394	< 173	146	1340	< 13.4	< 19.3	126	714	86.0	5260	293	872	6940	15.6	5080			
Fluorene	Lab	ug/kg	1910	101	206	< 27.0	< 77.6	< 13.4	< 19.3	90.8	< 558	< 10.8	2030	< 56.4	354	413	< 10.8	972			
Indeno(1,2,3-cd)pyrene	Lab	ug/kg	5960	< 81.0	< 173	66.3	453	< 13.4	< 19.3	46.6	< 558	14.7	1020	71.6	153	1550	< 10.8	714			
Naphthalene	Lab	ug/kg	617	109	199	< 27.0	< 77.6	< 13.4	< 19.3	30.8	< 558	< 10.8	735	< 56.4	825	< 62.9	< 10.8	2240			
Phenanthrene	Lab	ug/kg	15800	332	249	78.7	437	< 13.4	< 19.3	116	1340	58.1	5160	239	1100	4240	< 10.8	8530			
Pyrene	Lab	ug/kg	18000	344	< 173	124	1100	< 13.4	< 19.3	96.0	1310	67.7	4170	257	781	5350	13.2	3920			
B(a)P Equivalent, non-detects at 0, 2002 PEFs	Barr Calculation	ug/kg	15000	150	ND	180	1100	ND	ND	100	ND	49	2900	170	410	4400	ND	1900			
B(a)P Equivalent, non-detects at 1/																					

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Parameter	Analysis Location	Units	Location	FL-TT-01	FL-TT-02	FL-TT-03	FL-TT-04	FL-TT-05	FL-TT-06	FL-TT-07	FL-TT-08	TS-SB-01	TS-SB-02	TS-SB-03	TS-SB-04	TS-SB-05	TS-SB-06	TS-SB-07	TS-SB-08		
			Date	4/18/2018	4/18/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/20/2018	4/12/2018	4/12/2018	4/12/2018	4/13/2018	4/13/2018	4/13/2018	4/13/2018	4/13/2018
			Depth	3 - 11 ft	2 - 10.5 ft	2 - 10 ft	2 - 14 ft	5 - 15 ft	0 - 10 ft	1 - 5 ft	1 - 7 ft	5 - 8 ft	5 - 10 ft	1.5 - 3 ft	7 - 15 ft	5 - 7.5 ft	8 - 12 ft	15 - 18.5 ft	10 - 20 ft		
Sample Description	Waste	Waste	Waste	Waste	Waste	Native Soil	Native Soil	Waste	Waste	Fill Soil	Waste	Waste	Waste	Waste	Waste	Fill Soil	Waste				
1,2,3-Trichloropropane	Lab	ug/kg	< 265	< 423	< 693	< 288	< 303	< 271	< 404	< 549	< 229	< 225	< 234	< 232	< 392	< 257	< 208	< 457			
1,2,4-Trichlorobenzene	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
1,2,4-Trimethylbenzene	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	164	< 67.7	< 101	156	327	< 56.3	< 58.4	< 58.0	386	< 64.2	< 52.1	1130			
1,2-Dibromo-3-chloropropane (DBCP)	Lab	ug/kg	< 662	< 1060	< 1730	< 720	< 759	< 677	< 1010	< 1370	< 573	< 563	< 584	< 580	< 980	< 642	< 521	< 1140			
1,2-Dibromoethane (EDB)	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
1,2-Dichlorobenzene	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
1,2-Dichloroethane	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
1,2-Dichloroethylene, cis	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
1,2-Dichloroethylene, trans	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
1,2-Dichloropropane	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
1,3,5-Trimethylbenzene	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	137	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	366			
1,3-Dichlorobenzene	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
1,3-Dichloropropane	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
1,3-Dichloropropene, cis	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
1,3-Dichloropropene, trans	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
1,4-Dichlorobenzene	Lab	ug/kg	< 66.2	255	175	< 72.0	443	< 67.7	< 101	415	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	512			
2,2-Dichloropropane	Lab	ug/kg	< 265	< 423	< 693	< 288	< 303	< 271	< 404	< 549	< 229	< 225	< 234	< 232	< 392	< 257	< 208	< 457			
Acetone	Lab	ug/kg	< 1320	< 2110	< 3470	< 1440	< 1520	< 1350	< 2020	< 2740	< 1150	< 1130	< 1170	< 1160	< 1960	< 1280	< 1040	< 2290			
Allyl chloride	Lab	ug/kg	< 265	< 423	< 693	< 288	< 303	< 271	< 404	< 549	< 229	< 225	< 234	< 232	< 392	< 257	< 208	< 457			
Benzene	Lab	ug/kg	< 26.5	54.0	< 69.3	< 28.8	< 30.3	< 27.1	< 40.4	< 54.9	< 22.9	< 22.5	< 23.4	< 23.2	58.1	< 25.7	< 20.8	< 45.7			
Bromobenzene	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
Bromochloromethane	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
Bromodichloromethane	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
Bromoform	Lab	ug/kg	< 662	< 1060	< 1730	< 288	< 303	< 271	< 404	< 549	< 573	< 563	< 584	< 580	< 980	< 642	< 521	< 1140			
Bromomethane	Lab	ug/kg	< 662	< 1060	< 1730	< 720	< 759	< 677	< 1010	< 1370	< 573	< 563	< 584	< 580	< 980	< 642	< 521	< 1140			
Butylbenzene	Lab	ug/kg	< 66.2	106	< 173	< 72.0	234	< 67.7	< 101	< 137	76.6	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
Butylbenzene, sec	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	269	< 67.7	< 101	< 137	60.0	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
Butylbenzene, tert	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
Carbon tetrachloride	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
Chlorobenzene	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	129	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
Chlorodibromomethane	Lab	ug/kg	< 265	< 423	< 693	< 288	< 303	< 271	< 404	< 549	< 229	< 225	< 234	< 232	< 392	< 257	< 208	< 457			
Chloroethane	Lab	ug/kg	< 662	< 1060	< 1730	< 720	< 759	< 677	< 1010	< 1370	< 573	< 563	< 584	< 580	< 980	< 642	< 521	< 1140			
Chloroform	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
Chloromethane	Lab	ug/kg	< 265	< 423	< 693	< 288	< 303	< 271	< 404	< 549	< 229	< 225	< 234	< 232	< 392	< 257	< 208	< 457			
Chlorotoluene, o	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
Chlorotoluene, p	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
Cumene (isopropyl benzene)	Lab	ug/kg	< 66.2	110	< 173	< 72.0	127	< 67.7	< 101	< 137	72.1	< 56.3	< 58.4	< 58.0	106	< 64.2	< 52.1	292			
Cymene p- (toluene isopropyl p-)	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	635			
Dibromomethane (methylene bromide)	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
Dichlorodifluoromethane (Freon-12)	Lab	ug/kg	< 265	< 423	< 693	< 288	< 303	< 271	< 404	< 549	< 229	< 225	< 234	< 232	< 392	< 257	< 208	< 457			
Dichlorofluoromethane (Freon-21)	Lab	ug/kg	< 662	< 1060	< 1730	< 720	< 759	< 677	< 1010	< 1370	< 573	< 563	< 584	< 580	< 980	< 642	< 521	< 1140			
Ethyl benzene	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	649			
Ethyl ether	Lab	ug/kg	< 265	< 423	< 693	< 288	< 303	< 271	< 404	< 549	< 229	< 225	< 234	< 232	< 392	< 257	< 208	< 457			
Hexachlorobutadiene	Lab	ug/kg	< 331	< 528	< 866	< 360	< 379	< 338	< 505	< 686	< 287	< 281	< 292	< 290	< 490	< 321	< 261	< 572			
Methyl ethyl ketone (2-butanone)	Lab	ug/kg	< 331	< 528	< 866	< 360	< 379	< 338	< 505	< 686	< 287	< 281	< 292	< 290	< 490	< 321	< 261	< 572			
Methyl isobutyl ketone (MIBK)	Lab	ug/kg	< 331	< 528	< 866	< 360	< 379	< 338	< 505	< 686	< 287	< 281	< 292	< 290	< 490	< 321	< 261	< 572			
Methyl tertiary butyl ether (MTBE)	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
Methylene chloride	Lab	ug/kg	< 265 *	< 423 *	< 693	< 288	< 303	< 271	< 404	< 549	< 229	< 225	< 234	< 232	< 392	< 257	< 208	< 457			
Naphthalene	Lab	ug/kg	272	< 423	< 693	< 288	< 303	< 271	< 404	< 549	1320	< 225	< 234	448	493	< 257	< 208	4880			
Propylbenzene	Lab	ug/kg	< 66.2	< 106	< 173	< 72.0	121	< 67.7	< 101	< 137	134	< 56.3	< 58.4	< 58.0	117	< 64.2	< 52.1	329			
Styrene	Lab	ug/kg	< 66.2	< 106	219	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
Tetrachloroethylene	Lab	ug/kg	< 66.2	< 106	178 *	< 72.0	< 75.9	< 67.7	< 101	< 137	< 57.3	< 56.3	< 58.4	< 58.0	< 98.0	< 64.2	< 52.1	< 114			
Tetrahydrofuran	Lab	ug/kg	< 2650	< 4230	< 6930	< 2880	< 3030	< 2710	< 4040	< 5490	< 2290	< 2250	< 2340	< 2320	< 3920	< 2570	< 2080				

Appendix D1
Solid Analytical Data Summary
 Site Investigation Report
 Dakota County, Minnesota

Parameter	Analysis Location	Units	Location	FL-TT-01	FL-TT-02	FL-TT-03	FL-TT-04	FL-TT-05	FL-TT-06	FL-TT-07	FL-TT-08	TS-SB-01	TS-SB-02	TS-SB-03	TS-SB-04	TS-SB-05	TS-SB-06	TS-SB-07	TS-SB-08		
			Date	4/18/2018	4/18/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/20/2018	4/12/2018	4/12/2018	4/12/2018	4/13/2018	4/13/2018	4/13/2018	4/13/2018	4/13/2018	4/13/2018
			Depth	3 - 11 ft	2 - 10.5 ft	2 - 10 ft	2 - 14 ft	5 - 15 ft	0 - 10 ft	1 - 5 ft	1 - 7 ft	5 - 8 ft	5 - 10 ft	1.5 - 3 ft	7 - 15 ft	5 - 7.5 ft	8 - 12 ft	15 - 18.5 ft	10 - 20 ft		
Sample Description	Waste	Waste	Waste	Waste	Waste	Native Soil	Native Soil	Waste	Waste	Fill Soil	Waste	Waste	Waste	Waste	Waste	Waste	Fill Soil	Waste			
Pesticides																					
4,4'-DDD	Lab	ug/kg	< 202	92.0	< 46.1	< 9.0	< 25.8 *	< 4.5	< 12.8	68.7	< 371	< 7.2	< 37.8	< 188	< 97.7	< 83.7	< 7.2	< 548			
4,4'-DDE	Lab	ug/kg	< 202	70.3	53.4	< 9.0	< 25.8	< 4.5	< 12.8	93.9	< 371	< 7.2	< 37.8	< 188	< 97.7	< 83.7	< 7.2	< 548			
4,4'-DDT	Lab	ug/kg	< 202	100	75.3	< 9.0	< 25.8	< 4.5	< 12.8	< 46.2	< 371	< 7.2	< 37.8	< 188	< 97.7	< 83.7	< 7.2	< 548			
a-BHC	Lab	ug/kg	< 101	< 27.0	< 23.1	4.7	< 13.0	< 2.2	< 6.4	< 23.2	< 186	< 3.6	< 19.0	< 94.0	< 49.0	< 42.0	< 3.6	< 275			
Aldrin	Lab	ug/kg	< 101	< 27.0	< 23.1	< 4.5	< 13.0	< 2.2	< 6.4	< 23.2	< 186	< 3.6	< 19.0	< 94.0	< 49.0	< 42.0	< 3.6	< 275			
b-BHC	Lab	ug/kg	< 101	< 27.0	< 23.1	< 4.5	18.5	< 2.2	< 6.4	< 23.2	< 186	< 3.6	< 19.0	< 94.0	< 49.0	< 42.0	< 3.6	< 275			
Chlordane, alpha & gamma	Lab	ug/kg	< 1010	< 270	< 231	< 45.1	< 130	< 22.3	< 64.4	< 232	< 1860	< 36.0	< 190	< 940	< 490	< 420	< 35.9	< 2750			
Chlordane, cis (alpha)	Lab	ug/kg	< 101	67.0	< 23.1	< 4.5	< 13.0	< 2.2	< 6.4	< 23.2	< 186	< 3.6	< 19.0	< 94.0	< 49.0	< 42.0	< 3.6	< 275			
Chlordane, trans (gamma)	Lab	ug/kg	< 101	37.0	< 23.1	< 4.5	< 13.0	< 2.2	< 6.4	< 23.2	< 186	< 3.6	< 19.0	< 94.0	< 49.0	< 42.0	< 3.6	< 275			
d-BHC	Lab	ug/kg	< 101	< 27.0	< 23.1	< 4.5	< 13.0	< 2.2	< 6.4	< 23.2	< 186	< 3.6	< 19.0	< 94.0	< 49.0	< 42.0	< 3.6	< 275			
Dieldrin	Lab	ug/kg	< 202	< 53.9	< 46.1	< 9.0	< 25.8	< 4.5	< 12.8	< 46.2	< 371	< 7.2	< 37.8	< 188	< 97.7	< 83.7	< 7.2	< 548			
Endosulfan I	Lab	ug/kg	< 101	< 27.0	< 23.1	< 4.5	22.0 *	< 2.2	< 6.4	< 23.2	< 186	< 3.6	< 19.0	< 94.0	< 49.0	< 42.0	< 3.6	< 275			
Endosulfan II	Lab	ug/kg	< 202	< 53.9	< 46.1	< 9.0	< 25.8	< 4.5	< 12.8	< 46.2	< 371	< 7.2	< 37.8	< 188	< 97.7	< 83.7	< 7.2	< 548			
Endosulfan sulfate	Lab	ug/kg	< 202	< 53.9	< 46.1	< 9.0	< 25.8	< 4.5	< 12.8	< 46.2	< 371	< 7.2	< 37.8	< 188	< 97.7	< 83.7	< 7.2	< 548			
Endrin	Lab	ug/kg	< 202	< 53.9	< 46.1	< 9.0	< 25.8	< 4.5	< 12.8	< 46.2	< 371	< 7.2	< 37.8	< 188	< 97.7	< 83.7	< 7.2	< 548			
Endrin aldehyde	Lab	ug/kg	< 202	< 53.9	< 46.1	< 9.0	< 25.8	< 4.5	< 12.8	< 46.2	< 371	< 7.2	< 37.8	< 188	< 97.7	< 83.7	< 7.2	< 548			
Endrin ketone	Lab	ug/kg	< 202	< 53.9	355	< 9.0	< 25.8	< 4.5	< 12.8	< 46.2	< 371	< 7.2	< 37.8	< 188	< 97.7	< 83.7	< 7.2	< 548			
g-BHC (Lindane)	Lab	ug/kg	< 101	67.4	102	< 4.5	< 13.0 *	< 2.2	< 6.4	< 23.2	< 186	< 3.6	< 19.0	< 94.0	< 49.0	< 42.0	< 3.6	< 275			
Heptachlor	Lab	ug/kg	< 101	< 27.0	< 23.1	< 4.5	< 13.0	< 2.2	< 6.4	< 23.2	< 186	< 3.6	< 19.0	< 94.0	< 49.0	< 42.0	< 3.6	< 275			
Heptachlor epoxide	Lab	ug/kg	< 101	< 27.0	< 23.1	< 4.5	19.9 *	< 2.2	< 6.4	< 23.2	< 186	< 3.6	< 19.0	< 94.0	< 49.0	< 42.0	< 3.6	< 275			
Methoxychlor	Lab	ug/kg	< 1010	< 270	< 231	< 45.1	< 130	< 22.3	< 64.4	< 232	< 1860	< 36.0	< 190	< 940	< 490	< 420	< 35.9	< 2750			
Toxaphene	Lab	ug/kg	< 3040	< 810	< 692	< 135	< 388	< 66.9	< 193	< 693	< 5570	< 108	< 568	< 2820	< 1470	< 1260	< 108	< 8220			
Polychlorinated Biphenyls																					
Aroclor 1016	Lab	ug/kg	< 40.1	< 53.3	< 229	< 44.7	< 51.1	< 44.1	< 63.6	< 91.3	< 36.8	< 35.7	< 37.5	< 37.1	< 48.4	< 41.3	< 35.5	< 54.4			
Aroclor 1221	Lab	ug/kg	< 40.1	< 53.3	< 229	< 44.7	< 51.1	< 44.1	< 63.6	< 91.3	< 36.8	< 35.7	< 37.5	< 37.1	< 48.4	< 41.3	< 35.5	< 54.4			
Aroclor 1232	Lab	ug/kg	< 40.1	< 53.3	< 229	< 44.7	< 51.1	< 44.1	< 63.6	< 91.3	< 36.8	< 35.7	< 37.5	< 37.1	< 48.4	< 41.3	< 35.5	< 54.4			
Aroclor 1242	Lab	ug/kg	< 40.1	3780	10500	475	1000	< 44.1	< 63.6	< 91.3	< 36.8	< 35.7	< 37.5	< 37.1	< 48.4	< 41.3	< 35.5	< 54.4			
Aroclor 1248	Lab	ug/kg	< 40.1	< 53.3	< 229	< 44.7	< 51.1	< 44.1	< 63.6	< 91.3	< 36.8	< 35.7	56.3	< 37.1	< 48.4	< 41.3	< 35.5	< 54.4			
Aroclor 1254	Lab	ug/kg	125	929	878	158	224	< 44.1	< 63.6	< 91.3	< 36.8	< 35.7	< 37.5	< 37.1	< 48.4	94.1	< 35.5	< 54.4			
Aroclor 1260	Lab	ug/kg	< 40.1	< 53.3	< 229	< 44.7	< 51.1	< 44.1	< 63.6	< 91.3	< 36.8	< 35.7	< 37.5	150	< 48.4	< 41.3	< 35.5	< 54.4			
Aroclor 1262	Lab	ug/kg	< 40.1	< 53.3	< 229	< 44.7	< 51.1	< 44.1	< 63.6	< 91.3	< 36.8	< 35.7	< 37.5	< 37.1	< 48.4	< 41.3	< 35.5	< 54.4			
Aroclor 1268	Lab	ug/kg	< 40.1	277	< 229	< 44.7	< 51.1	< 44.1	< 63.6	< 91.3	< 36.8	< 35.7	< 37.5	< 37.1	< 48.4	< 41.3	< 35.5	< 54.4			
Polychlorinated biphenyls	Lab	ug/kg	125	4990	11300	633	1230	< 44.1	< 63.6	< 91.3	< 36.8	< 35.7	56.3	150	< 48.4	94.1	< 35.5	< 54.4			
Herbicides																					
2,4,5-TP (Silvex)	Lab	mg/kg	0.20	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.15	< 0.10	0.13 *	< 0.10	< 0.10	< 4.0			
2,4,5-Trichlorophenoxyacetic acid	Lab	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.18	< 0.10	< 4.0			
2,4-D	Lab	mg/kg	< 0.10	0.43 *	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.30 *	0.29 *	< 0.10	< 4.0			
2,4-DB	Lab	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.45 *	< 0.10	< 0.10	< 4.0			
Bentazone	Lab	mg/kg	< 0.10	< 0.10	0.75	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 2.0			
Dicamba	Lab	mg/kg	< 0.10	0.23	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 4.0			
Dinoseb (DNBP)	Lab	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
MCPA	Lab	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 5.0			
Pentachlorophenol	Lab	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
Picloram	Lab	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 2.0			
Triclopyr	Lab	mg/kg	0.18	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.11	< 0.10	< 0.10	0.22	< 0.10	< 4.0			
Total Petroleum Hydrocarbons																					
DRO-modified, C10-C28	Lab	mg/kg	889	2300	3370	171	395	< 8.3	< 14.7	781	1480	12.4	674	371	1150	3820	< 7.2	2810			
Gasoline Range Organics, C6-C10	Lab	mg/kg	< 13.1	40.2	< 33.6	< 14.2	74.1	< 13.4	< 18.5	< 29.9	53.6	< 11.9	< 11.7	< 11.9	38.9	< 14.4	< 11.2	47.7			
Chlorinated Dioxins / Furans																					
2,3,7,8-Dioxin, tetra (TCDD)	Lab	ng/kg	< 2.9	--	4.3	1.4	< 1.0	< 1.0	4.3	1.5	< 1.0	--	< 1.0	--	< 1.0 *	--	< 1.0	--			

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

--	Not analyzed/Not available.
NA	NA (not applicable) indicates that a fractional portion of the sample is not part of the analytical testing or field collection procedures.
ND	Not detected.
TIC	Tentatively identified compound.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
a	Estimated value, calculated using some or all values that are estimates.
l	Indeterminate value based on failure of blind duplicate data to meet quality assurance criteria

Appendix D2
Water Analytical Data Summary
Site Investigation Report
Dakota County, Minnesota

Parameter	Total or Dissolved	Analysis Location	Units	Location												FD-SB-D5		FD-SB-E5	
				Date	FD-SB-A2	FD-SB-A3	FD-SB-A3	FD-SB-A4	FD-SB-A5	FD-SB-B3	FD-SB-B4	FD-SB-B4	FD-SB-B4	FD-SB-B5	FD-SB-D4	FD-SB-D5	3/29/2018		3/22/2018
				Sample Type	3/28/2018	3/26/2018	3/29/2018	3/26/2018	3/21/2018	3/28/2018	3/23/2018	3/26/2018	3/29/2018	3/21/2018	3/23/2018	3/21/2018	N	FR	N
General Parameters																			
Biochemical Oxygen Demand (5-day)	NA	Lab	mg/l	--	4.7 *	--	--	13.2 *	12.1 *	79.3	--	--	6.8 *	24.0	< 20.0 *	--	--	2.3	
Bromate	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	< 10.0	< 10.0	< 5.0	
Chloride	NA	Lab	mg/l	--	--	--	--	--	167	--	--	--	--	--	--	80.1	82.8	176	
Chlorine dioxide	NA	Lab	mg/l	--	--	--	--	0.45 h	< 0.10 h	--	--	--	--	--	--	1.1 h	0.81 h	0.25 h	
Chlorite	NA	Lab	ug/l	--	--	--	--	< 500	< 500	--	--	--	--	--	< 50.0	< 50.0	< 25.0		
Cyanide	NA	Lab	ug/l	--	17.3	--	--	52.0	26.8	--	11.0	--	12.4	26.0	20.6	--	--	13.2	
Cyanide, free	NA	Lab	ug/l	--	< 5.0	--	--	< 5.0 h	< 5.0	--	< 5.0	--	--	< 5.0	--	--	--	< 5.0	
Fluoride	NA	Lab	mg/l	--	0.065	--	--	< 0.050	< 0.050	< 0.050	--	--	0.12	0.14	0.18	--	--	0.16	
Hardness, as CaCO3	NA	Lab	ug/l	--	1030000	--	--	2120000	1280000	1100000	--	--	1010000	1030000	1060000	--	--	717000	
Nitrogen, ammonia, as N	NA	Lab	mg/l	--	46.9 44.2	--	--	72.7	32.8 *	32.4	--	--	8.1	99.2	15.5	--	--	2.0 *	
Nitrogen, nitrate + nitrite, as N	NA	Lab	mg/l	--	< 0.020	--	--	< 0.020	0.021	0.032	--	--	< 0.020	< 0.020	< 0.020	--	--	< 0.020	
Nitrogen, nitrate, as N	NA	Lab	mg/l	--	< 0.020	--	--	< 0.020	0.021	< 0.020	--	--	< 0.020	< 0.020	< 0.020	--	--	< 0.020	
Nitrogen, nitrite, as N	NA	Lab	mg/l	--	< 0.020	--	--	< 0.020	< 0.020	0.027	--	--	< 0.020	< 0.020	< 0.020	--	--	< 0.020	
Nitrogen, unionized ammonia, as N	NA	Lab	mg/l	--	--	--	--	--	0.052	--	--	--	--	0.15	--	--	--	--	
Oil and Grease	NA	Lab	mg/l	--	--	< 5.2	--	< 5.4	< 5.4	--	--	--	< 5.4	< 5.7	< 5.4	--	--	< 5.6	
pH	NA	Lab	pH units	--	7.4 h	--	--	7.1 h	6.9	6.7 h	--	--	6.7 h	6.6 h	6.8 h	--	--	7.0 h	
pH	NA	Field	pH units	--	--	--	--	--	6.9	--	--	--	6.9	--	--	--	--	--	
Phosphorus, total, as P	NA	Lab	mg/l	--	0.15	--	--	0.38	0.53	6.1	--	--	0.11	0.29	0.40	--	--	< 0.050	
Solids, total suspended	NA	Lab	mg/l	--	379	--	--	12.0	113	22200	--	--	111	220	60.0	--	--	10.0	
Temperature	NA	Field	deg C	--	--	--	--	--	11.0	--	--	--	--	10.0	--	--	--	--	
Turbidity	NA	Lab	NTU	--	520	--	--	145	416	18400	--	--	200	309	302	--	--	5.0	
Metals																			
Aluminum	Dissolved	Lab	ug/l	--	< 200	--	--	< 200	< 200	< 200	--	--	< 200	< 200	< 200	--	--	< 200	
Antimony	Dissolved	Lab	ug/l	--	< 0.50	--	--	< 0.50	< 0.50	1.7	--	--	< 0.50	< 0.50	1.7	--	--	< 0.50	
Arsenic	Dissolved	Lab	ug/l	--	0.75	--	--	< 2.5	1.2	3.5	--	--	1.3	8.1	7.8	--	--	0.66	
Barium	Dissolved	Lab	ug/l	--	1110	--	--	132	< 10.0	490	--	--	253	694	910	--	--	170	
Beryllium	Dissolved	Lab	ug/l	--	< 0.20	--	--	< 0.20	< 0.20	< 0.20	--	--	< 0.20	< 0.20	< 0.20	--	--	< 0.20	
Boron	Dissolved	Lab	ug/l	--	33000	--	--	399000	51900	15200	--	--	10700	19500	15600	--	--	1690 *	
Cadmium	Dissolved	Lab	ug/l	--	< 0.080	--	--	< 0.080	< 0.080	< 0.080	--	--	< 0.080	< 0.080	< 0.080	--	--	< 0.080	
Chromium	Dissolved	Lab	ug/l	--	3.7	--	--	22.2	3.2	3.2	--	--	2.5	4.7	14.2	--	--	0.56	
Cobalt	Dissolved	Lab	ug/l	--	1.1	--	--	< 2.5	3.8	0.96	--	--	0.71	2.3	1.5	--	--	< 0.50	
Copper	Dissolved	Lab	ug/l	--	< 10.0	--	--	< 10.0	< 10.0	< 10.0	--	--	< 10.0	< 10.0	< 10.0	--	--	< 10.0	
Lead	Dissolved	Lab	ug/l	--	1.2	--	--	< 0.10	1.6	0.42	--	--	< 0.10	< 0.10	64.8	--	--	< 0.10	
Manganese	Dissolved	Lab	ug/l	--	623	--	--	267	< 5.0	1300	--	--	361	351	801	--	--	719	
Mercury	Dissolved	Lab	ug/l	--	< 0.20	--	--	< 0.20	< 0.20	< 0.20	--	--	< 0.20	< 0.20	< 0.20	--	--	< 0.20	
Nickel	Dissolved	Lab	ug/l	--	< 20.0	--	--	< 20.0	< 20.0	< 20.0	--	--	< 20.0	< 20.0	< 20.0	--	--	< 20.0	
Selenium	Dissolved	Lab	ug/l	--	0.72	--	--	< 2.5	0.79	< 0.50	--	--	< 0.50	0.81	< 0.50	--	--	< 0.50	
Silver	Dissolved	Lab	ug/l	--	< 10.0	--	--	< 10.0	< 10.0	< 10.0	--	--	< 10.0	< 10.0	< 10.0	--	--	< 10.0	
Thallium	Dissolved	Lab	ug/l	--	< 0.10	--	--	< 0.10	< 0.10	< 0.10	--	--	< 0.10	< 0.10	< 0.10	--	--	< 0.10	
Tin	Dissolved	Lab	ug/l	--	< 75.0	--	--	< 75.0	< 75.0	< 75.0	--	--	< 75.0	< 75.0	< 75.0	--	--	< 75.0	
Uranium	Dissolved	Lab	ug/l	--	< 0.50	--	--	1.2	< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50	--	--	3.3	
Vanadium	Dissolved	Lab	ug/l	--	2.3	--	--	102	1.3	< 1.0	--	--	< 1.0	1.7	< 1.0	--	--	1.7	
Zinc	Dissolved	Lab	ug/l	--	< 20.0	--	--	< 20.0	< 20.0	< 20.0	--	--	< 20.0	< 20.0	53.6	--	--	< 20.0	
Chromium	Total	Lab	ug/l	--	7.3	--	--	--	10.4	20.0	--	--	--	6.0	--	--	--	--	
Chromium, hexavalent	Total	Lab	mg/l	--	< 0.010 **	--	--	< 0.010	< 0.010 **	0.060 **	--	--	< 0.010	< 0.010	< 0.010 **	--	--	< 0.010 **	
Chromium, trivalent	Total	Lab	mg/l	--	--	--	--	--	< 0.010	< 0.010	--	--	--	< 0.010	--	--	--	--	
Semivolatile Organic Compounds																			
1,2,4-Trichlorobenzene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
1,2-Dichlorobenzene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
1,2-Diphenylhydrazine	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
1,3-Dichlorobenzene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
1,4-Dichlorobenzene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
1,4-Dioxane	NA	Lab	ug/l	--	37	--	40	160	79	87	--	--	10	22	11	--	--	8.0	
1-Methylnaphthalene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
2,2'-oxybis (1-chloropropane)	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
2,4,5-Trichlorophenol	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
2,4,6-Trichlorophenol	NA	Lab	ug/l	--	--	< 11.6	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	
2,4-Dichlorophenol	NA	Lab	ug/l	--	--	< 11.6	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	
2,4-Dimethylphenol	NA	Lab	ug/l	--	--	< 58.1	--	< 52.1	< 256	--	< 529	< 53.8	< 53.2	< 53.8	< 51.5	--	--	< 56.2	
2,4-Dinitrophenol	NA	Lab	ug/l	--	--	< 11.6	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	
2,4-Dinitrotoluene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
2,6-Dinitrotoluene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
2-Chloronaphthalene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
2-Chlorophenol	NA	Lab	ug/l	--	--	< 11.6	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	

Appendix D2
Water Analytical Data Summary
Site Investigation Report
Dakota County, Minnesota

Parameter	Total or Dissolved	Analysis Location	Units	Location		FD-SB-A2	FD-SB-A3	FD-SB-A3	FD-SB-A4	FD-SB-A5	FD-SB-B3	FD-SB-B4	FD-SB-B4	FD-SB-B4	FD-SB-B5	FD-SB-D4	FD-SB-D5	FD-SB-D5		FD-SB-E5
				Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	3/29/2018		Date	
				3/28/2018	3/26/2018	3/29/2018	3/26/2018	3/21/2018	3/28/2018	3/23/2018	3/26/2018	3/29/2018	3/21/2018	3/23/2018	3/21/2018	N	FR	3/22/2018		
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
2-Methyl-4,6-dinitrophenol	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
2-Methylphenol (o-cresol)	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
2-Nitroaniline	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Nitrophenol	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	NA	Lab	ug/l	--	--	< 58.1	--	--	< 52.1	< 256	--	< 529	< 53.8	< 53.2	< 53.8	< 51.5	--	--	< 56.2	--
3,4-Methylphenol (m,p cresols)	NA	Lab	ug/l	--	--	< 23.3	--	--	< 20.8	< 103	--	< 212	< 21.5	< 21.3	< 21.5	< 20.6	--	--	< 22.5	--
3-Nitroaniline	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
4-Chloro-3-methylphenol	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Chloroaniline	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Nitroaniline	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Nitrophenol	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthene	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Acenaphthylene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aldicarb	NA	Lab	ug/l	--	--	--	--	--	--	< 2.0	--	--	--	--	--	--	< 2.0	< 2.0	--	--
Anthracene	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Benz(a)anthracene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Benzo(b)fluoranthene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzoic acid	NA	Lab	ug/l	--	--	< 58.1	--	--	< 52.1	< 256	--	< 529	< 53.8	< 53.2	< 53.8 *	< 51.5	--	--	< 56.2	--
Bis(2-chloroethoxy)methane	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bis(2-chloroethyl)ether	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Bis(2-ethylhexyl)phthalate	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Butyl benzyl phthalate	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Carbazole	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbofuran	NA	Lab	ug/l	--	--	--	--	--	--	< 2.0	--	--	--	--	--	--	< 2.0	< 2.0	< 2.0	--
Chrysene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibenzofuran	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Diethyl phthalate	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Dimethyl phthalate	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Di-n-butyl phthalate	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Di-n-octyl phthalate	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Ethylene glycol	NA	Lab	mg/l	--	--	--	--	--	< 5.0	< 5.0	--	--	--	--	--	--	< 5.0	< 5.0	< 5.0	--
Fluoranthene	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Fluorene	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Glyphosate	NA	Lab	ug/l	--	--	--	--	--	< 6.0	< 6.0	--	--	--	--	--	--	< 6.0	< 6.0	< 6.0 *	--
Hexachlorobenzene	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Hexachlorobutadiene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	NA	Lab	ug/l	--	--	< 58.1	--	--	< 52.1	< 256	--	< 529	< 53.8	< 53.2	< 53.8	< 51.5	--	--	< 56.2	--
Hexachloroethane	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Indeno(1,2,3-cd)pyrene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Isophorone	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Methyl alcohol	NA	Lab	mg/l	--	--	--	--	--	< 5.0	< 5.0	--	--	--	--	--	--	< 5.0	< 5.0	< 5.0	--
Methyl alcohol	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrobenzene	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
n-Nitrosodimethylamine	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
n-Nitrosodi-n-propylamine	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
n-Nitrosodiphenylamine	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Oxamyl (vydate)	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	< 2.0
Pentachlorophenol	NA	Lab	ug/l	--	--	< 23.3	--	--	< 20.8	< 103	--	< 212	< 21.5	< 21.3	< 21.5	< 20.6	--	--	< 22.5	--
Phenanthrene	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Phenol	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Pyrene	NA	Lab	ug/l	--	--	< 11.6	--	--	< 10.4	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	--
Volatile Organic Compounds																				
1,1,1,2-Tetrachloroethane	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	--
1,1,1-Trichloroethane	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	--
1,1,2,2-Tetrachloroethane	NA	Lab	ug/l	< 0.50	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50	--	--	< 0.50	--
1,1,2-Trichloroethane	NA	Lab	ug/l	< 0.50	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50	--	--	< 0.50	--
1,1-Dichloroethane	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	--
1,1-Dichloroethylene	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	--
1,1-Dichloropropene	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	--

Appendix D2
Water Analytical Data Summary
 Site Investigation Report
 Dakota County, Minnesota

Parameter	Location			FD-SB-A2	FD-SB-A3	FD-SB-A3	FD-SB-A4	FD-SB-A5	FD-SB-B3	FD-SB-B4	FD-SB-B4	FD-SB-B4	FD-SB-B5	FD-SB-D4	FD-SB-D5	FD-SB-D5		FD-SB-E5
	Total or Dissolved	Analysis Location	Units	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	3/29/2018		Date
				3/28/2018	3/26/2018	3/29/2018	3/26/2018	3/21/2018	3/28/2018	3/23/2018	3/26/2018	3/29/2018	3/21/2018	3/23/2018	3/21/2018	N	FR	3/22/2018
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
1,2,3-Trichlorobenzene	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
1,2,3-Trichloropropane	NA	Lab	ug/l	< 0.20	< 0.20	--	< 0.20	< 0.20	< 0.20	< 0.20	--	--	< 0.20	< 0.20	< 0.20	--	--	< 0.20
1,2,4-Trichlorobenzene	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
1,2,4-Trimethylbenzene	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	15	36	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
1,2-Dibromo-3-chloropropane (DBCP)	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 0.010 < 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	< 0.0098	< 0.0098	< 1.0
1,2-Dibromoethane (EDB)	NA	Lab	ug/l	< 0.50	< 0.50	--	< 0.50	< 0.50	< 0.010 < 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50	< 0.0098	< 0.0098	< 0.50
1,2-Dichlorobenzene	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	1.0	< 1.0	--	--	< 1.0
1,2-Dichloroethane	NA	Lab	ug/l	< 0.20	< 0.20	--	< 0.20	0.43	12	< 0.20	--	--	< 0.20	< 0.20	< 0.20	--	--	< 0.20
1,2-Dichloroethylene, cis	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	3.2	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
1,2-Dichloroethylene, trans	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
1,2-Dichloropropane	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
1,3,5-Trimethylbenzene	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	11	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
1,3-Dichlorobenzene	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
1,3-Dichloropropane	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
1,3-Dichloropropene, cis	NA	Lab	ug/l	< 0.50	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50	--	--	< 0.50
1,3-Dichloropropene, trans	NA	Lab	ug/l	< 0.50	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50	--	--	< 0.50
1,4-Dichlorobenzene	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	2.2	3.6	< 1.0	--	--	< 1.0	2.6	< 1.0	--	--	< 1.0
2,2-Dichloropropane	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Acetone	NA	Lab	ug/l	77	25	--	< 20	< 20	49	< 20	--	--	< 20	< 20	< 20	--	--	< 20
Acrylamide	NA	Lab	ug/l	--	--	--	--	< 20.0 h	< 20.0	--	--	--	--	--	--	841	< 20.0	< 20.0
Allyl chloride	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Benzene	NA	Lab	ug/l	1.9	9.8	--	14	10	30	7.6	--	--	1.6	10	< 0.50	--	--	0.53
Bromobenzene	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Bromochloromethane	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Bromodichloromethane	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Bromoform	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Bromomethane	NA	Lab	ug/l	< 2.0	< 2.0	--	< 2.0	< 2.0	< 2.0	< 2.0	--	--	< 2.0	< 2.0	< 2.0	--	--	< 2.0
Butylbenzene	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Butylbenzene, sec	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	1.2	1.7	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Butylbenzene, tert	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Carbon tetrachloride	NA	Lab	ug/l	< 0.20	< 0.20	--	< 0.20	< 0.20	< 0.20	< 0.20	--	--	< 0.20	< 0.20	< 0.20	--	--	< 0.20
Chlorobenzene	NA	Lab	ug/l	< 1.0	1.7	--	< 1.0	< 1.0	20	6.5	--	--	2.2	8.2	< 1.0	--	--	< 1.0
Chlorodibromomethane	NA	Lab	ug/l	< 0.50	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50	--	--	< 0.50
Chloroethane	NA	Lab	ug/l	< 1.0	1.1	--	< 1.0	< 1.0	1.2	46	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Chloroform	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Chloromethane	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Chlorotoluene, o	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Chlorotoluene, p	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Cumene (isopropyl benzene)	NA	Lab	ug/l	< 1.0	2.0	--	< 1.0	4.5	27	< 1.0	--	--	< 1.0	1.9	< 1.0	--	--	< 1.0
Cymene p- (toluene isopropyl p-)	NA	Lab	ug/l	< 1.0	1.2	--	< 1.0	< 1.0	3.9	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Dibromomethane (methylene bromide)	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Dichlorodifluoromethane (Freon-12)	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	6.6	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Dichlorofluoromethane (Freon-21)	NA	Lab	ug/l	2.1	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Ethyl benzene	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	1.7	1000	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Ethyl ether	NA	Lab	ug/l	53	4.4	--	6.6	7.6	5.1	8.6	--	--	1.6	6.2	< 1.0	--	--	1.8
Formaldehyde	NA	Lab	ug/l	--	--	--	--	< 100 h	< 100	--	--	--	--	--	--	< 100 h	< 100 h	< 100 h
Hexachlorobutadiene	NA	Lab	ug/l	< 0.50	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50	--	--	< 0.50
Methyl ethyl ketone (2-butanone)	NA	Lab	ug/l	15	< 10	--	< 10	< 10	42	< 10	--	--	< 10	< 10	< 10	--	--	< 10
Methyl isobutyl ketone (MIBK)	NA	Lab	ug/l	< 5.0	< 5.0	--	< 5.0	< 5.0	140	< 5.0	--	--	< 5.0	< 5.0	< 5.0	--	--	< 5.0
Methyl tertiary butyl ether (MTBE)	NA	Lab	ug/l	< 2.0	< 2.0	--	< 2.0	< 2.0	< 2.0	< 2.0	--	--	< 2.0	< 2.0	< 2.0	--	--	< 2.0
Methylene chloride	NA	Lab	ug/l	3.3	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Naphthalene	NA	Lab	ug/l	< 1.0	14	--	< 1.0	< 1.0	5.5	< 1.0	--	--	< 1.0	< 1.0	6.4	--	--	2.1
Propylbenzene	NA	Lab	ug/l	< 1.0	1.2	--	< 1.0	5.5	13	< 1.0	--	--	< 1.0	1.1	< 1.0	--	--	< 1.0
Styrene	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Tetrachloroethylene	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Tetrahydrofuran	NA	Lab	ug/l	540	19	--	19	100	4600	10	--	--	< 10	170	< 10	--	--	< 10
Toluene	NA	Lab	ug/l	2.3	< 1.0	--	< 1.0	< 1.0	1100	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Trichloroethylene (TCE)	NA	Lab	ug/l	0.21	< 0.10	--	< 0.10	< 0.10	0.33	< 0.10	--	--	< 0.10	< 0.10	< 0.10	--	--	< 0.10
Trichlorofluoromethane (Freon-11)	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Trichlorotrifluoroethane (Freon 113)	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0
Trihalomethanes, total (TTHMs)	NA	Lab	ug/l	--	--	--	--	< 4.0	< 4.0	--	--	--	--	--	--	< 4.0	< 4.0	--
Vinyl chloride	NA	Lab	ug/l	0.68	< 0.050	--	< 0.050	0.37	0.45	< 0.050	--	--	0.090	0.050	< 0.050	--	--	< 0.050
Xylene, m & p	NA	Lab	ug/l	< 1.0	1.2	--	< 1.0	5.0	3300	< 1.0	--	--	< 1.0	1.4	< 1.0	--	--	< 1.0
Xylene, o	NA	Lab	ug/l	< 1.0	< 1.0	--	< 1.0	< 1.0	870	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0

Appendix D2
Water Analytical Data Summary
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Parameter	Total or Dissolved	Analysis Location	Units	Location		FD-SB-A2	FD-SB-A3	FD-SB-A3	FD-SB-A4	FD-SB-A5	FD-SB-B3	FD-SB-B4	FD-SB-B4	FD-SB-B4	FD-SB-B5	FD-SB-D4	FD-SB-D5	FD-SB-D5		FD-SB-E5
				Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	3/29/2018		Date		
				3/28/2018	3/26/2018	3/29/2018	3/26/2018	3/21/2018	3/28/2018	3/23/2018	3/26/2018	3/29/2018	3/21/2018	3/23/2018	3/21/2018	N	FR	3/22/2018		
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
Haloacetic Acids																				
Dibromoacetic acid	NA	Lab	ug/l	--	--	--	--	--	< 1.0	< 1.0	--	--	--	--	--	--	--	--	--	< 1.0
Dichloroacetic acid	NA	Lab	ug/l	--	--	--	--	--	< 1.0	< 1.0	--	--	--	--	--	--	--	--	--	< 1.0
Haloacetic acids, total (HAA5)	NA	Lab	ug/l	--	--	--	--	--	< 1.0	< 1.0	--	--	--	--	--	--	--	--	--	< 1.0
Monobromoacetic acid	NA	Lab	ug/l	--	--	--	--	--	< 1.0	< 1.0	--	--	--	--	--	--	--	--	--	< 1.0
Monochloroacetic acid	NA	Lab	ug/l	--	--	--	--	--	< 1.0	< 1.0	--	--	--	--	--	--	--	--	--	< 1.0
Trichloroacetic acid	NA	Lab	ug/l	--	--	--	--	--	< 1.0	< 1.0	--	--	--	--	--	--	--	--	--	< 1.0
Pesticides																				
4,4'-DDD	NA	Lab	ug/l	--	--	< 0.12	--	--	< 2.2	< 0.11	--	--	--	< 1.1	< 1.1	< 0.11	--	--	--	< 0.11
4,4'-DDE	NA	Lab	ug/l	--	--	< 0.12	--	--	< 2.2	< 0.11	--	--	--	< 1.1	< 1.1	< 0.11	--	--	--	< 0.11
4,4'-DDT	NA	Lab	ug/l	--	--	< 0.12	--	--	< 2.2	< 0.11	--	--	--	< 1.1	< 1.1	< 0.11	--	--	--	< 0.11
a-BHC	NA	Lab	ug/l	--	--	< 0.058	--	--	< 1.1	< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	--	< 0.055
Acetochlor	NA	Lab	ug/l	--	--	--	--	--	< 0.47	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50
Alachlor	NA	Lab	ug/l	--	--	--	--	--	< 0.48	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50
Aldrin	NA	Lab	ug/l	--	--	< 0.058	--	--	< 1.1	< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	--	< 0.055
Atrazine	NA	Lab	ug/l	--	--	--	--	--	< 0.41	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50
b-BHC	NA	Lab	ug/l	--	--	< 0.058	--	--	< 1.1	< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	--	< 0.055
Chlordane, alpha & gamma	NA	Lab	ug/l	--	--	< 0.58	--	--	< 10.8	< 0.53	--	--	--	< 5.6	< 5.4	< 0.53	--	--	--	< 0.55
Chlordane, cis (alpha)	NA	Lab	ug/l	--	--	< 0.058	--	--	< 1.1	< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	--	< 0.055
Chlordane, trans (gamma)	NA	Lab	ug/l	--	--	< 0.058	--	--	< 1.1	< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	--	< 0.055
Chlorpyrifos	NA	Lab	ug/l	--	--	--	--	--	< 0.54	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50
Cyanazine (bladex)	NA	Lab	ug/l	--	--	--	--	--	< 0.91	< 0.20	--	--	--	--	--	--	< 0.20	< 0.20	--	< 0.20
d-BHC	NA	Lab	ug/l	--	--	< 0.058	--	--	< 1.1	< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	--	< 0.055
Deisopropyl atrazine	NA	Lab	ug/l	--	--	--	--	--	< 0.52	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50
Desethylatrazine	NA	Lab	ug/l	--	--	--	--	--	< 0.18	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50
Dieldrin	NA	Lab	ug/l	--	--	< 0.12	--	--	< 2.2	< 0.11	--	--	--	< 1.1	< 1.1	< 0.11	--	--	--	< 0.11
Dimethenamid	NA	Lab	ug/l	--	--	--	--	--	< 0.23	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50
Endosulfan I	NA	Lab	ug/l	--	--	< 0.058	--	--	< 1.1	< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	--	< 0.055
Endosulfan II	NA	Lab	ug/l	--	--	< 0.12	--	--	< 2.2	< 0.11	--	--	--	< 1.1	< 1.1	< 0.11	--	--	--	< 0.11
Endosulfan sulfate	NA	Lab	ug/l	--	--	< 0.12	--	--	< 2.2	< 0.11	--	--	--	< 1.1	< 1.1	< 0.11	--	--	--	< 0.11
Endrin	NA	Lab	ug/l	--	--	< 0.12	--	--	< 2.2	< 0.11	--	--	--	< 1.1	< 1.1	< 0.11	--	--	--	< 0.11
Endrin aldehyde	NA	Lab	ug/l	--	--	< 0.12	--	--	< 2.2	< 0.11	--	--	--	< 1.1	< 1.1	< 0.11	--	--	--	< 0.11
Endrin ketone	NA	Lab	ug/l	--	--	< 0.12	--	--	< 2.2	< 0.11	--	--	--	< 1.1	< 1.1	< 0.11	--	--	--	< 0.11
EPTC	NA	Lab	ug/l	--	--	--	--	--	< 0.61	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50
Ethalfuralin	NA	Lab	ug/l	--	--	--	--	--	< 1.3	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50
Fonofos (dyphonate)	NA	Lab	ug/l	--	--	--	--	--	< 0.32	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50
g-BHC (Lindane)	NA	Lab	ug/l	--	--	< 0.058	--	--	< 1.1	< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	--	< 0.055
Heptachlor	NA	Lab	ug/l	--	--	< 0.058	--	--	< 1.1	< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	--	< 0.055
Heptachlor epoxide	NA	Lab	ug/l	--	--	< 0.058	--	--	< 1.1	< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	--	< 0.055
Methoxychlor	NA	Lab	ug/l	--	--	< 0.58	--	--	< 10.8	< 0.53	--	--	--	< 5.6	< 5.4	< 0.53	--	--	--	< 0.55
Metolachlor	NA	Lab	ug/l	--	--	--	--	--	< 0.28	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50
Metribuzin	NA	Lab	ug/l	--	--	--	--	--	< 0.33	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50
Pendimethalin	NA	Lab	ug/l	--	--	--	--	--	< 0.38	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50
Phorate	NA	Lab	ug/l	--	--	--	--	--	< 0.58	< 0.30	--	--	--	--	--	--	< 0.30	< 0.30	--	< 0.30
Prometon	NA	Lab	ug/l	--	--	--	--	--	< 0.78	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50
Propachlor	NA	Lab	ug/l	--	--	--	--	--	< 0.22	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50
Propazine	NA	Lab	ug/l	--	--	--	--	--	< 0.65	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50
Simazine	NA	Lab	ug/l	--	--	--	--	--	< 0.47	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50
Terbufos	NA	Lab	ug/l	--	--	--	--	--	< 0.32	< 0.20	--	--	--	--	--	--	< 0.20	< 0.20	--	< 0.20
Toxaphene	NA	Lab	ug/l	--	--	< 1.7	--	--	< 32.3	< 1.6	--	--	--	< 16.9	< 16.1	< 1.6	--	--	--	< 1.6
Triallate	NA	Lab	ug/l	--	--	--	--	--	< 0.59	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50
Trifluralin	NA	Lab	ug/l	--	--	--	--	--	< 0.16	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	--	< 0.50

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Water Analytical Data Summary
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Parameter	Total or Dissolved	Analysis Location	Units	Location													FD-SB-D5		FD-SB-E5
				Date	FD-SB-A2	FD-SB-A3	FD-SB-A3	FD-SB-A4	FD-SB-A5	FD-SB-B3	FD-SB-B4	FD-SB-B4	FD-SB-B4	FD-SB-B5	FD-SB-D4	FD-SB-D5	3/29/2018		3/22/2018
				Sample Type	3/28/2018	3/26/2018	3/29/2018	3/26/2018	3/21/2018	3/28/2018	3/23/2018	3/26/2018	3/29/2018	3/21/2018	3/23/2018	3/21/2018	N	FR	N
Polychlorinated Biphenyls																			
Aroclor 1016	NA	Lab	ug/l	--	--	< 0.12	--	< 0.11	< 0.11	--	--	--	< 0.11	< 0.11	< 0.11	--	--	< 0.11	
Aroclor 1221	NA	Lab	ug/l	--	--	< 0.12	--	< 0.11	< 0.11	--	--	--	< 0.11	< 0.11	< 0.11	--	--	< 0.11	
Aroclor 1232	NA	Lab	ug/l	--	--	< 0.12	--	< 0.11	< 0.11	--	--	--	< 0.11	< 0.11	< 0.11	--	--	< 0.11	
Aroclor 1242	NA	Lab	ug/l	--	--	< 0.12	--	< 0.11	< 0.11	--	--	--	< 0.11	< 0.11	< 0.11	--	--	< 0.11	
Aroclor 1248	NA	Lab	ug/l	--	--	< 0.12	--	< 0.11	< 0.11	--	--	--	< 0.11	< 0.11	< 0.11	--	--	< 0.11	
Aroclor 1254	NA	Lab	ug/l	--	--	< 0.12	--	< 0.11	0.31	--	--	--	< 0.11	< 0.11	< 0.11	--	--	< 0.11	
Aroclor 1260	NA	Lab	ug/l	--	--	< 0.12	--	< 0.11	< 0.11	--	--	--	< 0.11	< 0.11	< 0.11	--	--	< 0.11	
Aroclor 1262	NA	Lab	ug/l	--	--	< 0.12	--	< 0.11	< 0.11	--	--	--	< 0.11	< 0.11	< 0.11	--	--	< 0.11	
Aroclor 1268	NA	Lab	ug/l	--	--	< 0.12	--	< 0.11	< 0.11	--	--	--	< 0.11	< 0.11	< 0.11	--	--	< 0.11	
Herbicides																			
2,4,5-TP (Silvex)	NA	Lab	ug/l	--	--	--	--	< 0.50	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	
2,4,5-Trichlorophenoxyacetic acid	NA	Lab	ug/l	--	--	--	--	< 0.50	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	
2,4-D	NA	Lab	ug/l	--	--	--	--	< 0.50	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	
2,4-DB	NA	Lab	ug/l	--	--	--	--	< 0.50	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	
Bentazone	NA	Lab	ug/l	--	--	--	--	< 0.50	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	
Dicamba	NA	Lab	ug/l	--	--	--	--	< 0.50	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	
Diquat	NA	Lab	ug/l	--	--	--	--	< 0.40 h	< 0.40	--	--	--	--	--	--	< 0.40	< 0.40	< 0.40	
Endothall	NA	Lab	ug/l	--	--	--	--	--	< 9.0 **	--	--	--	--	--	--	< 9.0 **	< 9.0 **	< 9.0 *	
MCPA	NA	Lab	ug/l	--	--	--	--	< 0.30	< 0.30	--	--	--	--	--	--	< 0.30	< 0.30	< 0.30	
Paraquat	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Picloram	NA	Lab	ug/l	--	--	--	--	< 0.50	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	
Triclopyr	NA	Lab	ug/l	--	--	--	--	< 0.50	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	
Chlorinated Dioxins / Furans																			
2,3,7,8-Dioxin, tetra (TCDD)	NA	Lab	pg/l	--	--	< 10	--	< 10	< 10	--	< 10	< 10	< 10	< 10	< 10	--	--	< 10	
Radiochemical Parameters																			
Gross Alpha (radiation)	NA	Lab	pCi/l	--	--	--	--	< 14.7	5.96 +/- 2.57	--	--	--	--	--	--	< 4.42	< 2.72	3.06 +/- 1.90	
Gross Beta (radiation)	NA	Lab	pCi/l	--	--	--	--	142 +/- 26.9	98.4 +/- 18.0	--	--	--	--	--	--	48.2 +/- 9.69	57.2 +/- 10.7	5.90 +/- 2.23	
Radium 226	NA	Lab	pCi/l	--	--	--	--	--	< 0.581	--	--	--	--	--	--	0.703 +/- 0.520	1.25 +/- 0.785	< 0.815	
Radium 228	NA	Lab	pCi/l	--	--	--	--	--	< 0.667	--	--	--	--	--	--	< 0.804	< 0.810	0.937 +/- 0.493	
Radium, total	NA	Lab	pCi/l	--	--	--	--	--	< 1.25	--	--	--	--	--	--	< 1.51	< 1.85	< 1.72	
Per- and Polyfluoroalkyl Substances																			
Perfluorobutanesulfonate	NA	Lab	ug/l	--	0.053	--	0.033 j	0.023 j	0.15	0.027 j	--	--	0.024 j	0.065	0.060	--	--	< 0.050	
Perfluorobutanoic acid (PFBA)	NA	Lab	ug/l	--	0.36	--	1.4	0.50	0.36	0.18	--	--	0.11	0.24	0.27	--	--	0.052	
Perfluorohexane sulfonate (PFHxS)	NA	Lab	ug/l	--	0.15	--	0.063	0.064	0.27	0.050	--	--	0.048	0.14	0.084	--	--	< 0.025	
Perfluorohexanoic acid (PFHxA)	NA	Lab	ug/l	--	0.31	--	0.31	0.24	1.5	0.59	--	--	0.18	0.40	0.25	--	--	0.022 j	
Perfluorooctanesulfonate (PFOS)	NA	Lab	ug/l	--	0.48	--	0.19	0.17	4.1	0.13	--	--	< 0.025	0.63	0.28	--	--	< 0.025	
Perfluorooctanoic acid (PFOA)	NA	Lab	ug/l	--	1.5	--	0.53	2.1	7.3	1.4	--	--	1.0	3.9	25	--	--	0.19	
Perfluoropentanoic acid (PFPeA)	NA	Lab	ug/l	--	0.17	--	0.25	0.096	0.43	0.47	--	--	0.12	0.13	0.11	--	--	< 0.050	

Appendix D2
Water Analytical Data Summary
Site Investigation Report
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Parameter	Location			FD-TT-06	FD-TT-10	FL-TT-02	FL-TT-03	FL-TT-04	FL-TT-05	FL-TT-07	FL-TT-08		TS-SB-02	TS-SB-05	TS-SB-07	TS-SB-08
	Total or Dissolved	Analysis Location	Units	Date	Date	Date	Date	Date	Date	Date	Date		Date	Date	Date	Date
				4/12/2018	4/17/2018	4/18/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/20/2018	4/12/2018	4/13/2018	4/13/2018	4/13/2018	
Sample Type	N	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N
General Parameters																
Biochemical Oxygen Demand (5-day)	NA	Lab	mg/l	27.7	3.8 *	21.6	11.2 *	< 20.0 *	15.9 *	< 20.0 *	60.2 *	47.7 *	--	--	--	< 20.0
Bromate	NA	Lab	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	--	< 10.0	--	--	--	--	--	--	< 10.0
Chloride	NA	Lab	mg/l	56.5 *	199	15.2	11.9	109	37.1	47.6	--	--	--	--	--	820
Chlorine dioxide	NA	Lab	mg/l	1.6 h	--	< 0.10 h	0.83 h	0.88 h	1.5 h	< 0.10 h	--	--	--	--	--	0.11 h
Chlorite	NA	Lab	ug/l	< 50.0	< 50.0	< 500 *	< 1000	--	< 1000	--	--	--	--	--	--	< 500
Cyanide	NA	Lab	ug/l	< 10.0	13.4	22.0	< 10.0	< 10.0	< 10.0	< 10.0	16.3	20.5	--	--	--	41.3
Cyanide, free	NA	Lab	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	--	--	--	< 5.0
Fluoride	NA	Lab	mg/l	0.14 *	0.17	0.053	0.077	0.17	0.13	0.085	0.17	0.16	--	--	--	< 0.050
Hardness, as CaCO3	NA	Lab	ug/l	477000	1450000	674000	411000	479000	303000	632000	795000	708000	--	2230000	9500000	1410000
Nitrogen, ammonia, as N	NA	Lab	mg/l	5.4	0.11	10.6	5.0	7.8	4.5	9.7	11.1	10.6	--	--	--	95.2
Nitrogen, nitrate + nitrite, as N	NA	Lab	mg/l	0.58	0.034	0.038	0.054	0.11 *	0.094	0.40	0.42	0.34	--	--	--	< 0.020
Nitrogen, nitrate, as N	NA	Lab	mg/l	0.55	0.025	< 0.020	0.022	0.080 *	0.076	0.34	0.37	0.30	--	--	--	< 0.020
Nitrogen, nitrite, as N	NA	Lab	mg/l	0.032	< 0.020	0.039	0.031	0.027	< 0.020	0.056	0.046	0.043	--	--	--	< 0.020
Nitrogen, unionized ammonia, as N	NA	Lab	mg/l	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	--	--	--	0.18
Oil and Grease	NA	Lab	mg/l	< 4.8	< 4.9	< 4.9	< 5.4	< 4.8	< 4.9	< 5.0	< 4.8	< 4.9	--	--	--	< 5.0
pH	NA	Lab	pH units	6.8 h	7.1 h	6.3 h	6.8 h	6.7 h	6.8 h	6.7 h	6.6 h	6.6 h	--	--	--	6.9 h
pH	NA	Field	pH units	6.7	5.9	5.9	5.6	5.9	6.3	6.2	6.0	6.0	--	--	--	7.0
Phosphorus, total, as P	NA	Lab	mg/l	0.19	0.24	0.29	< 0.10	0.12	< 0.10	< 0.10	0.41	0.50	--	--	--	0.096
Solids, total suspended	NA	Lab	mg/l	230	397	518	130	249	184	95.0	2370 *	1170 *	--	--	--	109
Temperature	NA	Field	deg C	6.5	3.6	3.6	9.5	10.6	8.5	6.0	10.5	10.5	--	--	--	10.5
Turbidity	NA	Lab	NTU	315	388	620	156	246	196	152	1460 *	1590 *	--	--	--	965 *
Metals																
Aluminum	Dissolved	Lab	ug/l	1610	< 200	< 200	< 200	< 200	< 200	358	350 *	1100 *	< 200	3810	92800	< 200
Antimony	Dissolved	Lab	ug/l	1.3	2.1	0.58	< 0.50	1.5	0.58	< 0.50	0.78	0.66	1.5	1.4	1.1	0.57
Arsenic	Dissolved	Lab	ug/l	2.4	1.7	7.3	1.8	3.7	3.4	1.4	1.3	1.5	3.1	4.4	71.2	6.6
Barium	Dissolved	Lab	ug/l	407	132	494	333	465	250	607	303	315	796	2750	2810	1080
Beryllium	Dissolved	Lab	ug/l	0.21	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	2.8	< 0.20
Boron	Dissolved	Lab	ug/l	6600	7030	536	295	1090	406	1610	352	336	582	859	889	6960
Cadmium	Dissolved	Lab	ug/l	0.65	0.93	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	0.10	0.24	< 0.080	0.27	3.8	< 0.080
Chromium	Dissolved	Lab	ug/l	3.9	< 0.50	1.3	1.2	0.96	0.69	0.90	1.1	2.6	1.1	14.0	165	7.1
Cobalt	Dissolved	Lab	ug/l	4.6	4.1	3.2	1.7	3.6	4.5	1.5	3.2	2.8	2.3	4.8	105	5.0
Copper	Dissolved	Lab	ug/l	54.1	26.6	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	11.9	313	< 10.0
Lead	Dissolved	Lab	ug/l	21.5	0.67	0.71	0.56	10.9	1.6	0.54	6.2 *	17.5 *	0.36	24.3	113	4.9
Manganese	Dissolved	Lab	ug/l	738	496	985	1120	1030	749	902	2290	2300	722	2440	9940	226
Mercury	Dissolved	Lab	ug/l	0.26	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	0.35	< 0.20
Nickel	Dissolved	Lab	ug/l	27.4	159	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	22.4	215	30.9
Selenium	Dissolved	Lab	ug/l	2.6	44.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	3.8	1.1
Silver	Dissolved	Lab	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Thallium	Dissolved	Lab	ug/l	0.61	0.57	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.21	2.9	< 0.10
Tin	Dissolved	Lab	ug/l	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0
Uranium	Dissolved	Lab	ug/l	2.0	16.5	< 0.50	0.69	< 0.50	< 0.50	< 0.50	2.5	2.5	0.85	1.8	8.5	< 0.50
Vanadium	Dissolved	Lab	ug/l	4.4	3.7	< 1.0	< 1.0	< 1.0	< 1.0	1.2	1.1	2.4	1.3	12.0	205	1.9
Zinc	Dissolved	Lab	ug/l	212	509	< 20.0	28.3	155	97.3	< 20.0	32.3	59.5	< 20.0	77.6	492	43.0
Chromium	Total	Lab	ug/l	14.6	22.7	58.0	4.4	19.5	11.6	1.6	64.4	38.3	--	594	713	21.6
Chromium, hexavalent	Total	Lab	mg/l	0.011 **	< 0.010 *	< 0.010 **	< 0.010	< 0.010 **	< 0.010	< 0.010 **	< 0.010 **	< 0.010	--	--	--	< 0.010
Chromium, trivalent	Total	Lab	mg/l	< 0.010	0.023	0.058	< 0.010	0.020	0.012	< 0.010	0.064	0.038	--	--	--	0.022
Semivolatile Organic Compounds																
1,2,4-Trichlorobenzene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
1,2-Dichlorobenzene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
1,2-Diphenylhydrazine	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
1,3-Dichlorobenzene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
1,4-Dichlorobenzene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
1,4-Dioxane	NA	Lab	ug/l	8.4	< 0.049	0.82	0.36	0.37	0.11	1.2	0.17	--	2.2	36	11	120
1-Methylnaphthalene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
2,2'-oxybis (1-chloropropane)	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
2,4,5-Trichlorophenol	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
2,4,6-Trichlorophenol	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
2,4-Dichlorophenol	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
2,4-Dimethylphenol	NA	Lab	ug/l	< 51.8	< 51.0	< 51.5	< 56.8	< 50.8	< 51.5	< 51.3	< 256	< 51.0	--	< 52.1	< 52.6	< 52.1
2,4-Dinitrophenol	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4 *	< 10.2 *	< 10.3 *	< 10.3 *	< 51.3 *	< 10.2 *	--	< 10.4	< 10.5	< 10.4
2,4-Dinitrotoluene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
2,6-Dinitrotoluene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
2-Chloronaphthalene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
2-Chlorophenol	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4

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Water Analytical Data Summary
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Parameter	Location			FD-TT-06	FD-TT-10	FL-TT-02	FL-TT-03	FL-TT-04	FL-TT-05	FL-TT-07	FL-TT-08		TS-SB-02	TS-SB-05	TS-SB-07	TS-SB-08
	Total or Dissolved	Analysis Location	Units	Date	Date	Date	Date	Date	Date	Date	Date		Date	Date	Date	Date
				4/12/2018	4/17/2018	4/18/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/20/2018		4/12/2018	4/13/2018	4/13/2018	4/13/2018
Sample Type	N	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N
2-Methyl-4,6-dinitrophenol	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4 *	< 10.2 *	< 10.3 *	< 10.3 *	--	--	--	--	--	--
2-Methylnaphthalene	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
2-Methylphenol (o-cresol)	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
2-Nitroaniline	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
2-Nitrophenol	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
3,3'-Dichlorobenzidine	NA	Lab	ug/l	< 51.8	< 51.0	< 51.5	< 56.8	< 50.8	< 51.5	< 51.3	< 256	< 51.0	--	< 52.1	< 52.6	< 52.1
3,4-Methylphenol (m,p cresols)	NA	Lab	ug/l	< 20.7	< 20.4	< 20.6	< 22.7	< 20.3	< 20.6	< 20.5	< 103	< 20.4	--	232	< 21.1	< 20.8
3-Nitroaniline	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
4-Bromophenyl phenyl ether	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
4-Chloro-3-methylphenol	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
4-Chloroaniline	NA	Lab	ug/l	--	< 51.0	< 51.5	< 56.8	< 50.8	< 51.5	< 51.3	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
4-Nitroaniline	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
4-Nitrophenol	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
Acenaphthene	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
Acenaphthylene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
Aldicarb	NA	Lab	ug/l	< 2.0	< 2.0	< 2.0	< 2.0	--	< 2.0	--	--	--	--	--	--	< 2.0
Anthracene	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
Benz(a)anthracene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
Benzo(a)pyrene	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
Benzo(b)fluoranthene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
Benzo(g,h,i)perylene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
Benzo(k)fluoranthene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
Benzoic acid	NA	Lab	ug/l	< 51.8	--	--	--	--	--	--	< 256	< 51.0	--	< 521	< 52.6	< 52.1
Bis(2-chloroethoxy)methane	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
Bis(2-chloroethyl)ether	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
Bis(2-ethylhexyl)phthalate	NA	Lab	ug/l	< 10.4	< 10.2	13.8	< 11.4	< 10.2	264	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
Butyl benzyl phthalate	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
Carbazole	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
Carbofuran	NA	Lab	ug/l	< 2.0	< 2.0	< 2.0	< 2.0	--	< 2.0	--	--	--	--	--	--	< 2.0
Chrysene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
Dibenz(a,h)anthracene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
Dibenzofuran	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
Diethyl phthalate	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
Dimethyl phthalate	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
Di-n-butyl phthalate	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
Di-n-octyl phthalate	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
Ethylene glycol	NA	Lab	mg/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	--	--	--	--	--	< 5.0
Fluoranthene	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
Fluorene	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
Glyphosate	NA	Lab	ug/l	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0 **	< 6.0	< 6.0	--	--	--	--	--	< 6.0
Hexachlorobenzene	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
Hexachlorobutadiene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
Hexachlorocyclopentadiene	NA	Lab	ug/l	< 51.8	--	--	--	--	--	--	< 256 **	< 51.0 **	--	< 52.1	< 52.6	< 52.1
Hexachloroethane	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
Indeno(1,2,3-cd)pyrene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
Isophorone	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
Methyl alcohol	NA	Lab	mg/l	--	--	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	--	--	--	--	--	--
Methyl alcohol	NA	Lab	ug/l	< 5000	< 5000	--	--	--	--	--	--	--	--	--	--	< 5000
Naphthalene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
Nitrobenzene	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
n-Nitrosodimethylamine	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
n-Nitrosodi-n-propylamine	NA	Lab	ug/l	--	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--
n-Nitrosodiphenylamine	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
Oxamyl (vydate)	NA	Lab	ug/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Pentachlorophenol	NA	Lab	ug/l	< 20.7	< 20.4	< 20.6	< 22.7	< 20.3	< 20.6	< 20.5	< 103	< 20.4	--	< 20.8	< 21.1	< 20.8
Phenanthrene	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
Phenol	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	12.3	< 10.5	< 10.4
Pyrene	NA	Lab	ug/l	< 10.4	< 10.2	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4
Volatile Organic Compounds																
1,1,1,2-Tetrachloroethane	NA	Lab	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	NA	Lab	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	NA	Lab	ug/l	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 2.5	< 0.50	< 0.50	< 0.50
1,1,2-Trichloroethane	NA	Lab	ug/l	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 2.5	< 0.50	< 0.50	< 0.50
1,1-Dichloroethane	NA	Lab	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethylene	NA	Lab	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	NA	Lab	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0

Appendix D2
Water Analytical Data Summary
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Parameter	Location			FD-TT-06	FD-TT-10	FL-TT-02	FL-TT-03	FL-TT-04	FL-TT-05	FL-TT-07	FL-TT-08		TS-SB-02	TS-SB-05	TS-SB-07	TS-SB-08
	Total or Dissolved	Analysis Location	Units	Date	Date	Date	Date	Date	Date	Date	Date		Date	Date	Date	Date
				4/12/2018	4/17/2018	4/18/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/20/2018		4/12/2018	4/13/2018	4/13/2018	4/13/2018
Sample Type	N	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N
Haloacetic Acids																
Dibromoacetic acid	NA	Lab	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	--	< 1.0	--	--	--	--	--	--	< 1.0
Dichloroacetic acid	NA	Lab	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	--	< 1.0	--	--	--	--	--	--	< 1.0
Haloacetic acids, total (HAA5)	NA	Lab	ug/l	< 1.0	< 1.0	5.0	< 1.0	--	< 1.0	--	--	--	--	--	--	< 1.0
Monobromoacetic acid	NA	Lab	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	--	< 1.0	--	--	--	--	--	--	< 1.0
Monochloroacetic acid	NA	Lab	ug/l	< 1.0	< 1.0	5.0 *	< 1.0	--	< 1.0	--	--	--	--	--	--	< 1.0
Trichloroacetic acid	NA	Lab	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	--	< 1.0	--	--	--	--	--	--	< 1.0
Pesticides																
4,4'-DDD	NA	Lab	ug/l	< 0.21	< 2.1	< 1.0	< 0.57	< 0.51	< 0.52	< 0.11	< 0.52	< 0.52	--	--	--	< 1.1
4,4'-DDE	NA	Lab	ug/l	< 0.21	< 2.1	< 1.0	< 0.57	< 0.51	< 0.52	< 0.11	< 0.52	< 0.52	--	--	--	< 1.1
4,4'-DDT	NA	Lab	ug/l	< 0.21	< 2.1	< 1.0	< 0.57	< 0.51	< 0.52	< 0.11	< 0.52	< 0.52	--	--	--	< 1.1
a-BHC	NA	Lab	ug/l	< 0.10	< 1.1	< 0.51	< 0.29	< 0.26	< 0.26	< 0.053	< 0.26	< 0.26	--	--	--	< 0.53
Acetochlor	NA	Lab	ug/l	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Alachlor	NA	Lab	ug/l	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Aldrin	NA	Lab	ug/l	< 0.10	< 1.1 *	< 0.51 *	< 0.29 *	< 0.26 *	< 0.26 *	< 0.053 *	< 0.26	< 0.26	--	--	--	< 0.53
Atrazine	NA	Lab	ug/l	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
b-BHC	NA	Lab	ug/l	< 0.10	< 1.1	< 0.51	< 0.29	< 0.26	< 0.26	< 0.053	< 0.26	< 0.26	--	--	--	< 0.53
Chlordane, alpha & gamma	NA	Lab	ug/l	< 1.0	< 10.6	< 5.1	< 2.9	< 2.6	< 2.6	< 0.53	< 2.6	< 2.6	--	--	--	< 5.3
Chlordane, cis (alpha)	NA	Lab	ug/l	< 0.10	< 1.1	< 0.51	< 0.29	< 0.26	< 0.26	< 0.053	< 0.26	< 0.26	--	--	--	< 0.53
Chlordane, trans (gamma)	NA	Lab	ug/l	< 0.10	< 1.1	< 0.51	< 0.29	< 0.26	< 0.26	< 0.053	< 0.26	< 0.26	--	--	--	< 0.53
Chlorpyrifos	NA	Lab	ug/l	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Cyanazine (bladex)	NA	Lab	ug/l	< 0.20	< 0.20	< 0.40	< 0.20	< 0.20	< 0.20	< 0.20	--	--	--	--	--	< 0.20
d-BHC	NA	Lab	ug/l	< 0.10	< 1.1	< 0.51	< 0.29	< 0.26	< 0.26	< 0.053	< 0.26	< 0.26	--	--	--	< 0.53
Deisopropyl atrazine	NA	Lab	ug/l	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Desethylatrazine	NA	Lab	ug/l	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Dieldrin	NA	Lab	ug/l	< 0.21	< 2.1	< 1.0	< 0.57	< 0.51	< 0.52	< 0.11	< 0.52	< 0.52	--	--	--	< 1.1
Dimethenamid	NA	Lab	ug/l	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Endosulfan I	NA	Lab	ug/l	< 0.10	< 1.1	< 0.51	< 0.29	< 0.26	< 0.26	< 0.053	< 0.26	< 0.26	--	--	--	< 0.53
Endosulfan II	NA	Lab	ug/l	< 0.21	< 2.1	< 1.0	< 0.57	< 0.51	< 0.52	< 0.11	< 0.52	< 0.52	--	--	--	< 1.1
Endosulfan sulfate	NA	Lab	ug/l	< 0.21	< 2.1	< 1.0	< 0.57	< 0.51	< 0.52	< 0.11	< 0.52	< 0.52	--	--	--	< 1.1
Endrin	NA	Lab	ug/l	< 0.21	< 2.1	< 1.0	< 0.57	< 0.51	< 0.52	< 0.11	< 0.52	< 0.52	--	--	--	< 1.1
Endrin aldehyde	NA	Lab	ug/l	< 0.21	< 2.1	< 1.0	< 0.57	< 0.51	< 0.52	< 0.11	< 0.52	< 0.52	--	--	--	< 1.1
Endrin ketone	NA	Lab	ug/l	< 0.21	< 2.1	< 1.0	< 0.57	< 0.51	< 0.52	< 0.11	< 0.52	< 0.52	--	--	--	< 1.1
EPTC	NA	Lab	ug/l	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Ethalfuralin	NA	Lab	ug/l	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Fonofos (dyphonate)	NA	Lab	ug/l	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
g-BHC (Lindane)	NA	Lab	ug/l	< 0.10	< 1.1	< 0.51	< 0.29	< 0.26	< 0.26	< 0.053	< 0.26	< 0.26	--	--	--	< 0.53
Heptachlor	NA	Lab	ug/l	< 0.10	< 1.1	< 0.51	< 0.29	< 0.26	< 0.26	< 0.053	< 0.26	< 0.26	--	--	--	< 0.53
Heptachlor epoxide	NA	Lab	ug/l	< 0.10	< 1.1	< 0.51	< 0.29	< 0.26	< 0.26	< 0.053	< 0.26	< 0.26	--	--	--	< 0.53
Methoxychlor	NA	Lab	ug/l	< 1.0	< 10.6	< 5.1	< 2.9	< 2.6	< 2.6	< 0.53	< 2.6	< 2.6	--	--	--	< 5.3
Metolachlor	NA	Lab	ug/l	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Metribuzin	NA	Lab	ug/l	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Pendimethalin	NA	Lab	ug/l	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Phorate	NA	Lab	ug/l	< 0.30	< 0.30	< 0.60	< 0.30	< 0.30	< 0.30	< 0.30	--	--	--	--	--	< 0.30
Prometon	NA	Lab	ug/l	< 0.50 *	< 0.50	< 1.0 *	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Propachlor	NA	Lab	ug/l	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Propazine	NA	Lab	ug/l	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Simazine	NA	Lab	ug/l	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Terbufos	NA	Lab	ug/l	< 0.20	< 0.20	< 0.40	< 0.20	< 0.20	< 0.20	< 0.20	--	--	--	--	--	< 0.20
Toxaphene	NA	Lab	ug/l	< 3.1	< 31.9	< 15.4	< 8.6	< 7.7	< 7.7	< 1.6	< 7.7	< 7.8	--	--	--	< 15.8
Triallate	NA	Lab	ug/l	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Trifluralin	NA	Lab	ug/l	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50

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Parameter	Location			FD-TT-06	FD-TT-10	FL-TT-02	FL-TT-03	FL-TT-04	FL-TT-05	FL-TT-07	FL-TT-08		TS-SB-02	TS-SB-05	TS-SB-07	TS-SB-08
	Total or Dissolved	Analysis Location	Units	4/12/2018	4/17/2018	4/18/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/20/2018		4/12/2018	4/13/2018	4/13/2018	4/13/2018
				N	N	N	N	N	N	N	N	N	N	N		
Polychlorinated Biphenyls																
Aroclor 1016	NA	Lab	ug/l	< 0.10	< 0.10	< 0.10 *	< 0.11 *	< 0.10 *	< 0.10 *	< 0.10 *	< 0.10	< 0.10	--	--	--	< 0.11
Aroclor 1221	NA	Lab	ug/l	< 0.10	< 0.10	< 0.10 *	< 0.11 *	< 0.10 *	< 0.10 *	< 0.10 *	< 0.10	< 0.10	--	--	--	< 0.11
Aroclor 1232	NA	Lab	ug/l	< 0.10	< 0.10	< 0.10 *	< 0.11 *	< 0.10 *	< 0.10 *	< 0.10 *	< 0.10	< 0.10	--	--	--	< 0.11
Aroclor 1242	NA	Lab	ug/l	< 0.10	< 0.10	27.7 *	2.0 *	1.3 *	3.8 *	< 0.10 *	0.92	1.4	--	--	--	< 0.11
Aroclor 1248	NA	Lab	ug/l	< 0.10	< 0.10	< 0.10 *	< 0.11 *	< 0.10 *	< 0.10 *	< 0.10 *	< 0.10	< 0.10	--	--	--	< 0.11
Aroclor 1254	NA	Lab	ug/l	< 0.10	< 0.10	3.8 *	0.18 *	0.17 *	0.19 *	< 0.10 *	0.19	0.24	--	--	--	< 0.11
Aroclor 1260	NA	Lab	ug/l	< 0.10	< 0.10	< 0.10 *	< 0.11 *	< 0.10 *	< 0.10 *	< 0.10 *	< 0.10	< 0.10	--	--	--	< 0.11
Aroclor 1262	NA	Lab	ug/l	< 0.10	< 0.10	< 0.10 *	< 0.11 *	< 0.10 *	< 0.10 *	< 0.10 *	< 0.10	< 0.10	--	--	--	< 0.11
Aroclor 1268	NA	Lab	ug/l	< 0.10	< 0.10	< 0.10 *	< 0.11 *	< 0.10 *	< 0.10 *	< 0.10 *	< 0.10	< 0.10	--	--	--	< 0.11
Herbicides																
2,4,5-TP (Silvex)	NA	Lab	ug/l	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
2,4,5-Trichlorophenoxyacetic acid	NA	Lab	ug/l	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
2,4-D	NA	Lab	ug/l	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
2,4-DB	NA	Lab	ug/l	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Bentazone	NA	Lab	ug/l	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Dicamba	NA	Lab	ug/l	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Diquat	NA	Lab	ug/l	< 0.40	< 0.40	< 0.40	< 0.40	--	< 0.40	--	--	--	--	--	--	< 0.40
Endothall	NA	Lab	ug/l	< 9.0 *	< 9.0	< 9.0	< 9.0 *	--	< 9.0 *	< 9.0 *	--	--	--	--	--	< 9.0
MCPA	NA	Lab	ug/l	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	--	--	--	--	--	< 0.30
Paraquat	NA	Lab	ug/l	< 0.40	< 0.40	< 0.40	< 0.40	--	< 0.40	--	--	--	--	--	--	< 0.40
Picloram	NA	Lab	ug/l	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Triclopyr	NA	Lab	ug/l	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50
Chlorinated Dioxins / Furans																
2,3,7,8-Dioxin, tetra (TCDD)	NA	Lab	pg/l	17 j	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	--	--	--	--
Radiochemical Parameters																
Gross Alpha (radiation)	NA	Lab	pCi/l	< 18.6	29.2 +/- 8.77	7.56 +/- 2.61	5.81 +/- 3.02	4.78 +/- 2.20	9.07 +/- 2.50	< 2.63	--	--	--	--	--	< 15.4
Gross Beta (radiation)	NA	Lab	pCi/l	< 30.2	< 8.16	9.79 +/- 3.19	9.38 +/- 3.53	7.32 +/- 1.94	8.72 +/- 1.93	7.15 +/- 2.03	--	--	--	--	--	98.0 +/- 19.5
Radium 226	NA	Lab	pCi/l	0.821 +/- 0.548	1.54 +/- 0.735	< 0.531	< 0.950	< 0.753	< 0.826	< 0.743	--	--	--	--	--	< 0.779
Radium 228	NA	Lab	pCi/l	< 0.976	< 1.04	< 1.64	< 1.11	< 1.08	< 0.789	< 0.706	--	--	--	--	--	0.991 +/- 0.456
Radium, total	NA	Lab	pCi/l	< 1.66	2.40 +/- 1.28	< 2.17	< 2.06	< 1.83	< 1.62	< 1.45	--	--	--	--	--	< 1.54
Per- and Polyfluoroalkyl Substances																
Perfluorobutanesulfonate	NA	Lab	ug/l	0.015 j	0.038 j	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	--	0.0090 j	0.011 j	0.020 j	0.039 j
Perfluorobutanoic acid (PFBA)	NA	Lab	ug/l	0.080	0.020 j	0.021 j	0.018 j	0.025 j	0.018 j	0.031 j	0.070	--	0.14	0.38	0.27	1.6
Perfluorohexane sulfonate (PFHxS)	NA	Lab	ug/l	0.057	< 0.025	0.017 j	< 0.025	< 0.025	< 0.025	< 0.025	0.019 j	--	0.032	0.085	0.12	1.9
Perfluorohexanoic acid (PFHxA)	NA	Lab	ug/l	0.17	< 0.050	0.013 j	< 0.050	0.013 j	< 0.050	0.018 j	0.080	--	0.054	0.12	0.12	0.66
Perfluorooctanesulfonate (PFOS)	NA	Lab	ug/l	0.23	0.041	0.051	0.022 j	0.14	0.12	0.048	0.14	--	0.042	0.30	0.50	0.33
Perfluorooctanoic acid (PFOA)	NA	Lab	ug/l	0.79	0.033 j	0.12	0.041	0.22	0.15	0.27	0.21	--	0.084	0.35	0.24	1.6
Perfluoropentanoic acid (PFPeA)	NA	Lab	ug/l	0.13	< 0.050	< 0.050	< 0.050	0.0090 j	< 0.050	0.011 j	0.070	--	0.058	0.12	0.076	0.24

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

--	Not analyzed/Not available.
N	Sample Type: Normal
FD	Sample Type: Field Duplicate
NA	NA (not applicable) indicates that a fractional portion of the sample is not part of the analytical testing or field collection procedures.
TIC	Tentatively identified compound.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
h	EPA recommended sample preservation, extraction or analysis holding time was exceeded.
j	Estimated detected value. The reported value is less than the stated laboratory quantitation limit but greater than the laboratory method detection limit.

Appendix E

Laboratory Analytical Reports



Protecting, maintaining and improving the health of all Minnesotans

Report Date: 5/16/18

Client Name: QU - MPCA - Closed Landfill Assessment 4

Project Code: QU

Project Name: Closed Landfill Assessment 4

Work Order Number: 18D1273

Report To: QU - MPCA - Closed Landfill Assessment 4

Benjamin Klismith

520 Lafayette Rd.

Saint Paul, MN 55155

The MDH Public Health Laboratory performs chemical, bacteriological and radiological analyses of environmental samples including water, waste water, sediment, air, soil and hazardous material. The laboratory provides testing services in accordance with standard operating procedures referencing approved methodology as defined in Standard Methods for the Examination of Water and Wastewater, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods: EPA SW-846, and 40 Code of Federal Regulation (CFR) parts 136, 141, and 261. In cases where analytes of interest do not have corresponding EPA approved methodology, the MDH Public Health Laboratory uses in-house methods that have undergone rigorous validation and documentation.

The results within this report are in compliance with the terms and conditions stated in the standard operating procedures, reference methodologies, and quality assurance project plan; unless otherwise narrated in the attached report.

Release of the data contained in this report has been authorized by laboratory management and is verified with the following signature affirmation. Thank you for using the MDH Public Health Laboratory.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul Moyer", is written over a light gray rectangular background.

Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Public Health Laboratory . Environmental Laboratory Section . 601 Robert St. N . PO Box 64899 . St Paul, MN 55164
(651) 201-5300

<http://www.health.mn.us/divs/phl/environmental>

Final Report
Summary of Samples Received

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Work Order Comment: Samples were received in proper condition unless otherwise specified in the receiving comments.

Field ID	MDH Sample Number	Matrix	Date & Time Collected	Date & Time Received	Receipt °C
FL-TT-08	18D1273-01	Non-potable Water	04/20/18 15:00	04/24/18 9:10	5.4

Authorized by:

*The results in this report apply only to the samples analyzed.
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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Sample Condition Upon Receipt
Minnesota Department of Health Public Health Laboratory



Data Entry Worksheet

Parcel Information

Date & time of receipt: APR 24 '18 9:10

Courier: Walk-in FedEx Spee-Dee UPS USPS Other courier _____

Tracking # 7475 9832 2621

After hours drop-off: Refrigerator (207) (186) () Freezer (185) () Unrefrigerated

Parcel: Plastic cooler Styrofoam/cardboard cooler Cardboard box Envelope Plastic can
 None Other _____

Custody seals present: No; Yes, If "Yes" Custody seals intact: Yes; No _____

Custody seal # _____ Evidentiary samples identified: No Yes

Packaging, Temperature & Radiochemical Information

Packing material: Bubble wrap Styrofoam Paper None Other _____

Cooling material: Wet ice (loose) Wet ice pack #() Gel pack #() Dry ice None
 Other _____

Condition of cooling material: Solid Partially frozen Liquid; Liquid temperature: _____ °C N/A

Representative sample temperature: 5.4 °C IR thermometer instrument used: AS

Samples received with evidence of freezing: No; Yes _____

Rad Chem. request received: No; Yes, If "Yes" sample survey results: < 0.5 mrem/hr ≥ 0.5 mrem/hr

Initials of person receiving parcel:

Chain of Custody, Sample Container & Analysis Information

Chain of custody received with sample containers: Yes No

Chain of custody type: Standard Civil Criminal Priority/Emergency Unknown

All sample containers are unique to a sample point listed on the chain of custody: Yes; No

All sample containers have been collected prior to the expiration date listed on container label:
 Yes; No Unknown _____

All sample containers received intact: Yes; No _____

All sample containers are appropriate for requested analysis: Yes; No Unknown

All analysis have been received within the specified holding time for analysis: Yes; No Unknown

Sample submission details are entered in the Environmental Laboratory LIMS.
Initials of person logging in the work order request into LIMS:

Final Report
Case Narrative

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name: MN SW-057 / MPCA - Freeway LF
Collected by: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/2018 10:44

Except where noted in this report, no additional comments are needed for this Work Order.

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

MDH Sample Number: 18D1273-01

Location ID: FL-TT-08	Collect Date: 04/20/18	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:00	Field Fluoride Result: None
Sampling Point: FL-TT-08	Matrix: Non-potable Water	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		102	70-130	%	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Surrogate: 4-Bromofluorobenzene		101	70-130	%	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Surrogate: Methyl tertiary butyl ether-d3		99	70-130	%	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,1,1-Trichloroethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,1,2-Trichloroethane		<	0.50	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,1-Dichloroethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,1-Dichloroethene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,1-Dichloropropene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,2,3-Trichloropropane		<	0.20	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,2-Dichlorobenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,2-Dichloroethane		<	0.20	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,2-Dichloropropane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,3-Dichlorobenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,3-Dichloropropane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,4-Dichlorobenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
2,2-Dichloropropane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B

FINAL REPORT

Report ID: 05162018104423

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

MDH Sample Number: 18D1273-01

Location ID: FL-TT-08	Collect Date: 04/20/18	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:00	Field Fluoride Result: None
Sampling Point: FL-TT-08	Matrix: Non-potable Water	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
2-Chlorotoluene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
4-Chlorotoluene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Acetone		26	20	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Allyl chloride		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Benzene		<	0.50	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Bromobenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Bromochloromethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Bromodichloromethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Bromoform		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Bromomethane		<	2.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Carbon tetrachloride		<	0.20	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Chlorobenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Chlorodibromomethane		<	0.50	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Chloroethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Chloroform		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Chloromethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Dibromomethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Dichlorodifluoromethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Dichlorofluoromethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Ethyl ether		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Ethylbenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Hexachlorobutadiene		<	0.50	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Isopropylbenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B

FINAL REPORT

Report ID: 05162018104423

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

MDH Sample Number: 18D1273-01

Location ID: FL-TT-08	Collect Date: 04/20/18	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:00	Field Fluoride Result: None
Sampling Point: FL-TT-08	Matrix: Non-potable Water	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Methylene chloride		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Naphthalene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
n-Butylbenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
n-Propylbenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
o-Xylene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
p&m-Xylene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
p-Isopropyltoluene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
sec-Butylbenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Styrene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
tert-Butylbenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Tetrachloroethene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Tetrahydrofuran (THF)		<	10	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Toluene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Trichloroethene (TCE)		<	0.10	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Trichlorofluoromethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Vinyl chloride		<	0.050	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		0.17	0.048	ug/L	1	B8D0444	04/27/18 08:39	04/30/18 16:10	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B8D0470	04/27/18 23:08	04/27/18 23:08	MDH 555

FINAL REPORT

Report ID: 05162018104423

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44


MDH Sample Number: 18D1273-01

Location ID: FL-TT-08	Collect Date: 04/20/18	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:00	Field Fluoride Result: None
Sampling Point: FL-TT-08	Matrix: Non-potable Water	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanoic acid (PFBA)		0.070	0.050	ug/L	1	B8D0470	04/27/18 23:08	04/27/18 23:08	MDH 555
Perfluorohexanesulfonate (PFHxS)	J	0.019	0.025	ug/L	1	B8D0470	04/27/18 23:08	04/27/18 23:08	MDH 555
Perfluorohexanoic acid (PFHxA)		0.080	0.050	ug/L	1	B8D0470	04/27/18 23:08	04/27/18 23:08	MDH 555
Perfluorooctanesulfonate (PFOS)		0.14	0.025	ug/L	1	B8D0470	04/27/18 23:08	04/27/18 23:08	MDH 555
Perfluorooctanoic acid (PFOA)		0.21	0.035	ug/L	1	B8D0470	04/27/18 23:08	04/27/18 23:08	MDH 555
Perfluoropentanoic acid (PFPeA)		0.070	0.050	ug/L	1	B8D0470	04/27/18 23:08	04/27/18 23:08	MDH 555

Authorized by:  <hr/> Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health	<i>The results in this report apply only to the samples analyzed. This report must not be reproduced, except in full, without the written approval of the laboratory.</i>
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Final Report
Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Batch Summary

Samples in Batch: B8D0371 - EPA 5030B Preparation

18D1273-01

Samples in Batch: B8D0444 - 1,4 Dioxane in Water SPE

18D1273-01

Samples in Batch: B8D0470 - PFCs Preparation

18D1273-01

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Final Report
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Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

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Batch B8D0371 - EPA 5030B Preparation

Blank (B8D0371-BLK1)

Prepared: 04/24/18 17:15 Analyzed: 04/24/18 17:15

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		102	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L						
1,1,1-Trichloroethane		<	1.0	ug/L						
1,1,2,2-Tetrachloroethane		<	0.50	ug/L						
1,1,2-Trichloroethane		<	0.50	ug/L						
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L						
1,1-Dichloroethane		<	1.0	ug/L						
1,1-Dichloroethene		<	1.0	ug/L						
1,1-Dichloropropene		<	1.0	ug/L						
1,2,3-Trichlorobenzene		<	1.0	ug/L						
1,2,3-Trichloropropane		<	0.20	ug/L						
1,2,4-Trichlorobenzene		<	1.0	ug/L						
1,2,4-Trimethylbenzene		<	1.0	ug/L						
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L						
1,2-Dibromoethane (EDB)		<	0.50	ug/L						
1,2-Dichlorobenzene		<	1.0	ug/L						
1,2-Dichloroethane		<	0.20	ug/L						
1,2-Dichloropropane		<	1.0	ug/L						
1,3,5-Trimethylbenzene		<	1.0	ug/L						
1,3-Dichlorobenzene		<	1.0	ug/L						
1,3-Dichloropropane		<	1.0	ug/L						
1,4-Dichlorobenzene		<	1.0	ug/L						
2,2-Dichloropropane		<	1.0	ug/L						
2-Chlorotoluene		<	1.0	ug/L						
4-Chlorotoluene		<	1.0	ug/L						
Acetone		<	20	ug/L						
Allyl chloride		<	1.0	ug/L						
Benzene		<	0.50	ug/L						
Bromobenzene		<	1.0	ug/L						
Bromochloromethane		<	1.0	ug/L						
Bromodichloromethane		<	1.0	ug/L						
Bromoform		<	1.0	ug/L						

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Report ID: 05162018104423

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Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

Blank (B8D0371-BLK1)

Prepared: 04/24/18 17:15 Analyzed: 04/24/18 17:15

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Bromomethane		<	2.0	ug/L						
Carbon tetrachloride		<	0.20	ug/L						
Chlorobenzene		<	1.0	ug/L						
Chlorodibromomethane		<	0.50	ug/L						
Chloroethane		<	1.0	ug/L						
Chloroform		<	1.0	ug/L						
Chloromethane		<	1.0	ug/L						
cis-1,2-Dichloroethene		<	1.0	ug/L						
cis-1,3-Dichloropropene		<	0.50	ug/L						
Dibromomethane		<	1.0	ug/L						
Dichlorodifluoromethane		<	1.0	ug/L						
Dichlorofluoromethane		<	1.0	ug/L						
Ethyl ether		<	1.0	ug/L						
Ethylbenzene		<	1.0	ug/L						
Hexachlorobutadiene		<	0.50	ug/L						
Isopropylbenzene		<	1.0	ug/L						
Methyl ethyl ketone (MEK)		<	10	ug/L						
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L						
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L						
Methylene chloride		<	1.0	ug/L						
Naphthalene		<	1.0	ug/L						
n-Butylbenzene		<	1.0	ug/L						
n-Propylbenzene		<	1.0	ug/L						
o-Xylene		<	1.0	ug/L						
p&m-Xylene		<	1.0	ug/L						
p-Isopropyltoluene		<	1.0	ug/L						
sec-Butylbenzene		<	1.0	ug/L						
Styrene		<	1.0	ug/L						
tert-Butylbenzene		<	1.0	ug/L						
Tetrachloroethene		<	1.0	ug/L						
Tetrahydrofuran (THF)		<	10	ug/L						
Toluene		<	1.0	ug/L						
trans-1,2-Dichloroethene		<	1.0	ug/L						
trans-1,3-Dichloropropene		<	0.50	ug/L						
Trichloroethene (TCE)		<	0.10	ug/L						

FINAL REPORT

Report ID: 05162018104423

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Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

Blank (B8D0371-BLK1)

Prepared: 04/24/18 17:15 Analyzed: 04/24/18 17:15

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Trichlorofluoromethane		<	1.0	ug/L						
Vinyl chloride		<	0.050	ug/L						

LCS (B8D0371-BS1)

Prepared: 04/24/18 14:57 Analyzed: 04/24/18 14:57

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		100	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		103	70-130	%	10					
1,1,1,2-Tetrachloroethane		9.9	1.0	ug/L	10		99	70-130		
1,1,1-Trichloroethane		10	1.0	ug/L	10		104	70-130		
1,1,2,2-Tetrachloroethane		9.7	0.50	ug/L	10		97	70-130		
1,1,2-Trichloroethane		9.2	0.50	ug/L	10		92	70-130		
1,1,2-Trichlorotrifluoroethane		10	1.0	ug/L	10		105	70-130		
1,1-Dichloroethane		10	1.0	ug/L	10		102	70-130		
1,1-Dichloroethene		10	1.0	ug/L	10		104	70-130		
1,1-Dichloropropene		11	1.0	ug/L	10		105	70-130		
1,2,3-Trichlorobenzene		9.8	1.0	ug/L	10		98	70-130		
1,2,3-Trichloropropane		9.4	0.20	ug/L	10		94	70-130		
1,2,4-Trichlorobenzene		10	1.0	ug/L	10		100	70-130		
1,2,4-Trimethylbenzene		10	1.0	ug/L	10		101	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		10	1.0	ug/L	10		101	70-130		
1,2-Dibromoethane (EDB)		9.9	0.50	ug/L	10		99	70-130		
1,2-Dichlorobenzene		9.8	1.0	ug/L	10		98	70-130		
1,2-Dichloroethane		9.7	0.20	ug/L	10		97	70-130		
1,2-Dichloropropane		10	1.0	ug/L	10		101	70-130		
1,3,5-Trimethylbenzene		10	1.0	ug/L	10		102	70-130		
1,3-Dichlorobenzene		9.9	1.0	ug/L	10		99	70-130		
1,3-Dichloropropane		9.8	1.0	ug/L	10		98	70-130		
1,4-Dichlorobenzene		10	1.0	ug/L	10		101	70-130		
2,2-Dichloropropane		10	1.0	ug/L	10		104	70-130		
2-Chlorotoluene		10	1.0	ug/L	10		100	70-130		
4-Chlorotoluene		10	1.0	ug/L	10		101	70-130		
Acetone		86	20	ug/L	100		86	70-130		

FINAL REPORT

Report ID: 05162018104423

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Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

LCS (B8D0371-BS1)

Prepared: 04/24/18 14:57 Analyzed: 04/24/18 14:57

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Allyl chloride		9.8	1.0	ug/L	10		98	70-130		
Benzene		10	0.50	ug/L	10		103	70-130		
Bromobenzene		10	1.0	ug/L	10		100	70-130		
Bromochloromethane		9.9	1.0	ug/L	10		99	70-130		
Bromodichloromethane		10	1.0	ug/L	10		103	70-130		
Bromoform		10	1.0	ug/L	10		103	70-130		
Bromomethane		11	2.0	ug/L	10		107	70-130		
Carbon tetrachloride		11	0.20	ug/L	10		105	70-130		
Chlorobenzene		9.9	1.0	ug/L	10		99	70-130		
Chlorodibromomethane		10	0.50	ug/L	10		102	70-130		
Chloroethane		9.7	1.0	ug/L	10		97	70-130		
Chloroform		10	1.0	ug/L	10		101	70-130		
Chloromethane		9.6	1.0	ug/L	10		96	70-130		
cis-1,2-Dichloroethene		10	1.0	ug/L	10		101	70-130		
cis-1,3-Dichloropropene		9.7	0.50	ug/L	10		97	70-130		
Dibromomethane		9.8	1.0	ug/L	10		98	70-130		
Dichlorodifluoromethane		9.5	1.0	ug/L	10		95	70-130		
Dichlorofluoromethane		10	1.0	ug/L	10		102	70-130		
Ethyl ether		9.8	1.0	ug/L	10		98	70-130		
Ethylbenzene		10	1.0	ug/L	10		101	70-130		
Hexachlorobutadiene		10	0.50	ug/L	10		102	70-130		
Isopropylbenzene		10	1.0	ug/L	10		101	70-130		
Methyl ethyl ketone (MEK)		47	10	ug/L	50		95	70-130		
Methyl isobutyl ketone (MIBK)		50	5.0	ug/L	50		100	70-130		
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10		100	70-130		
Methylene chloride		10	1.0	ug/L	10		102	70-130		
Naphthalene		10	1.0	ug/L	10		102	70-130		
n-Butylbenzene		10	1.0	ug/L	10		104	70-130		
n-Propylbenzene		10	1.0	ug/L	10		103	70-130		
o-Xylene		10	1.0	ug/L	10		101	70-130		
p&m-Xylene		10	1.0	ug/L	10		102	70-130		
p-Isopropyltoluene		10	1.0	ug/L	10		104	70-130		
sec-Butylbenzene		11	1.0	ug/L	10		106	70-130		
Styrene		10	1.0	ug/L	10		100	70-130		
tert-Butylbenzene		10	1.0	ug/L	10		103	70-130		

FINAL REPORT

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Final Report
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Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

LCS (B8D0371-BS1)

Prepared: 04/24/18 14:57 Analyzed: 04/24/18 14:57

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Tetrachloroethene		10	1.0	ug/L	10		102	70-130		
Tetrahydrofuran (THF)		93	10	ug/L	100		93	70-130		
Toluene		9.8	1.0	ug/L	10		98	70-130		
trans-1,2-Dichloroethene		10	1.0	ug/L	10		105	70-130		
trans-1,3-Dichloropropene		9.9	0.50	ug/L	10		99	70-130		
Trichloroethene (TCE)		10	0.10	ug/L	10		101	70-130		
Trichlorofluoromethane		10	1.0	ug/L	10		100	70-130		
Vinyl chloride		9.8	0.050	ug/L	10		98	70-130		

LCS Dup (B8D0371-BSD1)

Prepared: 04/24/18 15:24 Analyzed: 04/24/18 15:24

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		100	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		103	70-130	%	10					
1,1,1,2-Tetrachloroethane		9.9	1.0	ug/L	10		99	70-130	0.1	30
1,1,1-Trichloroethane		10	1.0	ug/L	10		102	70-130	2	30
1,1,2,2-Tetrachloroethane		9.9	0.50	ug/L	10		99	70-130	2	30
1,1,2-Trichloroethane		9.7	0.50	ug/L	10		97	70-130	5	30
1,1,2-Trichlorotrifluoroethane		10	1.0	ug/L	10		103	70-130	2	30
1,1-Dichloroethane		10	1.0	ug/L	10		103	70-130	1	30
1,1-Dichloroethene		10	1.0	ug/L	10		100	70-130	4	30
1,1-Dichloropropene		10	1.0	ug/L	10		104	70-130	1	30
1,2,3-Trichlorobenzene		10	1.0	ug/L	10		100	70-130	2	30
1,2,3-Trichloropropane		9.5	0.20	ug/L	10		95	70-130	2	30
1,2,4-Trichlorobenzene		9.8	1.0	ug/L	10		98	70-130	1	30
1,2,4-Trimethylbenzene		10	1.0	ug/L	10		101	70-130	0	30
1,2-Dibromo-3-chloropropane (DBCP)		9.7	1.0	ug/L	10		97	70-130	4	30
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10		100	70-130	1	30
1,2-Dichlorobenzene		9.8	1.0	ug/L	10		98	70-130	0.1	30
1,2-Dichloroethane		9.8	0.20	ug/L	10		98	70-130	1	30
1,2-Dichloropropane		10	1.0	ug/L	10		102	70-130	1	30
1,3,5-Trimethylbenzene		10	1.0	ug/L	10		100	70-130	2	30
1,3-Dichlorobenzene		10	1.0	ug/L	10		100	70-130	0.8	30

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

LCS Dup (B8D0371-BSD1)

Prepared: 04/24/18 15:24 Analyzed: 04/24/18 15:24

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,3-Dichloropropane		9.9	1.0	ug/L	10		99	70-130	0.9	30
1,4-Dichlorobenzene		9.8	1.0	ug/L	10		98	70-130	3	30
2,2-Dichloropropane		10	1.0	ug/L	10		102	70-130	3	30
2-Chlorotoluene		10	1.0	ug/L	10		100	70-130	0.2	30
4-Chlorotoluene		10	1.0	ug/L	10		100	70-130	0.5	30
Acetone		90	20	ug/L	100		90	70-130	5	30
Allyl chloride		10	1.0	ug/L	10		102	70-130	4	30
Benzene		10	0.50	ug/L	10		103	70-130	0.5	30
Bromobenzene		9.9	1.0	ug/L	10		99	70-130	0.4	30
Bromochloromethane		10	1.0	ug/L	10		101	70-130	2	30
Bromodichloromethane		10	1.0	ug/L	10		102	70-130	1	30
Bromoform		9.8	1.0	ug/L	10		98	70-130	5	30
Bromomethane		11	2.0	ug/L	10		107	70-130	0.5	30
Carbon tetrachloride		10	0.20	ug/L	10		104	70-130	2	30
Chlorobenzene		10	1.0	ug/L	10		100	70-130	0.9	30
Chlorodibromomethane		10	0.50	ug/L	10		100	70-130	2	30
Chloroethane		9.7	1.0	ug/L	10		97	70-130	0	30
Chloroform		10	1.0	ug/L	10		101	70-130	0.1	30
Chloromethane		9.5	1.0	ug/L	10		95	70-130	1	30
cis-1,2-Dichloroethene		10	1.0	ug/L	10		101	70-130	0.1	30
cis-1,3-Dichloropropene		9.6	0.50	ug/L	10		96	70-130	0.6	30
Dibromomethane		10	1.0	ug/L	10		100	70-130	2	30
Dichlorodifluoromethane		9.4	1.0	ug/L	10		94	70-130	0.5	30
Dichlorofluoromethane		10	1.0	ug/L	10		102	70-130	0.4	30
Ethyl ether		10	1.0	ug/L	10		101	70-130	3	30
Ethylbenzene		10	1.0	ug/L	10		100	70-130	1	30
Hexachlorobutadiene		10	0.50	ug/L	10		100	70-130	3	30
Isopropylbenzene		10	1.0	ug/L	10		101	70-130	0.5	30
Methyl ethyl ketone (MEK)		49	10	ug/L	50		97	70-130	2	30
Methyl isobutyl ketone (MIBK)		51	5.0	ug/L	50		101	70-130	2	30
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10		101	70-130	1	30
Methylene chloride		10	1.0	ug/L	10		104	70-130	2	30
Naphthalene		10	1.0	ug/L	10		101	70-130	0.8	30
n-Butylbenzene		10	1.0	ug/L	10		103	70-130	1	30
n-Propylbenzene		10	1.0	ug/L	10		102	70-130	1	30

FINAL REPORT

Report ID: 05162018104423

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

LCS Dup (B8D0371-BSD1)

Prepared: 04/24/18 15:24 Analyzed: 04/24/18 15:24

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
o-Xylene		9.9	1.0	ug/L	10		99	70-130	2	30
p&m-Xylene		10	1.0	ug/L	10		103	70-130	1	30
p-Isopropyltoluene		10	1.0	ug/L	10		103	70-130	1	30
sec-Butylbenzene		10	1.0	ug/L	10		104	70-130	2	30
Styrene		10	1.0	ug/L	10		101	70-130	1	30
tert-Butylbenzene		10	1.0	ug/L	10		100	70-130	3	30
Tetrachloroethene		10	1.0	ug/L	10		102	70-130	0.3	30
Tetrahydrofuran (THF)		94	10	ug/L	100		94	70-130	1	30
Toluene		9.9	1.0	ug/L	10		99	70-130	0.8	30
trans-1,2-Dichloroethene		10	1.0	ug/L	10		102	70-130	3	30
trans-1,3-Dichloropropene		9.9	0.50	ug/L	10		99	70-130	0.2	30
Trichloroethene (TCE)		10	0.10	ug/L	10		100	70-130	0.7	30
Trichlorofluoromethane		9.8	1.0	ug/L	10		98	70-130	1	30
Vinyl chloride		9.7	0.050	ug/L	10		97	70-130	1	30

Duplicate (B8D0371-DUP1)

Source: 18D0792-01

Prepared: 04/24/18 19:04 Analyzed: 04/24/18 19:04

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4	F4	100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene	F4	102	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3	F4	100	70-130	%	10					
1,1,1,2-Tetrachloroethane	F4	<	1.0	ug/L		<				30
1,1,1-Trichloroethane	F4	<	1.0	ug/L		<				30
1,1,2,2-Tetrachloroethane	F4	<	0.50	ug/L		<				30
1,1,2-Trichloroethane	F4	<	0.50	ug/L		<				30
1,1,2-Trichlorotrifluoroethane	F4	<	1.0	ug/L		<				30
1,1-Dichloroethane	F4	<	1.0	ug/L		<				30
1,1-Dichloroethene	F4	<	1.0	ug/L		<				30
1,1-Dichloropropene	F4	<	1.0	ug/L		<				30
1,2,3-Trichlorobenzene	F4	<	1.0	ug/L		<				30
1,2,3-Trichloropropane	F4	<	0.20	ug/L		<				30
1,2,4-Trichlorobenzene	F4	<	1.0	ug/L		<				30
1,2,4-Trimethylbenzene	F4	6.2	1.0	ug/L		5.7			8	30
1,2-Dibromo-3-chloropropane (DBCP)	F4	<	1.0	ug/L		<				30

FINAL REPORT

Report ID: 05162018104423

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

Duplicate (B8D0371-DUP1)

Source: 18D0792-01

Prepared: 04/24/18 19:04 Analyzed: 04/24/18 19:04

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2-Dibromoethane (EDB)	F4	<	0.50	ug/L	<	<				30
1,2-Dichlorobenzene	F4	<	1.0	ug/L	<	<				30
1,2-Dichloroethane	F4	<	0.20	ug/L	<	<				30
1,2-Dichloropropane	F4	0.22	1.0	ug/L	<	<				30
1,3,5-Trimethylbenzene	F4	1.6	1.0	ug/L		1.6			5	30
1,3-Dichlorobenzene	F4	<	1.0	ug/L	<	<				30
1,3-Dichloropropane	F4	<	1.0	ug/L	<	<				30
1,4-Dichlorobenzene	F4	<	1.0	ug/L	<	<				30
2,2-Dichloropropane	F4	<	1.0	ug/L	<	<				30
2-Chlorotoluene	F4	<	1.0	ug/L	<	<				30
4-Chlorotoluene	F4	<	1.0	ug/L	<	<				30
Acetone	F4	18	20	ug/L	<	<			5	30
Allyl chloride	F4	<	1.0	ug/L	<	<				30
Benzene	F4	1.6	0.50	ug/L		1.4			11	30
Bromobenzene	F4	<	1.0	ug/L	<	<				30
Bromochloromethane	F4	<	1.0	ug/L	<	<				30
Bromodichloromethane	F4	<	1.0	ug/L	<	<				30
Bromoform	F4	<	1.0	ug/L	<	<				30
Bromomethane	F4	<	2.0	ug/L	<	<				30
Carbon tetrachloride	F4	<	0.20	ug/L	<	<				30
Chlorobenzene	F4	<	1.0	ug/L	<	<				30
Chlorodibromomethane	F4	<	0.50	ug/L	<	<				30
Chloroethane	F4	0.23	1.0	ug/L	<	<				30
Chloroform	F4	<	1.0	ug/L	<	<				30
Chloromethane	F4	<	1.0	ug/L	<	<				30
cis-1,2-Dichloroethene	F4	1.7	1.0	ug/L		1.6			7	30
cis-1,3-Dichloropropene	F4	<	0.50	ug/L	<	<				30
Dibromomethane	F4	<	1.0	ug/L	<	<				30
Dichlorodifluoromethane	F4	<	1.0	ug/L	<	<				30
Dichlorofluoromethane	F4	<	1.0	ug/L	<	<				30
Ethyl ether	F4	9.4	1.0	ug/L		8.6			8	30
Ethylbenzene	F4	2.2	1.0	ug/L		2.2			1	30
Hexachlorobutadiene	F4	<	0.50	ug/L	<	<				30
Isopropylbenzene	F4	0.80	1.0	ug/L	<	<			6	30
Methyl ethyl ketone (MEK)	F4	13	10	ug/L		13			1	30

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

Duplicate (B8D0371-DUP1)		Source: 18D0792-01		Prepared: 04/24/18 19:04 Analyzed: 04/24/18 19:04						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Methyl isobutyl ketone (MIBK)	F4	2.3	5.0	ug/L		<			3	30
Methyl tertiary butyl ether (MTBE)	F4	0.91	2.0	ug/L		<			6	30
Methylene chloride	F4	0.56	1.0	ug/L		<			7	30
Naphthalene	F4	2.2	1.0	ug/L		2.1			1	30
n-Butylbenzene	F4	<	1.0	ug/L		<				30
n-Propylbenzene	F4	0.89	1.0	ug/L		<			7	30
o-Xylene	F4	1.8	1.0	ug/L		1.7			3	30
p&m-Xylene	F4	5.1	1.0	ug/L		5.0			0.8	30
p-Isopropyltoluene	F4	2.4	1.0	ug/L		2.2			7	30
sec-Butylbenzene	F4	<	1.0	ug/L		<				30
Styrene	F4	<	1.0	ug/L		<				30
tert-Butylbenzene	F4	<	1.0	ug/L		<				30
Tetrachloroethene	F4	<	1.0	ug/L		<				30
Tetrahydrofuran (THF)	F4	26	10	ug/L		25			5	30
Toluene	F4	2.8	1.0	ug/L		2.8			2	30
trans-1,2-Dichloroethene	F4	<	1.0	ug/L		<				30
trans-1,3-Dichloropropene	F4	<	0.50	ug/L		<				30
Trichloroethene (TCE)	F4	0.080	0.10	ug/L		<			0	30
Trichlorofluoromethane	F4	<	1.0	ug/L		<				30
Vinyl chloride	F4	<	0.050	ug/L		<				30

Matrix Spike (B8D0371-MS1)		Source: 18D0790-01		Prepared: 04/24/18 15:52 Analyzed: 04/24/18 15:52						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		102	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		103	70-130	%	10					
1,1,1,2-Tetrachloroethane		7.9	1.0	ug/L	10	<	79	70-130		
1,1,1-Trichloroethane		8.1	1.0	ug/L	10	<	81	70-130		
1,1,2,2-Tetrachloroethane		7.9	0.50	ug/L	10	<	79	70-130		
1,1,2-Trichloroethane		7.5	0.50	ug/L	10	<	75	70-130		
1,1,2-Trichlorotrifluoroethane		8.5	1.0	ug/L	10	<	85	70-130		
1,1-Dichloroethane		8.2	1.0	ug/L	10	<	82	70-130		
1,1-Dichloroethene		8.5	1.0	ug/L	10	<	85	70-130		
1,1-Dichloropropene		8.6	1.0	ug/L	10	<	86	70-130		

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

Matrix Spike (B8D0371-MS1)		Source: 18D0790-01		Prepared: 04/24/18 15:52 Analyzed: 04/24/18 15:52						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2,3-Trichlorobenzene		7.8	1.0	ug/L	10	<	78	70-130		
1,2,3-Trichloropropane		8.1	0.20	ug/L	10	<	81	70-130		
1,2,4-Trichlorobenzene		7.6	1.0	ug/L	10	<	76	70-130		
1,2,4-Trimethylbenzene		7.9	1.0	ug/L	10	<	79	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		9.7	1.0	ug/L	10	<	97	70-130		
1,2-Dibromoethane (EDB)		7.7	0.50	ug/L	10	<	77	70-130		
1,2-Dichlorobenzene		7.7	1.0	ug/L	10	<	77	70-130		
1,2-Dichloroethane		7.5	0.20	ug/L	10	<	75	70-130		
1,2-Dichloropropane		7.6	1.0	ug/L	10	<	76	70-130		
1,3,5-Trimethylbenzene		8.1	1.0	ug/L	10	<	81	70-130		
1,3-Dichlorobenzene		7.6	1.0	ug/L	10	<	76	70-130		
1,3-Dichloropropane		7.6	1.0	ug/L	10	<	76	70-130		
1,4-Dichlorobenzene		7.8	1.0	ug/L	10	<	78	70-130		
2,2-Dichloropropane		8.3	1.0	ug/L	10	<	83	70-130		
2-Chlorotoluene		7.9	1.0	ug/L	10	<	79	70-130		
4-Chlorotoluene		7.9	1.0	ug/L	10	<	79	70-130		
Acetone		98	20	ug/L	100	<	94	70-130		
Allyl chloride		8.0	1.0	ug/L	10	<	80	70-130		
Benzene		10	0.50	ug/L	10	2.7	77	70-130		
Bromobenzene		7.5	1.0	ug/L	10	<	75	70-130		
Bromochloromethane		7.6	1.0	ug/L	10	<	76	70-130		
Bromodichloromethane		7.7	1.0	ug/L	10	<	77	70-130		
Bromoform		8.2	1.0	ug/L	10	<	82	70-130		
Bromomethane		8.4	2.0	ug/L	10	<	84	70-130		
Carbon tetrachloride		8.3	0.20	ug/L	10	<	83	70-130		
Chlorobenzene		10	1.0	ug/L	10	2.1	78	70-130		
Chlorodibromomethane		7.8	0.50	ug/L	10	<	78	70-130		
Chloroethane		8.3	1.0	ug/L	10	1.1	71	70-130		
Chloroform		7.8	1.0	ug/L	10	<	78	70-130		
Chloromethane		7.6	1.0	ug/L	10	<	76	70-130		
cis-1,2-Dichloroethene		7.8	1.0	ug/L	10	<	78	70-130		
cis-1,3-Dichloropropene		7.4	0.50	ug/L	10	<	74	70-130		
Dibromomethane		7.3	1.0	ug/L	10	<	73	70-130		
Dichlorodifluoromethane		7.7	1.0	ug/L	10	<	77	70-130		
Dichlorofluoromethane		8.1	1.0	ug/L	10	<	81	70-130		

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

Matrix Spike (B8D0371-MS1)		Source: 18D0790-01		Prepared: 04/24/18 15:52 Analyzed: 04/24/18 15:52						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Ethyl ether		8.4	1.0	ug/L	10	1.1	73	70-130		
Ethylbenzene		8.1	1.0	ug/L	10	<	81	70-130		
Hexachlorobutadiene		8.2	0.50	ug/L	10	<	82	70-130		
Isopropylbenzene		8.3	1.0	ug/L	10	<	83	70-130		
Methyl ethyl ketone (MEK)		52	10	ug/L	50	<	103	70-130		
Methyl isobutyl ketone (MIBK)		49	5.0	ug/L	50	<	97	70-130		
Methyl tertiary butyl ether (MTBE)		7.5	2.0	ug/L	10	<	75	70-130		
Methylene chloride		7.7	1.0	ug/L	10	<	77	70-130		
Naphthalene		8.3	1.0	ug/L	10	<	83	70-130		
n-Butylbenzene		8.4	1.0	ug/L	10	<	84	70-130		
n-Propylbenzene		8.3	1.0	ug/L	10	<	83	70-130		
o-Xylene		8.0	1.0	ug/L	10	<	80	70-130		
p&m-Xylene		8.3	1.0	ug/L	10	<	83	70-130		
p-Isopropyltoluene		8.5	1.0	ug/L	10	<	85	70-130		
sec-Butylbenzene		8.4	1.0	ug/L	10	<	84	70-130		
Styrene		7.6	1.0	ug/L	10	<	76	70-130		
tert-Butylbenzene		8.2	1.0	ug/L	10	<	82	70-130		
Tetrachloroethene		8.2	1.0	ug/L	10	<	82	70-130		
Tetrahydrofuran (THF)		99	10	ug/L	100	<	96	70-130		
Toluene		8.0	1.0	ug/L	10	<	80	70-130		
trans-1,2-Dichloroethene		8.1	1.0	ug/L	10	<	81	70-130		
trans-1,3-Dichloropropene		7.6	0.50	ug/L	10	<	76	70-130		
Trichloroethene (TCE)		8.1	0.10	ug/L	10	0.15	79	70-130		
Trichlorofluoromethane		8.0	1.0	ug/L	10	<	80	70-130		
Vinyl chloride		8.0	0.050	ug/L	10	0.10	78	70-130		

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0444 - 1,4 Dioxane in Water SPE

Blank (B8D0444-BLK1)

Prepared: 04/27/18 08:39 Analyzed: 04/30/18 10:53

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		<	0.050	ug/L						

LCS (B8D0444-BS1)

Prepared: 04/27/18 08:39 Analyzed: 04/30/18 11:08

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.21	0.050	ug/L	0.19		107	80-120		

Duplicate (B8D0444-DUP1)

Source: 18D0790-01

Prepared: 04/27/18 08:39 Analyzed: 04/30/18 11:56

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		8.6	0.049	ug/L		8.4			3	30

Matrix Spike (B8D0444-MS1)

Source: 18D0790-02

Prepared: 04/27/18 08:39 Analyzed: 04/30/18 11:24

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane	M1	3.2	0.052	ug/L	0.46	2.2	216	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0470 - PFCs Preparation

Blank (B8D0470-BLK1)

Prepared: 04/27/18 18:26 Analyzed: 04/27/18 18:26

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

Blank (B8D0470-BLK2)

Prepared: 04/28/18 00:29 Analyzed: 04/28/18 00:29

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

LCS (B8D0470-BS1)

Prepared: 04/27/18 18:18 Analyzed: 04/27/18 18:18

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50		101	80-120		
Perfluorobutanoic acid (PFBA)		0.48	0.050	ug/L	0.5		95	80-120		
Perfluorohexanesulfonate (PFHxS)		0.48	0.025	ug/L	0.50		95	80-120		
Perfluorohexanoic acid (PFHxA)		0.46	0.050	ug/L	0.5		91	80-120		
Perfluorooctanesulfonate (PFOS)		0.47	0.025	ug/L	0.49		95	80-120		
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5		99	80-120		
Perfluoropentanoic acid (PFPeA)		0.46	0.050	ug/L	0.5		92	80-120		

LCS Dup (B8D0470-BSD1)

Prepared: 04/28/18 00:21 Analyzed: 04/28/18 00:21

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.48	0.050	ug/L	0.50		96	80-120	5	20
Perfluorobutanoic acid (PFBA)		0.48	0.050	ug/L	0.5		96	80-120	0.9	20
Perfluorohexanesulfonate (PFHxS)		0.46	0.025	ug/L	0.50		92	80-120	3	20

FINAL REPORT

Report ID: 05162018104423

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0470 - PFCs Preparation

LCS Dup (B8D0470-BSD1)

Prepared: 04/28/18 00:21 Analyzed: 04/28/18 00:21

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.48	0.050	ug/L	0.5		96	80-120	5	20
Perfluorooctanesulfonate (PFOS)		0.45	0.025	ug/L	0.49		90	80-120	5	20
Perfluorooctanoic acid (PFOA)		0.47	0.035	ug/L	0.5		95	80-120	4	20
Perfluoropentanoic acid (PFPeA)		0.46	0.050	ug/L	0.5		92	80-120	0.3	20

Duplicate (B8D0470-DUP1)

Source: 18D0967-01

Prepared: 04/27/18 18:51 Analyzed: 04/27/18 18:51

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L		<				20
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L		<				20
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L		<				20
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L		<				20
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L		<				20
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L		<				20
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L		<				20

Matrix Spike (B8D0470-MS1)

Source: 18D0967-01

Prepared: 04/27/18 18:42 Analyzed: 04/27/18 18:42

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.47	0.050	ug/L	0.50	<	93	70-130		
Perfluorobutanoic acid (PFBA)		0.49	0.050	ug/L	0.5	<	95	70-130		
Perfluorohexanesulfonate (PFHxS)		0.46	0.025	ug/L	0.50	<	91	70-130		
Perfluorohexanoic acid (PFHxA)		0.44	0.050	ug/L	0.5	<	89	70-130		
Perfluorooctanesulfonate (PFOS)		0.48	0.025	ug/L	0.49	<	95	70-130		
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5	<	98	70-130		
Perfluoropentanoic acid (PFPeA)		0.47	0.050	ug/L	0.5	<	94	70-130		

Matrix Spike (B8D0470-MS2)

Source: 18D0967-02

Prepared: 04/27/18 19:15 Analyzed: 04/27/18 19:15

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.48	0.050	ug/L	0.50	<	96	70-130		
Perfluorobutanoic acid (PFBA)		0.72	0.050	ug/L	0.5	0.22	98	70-130		
Perfluorohexanesulfonate (PFHxS)		0.49	0.025	ug/L	0.50	<	98	70-130		
Perfluorohexanoic acid (PFHxA)		0.47	0.050	ug/L	0.5	<	94	70-130		
Perfluorooctanesulfonate (PFOS)		0.46	0.025	ug/L	0.49	<	92	70-130		
Perfluorooctanoic acid (PFOA)		0.48	0.035	ug/L	0.5	<	97	70-130		

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0470 - PFCs Preparation

Matrix Spike (B8D0470-MS2) Source: 18D0967-02 Prepared: 04/27/18 19:15 Analyzed: 04/27/18 19:15

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluoropentanoic acid (PFPeA)		0.48	0.050	ug/L	0.5	<	94	70-130		

Matrix Spike (B8D0470-MS3) Source: 18D0792-01 Prepared: 04/27/18 19:31 Analyzed: 04/27/18 19:31

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	96	70-130		
Perfluorobutanoic acid (PFBA)		0.85	0.050	ug/L	0.5	0.38	94	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	0.085	91	70-130		
Perfluorohexanoic acid (PFHxA)		0.58	0.050	ug/L	0.5	0.12	92	70-130		
Perfluorooctanesulfonate (PFOS)		0.78	0.025	ug/L	0.49	0.30	95	70-130		
Perfluorooctanoic acid (PFOA)		0.81	0.035	ug/L	0.5	0.35	92	70-130		
Perfluoropentanoic acid (PFPeA)		0.58	0.050	ug/L	0.5	0.12	92	70-130		

Matrix Spike (B8D0470-MS4) Source: 18D0792-02 Prepared: 04/27/18 19:47 Analyzed: 04/27/18 19:47

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	94	70-130		
Perfluorobutanoic acid (PFBA)		0.75	0.050	ug/L	0.5	0.27	96	70-130		
Perfluorohexanesulfonate (PFHxS)		0.60	0.025	ug/L	0.50	0.12	97	70-130		
Perfluorohexanoic acid (PFHxA)		0.56	0.050	ug/L	0.5	0.12	88	70-130		
Perfluorooctanesulfonate (PFOS)		1.0	0.025	ug/L	0.49	0.50	101	70-130		
Perfluorooctanoic acid (PFOA)		0.72	0.035	ug/L	0.5	0.24	97	70-130		
Perfluoropentanoic acid (PFPeA)		0.55	0.050	ug/L	0.5	0.076	95	70-130		

Matrix Spike (B8D0470-MS5) Source: 18D0792-03 Prepared: 04/27/18 20:03 Analyzed: 04/27/18 20:03

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	98	70-130		
Perfluorobutanoic acid (PFBA)		2.1	0.050	ug/L	0.5	1.6	89	70-130		
Perfluorohexanesulfonate (PFHxS)		2.5	0.025	ug/L	0.50	1.9	105	70-130		
Perfluorohexanoic acid (PFHxA)		1.2	0.050	ug/L	0.5	0.66	108	70-130		
Perfluorooctanesulfonate (PFOS)		0.79	0.025	ug/L	0.49	0.33	91	70-130		
Perfluorooctanoic acid (PFOA)		2.1	0.035	ug/L	0.5	1.6	115	70-130		
Perfluoropentanoic acid (PFPeA)		0.71	0.050	ug/L	0.5	0.24	94	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0470 - PFCs Preparation

Matrix Spike (B8D0470-MS6) Source: 18D0864-01 Prepared: 04/27/18 20:19 Analyzed: 04/27/18 20:19

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.47	0.050	ug/L	0.50	<	93	70-130		
Perfluorobutanoic acid (PFBA)		0.48	0.050	ug/L	0.5	<	95	70-130		
Perfluorohexanesulfonate (PFHxS)		0.52	0.025	ug/L	0.50	<	99	70-130		
Perfluorohexanoic acid (PFHxA)		0.44	0.050	ug/L	0.5	<	89	70-130		
Perfluorooctanesulfonate (PFOS)		0.48	0.025	ug/L	0.49	<	96	70-130		
Perfluorooctanoic acid (PFOA)		0.45	0.035	ug/L	0.5	<	90	70-130		
Perfluoropentanoic acid (PFPeA)		0.47	0.050	ug/L	0.5	<	95	70-130		

Matrix Spike (B8D0470-MS7) Source: 18D0864-02 Prepared: 04/27/18 20:35 Analyzed: 04/27/18 20:35

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.45	0.050	ug/L	0.50	<	89	70-130		
Perfluorobutanoic acid (PFBA)		0.49	0.050	ug/L	0.5	<	95	70-130		
Perfluorohexanesulfonate (PFHxS)		0.47	0.025	ug/L	0.50	<	94	70-130		
Perfluorohexanoic acid (PFHxA)		0.47	0.050	ug/L	0.5	<	91	70-130		
Perfluorooctanesulfonate (PFOS)		0.46	0.025	ug/L	0.49	<	91	70-130		
Perfluorooctanoic acid (PFOA)		0.47	0.035	ug/L	0.5	<	94	70-130		
Perfluoropentanoic acid (PFPeA)		0.48	0.050	ug/L	0.5	<	93	70-130		

Matrix Spike (B8D0470-MS8) Source: 18D0864-03 Prepared: 04/27/18 20:51 Analyzed: 04/27/18 20:51

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	98	70-130		
Perfluorobutanoic acid (PFBA)		0.61	0.050	ug/L	0.5	0.15	93	70-130		
Perfluorohexanesulfonate (PFHxS)		0.46	0.025	ug/L	0.50	<	92	70-130		
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	<	91	70-130		
Perfluorooctanesulfonate (PFOS)		0.48	0.025	ug/L	0.49	<	95	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	0.037	97	70-130		
Perfluoropentanoic acid (PFPeA)		0.55	0.050	ug/L	0.5	0.076	94	70-130		

Matrix Spike (B8D0470-MS9) Source: 18D0864-04 Prepared: 04/27/18 21:07 Analyzed: 04/27/18 21:07

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	100	70-130		
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5	<	95	70-130		
Perfluorohexanesulfonate (PFHxS)		0.49	0.025	ug/L	0.50	<	99	70-130		

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0470 - PFCs Preparation

Matrix Spike (B8D0470-MS9) Source: 18D0864-04 Prepared: 04/27/18 21:07 Analyzed: 04/27/18 21:07

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.47	0.050	ug/L	0.5	<	90	70-130		
Perfluorooctanesulfonate (PFOS)		0.48	0.025	ug/L	0.49	<	96	70-130		
Perfluorooctanoic acid (PFOA)		0.47	0.035	ug/L	0.5	<	94	70-130		
Perfluoropentanoic acid (PFPeA)		0.47	0.050	ug/L	0.5	<	91	70-130		

Matrix Spike (B8D0470-MSA) Source: 18D0864-05 Prepared: 04/27/18 21:24 Analyzed: 04/27/18 21:24

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.47	0.050	ug/L	0.50	<	94	70-130		
Perfluorobutanoic acid (PFBA)		0.48	0.050	ug/L	0.5	<	96	70-130		
Perfluorohexanesulfonate (PFHxS)		0.46	0.025	ug/L	0.50	<	92	70-130		
Perfluorohexanoic acid (PFHxA)		0.48	0.050	ug/L	0.5	<	95	70-130		
Perfluorooctanesulfonate (PFOS)		0.45	0.025	ug/L	0.49	<	90	70-130		
Perfluorooctanoic acid (PFOA)		0.47	0.035	ug/L	0.5	<	94	70-130		
Perfluoropentanoic acid (PFPeA)		0.46	0.050	ug/L	0.5	<	93	70-130		

Matrix Spike (B8D0470-MSB) Source: 18D1030-01 Prepared: 04/27/18 21:40 Analyzed: 04/27/18 21:40

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.48	0.050	ug/L	0.50	<	96	70-130		
Perfluorobutanoic acid (PFBA)		0.51	0.050	ug/L	0.5	<	97	70-130		
Perfluorohexanesulfonate (PFHxS)		0.46	0.025	ug/L	0.50	<	89	70-130		
Perfluorohexanoic acid (PFHxA)		0.46	0.050	ug/L	0.5	<	89	70-130		
Perfluorooctanesulfonate (PFOS)		0.55	0.025	ug/L	0.49	0.051	99	70-130		
Perfluorooctanoic acid (PFOA)		0.62	0.035	ug/L	0.5	0.12	100	70-130		
Perfluoropentanoic acid (PFPeA)		0.47	0.050	ug/L	0.5	<	95	70-130		

Matrix Spike (B8D0470-MSC) Source: 18D1031-01 Prepared: 04/27/18 21:56 Analyzed: 04/27/18 21:56

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	91	70-130		
Perfluorobutanoic acid (PFBA)		0.49	0.050	ug/L	0.5	<	94	70-130		
Perfluorohexanesulfonate (PFHxS)		0.47	0.025	ug/L	0.50	<	94	70-130		
Perfluorohexanoic acid (PFHxA)		0.45	0.050	ug/L	0.5	<	91	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	0.041	95	70-130		
Perfluorooctanoic acid (PFOA)		0.51	0.035	ug/L	0.5	<	96	70-130		

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0470 - PFCs Preparation

Matrix Spike (B8D0470-MSC) Source: 18D1031-01 Prepared: 04/27/18 21:56 Analyzed: 04/27/18 21:56

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluoropentanoic acid (PFPeA)		0.47	0.050	ug/L	0.5	<	93	70-130		

Matrix Spike (B8D0470-MSD) Source: 18D1272-01 Prepared: 04/27/18 22:12 Analyzed: 04/27/18 22:12

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.47	0.050	ug/L	0.50	<	93	70-130		
Perfluorobutanoic acid (PFBA)		0.49	0.050	ug/L	0.5	<	95	70-130		
Perfluorohexanesulfonate (PFHxS)		0.49	0.025	ug/L	0.50	<	99	70-130		
Perfluorohexanoic acid (PFHxA)		0.44	0.050	ug/L	0.5	<	88	70-130		
Perfluorooctanesulfonate (PFOS)		0.50	0.025	ug/L	0.49	<	96	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	0.041	97	70-130		
Perfluoropentanoic acid (PFPeA)		0.47	0.050	ug/L	0.5	<	94	70-130		

Matrix Spike Dup (B8D0470-MSD1) Source: 18D0967-01 Prepared: 04/27/18 18:59 Analyzed: 04/27/18 18:59

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	98	70-130	5	20
Perfluorobutanoic acid (PFBA)		0.50	0.050	ug/L	0.5	<	97	70-130	2	20
Perfluorohexanesulfonate (PFHxS)		0.47	0.025	ug/L	0.50	<	95	70-130	4	20
Perfluorohexanoic acid (PFHxA)		0.46	0.050	ug/L	0.5	<	92	70-130	4	20
Perfluorooctanesulfonate (PFOS)		0.48	0.025	ug/L	0.49	<	96	70-130	1	20
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5	<	97	70-130	1	20
Perfluoropentanoic acid (PFPeA)		0.47	0.050	ug/L	0.5	<	95	70-130	0.8	20

Matrix Spike (B8D0470-MSE) Source: 18D1272-02 Prepared: 04/27/18 22:28 Analyzed: 04/27/18 22:28

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.48	0.050	ug/L	0.50	<	95	70-130		
Perfluorobutanoic acid (PFBA)		0.50	0.050	ug/L	0.5	<	96	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	100	70-130		
Perfluorohexanoic acid (PFHxA)		0.47	0.050	ug/L	0.5	<	91	70-130		
Perfluorooctanesulfonate (PFOS)		0.59	0.025	ug/L	0.49	0.14	90	70-130		
Perfluorooctanoic acid (PFOA)		0.67	0.035	ug/L	0.5	0.22	91	70-130		
Perfluoropentanoic acid (PFPeA)		0.48	0.050	ug/L	0.5	<	94	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0470 - PFCs Preparation

Matrix Spike (B8D0470-MSF) Source: 18D1272-03 Prepared: 04/27/18 22:44 Analyzed: 04/27/18 22:44

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.48	0.050	ug/L	0.50	<	95	70-130		
Perfluorobutanoic acid (PFBA)		0.49	0.050	ug/L	0.5	<	95	70-130		
Perfluorohexanesulfonate (PFHxS)		0.48	0.025	ug/L	0.50	<	96	70-130		
Perfluorohexanoic acid (PFHxA)		0.48	0.050	ug/L	0.5	<	96	70-130		
Perfluorooctanesulfonate (PFOS)		0.57	0.025	ug/L	0.49	0.12	90	70-130		
Perfluorooctanoic acid (PFOA)		0.63	0.035	ug/L	0.5	0.15	95	70-130		
Perfluoropentanoic acid (PFPeA)		0.47	0.050	ug/L	0.5	<	94	70-130		

Matrix Spike (B8D0470-MSG) Source: 18D1272-04 Prepared: 04/27/18 23:00 Analyzed: 04/27/18 23:00

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.48	0.050	ug/L	0.50	<	97	70-130		
Perfluorobutanoic acid (PFBA)		0.51	0.050	ug/L	0.5	<	97	70-130		
Perfluorohexanesulfonate (PFHxS)		0.46	0.025	ug/L	0.50	<	93	70-130		
Perfluorohexanoic acid (PFHxA)		0.48	0.050	ug/L	0.5	<	92	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	0.048	94	70-130		
Perfluorooctanoic acid (PFOA)		0.77	0.035	ug/L	0.5	0.27	101	70-130		
Perfluoropentanoic acid (PFPeA)		0.48	0.050	ug/L	0.5	<	94	70-130		

Matrix Spike (B8D0470-MSH) Source: 18D1273-01 Prepared: 04/27/18 23:16 Analyzed: 04/27/18 23:16

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	99	70-130		
Perfluorobutanoic acid (PFBA)		0.55	0.050	ug/L	0.5	0.070	95	70-130		
Perfluorohexanesulfonate (PFHxS)		0.47	0.025	ug/L	0.50	<	91	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	0.080	87	70-130		
Perfluorooctanesulfonate (PFOS)		0.64	0.025	ug/L	0.49	0.14	98	70-130		
Perfluorooctanoic acid (PFOA)		0.69	0.035	ug/L	0.5	0.21	97	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	0.070	93	70-130		

Matrix Spike (B8D0470-MSI) Source: 18D1440-01 Prepared: 04/27/18 23:32 Analyzed: 04/27/18 23:32

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.48	0.050	ug/L	0.50	<	94	70-130		
Perfluorobutanoic acid (PFBA)		0.66	0.050	ug/L	0.5	0.19	95	70-130		
Perfluorohexanesulfonate (PFHxS)		0.57	0.025	ug/L	0.50	0.082	98	70-130		

FINAL REPORT

Report ID: 05162018104423

Authorized by:

The results in this report apply only to the samples analyzed.
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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0470 - PFCs Preparation

Matrix Spike (B8D0470-MSI) Source: 18D1440-01 Prepared: 04/27/18 23:32 Analyzed: 04/27/18 23:32

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	0.068	86	70-130		
Perfluorooctanesulfonate (PFOS)		0.49	0.025	ug/L	0.49	<	94	70-130		
Perfluorooctanoic acid (PFOA)		0.56	0.035	ug/L	0.5	0.074	97	70-130		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5	<	96	70-130		

Matrix Spike (B8D0470-MSJ) Source: 18D1440-02 Prepared: 04/27/18 23:49 Analyzed: 04/27/18 23:49

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.48	0.050	ug/L	0.50	<	93	70-130		
Perfluorobutanoic acid (PFBA)		1.1	0.050	ug/L	0.5	0.66	97	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	0.035	95	70-130		
Perfluorohexanoic acid (PFHxA)		0.63	0.050	ug/L	0.5	0.16	93	70-130		
Perfluorooctanesulfonate (PFOS)		0.46	0.025	ug/L	0.49	<	93	70-130		
Perfluorooctanoic acid (PFOA)		0.59	0.035	ug/L	0.5	0.11	94	70-130		
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	0.066	95	70-130		

Matrix Spike (B8D0470-MSK) Source: 18D1440-03 Prepared: 04/28/18 00:05 Analyzed: 04/28/18 00:05

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	97	70-130		
Perfluorobutanoic acid (PFBA)		0.49	0.050	ug/L	0.5	<	97	70-130		
Perfluorohexanesulfonate (PFHxS)		0.49	0.025	ug/L	0.50	<	98	70-130		
Perfluorohexanoic acid (PFHxA)		0.46	0.050	ug/L	0.5	<	92	70-130		
Perfluorooctanesulfonate (PFOS)		0.47	0.025	ug/L	0.49	<	95	70-130		
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5	<	98	70-130		
Perfluoropentanoic acid (PFPeA)		0.47	0.050	ug/L	0.5	<	94	70-130		

FINAL REPORT

Report ID: 05162018104423

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
Quality Control

Data Qualifiers and Definitions

M1	Matrix spike and/or matrix spike duplicate recovery was high; the associated laboratory control sample and/or laboratory control sample duplicate recovery was acceptable.
J	Analyte was present between the method detection limit and reporting limit and should be considered an estimated value.
F4	The sample pH was greater than 2. Sample was analyzed within 14 days of sampling, but beyond the 7 days recommended for aromatics.
Dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
%REC	Percent Recovery

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

April 06, 2018

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

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

Dear Mr. Jacobson:

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

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

Sincerely,



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

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

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

Minnesota Certification IDs

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

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

Virginia Minnesota Certification ID's

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

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

Duluth Minnesota Certification ID's

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

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

Green Bay Certification IDs

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

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

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	4850	5	03/21/18 18:56	03/31/18 22:32		
Naphthalene	2940	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	91-20-3	M1
2-Nitroaniline	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	88-74-4	
3-Nitroaniline	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	99-09-2	
4-Nitroaniline	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	100-01-6	
Nitrobenzene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	98-95-3	
2-Nitrophenol	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	88-75-5	
4-Nitrophenol	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	86-30-6	
Pentachlorophenol	ND	ug/kg	4920	5	03/21/18 18:56	03/31/18 22:32	87-86-5	
Phenanthrene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	85-01-8	
Phenol	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	108-95-2	
Pyrene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	79	%	43-125	5	03/21/18 18:56	03/31/18 22:32	4165-60-0	D4
2-Fluorobiphenyl (S)	75	%	30-132	5	03/21/18 18:56	03/31/18 22:32	321-60-8	
p-Terphenyl-d14 (S)	74	%	62-125	5	03/21/18 18:56	03/31/18 22:32	1718-51-0	
Phenol-d6 (S)	80	%	48-125	5	03/21/18 18:56	03/31/18 22:32	13127-88-3	
2-Fluorophenol (S)	69	%	40-125	5	03/21/18 18:56	03/31/18 22:32	367-12-4	
2,4,6-Tribromophenol (S)	73	%	60-125	5	03/21/18 18:56	03/31/18 22:32	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	546	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	83-32-9	
Acenaphthylene	ND	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	208-96-8	
Anthracene	252	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	120-12-7	
Benzo(a)anthracene	206	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	56-55-3	
Benzo(a)pyrene	215	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	50-32-8	
Benzo(b)fluoranthene	367	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	205-99-2	
Benzo(g,h,i)perylene	282	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	191-24-2	
Benzo(k)fluoranthene	130	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	207-08-9	
Chrysene	450	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	218-01-9	
Dibenz(a,h)anthracene	87.3	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	53-70-3	
Fluoranthene	853	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	206-44-0	
Fluorene	928	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	86-73-7	
Indeno(1,2,3-cd)pyrene	210	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	193-39-5	
Naphthalene	2300	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	91-20-3	
Phenanthrene	1840	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	85-01-8	
Pyrene	655	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	88	%	42-125	5	03/21/18 09:04	03/22/18 22:14	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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

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

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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

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

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Lab Project No.: 10424249

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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

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

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

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

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

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

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

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

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

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

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

LABORATORY CONTROL SAMPLE: 553601

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553602 553603

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553604 553605

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

METHOD BLANK: 2871492 Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

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

LABORATORY CONTROL SAMPLE & LCSD: 2871493 2871494

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

MATRIX SPIKE SAMPLE: 2871826

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

SAMPLE DUPLICATE: 2871827

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

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QUALITY CONTROL DATA

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

QC Batch: 528273 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2867291 Matrix: Solid
Associated Lab Samples: 10424249001, 10424249002

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

LABORATORY CONTROL SAMPLE: 2867292

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2867293 2867294

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

METHOD BLANK: 2867287 Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

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

LABORATORY CONTROL SAMPLE: 2867288

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2867289 2867290

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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QUALITY CONTROL DATA

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

QC Batch: 434613 Analysis Method: EPA 6020
QC Batch Method: EPA 3050B Analysis Description: 6020 MET
Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2007430 Matrix: Solid
Associated Lab Samples: 10424249001, 10424249002

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

LABORATORY CONTROL SAMPLE: 2007431

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2007432 2007433

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

METHOD BLANK: 2867279 Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

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

LABORATORY CONTROL SAMPLE: 2867280

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2867281 2867282

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 528315

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10424249001, 10424249002

SAMPLE DUPLICATE: 2867413

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

SAMPLE DUPLICATE: 2867479

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 528973 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2871002 Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

METHOD BLANK: 2871002

Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

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

LABORATORY CONTROL SAMPLE & LCSD: 2871003

2871004

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 528399

Analysis Method: EPA 8081B

QC Batch Method: EPA 3550

Analysis Description: 8081S GCS Pesticides

Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2867751

Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

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

LABORATORY CONTROL SAMPLE: 2867752

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

LABORATORY CONTROL SAMPLE: 2867752

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2867753 2867754

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

METHOD BLANK: 2867808 Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

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

LABORATORY CONTROL SAMPLE: 2867809

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2867810 2867811

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 528383 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2867687 Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

METHOD BLANK: 2867687

Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

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

LABORATORY CONTROL SAMPLE: 2867688

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

LABORATORY CONTROL SAMPLE: 2867688

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

LABORATORY CONTROL SAMPLE: 2867688

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2867689 2867690

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 528330	Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3550	Analysis Description: 8270D Solid PAH by SIM MSSV
Associated Lab Samples: 10424249001, 10424249002	

METHOD BLANK: 2867448 Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

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

LABORATORY CONTROL SAMPLE: 2867449

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Parameter	Units	2867450		2867451		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10423800009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Acenaphthene	ug/kg	74.5J	84.5	84.5	130	122J	65	57	30-125		30		
Acenaphthylene	ug/kg	26.8J	84.5	84.5	91.9J	84J	77	68	30-133		30		
Anthracene	ug/kg	170	84.5	84.5	246	251	89	95	30-150	2	30		
Benzo(a)anthracene	ug/kg	361	84.5	84.5	453	418	109	68	30-150	8	30		
Benzo(a)pyrene	ug/kg	412	84.5	84.5	471	381	69	-37	30-150	21	30	M1	
Benzo(b)fluoranthene	ug/kg	534	84.5	84.5	544	455	11	-94	30-150	18	30	M1	
Benzo(g,h,i)perylene	ug/kg	242	84.5	84.5	293	226	61	-19	30-150	26	30	M1	
Benzo(k)fluoranthene	ug/kg	169	84.5	84.5	293	234	147	76	30-150	23	30		
Chrysene	ug/kg	416	84.5	84.5	535	396	141	-24	30-150	30	30	M1	
Dibenz(a,h)anthracene	ug/kg	70.2J	84.5	84.5	140	96.7J	83	31	30-131		30		
Fluoranthene	ug/kg	773	84.5	84.5	885	820	131	55	30-150	8	30		
Fluorene	ug/kg	66.3J	84.5	84.5	134	119J	80	62	30-147		30		
Indeno(1,2,3-cd)pyrene	ug/kg	224	84.5	84.5	279	195	66	-35	30-150	36	30	M1,R1	
Naphthalene	ug/kg	15.5J	84.5	84.5	46.7J	50.9J	37	42	30-131		30		
Phenanthrene	ug/kg	512	84.5	84.5	566	540	64	33	30-150	5	30		
Pyrene	ug/kg	656	84.5	84.5	755	709	118	63	30-150	6	30		
2-Fluorobiphenyl (S)	%.							76	42-125				D3
p-Terphenyl-d14 (S)	%.							94	57-125				

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QUALITY CONTROL DATA

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

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

METHOD BLANK: 2869530 Matrix: Solid
Associated Lab Samples: 10424249001, 10424249002

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

LABORATORY CONTROL SAMPLE: 2869531

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869532 2869533

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 528474 Analysis Method: WI MOD DRO

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

Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2868174 Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

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

LABORATORY CONTROL SAMPLE & LCSD: 2868175

2868176

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

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

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

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

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

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

LABORATORY CONTROL SAMPLE: 2008421

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2008432 2008433

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2008434 2008435

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

SAMPLE DUPLICATE: 2008431

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

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

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

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

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

LABORATORY CONTROL SAMPLE: 1665481

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665482 1665483

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665484 1665485

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

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

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

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

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

LABORATORY CONTROL SAMPLE: 1665487

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665488 1665489

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665490 1665491

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 139654

Analysis Method: EPA 9056A

QC Batch Method: EPA 300.0

Analysis Description: 9056 IC Anions, Soil

Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 553043

Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

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

LABORATORY CONTROL SAMPLE: 553042

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553044 553045

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553046 553047

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

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth

PASI-G Pace Analytical Services - Green Bay

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

BATCH QUALIFIERS

Batch: 529212

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

ANALYTE QUALIFIERS

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

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

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

4M Sample was dark yellow in color.

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

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

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

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

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

ANALYTE QUALIFIERS

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

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

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

REPORT OF LABORATORY ANALYSIS

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Chain-of-Custody Form

Work Order Number:

COC Type:

Page: 1 of

Turnaround Time:

COC ID:

FOR LAB USE ONLY

PROJECT/CLIENT INFO

LABORATORY

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

Lab Name:

Project Name: MPCA Freeway LF Soils Project Task Code:

Address:

Project Manager:

EPIC Profile # 38716

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

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

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

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

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

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

PRESERV.

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

WO#: 10424249



Sampled By: Chris Pelosi

Sampler's Signature: Chris Pelosi

Phone #: 612-597-7254

Receiving Comments:

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

T=8.1
①

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

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

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

Sample Condition Upon Receipt

Client Name: MPPA Project #: _____

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

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

Tracking Number: _____

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

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

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

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

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

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

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: BA VC

Date: 3/21/18

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



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

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

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace MN

Project #: _____

WO# : 40166406

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



Tracking #: 1674108-1

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

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

Packing Material: Bubble Wrap Bubble Bags None Other

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

Cooler Temperature Uncorr: 2 / Corr: 2

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

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

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

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

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

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



SAMPLE CONDITION UPON RECEIPT FORM

Project #: S0193173

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

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 7405

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

Packing Material: Bubble Wrap Bubble Bags None Other _____

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

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

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

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

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

Comments:

Sample Condition Upon Receipt

Client Name: Pace MN Project #: _____

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

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

Tracking Number: _____

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

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

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

Cooler Temp Read °C: 1.9 Cooler Temp Corrected °C: 2.2 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: 3-21-18 DC

Comments: M31218

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

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____

Date: 3/22/18

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

Sample Condition Upon Receipt

Client Name: Pace - MPLS.

Project #:

WO#: 12106175

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

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

Tracking Number: _____

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

Optional: Proj. Due Date: _____ Proj. Name: _____

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

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

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

Comments: al 3/28/18

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

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____

Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Heather ZTD

Date: 3/28/18

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



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Pace Analytical Services, Inc.

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Phone: 612.607.1700

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Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

PaceProject#: 10424250

Sample Receipt Date: 03/20/2018

Client Project #: MPCA Freeway LF Soils

Client Sub PO #: N/A

State Cert #: 027-053-137

Invoicing & Reporting Options:

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

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

This report has been reviewed by:

April 11, 2018

Scott Unze, Project Manager

(612) 607-6383

(612) 607-6444 (fax)

scott.unze@pacelabs.com



Report of Laboratory Analysis

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

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

Report Prepared Date:

April 2, 2018

DISCUSSION

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

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

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

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

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

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

REPORT OF LABORATORY ANALYSIS

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Report No.....10424250

Appendix A

Sample Management

Sample Condition Upon Receipt

Client Name: MPPA Project #: _____

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

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

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

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

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

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

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

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

CLIENT NOTIFICATION/RESOLUTION

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

Comments/Resolution: Received during cool down phase.

Project Manager Review:

[Signature]

Date: 03/21/18

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

Reporting Flags

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

REPORT OF LABORATORY ANALYSIS

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Report No.....10424250

Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

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

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

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

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

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

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

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

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

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

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

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

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

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

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

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

REPORT OF LABORATORY ANALYSIS

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Method 8290 Spiked Sample Report

Client - PACE Minnesota Field

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

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

Qs = Quantity Spiked

Qm = Quantity Measured

Rec. = Recovery (Expressed as Percent)

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

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Spiked Sample Report

Client - PACE Minnesota Field

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

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

Qs = Quantity Spiked

Qm = Quantity Measured

Rec. = Recovery (Expressed as Percent)

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

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Spike Sample Results

Client - PACE Minnesota Field

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

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

Definitions

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

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

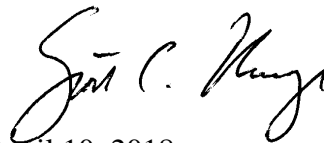
PaceProject#: 10424442
Sample Receipt Date: 03/21/2018
Client Project #: MPCA Freeway LF Soils
Client Sub PO #: 18-00383
State Cert #: 027-053-137

Invoicing & Reporting Options:

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

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

This report has been reviewed by:



April 10, 2018

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



Report of Laboratory Analysis

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

Report Prepared Date:

April 10, 2018

DISCUSSION

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

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

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

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

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

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

REPORT OF LABORATORY ANALYSIS

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Report No.....10424442

Appendix A

Sample Management

WO#: 10424442



		Chain-of-Custody Form		Work Order Number: Turnaround Time:		Page: 1 of								
PROJECT/CLIENT INFO				LABORATORY										
Facility Code: MPCA Freeway LF Soils		Program Code (MDH Lab Only):		Lab Name:		FOR LAB USE ONLY								
Project Name: MPCA Freeway LF Soils		Project Task Code:		Address: 18-00383		Lab Work Order Sticker								
Project Manager:		Potential Hazard?: If yes, add information to Sampler Comments Section		Phone No:		GPC Profile # 38716								
SAMPLE DETAILS				ANALYSIS REQUESTED										
SAMPLE TYPE CODES S-Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample		LAB MATRIX CODES QC-FB=Field Blank Sample QC-FR=Field Replicate Sample QC-TB=Trip Blank Sample		LAB MATRIX CODES AR=Air BL=Biological Material OT=Other TS=Tissue		FIELD MATRIX CODES Wt-Ground=Groundwater Wt-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample								
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Lab Sample No.	#
FD-WM-25 (15-17.5 m)	S	3/21/18	1005	15'	17.5'	C	SD	WM			13	X	001	1
FD-WM-BS (3-10 m)	S	3/21/18	1145	3'	16'	C	SD	WM			12	X		2
FD-WM-65 (5-10 m)	S	3/21/18	1300	5'	10'	C	SD	WM			13	X	002	3
FD-WM-F5 (3-11 m)	S	3/21/18	1530	3'	11'	C	SD	WM			13	X		4
FD-WM-65 (5-14 m)	S	3/21/18	1620	5'	14'	C	SD	WM			13	X	003	5
FD-WM-F4 (5-10 m)	S	3/21/18	1650	5'	10'	C	SD	WM			13	X		6
														7
														8
														9
														10
Sampled By: Chris Pelosi				Sampler's Signature: <i>Cliff P</i>				Phone #: 612-597-7254						
Receiving Comments:														
Relinquished By/Affiliation: <i>Cliff P</i>				Date/Time: 3/21/18 1811				Accepted By/ Affiliation: <i>Mary Vard Pace</i>				Date/Time: 3/21/18 1812		

F= 6.7, 9.4, 9.5, 7.1, 9.0°C

Sample Condition Upon Receipt

Client Name: Pace Field Project #: _____

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

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

Tracking Number: _____

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

Thermometer Used: 151401163 6.9, 9.2, 10.9 G87A9155100842 7.8 Type of Ice: Wet Blue None Dry Melted
 Cooler Temp Read (°C): _____ Cooler Temp Corrected (°C): 10.2 Biological Tissue Frozen? Yes No N/A

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

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

CLIENT NOTIFICATION/RESOLUTION

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

Project Manager Review: Eric Wang Date: 03/22/18

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

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

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

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

Reporting Flags

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

REPORT OF LABORATORY ANALYSIS

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Report No.....10424442

Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

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

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

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

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

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

A = Reporting Limit based on signal to noise
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

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

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

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

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

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

A = Reporting Limit based on signal to noise
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

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

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

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

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

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

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

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

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

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

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

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

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

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

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

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

REPORT OF LABORATORY ANALYSIS

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April 09, 2018

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

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

Dear Mr. Jacobson:

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

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

Sincerely,



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

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

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

Minnesota Certification IDs

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

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

Virginia Minnesota Certification ID's

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

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

Duluth Minnesota Certification ID's

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

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

Green Bay Certification IDs

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

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

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

8270D MSSV PAH by SIM

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

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

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,4-Dichlorobenzene	469	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	75-71-8	
1,1-Dichloroethane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	75-34-3	
1,2-Dichloroethane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	107-06-2	
1,1-Dichloroethene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	156-60-5	
Dichlorofluoromethane	ND	ug/kg	917	1	03/26/18 09:03	03/26/18 12:04	75-43-4	
1,2-Dichloropropane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	78-87-5	
1,3-Dichloropropane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	142-28-9	
2,2-Dichloropropane	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	594-20-7	
1,1-Dichloropropene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	60-29-7	
Ethylbenzene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	458	1	03/26/18 09:03	03/26/18 12:04	87-68-3	
Isopropylbenzene (Cumene)	558	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	98-82-8	
p-Isopropyltoluene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	99-87-6	
Methylene Chloride	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	458	1	03/26/18 09:03	03/26/18 12:04	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	1634-04-4	
Naphthalene	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	91-20-3	
n-Propylbenzene	474	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	103-65-1	
Styrene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	79-34-5	N2
Tetrachloroethene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	127-18-4	
Tetrahydrofuran	ND	ug/kg	3670	1	03/26/18 09:03	03/26/18 12:04	109-99-9	
Toluene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	79-00-5	
Trichloroethene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	76-13-1	
1,2,4-Trimethylbenzene	123	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	108-67-8	
Vinyl chloride	ND	ug/kg	36.7	1	03/26/18 09:03	03/26/18 12:04	75-01-4	
Xylene (Total)	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 12:04	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	93	%	75-125	1	03/26/18 09:03	03/26/18 12:04	17060-07-0	
Toluene-d8 (S)	95	%	75-125	1	03/26/18 09:03	03/26/18 12:04	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125	1	03/26/18 09:03	03/26/18 12:04	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

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

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

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

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

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

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

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

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

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

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

7196 Chromium, Hexavalent

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

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

Trivalent Chromium Calculation

Analytical Method: Trivalent Chromium Calculation

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

9012 Cyanide, Total

Analytical Method: EPA 9012 Preparation Method: EPA 9012A

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

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

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

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

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

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

Analytical Method: EPA 8270D Preparation Method: EPA 3550

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

Surrogates

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

8270D MSSV PAH by SIM

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

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

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

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

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ANALYTICAL RESULTS

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

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

Analytical Method: EPA 8270D Preparation Method: EPA 3550

Surrogates

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

8270D MSSV PAH by SIM

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

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

8270D MSSV MDA LIST 2

Analytical Method: EPA 8270D Preparation Method: EPA 3546

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

8260B MSV 5030 Med Level

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

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

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

7196 Chromium, Hexavalent

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

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

Analytical Method: Trivalent Chromium Calculation

Chromium, Trivalent	15.4	mg/kg	1.0	1		04/05/18 07:42	16065-83-1	
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9012 Cyanide, Total

Analytical Method: EPA 9012 Preparation Method: EPA 9012A

Cyanide	ND	mg/kg	0.42	1	03/29/18 10:55	03/29/18 13:04	57-12-5	
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9056 IC Anions

Analytical Method: EPA 9056A Preparation Method: EPA 300.0

Fluoride	ND	mg/kg	0.97	1	03/30/18 14:00	03/31/18 03:26	16984-48-8	
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Sample: FD-WM-F4 (5-10 wm) Lab ID: 10424443006 Collected: 03/21/18 16:50 Received: 03/21/18 18:12 Matrix: Solid

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

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

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

7196 Chromium, Hexavalent

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

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

Trivalent Chromium Calculation

Analytical Method: Trivalent Chromium Calculation

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

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

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

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

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

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

LABORATORY CONTROL SAMPLE: 553601

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553602 553603

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553604 553605

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

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

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

QC Batch: 529815 Analysis Method: WI MOD GRO
QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 2875655 Matrix: Solid
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

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

LABORATORY CONTROL SAMPLE & LCSD: 2875656

Parameter	Units	2875657								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	46.3	44.7	93	89	80-120	4	20	
a,a,a-Trifluorotoluene (S)	%				99	99	80-150			

MATRIX SPIKE SAMPLE: 2876408

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

SAMPLE DUPLICATE: 2876409

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

QC Batch: 529743 Analysis Method: EPA 7471
 QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
 Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 2875322 Matrix: Solid
 Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

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

LABORATORY CONTROL SAMPLE: 2875323

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875635 2875636

Parameter	Units	10424609001 Result	MS		MSD		% Rec		% Rec Limits	Max		Qual
			Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	RPD	RPD				
Mercury	mg/kg	ND	1.5	1.5	1.7	1.6	110	109	80-120	1	20	

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QUALITY CONTROL DATA

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

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

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

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

LABORATORY CONTROL SAMPLE: 2870799

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2870800 2870801

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

QC Batch: 434613 Analysis Method: EPA 6020
 QC Batch Method: EPA 3050B Analysis Description: 6020 MET
 Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 2007430 Matrix: Solid
 Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

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

LABORATORY CONTROL SAMPLE: 2007431

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2007432 2007433

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

QC Batch: 528917 Analysis Method: EPA 6020A
QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 2870806 Matrix: Solid
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

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

LABORATORY CONTROL SAMPLE: 2870807

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2870808 2870809

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

METHOD BLANK: 2871002

Matrix: Solid

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

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

LABORATORY CONTROL SAMPLE & LCSD: 2871003

2871004

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

QC Batch: 528619

Analysis Method: EPA 8081B

QC Batch Method: EPA 3550

Analysis Description: 8081S GCS Pesticides

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

METHOD BLANK: 2868814

Matrix: Solid

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

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

LABORATORY CONTROL SAMPLE: 2868815

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

LABORATORY CONTROL SAMPLE: 2868815

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2868816 2868817

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

QC Batch: 528752

Analysis Method: EPA 8082A

QC Batch Method: EPA 3550

Analysis Description: 8082A GCS PCB

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

METHOD BLANK: 2869601

Matrix: Solid

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

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

LABORATORY CONTROL SAMPLE: 2869602

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869603 2869604

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

METHOD BLANK: 2868737

Matrix: Solid

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

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

LABORATORY CONTROL SAMPLE: 2868738

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

LABORATORY CONTROL SAMPLE: 2868738

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

LABORATORY CONTROL SAMPLE: 2868738

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2868743 2868744

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

LABORATORY CONTROL SAMPLE: 2870960

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

LABORATORY CONTROL SAMPLE: 2869531

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869532 2869533

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

QC Batch: 528667 Analysis Method: WI MOD DRO

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

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

METHOD BLANK: 2869187 Matrix: Solid

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

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

LABORATORY CONTROL SAMPLE & LCSD: 2869188

2869189

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

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QUALITY CONTROL DATA

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

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

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

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

LABORATORY CONTROL SAMPLE: 2008421

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2008432 2008433

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2008434 2008435

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

SAMPLE DUPLICATE: 2008431

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

LABORATORY CONTROL SAMPLE: 2009758

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009842 2009843

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009844 2009845

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

SAMPLE DUPLICATE: 2009846

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

LABORATORY CONTROL SAMPLE: 1665487

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665488 1665489

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665490 1665491

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

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QUALITY CONTROL DATA

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

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

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

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

LABORATORY CONTROL SAMPLE: 553026

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553028 553029

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553030 553031

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

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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

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

LABORATORY CONTROL SAMPLE: 553042

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553044 553045

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553046 553047

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

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QUALIFIERS

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

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth
PASI-G Pace Analytical Services - Green Bay
PASI-I Pace Analytical Services - Indianapolis
PASI-M Pace Analytical Services - Minneapolis
PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10424443
[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 529212
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1M RPD value is outside control limits due to sample non-homogeneity.
2M Redox (174 mv) and pH (8.13) values indicate a naturally reducing matrix. This accounts for poor recovery values on the sample per method Eh/pH phase diagram.
3M Redox (25 mv) and pH (7.84) values indicate a naturally reducing matrix. This accounts for poor recovery values on the sample per method Eh/pH phase diagram.

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

ANALYTE QUALIFIERS

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

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

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

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

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

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

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

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

REPORT OF LABORATORY ANALYSIS

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

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

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



Document Name:
Sample Condition Upon Receipt Form

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

Document Revised: 14Dec2017
Page 1 of 2

Issuing Authority:
Pace Minnesota Quality Office

Sample Condition
Upon Receipt

Client Name:
Pace Field

Project #:
WO#: 10424443

Due Date: 3/22/18

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

Tracking Number: _____

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

Optional: Proj. Due Date: _____ Proj. Name: _____

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

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

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

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

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

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

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

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No


Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

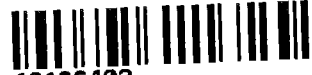
Project Manager Review: BA VC

Date: 3/22/18

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

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

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace MN **Project #:**
 1
WO# : 40166402

 40166402

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

Tracking #: 1674908-1

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

Packing Material: Bubble Wrap Bubble Bags None Other

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

Cooler Temperature Uncorr: 2 / Corr: 2

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

Person examining contents: Date: <u>3/24/18</u> Initials: <u>SSh</u>

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

Client Notification/ Resolution: _____ If checked, see attached form for additional comments

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

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



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50193165

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

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 7405

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

Packing Material: Bubble Wrap Bubble Bags None Other _____

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

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

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

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

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

Comments:

Sample Container Count

WO#: 50193165

CLIENT: Pace MN

COC PAGE 1 of 1

COC ID# _____

Project # 5093165

SBS
DI
Bulk
Kit



Sample Line Item	DC9H	VC9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	Matrix (Soil/W Aqueous)	pH <2	pH >9	pH >12	
1								1												Soil			
2								1															
3								1															
4								1															
5								1															
6								1															
7																							
8																							
9																							
10																							
11																							
12																							

Container Codes

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

Sample Condition Upon Receipt

Client Name: Pace - MPLS.

Project #:

WO# : 12106226

PM: HRZ Due Date: 04/05/18

CLIENT: PACE MPLS

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

Tracking Number: _____

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

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

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

Cooler Temp Read °C: 3.7 Cooler Temp Corrected °C: 4.0 Biological Tissue Frozen? Yes No N/A
Temp should be above freezing to 6°C Correction Factor: 1.03 Date and Initials of Person Examining Contents: 3/27/18 CJS

Comments: all 3/28/18

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

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Heather ZTD

Date: 3/28/18

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

WO#: 12106226

Chain of Custody

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

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

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

Report To Subcontract To Requested Analysis

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

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

Methyl Mercury EPA 1630

WO#: 10424443



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

Transfers					Comments		
Released By	Date/Time	Received By	Date/Time				
<i>Long Vind PACE</i>	<i>3/22/18 1810</i>	<i>DJ Chapp</i>	<i>3-22-18 1915</i>				
<i>DJ Chapp</i>	<i>3-22-18 2100</i>	<i>K. Hagg</i>	<i>3/23/18 0800</i>				
<i>DJ Chapp</i>	<i>3/28/18 1900</i>	<i>Long Vind PACE</i>	<i>3/28/18 1900</i>	<i>T = 4.3°C, CUSTODY SEALED, ON ICE, & INTACT</i>			
Cooler Temperature on Receipt	3.4 °C	Custody Seal	<input checked="" type="checkbox"/> or N	Received on Ice	<input checked="" type="checkbox"/> or N	Samples Intact	<input checked="" type="checkbox"/> or N

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

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

Sample Condition Upon Receipt

Client Name: 3/28/18 SD Project #: WO# : 10424443
Pace-Duluth MPLS

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

WO# : 10424443
 PM: BM2 Due Date: 04/03/18
 CLIENT: PASI-MNFLD

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

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

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

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

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

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

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

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

Project Manager Review: _____

Date: _____

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

April 10, 2018

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

RE: Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

Dear Mr. Jacobson:

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

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

Sincerely,



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

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

Pennsylvania Certification IDs

Pennsylvania/TNI Certification #: 65-00282	Vermont Dept. of Health: ID# VT-0282
Puerto Rico Certification #: PA01457	Virgin Island/PADEP Certification
Rhode Island Certification #: 65-00282	Virginia/VELAP Certification #: 9526
South Dakota Certification	Washington Certification #: C868
Tennessee Certification #: 02867	West Virginia DEP Certification #: 143
Texas/TNI Certification #: T104704188-17-3	West Virginia DHHR Certification #: 9964C
Utah/TNI Certification #: PA014572017-9	Wisconsin Approve List for Rad
USDA Soil Permit #: P330-17-00091	Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174	Nebraska Certification: NE-OS-28-14
Alabama Certification #: 41320	Nevada Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216	New Hampshire Certification #: 2958
Delaware Certification: FL NELAC Reciprocity	New Jersey Certification #: FL022
Florida Certification #: E83079	New York Certification #: 11608
Georgia Certification #: 955	North Carolina Environmental Certificate #: 667
Guam Certification: FL NELAC Reciprocity	North Carolina Certification #: 12710
Hawaii Certification: FL NELAC Reciprocity	Oklahoma Certification #: D9947
Illinois Certification #: 200068	Pennsylvania Certification #: 68-00547
Indiana Certification: FL NELAC Reciprocity	Puerto Rico Certification #: FL01264
Kansas Certification #: E-10383	South Carolina Certification: #96042001
Kentucky Certification #: 90050	Tennessee Certification #: TN02974
Louisiana Certification #: FL NELAC Reciprocity	Texas Certification: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007	US Virgin Islands Certification: FL NELAC Reciprocity
Maryland Certification: #346	Virginia Environmental Certification #: 460165
Michigan Certification #: 9911	Wyoming Certification: FL NELAC Reciprocity
Mississippi Certification: FL NELAC Reciprocity	West Virginia Certification #: 9962C
Missouri Certification #: 236	Wisconsin Certification #: 399079670
Montana Certification #: Cert 0074	Wyoming (EPA Region 8): FL NELAC Reciprocity

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512	New York State Department of Health, Serial #56192 and 56193
Minnesota Department of Health, Certificate #1385941	North Carolina Division of Water Resources, Certificate #659
Arkansas Department of Environmental Quality, Certificate #17-046-0	Virginia Department of General Services, Certificate #9028
Georgia Environmental Protection Division, Stipulation	Wisconsin Department of Natural Resources, Laboratory #999472650
Illinois Environmental Protection Agency, Certificate #004325	U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278
Michigan Department of Environmental Quality, Laboratory #0034	

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268	Ohio VAP Certification #: CL-0065
Illinois Certification #: 200074	Oklahoma Certification #: 2017-124
Indiana Certification #: C-49-06	Texas Certification #: T104704355-18-12
Kansas/NELAP Certification #:E-10177	West Virginia Certification #: 330
Kentucky UST Certification #: 80226	Wisconsin Certification #: 999788130
Kentucky WW Certification #:98019	USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10424447001	FD-A5	Water	03/21/18 10:00	03/21/18 18:12
10424447002	FD-B5	Water	03/21/18 13:20	03/21/18 18:12
10424447003	FD-D5	Water	03/21/18 15:45	03/21/18 18:12

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10424447001	FD-A5	EPA 547	AC1	1	PASI-O
		EPA 549.2	WFH	1	PASI-O
		EPA 552.3	MMB	7	PASI-O
		EPA 8015 Alcohol-Glycol	BJW	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 8270D	JRH	38	PASI-M
		EPA 524.2	AEZ	4	PASI-M
		EPA 900.0	NJV	2	PASI-PA
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-CIO2	AGS	1	PASI-O
		SM 4500-H+B	JFP	1	PASI-M
		EPA 300.0	KEO	1	PASI-M
		EPA 300.1	CMB	1	PASI-O
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 350.1	DCL	1	PASI-M
		EPA 353.2	JFP	3	PASI-M
		EPA 9016	AMM	1	PASI-GRMI
SM 4500-CN-E	DCL	1	PASI-M		
SM 4500-P E	DCL	1	PASI-M		
10424447002	FD-B5	EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 8270D	JRH	38	PASI-M
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-H+B	JFP	1	PASI-M
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 350.1	DCL	1	PASI-M
		EPA 353.2	JFP	3	PASI-M
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M
10424447003	FD-D5	EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 8270D	JRH	38	PASI-M
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-H+B	JFP	1	PASI-M
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 350.1	DCL	1	PASI-M
		EPA 353.2	JFP	3	PASI-M
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample: FD-A5	Lab ID: 10424447001	Collected: 03/21/18 10:00	Received: 03/21/18 18:12	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
547 HPLC Glyphosate								
Analytical Method: EPA 547								
Glyphosate	ND	ug/L	6.0	1		03/29/18 20:51		
549.2 HPLC Paraquat Diquat								
Analytical Method: EPA 549.2 Preparation Method: EPA 549.2								
Diquat	ND	ug/L	0.40	1	03/26/18 22:26	03/27/18 15:47	85-00-7	P4
552.3 Haloacetic Acids								
Analytical Method: EPA 552.3 Preparation Method: EPA 552.3								
Dibromoacetic Acid	ND	ug/L	1.0	1	03/28/18 14:30	03/30/18 01:52	631-64-1	
Dichloroacetic Acid	ND	ug/L	1.0	1	03/28/18 14:30	03/30/18 01:52	79-43-6	
Haloacetic Acids (Total)	ND	ug/L	1.0	1	03/28/18 14:30	03/30/18 01:52		
Monobromoacetic Acid	ND	ug/L	1.0	1	03/28/18 14:30	03/30/18 01:52	79-08-3	
Monochloroacetic Acid	ND	ug/L	1.0	1	03/28/18 14:30	03/30/18 01:52	79-11-8	
Trichloroacetic Acid	ND	ug/L	1.0	1	03/28/18 14:30	03/30/18 01:52	76-03-9	
Surrogates								
2,3-Dibromopropanoic Acid (S)	102	%	70-130	1	03/28/18 14:30	03/30/18 01:52	600-05-5	
8015M Alcohols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	mg/L	5.0	1		04/04/18 14:05	67-56-1	
8015M Glycols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/02/18 16:36	107-21-1	
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	309-00-2	
alpha-BHC	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	319-84-6	
beta-BHC	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	319-85-7	
delta-BHC	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	58-89-9	
Chlordane (Technical)	ND	ug/L	10.8	20	03/23/18 10:27	04/03/18 00:12	57-74-9	
alpha-Chlordane	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	5103-71-9	
gamma-Chlordane	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	5103-74-2	
4,4'-DDD	ND	ug/L	2.2	20	03/23/18 10:27	04/03/18 00:12	72-54-8	
4,4'-DDE	ND	ug/L	2.2	20	03/23/18 10:27	04/03/18 00:12	72-55-9	
4,4'-DDT	ND	ug/L	2.2	20	03/23/18 10:27	04/03/18 00:12	50-29-3	
Dieldrin	ND	ug/L	2.2	20	03/23/18 10:27	04/03/18 00:12	60-57-1	
Endosulfan I	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	959-98-8	
Endosulfan II	ND	ug/L	2.2	20	03/23/18 10:27	04/03/18 00:12	33213-65-9	
Endosulfan sulfate	ND	ug/L	2.2	20	03/23/18 10:27	04/03/18 00:12	1031-07-8	
Endrin	ND	ug/L	2.2	20	03/23/18 10:27	04/03/18 00:12	72-20-8	
Endrin aldehyde	ND	ug/L	2.2	20	03/23/18 10:27	04/03/18 00:12	7421-93-4	
Endrin ketone	ND	ug/L	2.2	20	03/23/18 10:27	04/03/18 00:12	53494-70-5	
Heptachlor	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	76-44-8	
Heptachlor epoxide	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	1024-57-3	
Methoxychlor	ND	ug/L	10.8	20	03/23/18 10:27	04/03/18 00:12	72-43-5	
Toxaphene	ND	ug/L	32.3	20	03/23/18 10:27	04/03/18 00:12	8001-35-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample: FD-A5	Lab ID: 10424447001	Collected: 03/21/18 10:00	Received: 03/21/18 18:12	Matrix: Water					
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8081B GCS Pesticides									
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C									
Surrogates									
Tetrachloro-m-xylene (S)	0	%.	62-125	20	03/23/18 10:27	04/03/18 00:12	877-09-8	2M, D3, S4	
Decachlorobiphenyl (S)	0	%.	30-143	20	03/23/18 10:27	04/03/18 00:12	2051-24-3	S4	
8082A GCS PCB									
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C									
PCB-1016 (Aroclor 1016)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:19	12674-11-2		
PCB-1221 (Aroclor 1221)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:19	11104-28-2		
PCB-1232 (Aroclor 1232)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:19	11141-16-5		
PCB-1242 (Aroclor 1242)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:19	53469-21-9		
PCB-1248 (Aroclor 1248)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:19	12672-29-6		
PCB-1254 (Aroclor 1254)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:19	11097-69-1		
PCB-1260 (Aroclor 1260)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:19	11096-82-5		
PCB-1262 (Aroclor 1262)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:19	37324-23-5		
PCB-1268 (Aroclor 1268)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:19	11100-14-4		
Surrogates									
Tetrachloro-m-xylene (S)	53	%.	30-125	1	03/23/18 10:26	03/26/18 15:19	877-09-8		
Decachlorobiphenyl (S)	44	%.	30-125	1	03/23/18 10:26	03/26/18 15:19	2051-24-3		
8315A GCSV Aldehydes									
Analytical Method: EPA 8315A Preparation Method: EPA 8315A									
Formaldehyde	ND	ug/L	100	1	03/29/18 09:32	03/30/18 11:31	50-00-0	H3	
8316 W GCSV Acrylamide									
Analytical Method: EPA 8316									
Acrylamide	ND	ug/L	20.0	1		03/29/18 15:35	79-06-1	H1	
200.7 MET ICP, Dissolved									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum, Dissolved	ND	ug/L	200	1	03/23/18 10:26	03/23/18 13:27	7429-90-5		
Barium, Dissolved	132	ug/L	10.0	1	03/23/18 10:26	03/23/18 13:27	7440-39-3		
Copper, Dissolved	ND	ug/L	10.0	1	03/23/18 10:26	03/23/18 13:27	7440-50-8		
Manganese, Dissolved	267	ug/L	5.0	1	03/23/18 10:26	03/23/18 13:27	7439-96-5		
Nickel, Dissolved	ND	ug/L	20.0	1	03/23/18 10:26	03/23/18 13:27	7440-02-0		
Silver, Dissolved	ND	ug/L	10.0	1	03/23/18 10:26	03/23/18 13:27	7440-22-4		
Tin, Dissolved	ND	ug/L	75.0	1	03/23/18 10:26	03/23/18 13:27	7440-31-5		
Total Hardness by 2340B, Dissolved	2120000	ug/L	3300	1	03/23/18 10:26	03/23/18 13:27			
Zinc, Dissolved	ND	ug/L	20.0	1	03/23/18 10:26	03/23/18 13:27	7440-66-6		
200.8 MET ICPMS, Dissolved									
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Antimony, Dissolved	ND	ug/L	0.50	1	03/23/18 09:55	03/27/18 21:57	7440-36-0		
Arsenic, Dissolved	ND	ug/L	2.5	5	03/23/18 09:55	03/27/18 22:06	7440-38-2	D3	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/23/18 09:55	03/27/18 21:57	7440-41-7		
Boron, Dissolved	399000	ug/L	25000	5000	03/23/18 09:55	03/30/18 10:19	7440-42-8		
Cadmium, Dissolved	ND	ug/L	0.080	1	03/23/18 09:55	03/27/18 21:57	7440-43-9		
Chromium, Dissolved	22.2	ug/L	0.50	1	03/23/18 09:55	03/27/18 21:57	7440-47-3		
Cobalt, Dissolved	ND	ug/L	2.5	5	03/23/18 09:55	03/27/18 22:06	7440-48-4	D3	
Lead, Dissolved	ND	ug/L	0.10	1	03/23/18 09:55	03/27/18 21:57	7439-92-1		
Selenium, Dissolved	ND	ug/L	2.5	5	03/23/18 09:55	03/27/18 22:06	7782-49-2	D3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample: FD-A5	Lab ID: 10424447001	Collected: 03/21/18 10:00	Received: 03/21/18 18:12	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Thallium, Dissolved	ND	ug/L	0.10	1	03/23/18 09:55	03/27/18 21:57	7440-28-0	
Uranium-238, Dissolved	1.2	ug/L	0.50	1	03/23/18 09:55	03/27/18 21:57	7440-61-1	
Vanadium, Dissolved	102	ug/L	1.0	1	03/23/18 09:55	03/27/18 21:57	7440-62-2	
245.1 Mercury, Dissolved		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND	ug/L	0.20	1	03/23/18 08:40	03/27/18 11:52	7439-97-6	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	83-32-9	
Anthracene	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	50-32-8	
Benzoic acid	ND	ug/L	52.1	1	03/22/18 12:56	03/30/18 11:28	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	111-44-4	
2-Chlorophenol	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	52.1	1	03/22/18 12:56	03/30/18 11:28	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	120-83-2	
Diethylphthalate	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	84-66-2	
2,4-Dimethylphenol	ND	ug/L	52.1	1	03/22/18 12:56	03/30/18 11:28	105-67-9	
Dimethylphthalate	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	117-81-7	
Fluoranthene	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	206-44-0	
Fluorene	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	86-73-7	
Hexachlorobenzene	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	52.1	1	03/22/18 12:56	03/30/18 11:28	77-47-4	
Hexachloroethane	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	67-72-1	
Isophorone	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.8	1	03/22/18 12:56	03/30/18 11:28		
N-Nitrosodiphenylamine	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	86-30-6	
Pentachlorophenol	ND	ug/L	20.8	1	03/22/18 12:56	03/30/18 11:28	87-86-5	
Phenanthrene	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	85-01-8	
Phenol	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	108-95-2	
Pyrene	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	80	%	60-125	1	03/22/18 12:56	03/30/18 11:28	4165-60-0	
2-Fluorobiphenyl (S)	89	%	56-125	1	03/22/18 12:56	03/30/18 11:28	321-60-8	
p-Terphenyl-d14 (S)	99	%	58-125	1	03/22/18 12:56	03/30/18 11:28	1718-51-0	
Phenol-d6 (S)	88	%	58-125	1	03/22/18 12:56	03/30/18 11:28	13127-88-3	
2-Fluorophenol (S)	81	%	55-125	1	03/22/18 12:56	03/30/18 11:28	367-12-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

Sample: FD-A5	Lab ID: 10424447001	Collected: 03/21/18 10:00	Received: 03/21/18 18:12	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV	Analytical Method: EPA 8270D Preparation Method: EPA 3520							
Surrogates								
2,4,6-Tribromophenol (S)	99	%	65-125	1	03/22/18 12:56	03/30/18 11:28	118-79-6	
524.2 MSV	Analytical Method: EPA 524.2							
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/02/18 14:46		
Surrogates								
4-Bromofluorobenzene (S)	96	%	75-125	1		04/02/18 14:46	460-00-4	1M
Toluene-d8 (S)	96	%	75-125	1		04/02/18 14:46	2037-26-5	
1,2-Dichloroethane-d4 (S)	101	%	75-125	1		04/02/18 14:46	17060-07-0	
Hach 10360 Rev 1.1 BOD	Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360							
BOD, 5 day	13.2	mg/L	6.0	3	03/22/18 12:31	03/27/18 10:31		B4,B6
1664 HEM, Oil and Grease	Analytical Method: EPA 1664A OG							
Oil and Grease	ND	mg/L	5.4	1		03/28/18 10:51		
180.1 Turbidity	Analytical Method: EPA 180.1							
Turbidity	145	NTU	6.0	20		03/22/18 17:01		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	12.0	mg/L	10.0	1		03/27/18 15:13		
4500CIO2 Chlorine Dioxide	Analytical Method: SM 4500-CIO2							
Chlorine Dioxide	0.45	mg/L	0.10	1		03/28/18 15:13		H6
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.1	Std. Units	0.10	1		03/27/18 13:57		H6
300.0 IC Anions	Analytical Method: EPA 300.0							
Fluoride	ND	mg/L	0.050	1		03/31/18 01:06	16984-48-8	
300.1 Oxihalide IC Anions 14d	Analytical Method: EPA 300.1							
Chlorite	ND	ug/L	500	100		04/01/18 19:32		D3
Chromium, Hexavalent	Analytical Method: SM 3500-Cr D Modified							
Chromium, Hexavalent	ND	mg/L	0.010	1		03/22/18 10:55		FS,H1
350.1 Ammonia	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	72.7	mg/L	1.6	40		03/23/18 12:41	7664-41-7	
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrate as N	ND	mg/L	0.020	1		03/22/18 15:40	14797-55-8	FS
Nitrite as N	ND	mg/L	0.020	1		03/22/18 15:40	14797-65-0	FS
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		03/22/18 15:40		FS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample: FD-A5		Lab ID: 10424447001	Collected: 03/21/18 10:00	Received: 03/21/18 18:12	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
9016 Cyanide, Free		Analytical Method: EPA 9016 Preparation Method: EPA 9016						
Cyanide, Free	ND	ug/L	5.0	1	04/05/18 16:15	04/05/18 17:15		H1,H2
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	52.0	ug/L	10.0	1	03/26/18 09:50	03/26/18 11:53	57-12-5	
SM4500P-E, Total Phosphorus		Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B						
Phosphorus	0.38	mg/L	0.050	1	03/27/18 09:22	03/27/18 12:48	7723-14-0	

Sample: FD-B5		Lab ID: 10424447002	Collected: 03/21/18 13:20	Received: 03/21/18 18:12	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C						
Aldrin	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	309-00-2	
alpha-BHC	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	319-84-6	
beta-BHC	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	319-85-7	
delta-BHC	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	58-89-9	
Chlordane (Technical)	ND	ug/L	5.6	10	03/23/18 10:27	04/03/18 00:31	57-74-9	
alpha-Chlordane	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	5103-71-9	
gamma-Chlordane	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	5103-74-2	
4,4'-DDD	ND	ug/L	1.1	10	03/23/18 10:27	04/03/18 00:31	72-54-8	
4,4'-DDE	ND	ug/L	1.1	10	03/23/18 10:27	04/03/18 00:31	72-55-9	
4,4'-DDT	ND	ug/L	1.1	10	03/23/18 10:27	04/03/18 00:31	50-29-3	
Dieldrin	ND	ug/L	1.1	10	03/23/18 10:27	04/03/18 00:31	60-57-1	
Endosulfan I	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	959-98-8	
Endosulfan II	ND	ug/L	1.1	10	03/23/18 10:27	04/03/18 00:31	33213-65-9	
Endosulfan sulfate	ND	ug/L	1.1	10	03/23/18 10:27	04/03/18 00:31	1031-07-8	
Endrin	ND	ug/L	1.1	10	03/23/18 10:27	04/03/18 00:31	72-20-8	
Endrin aldehyde	ND	ug/L	1.1	10	03/23/18 10:27	04/03/18 00:31	7421-93-4	
Endrin ketone	ND	ug/L	1.1	10	03/23/18 10:27	04/03/18 00:31	53494-70-5	
Heptachlor	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	76-44-8	
Heptachlor epoxide	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	1024-57-3	
Methoxychlor	ND	ug/L	5.6	10	03/23/18 10:27	04/03/18 00:31	72-43-5	
Toxaphene	ND	ug/L	16.9	10	03/23/18 10:27	04/03/18 00:31	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	62-125	10	03/23/18 10:27	04/03/18 00:31	877-09-8	3M, D3, S4
Decachlorobiphenyl (S)	0	%	30-143	10	03/23/18 10:27	04/03/18 00:31	2051-24-3	S4
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:35	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:35	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:35	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:35	53469-21-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample: FD-B5	Lab ID: 10424447002	Collected: 03/21/18 13:20	Received: 03/21/18 18:12	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1248 (Aroclor 1248)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:35	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:35	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:35	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:35	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:35	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	42	%	30-125	1	03/23/18 10:26	03/26/18 15:35	877-09-8	
Decachlorobiphenyl (S)	35	%	30-125	1	03/23/18 10:26	03/26/18 15:35	2051-24-3	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	03/23/18 10:26	03/23/18 13:35	7429-90-5	
Barium, Dissolved	253	ug/L	10.0	1	03/23/18 10:26	03/23/18 13:35	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/23/18 10:26	03/23/18 13:35	7440-50-8	
Manganese, Dissolved	361	ug/L	5.0	1	03/23/18 10:26	03/23/18 13:35	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/23/18 10:26	03/23/18 13:35	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/23/18 10:26	03/23/18 13:35	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/23/18 10:26	03/23/18 13:35	7440-31-5	
Total Hardness by 2340B, Dissolved	1010000	ug/L	3300	1	03/23/18 10:26	03/23/18 13:35		
Zinc, Dissolved	ND	ug/L	20.0	1	03/23/18 10:26	03/23/18 13:35	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:11	7440-36-0	
Arsenic, Dissolved	1.3	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:11	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/23/18 09:55	03/27/18 22:11	7440-41-7	
Boron, Dissolved	10700	ug/L	1250	250	03/23/18 09:55	03/30/18 11:05	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/23/18 09:55	03/27/18 22:11	7440-43-9	
Chromium, Dissolved	2.5	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:11	7440-47-3	
Cobalt, Dissolved	0.71	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:11	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/23/18 09:55	03/27/18 22:11	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:11	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/23/18 09:55	03/27/18 22:11	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:11	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/23/18 09:55	03/27/18 22:11	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	03/23/18 08:40	03/27/18 11:55	7439-97-6	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	83-32-9	
Anthracene	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	50-32-8	
Benzoic acid	ND	ug/L	53.2	1	03/22/18 12:56	03/30/18 11:57	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

Sample: FD-B5	Lab ID: 10424447002	Collected: 03/21/18 13:20	Received: 03/21/18 18:12	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
2-Chlorophenol	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	53.2	1	03/22/18 12:56	03/30/18 11:57	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	120-83-2	
Diethylphthalate	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	84-66-2	
2,4-Dimethylphenol	ND	ug/L	53.2	1	03/22/18 12:56	03/30/18 11:57	105-67-9	
Dimethylphthalate	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	117-81-7	
Fluoranthene	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	206-44-0	
Fluorene	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	86-73-7	
Hexachlorobenzene	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	53.2	1	03/22/18 12:56	03/30/18 11:57	77-47-4	
Hexachloroethane	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	67-72-1	
Isophorone	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	21.3	1	03/22/18 12:56	03/30/18 11:57		
N-Nitrosodiphenylamine	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	86-30-6	
Pentachlorophenol	ND	ug/L	21.3	1	03/22/18 12:56	03/30/18 11:57	87-86-5	
Phenanthrene	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	85-01-8	
Phenol	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	108-95-2	
Pyrene	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	76	%	60-125	1	03/22/18 12:56	03/30/18 11:57	4165-60-0	
2-Fluorobiphenyl (S)	88	%	56-125	1	03/22/18 12:56	03/30/18 11:57	321-60-8	
p-Terphenyl-d14 (S)	103	%	58-125	1	03/22/18 12:56	03/30/18 11:57	1718-51-0	
Phenol-d6 (S)	86	%	58-125	1	03/22/18 12:56	03/30/18 11:57	13127-88-3	
2-Fluorophenol (S)	79	%	55-125	1	03/22/18 12:56	03/30/18 11:57	367-12-4	
2,4,6-Tribromophenol (S)	93	%	65-125	1	03/22/18 12:56	03/30/18 11:57	118-79-6	
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	6.8	mg/L	6.0	3	03/22/18 12:31	03/27/18 10:36		B4,B6
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	5.4	1		03/28/18 10:51		
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	200	NTU	15.0	50		03/22/18 17:04		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	111	mg/L	10.0	1		03/27/18 11:11		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample: FD-B5		Lab ID: 10424447002		Collected: 03/21/18 13:20		Received: 03/21/18 18:12		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	6.7	Std. Units	0.10	1		03/27/18 14:14		H6	
300.0 IC Anions		Analytical Method: EPA 300.0							
Fluoride	0.12	mg/L	0.050	1		03/31/18 01:22	16984-48-8		
Chromium, Hexavalent		Analytical Method: SM 3500-Cr D Modified							
Chromium, Hexavalent	ND	mg/L	0.010	1		03/22/18 10:36		FS	
350.1 Ammonia		Analytical Method: EPA 350.1							
Nitrogen, Ammonia	8.1	mg/L	0.40	10		03/23/18 11:57	7664-41-7		
353.2 Nitrate + Nitrite		Analytical Method: EPA 353.2							
Nitrate as N	ND	mg/L	0.020	1		03/22/18 15:41	14797-55-8	FS	
Nitrite as N	ND	mg/L	0.020	1		03/22/18 15:41	14797-65-0	FS	
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		03/22/18 15:41		FS	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E							
Cyanide	12.4	ug/L	10.0	1	03/26/18 09:50	03/26/18 11:53	57-12-5		
SM4500P-E, Total Phosphorus		Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B							
Phosphorus	0.11	mg/L	0.050	1	03/27/18 09:22	03/27/18 12:50	7723-14-0		

Sample: FD-D5		Lab ID: 10424447003		Collected: 03/21/18 15:45		Received: 03/21/18 18:12		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C							
Aldrin	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	309-00-2		
alpha-BHC	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	319-84-6		
beta-BHC	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	319-85-7		
delta-BHC	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	319-86-8		
gamma-BHC (Lindane)	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	58-89-9		
Chlordane (Technical)	ND	ug/L	0.53	1	03/23/18 10:27	04/02/18 23:18	57-74-9		
alpha-Chlordane	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	5103-71-9		
gamma-Chlordane	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	5103-74-2		
4,4'-DDD	ND	ug/L	0.11	1	03/23/18 10:27	04/02/18 23:18	72-54-8		
4,4'-DDE	ND	ug/L	0.11	1	03/23/18 10:27	04/02/18 23:18	72-55-9		
4,4'-DDT	ND	ug/L	0.11	1	03/23/18 10:27	04/02/18 23:18	50-29-3		
Dieldrin	ND	ug/L	0.11	1	03/23/18 10:27	04/02/18 23:18	60-57-1		
Endosulfan I	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	959-98-8		
Endosulfan II	ND	ug/L	0.11	1	03/23/18 10:27	04/02/18 23:18	33213-65-9		
Endosulfan sulfate	ND	ug/L	0.11	1	03/23/18 10:27	04/02/18 23:18	1031-07-8		
Endrin	ND	ug/L	0.11	1	03/23/18 10:27	04/02/18 23:18	72-20-8		
Endrin aldehyde	ND	ug/L	0.11	1	03/23/18 10:27	04/02/18 23:18	7421-93-4		
Endrin ketone	ND	ug/L	0.11	1	03/23/18 10:27	04/02/18 23:18	53494-70-5		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

Sample: FD-D5	Lab ID: 10424447003	Collected: 03/21/18 15:45	Received: 03/21/18 18:12	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Heptachlor	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	76-44-8	
Heptachlor epoxide	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	1024-57-3	
Methoxychlor	ND	ug/L	0.53	1	03/23/18 10:27	04/02/18 23:18	72-43-5	
Toxaphene	ND	ug/L	1.6	1	03/23/18 10:27	04/02/18 23:18	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	89	%.	62-125	1	03/23/18 10:27	04/02/18 23:18	877-09-8	
Decachlorobiphenyl (S)	42	%.	30-143	1	03/23/18 10:27	04/02/18 23:18	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:51	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:51	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:51	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:51	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:51	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:51	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:51	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:51	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:51	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	45	%.	30-125	1	03/23/18 10:26	03/26/18 15:51	877-09-8	
Decachlorobiphenyl (S)	37	%.	30-125	1	03/23/18 10:26	03/26/18 15:51	2051-24-3	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	03/23/18 10:26	03/23/18 13:38	7429-90-5	
Barium, Dissolved	910	ug/L	10.0	1	03/23/18 10:26	03/23/18 13:38	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/23/18 10:26	03/23/18 13:38	7440-50-8	
Manganese, Dissolved	801	ug/L	5.0	1	03/23/18 10:26	03/23/18 13:38	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/23/18 10:26	03/23/18 13:38	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/23/18 10:26	03/23/18 13:38	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/23/18 10:26	03/23/18 13:38	7440-31-5	
Total Hardness by 2340B, Dissolved	1060000	ug/L	3300	1	03/23/18 10:26	03/23/18 13:38		
Zinc, Dissolved	53.6	ug/L	20.0	1	03/23/18 10:26	03/23/18 13:38	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	1.7	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:24	7440-36-0	
Arsenic, Dissolved	7.8	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:24	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/23/18 09:55	03/27/18 22:24	7440-41-7	
Boron, Dissolved	15600	ug/L	1250	250	03/23/18 09:55	03/30/18 11:10	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/23/18 09:55	03/27/18 22:24	7440-43-9	
Chromium, Dissolved	14.2	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:24	7440-47-3	
Cobalt, Dissolved	1.5	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:24	7440-48-4	
Lead, Dissolved	64.8	ug/L	0.10	1	03/23/18 09:55	03/27/18 22:24	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:24	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/23/18 09:55	03/27/18 22:24	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:24	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/23/18 09:55	03/27/18 22:24	7440-62-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample:	Lab ID:	Collected:	Received:	Matrix:									
FD-D5	10424447003	03/21/18 15:45	03/21/18 18:12	Water	Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
245.1 Mercury, Dissolved					Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved					ND	ug/L	0.20	1		03/23/18 08:40	03/27/18 12:02	7439-97-6	
8270D MSSV					Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	83-32-9	
Anthracene					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	120-12-7	
Benzo(a)pyrene					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	50-32-8	
Benzoic acid					ND	ug/L	51.5	1		03/22/18 12:56	03/30/18 12:27	65-85-0	
4-Bromophenylphenyl ether					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	101-55-3	
Butylbenzylphthalate					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	85-68-7	
bis(2-Chloroethyl) ether					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	111-44-4	
2-Chlorophenol					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	95-57-8	
3,3'-Dichlorobenzidine					ND	ug/L	51.5	1		03/22/18 12:56	03/30/18 12:27	91-94-1	
2,4-Dichlorophenol					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	120-83-2	
Diethylphthalate					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	84-66-2	
2,4-Dimethylphenol					ND	ug/L	51.5	1		03/22/18 12:56	03/30/18 12:27	105-67-9	
Dimethylphthalate					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	131-11-3	
Di-n-butylphthalate					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	84-74-2	
2,4-Dinitrophenol					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	51-28-5	
Di-n-octylphthalate					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	117-84-0	
bis(2-Ethylhexyl)phthalate					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	117-81-7	
Fluoranthene					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	206-44-0	
Fluorene					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	86-73-7	
Hexachlorobenzene					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	118-74-1	
Hexachlorocyclopentadiene					ND	ug/L	51.5	1		03/22/18 12:56	03/30/18 12:27	77-47-4	
Hexachloroethane					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	67-72-1	
Isophorone					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	78-59-1	
2-Methylnaphthalene					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	91-57-6	
2-Methylphenol(o-Cresol)					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	95-48-7	
3&4-Methylphenol(m&p Cresol)					ND	ug/L	20.6	1		03/22/18 12:56	03/30/18 12:27		
N-Nitrosodiphenylamine					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	86-30-6	
Pentachlorophenol					ND	ug/L	20.6	1		03/22/18 12:56	03/30/18 12:27	87-86-5	
Phenanthrene					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	85-01-8	
Phenol					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	108-95-2	
Pyrene					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	129-00-0	
2,4,6-Trichlorophenol					ND	ug/L	10.3	1		03/22/18 12:56	03/30/18 12:27	88-06-2	
Surrogates													
Nitrobenzene-d5 (S)					75	%	60-125	1		03/22/18 12:56	03/30/18 12:27	4165-60-0	
2-Fluorobiphenyl (S)					89	%	56-125	1		03/22/18 12:56	03/30/18 12:27	321-60-8	
p-Terphenyl-d14 (S)					89	%	58-125	1		03/22/18 12:56	03/30/18 12:27	1718-51-0	
Phenol-d6 (S)					84	%	58-125	1		03/22/18 12:56	03/30/18 12:27	13127-88-3	
2-Fluorophenol (S)					78	%	55-125	1		03/22/18 12:56	03/30/18 12:27	367-12-4	
2,4,6-Tribromophenol (S)					92	%	65-125	1		03/22/18 12:56	03/30/18 12:27	118-79-6	
Hach 10360 Rev 1.1 BOD					Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day					ND	mg/L	20.0	10		03/22/18 12:31	03/27/18 10:45		B4,B6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample: FD-D5	Lab ID: 10424447003	Collected: 03/21/18 15:45	Received: 03/21/18 18:12	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1664 HEM, Oil and Grease	Analytical Method: EPA 1664A OG							
Oil and Grease	ND	mg/L	5.4	1		03/28/18 10:51		
180.1 Turbidity	Analytical Method: EPA 180.1							
Turbidity	302	NTU	15.0	50		03/22/18 17:05		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	60.0	mg/L	10.0	1		03/27/18 11:11		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	6.8	Std. Units	0.10	1		03/27/18 14:17		H6
300.0 IC Anions	Analytical Method: EPA 300.0							
Fluoride	0.18	mg/L	0.050	1		03/31/18 01:37	16984-48-8	
Chromium, Hexavalent	Analytical Method: SM 3500-Cr D Modified							
Chromium, Hexavalent	ND	mg/L	0.010	1		03/22/18 10:36		FS,M1
350.1 Ammonia	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	15.5	mg/L	0.40	10		03/23/18 11:58	7664-41-7	
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrate as N	ND	mg/L	0.020	1		03/22/18 15:43	14797-55-8	FS
Nitrite as N	ND	mg/L	0.020	1		03/22/18 15:43	14797-65-0	FS
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		03/22/18 15:43		FS
SM4500CN-E Cyanide	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E							
Cyanide	20.6	ug/L	10.0	1	03/26/18 09:50	03/26/18 11:54	57-12-5	
SM4500P-E, Total Phosphorus	Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B							
Phosphorus	0.40	mg/L	0.050	1	03/27/18 09:22	03/27/18 12:50	7723-14-0	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 436495

Analysis Method: EPA 547

QC Batch Method: EPA 547

Analysis Description: 547 HPLC Glyphosate

Associated Lab Samples: 10424447001

METHOD BLANK: 2370792

Matrix: Water

Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Glyphosate	ug/L	ND	6.0	03/29/18 17:29	

LABORATORY CONTROL SAMPLE: 2370793

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Glyphosate	ug/L	50	45.7	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2370794 2370795

Parameter	Units	35382120001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	4.2U	50	50	43.8	45.2	88	90	80-120	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2370796 2370797

Parameter	Units	10424606001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	ND	50	50	36.4	36.2	73	72	80-120	0	30	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 435508 Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10424447001

METHOD BLANK: 2011284 Matrix: Water
Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methanol	mg/L	ND	5.0	04/04/18 13:46	

LABORATORY CONTROL SAMPLE: 2011285

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methanol	mg/L	50	56.4	113	79-111	L3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2011376 2011377

Parameter	Units	60266710003 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec				
Methanol	mg/L	ND	50	50	46.8	46.4	94	93	43-138	1	20			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 435081 Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10424447001

METHOD BLANK: 2009741 Matrix: Water
Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylene glycol	mg/L	ND	5.0	04/02/18 16:08	

LABORATORY CONTROL SAMPLE: 2009742

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylene glycol	mg/L	25	24.8	99	55-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009945 2009946

Parameter	Units	2009945		2009946		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10424606001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Ethylene glycol	mg/L	ND	25	25	14.4	25.6	58	103	38-154	56	20 R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 19069	Analysis Method: EPA 8316
QC Batch Method: EPA 8316	Analysis Description: 8316 W GCSV Acrylamide
Associated Lab Samples: 10424447001	

METHOD BLANK: 75864 Matrix: Water

Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acrylamide	ug/L	ND	20.0	03/29/18 15:20	

LABORATORY CONTROL SAMPLE: 75865

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acrylamide	ug/L	1000	1030	103	80-120	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 528713 Analysis Method: EPA 245.1
 QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury - Dissolved
 Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2869488 Matrix: Water
 Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	03/27/18 11:48	

LABORATORY CONTROL SAMPLE: 2869489

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	5.2	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869490 2869491

Parameter	Units	10424447002		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	ND	Spike Conc.	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec				
Mercury, Dissolved	ug/L	ND	ND	5	5	5.3	5.2	106	105	70-130	1	20			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 528712 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2869484 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	03/23/18 13:22	
Barium, Dissolved	ug/L	ND	10.0	03/23/18 13:22	
Copper, Dissolved	ug/L	ND	10.0	03/23/18 13:22	
Manganese, Dissolved	ug/L	ND	5.0	03/23/18 13:22	
Nickel, Dissolved	ug/L	ND	20.0	03/23/18 13:22	
Silver, Dissolved	ug/L	ND	10.0	03/23/18 13:22	
Tin, Dissolved	ug/L	ND	75.0	03/23/18 13:22	
Zinc, Dissolved	ug/L	ND	20.0	03/23/18 13:22	

LABORATORY CONTROL SAMPLE: 2869485

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21100	106	85-115	
Barium, Dissolved	ug/L	1000	1020	102	85-115	
Copper, Dissolved	ug/L	1000	982	98	85-115	
Manganese, Dissolved	ug/L	1000	1020	102	85-115	
Nickel, Dissolved	ug/L	1000	1010	101	85-115	
Silver, Dissolved	ug/L	500	488	98	85-115	
Tin, Dissolved	ug/L	1000	995	100	85-115	
Zinc, Dissolved	ug/L	1000	1000	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869486 2869487

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Spike Conc.	10424447001 Result	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	22800	22900	114	114	70-130	0	30
Barium, Dissolved	ug/L	132	1000	1000	1140	1140	101	101	70-130	0	30
Copper, Dissolved	ug/L	ND	1000	1000	1070	1070	107	107	70-130	0	30
Manganese, Dissolved	ug/L	267	1000	1000	1260	1270	99	100	70-130	0	30
Nickel, Dissolved	ug/L	ND	1000	1000	933	937	93	93	70-130	0	30
Silver, Dissolved	ug/L	ND	500	500	524	526	105	105	70-130	0	30
Tin, Dissolved	ug/L	ND	1000	1000	953	960	94	95	70-130	1	30
Zinc, Dissolved	ug/L	ND	1000	1000	911	918	91	92	70-130	1	30

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 528701 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2869446 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	03/27/18 20:58	
Arsenic, Dissolved	ug/L	ND	0.50	03/27/18 20:58	
Beryllium, Dissolved	ug/L	ND	0.20	03/27/18 20:58	
Boron, Dissolved	ug/L	ND	5.0	03/27/18 20:58	
Cadmium, Dissolved	ug/L	ND	0.080	03/27/18 20:58	
Chromium, Dissolved	ug/L	ND	0.50	03/27/18 20:58	
Cobalt, Dissolved	ug/L	ND	0.50	03/27/18 20:58	
Lead, Dissolved	ug/L	ND	0.10	03/27/18 20:58	
Selenium, Dissolved	ug/L	ND	0.50	03/27/18 20:58	
Thallium, Dissolved	ug/L	ND	0.10	03/27/18 20:58	
Uranium-238, Dissolved	ug/L	ND	0.50	03/27/18 20:58	
Vanadium, Dissolved	ug/L	ND	1.0	03/27/18 20:58	

LABORATORY CONTROL SAMPLE: 2869447

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	111	111	85-115	
Arsenic, Dissolved	ug/L	100	112	112	85-115	
Beryllium, Dissolved	ug/L	100	113	113	85-115	
Boron, Dissolved	ug/L	100	113	113	85-115	
Cadmium, Dissolved	ug/L	100	110	110	85-115	
Chromium, Dissolved	ug/L	100	111	111	85-115	
Cobalt, Dissolved	ug/L	100	109	109	85-115	
Lead, Dissolved	ug/L	100	113	113	85-115	
Selenium, Dissolved	ug/L	100	115	115	85-115	
Thallium, Dissolved	ug/L	100	110	110	85-115	
Uranium-238, Dissolved	ug/L	100	111	111	85-115	
Vanadium, Dissolved	ug/L	100	112	112	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869448 2869449

Parameter	Units	30246525001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Antimony, Dissolved	ug/L	ND	100	100	111	109	110	108	70-130	2	20	
Arsenic, Dissolved	ug/L	ND	100	100	110	107	110	107	70-130	3	20	
Beryllium, Dissolved	ug/L	ND	100	100	68.8	65.1	68	65	70-130	6	20	M6
Boron, Dissolved	ug/L	35400	100	100	35200	30700	-200	-4740	70-130	14	20	M6
Cadmium, Dissolved	ug/L	ND	100	100	94.6	91.4	95	91	70-130	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Parameter	Units	2869448		2869449		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		30246525001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Chromium, Dissolved	ug/L	ND	100	100	114	110	114	110	70-130	4	20	
Cobalt, Dissolved	ug/L	14.6	100	100	139	135	125	120	70-130	3	20	
Lead, Dissolved	ug/L	ND	100	100	99.2	94.9	99	95	70-130	4	20	
Selenium, Dissolved	ug/L	ND	100	100	93.2	94.4	92	94	70-130	1	20	
Thallium, Dissolved	ug/L	7.9	100	100	109	106	101	99	70-130	3	20	
Uranium-238, Dissolved	ug/L	ND	100	100	115	111	115	111	70-130	4	20	
Vanadium, Dissolved	ug/L	ND	100	100	116	112	116	112	70-130	4	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 530204 Analysis Method: EPA 524.2
 QC Batch Method: EPA 524.2 Analysis Description: 524.2 MSV
 Associated Lab Samples: 10424447001

METHOD BLANK: 2878023 Matrix: Water

Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	ND	4.0	04/02/18 12:48	
1,2-Dichloroethane-d4 (S)	%.	100	75-125	04/02/18 12:48	
4-Bromofluorobenzene (S)	%.	98	75-125	04/02/18 12:48	
Toluene-d8 (S)	%.	97	75-125	04/02/18 12:48	

LABORATORY CONTROL SAMPLE: 2878024

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	80	80.0	100	70-130	
1,2-Dichloroethane-d4 (S)	%.			100	75-125	
4-Bromofluorobenzene (S)	%.			96	75-125	
Toluene-d8 (S)	%.			98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878707 2878708

Parameter	Units	10425345001		2878708		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					
Total Trihalomethanes (Calc.)	ug/L	ND	80	80	76.7	81.1	96	101	70-130	5 20
1,2-Dichloroethane-d4 (S)	%.						100	99	75-125	
4-Bromofluorobenzene (S)	%.						97	97	75-125	HS
Toluene-d8 (S)	%.						98	99	75-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 435581 Analysis Method: EPA 549.2
QC Batch Method: EPA 549.2 Analysis Description: 549 HPLC Paraquat Diquat
Associated Lab Samples: 10424447001

METHOD BLANK: 2366828 Matrix: Water
Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diquat	ug/L	ND	0.40	03/27/18 10:27	

LABORATORY CONTROL SAMPLE: 2366829

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	2	1.5	77	70-130	

LABORATORY CONTROL SAMPLE: 2366830

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	.4	.33J	83	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2367284 2367285

Parameter	Units	35381489001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Diquat	ug/L	<0.30	2	2	1.6	1.5	79	76	70-130	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2367286 2367287

Parameter	Units	35381489002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Diquat	ug/L	<0.30	2	2	1.6	1.6	79	81	70-130	3	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 435937 Analysis Method: EPA 552.3
 QC Batch Method: EPA 552.3 Analysis Description: 5523 Haloacetic Acids
 Associated Lab Samples: 10424447001

METHOD BLANK: 2368198 Matrix: Water

Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromoacetic Acid	ug/L	ND	1.0	03/29/18 15:10	
Dichloroacetic Acid	ug/L	ND	1.0	03/29/18 15:10	
Haloacetic Acids (Total)	ug/L	ND	1.0	03/29/18 15:10	
Monobromoacetic Acid	ug/L	ND	1.0	03/29/18 15:10	
Monochloroacetic Acid	ug/L	ND	1.0	03/29/18 15:10	
Trichloroacetic Acid	ug/L	ND	1.0	03/29/18 15:10	
2,3-Dibromopropanoic Acid (S)	%	89	70-130	03/29/18 15:10	

LABORATORY CONTROL SAMPLE: 2368199

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromoacetic Acid	ug/L	10	10.6	106	70-130	
Dichloroacetic Acid	ug/L	10	10.3	103	70-130	
Haloacetic Acids (Total)	ug/L	50	53.4	107		
Monobromoacetic Acid	ug/L	10	10.9	109	70-130	
Monochloroacetic Acid	ug/L	10	11.2	112	70-130	
Trichloroacetic Acid	ug/L	10	10.5	105	70-130	
2,3-Dibromopropanoic Acid (S)	%			92	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2368425 2368426

Parameter	Units	35380326001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Dibromoacetic Acid	ug/L	<0.43	10	10	10.4	10.8	100	104	104	70-130	4	30	
Dichloroacetic Acid	ug/L	<0.24	10	10	9.9	10.3	99	103	103	70-130	4	30	
Haloacetic Acids (Total)	ug/L	<0.67	50	50	51.6	54.2	102	108	108		5	30	
Monobromoacetic Acid	ug/L	<0.29	10	10	10	10.9	100	109	109	70-130	9	30	
Monochloroacetic Acid	ug/L	<0.90	10	10	10.9	11.7	109	117	117	70-130	7	30	
Trichloroacetic Acid	ug/L	<0.26	10	10	10.4	10.6	104	106	106	70-130	1	30	
2,3-Dibromopropanoic Acid (S)	%						91	88	88	70-130		30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2368427 2368428

Parameter	Units	35380330001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Dibromoacetic Acid	ug/L	0.49J	10	10	11.0	11.3	105	108	108	70-130	2	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Parameter	Units	35380330001		2368427		2368428		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
Dichloroacetic Acid	ug/L	<0.24	10	10	10.5	10.7	103	105	70-130	2	30			
Haloacetic Acids (Total)	ug/L	0.68J	50	50	54.3	54.5	107	108		0	30			
Monobromoacetic Acid	ug/L	<0.29	10	10	10.8	10.6	108	106	70-130	2	30			
Monochloroacetic Acid	ug/L	<0.90	10	10	11.4	11.0	114	110	70-130	4	30			
Trichloroacetic Acid	ug/L	<0.26	10	10	10.6	11.0	106	110	70-130	4	30			
2,3-Dibromopropanoic Acid (S)	%						87	97	70-130		30			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 528742 Analysis Method: EPA 8081B
QC Batch Method: EPA Mod. 3510C Analysis Description: 8081B GCS Pesticides
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2869568 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/02/18 22:23	
4,4'-DDE	ug/L	ND	0.10	04/02/18 22:23	
4,4'-DDT	ug/L	ND	0.10	04/02/18 22:23	
Aldrin	ug/L	ND	0.050	04/02/18 22:23	
alpha-BHC	ug/L	ND	0.050	04/02/18 22:23	
alpha-Chlordane	ug/L	ND	0.050	04/02/18 22:23	
beta-BHC	ug/L	ND	0.050	04/02/18 22:23	
Chlordane (Technical)	ug/L	ND	0.50	04/02/18 22:23	
delta-BHC	ug/L	ND	0.050	04/02/18 22:23	
Dieldrin	ug/L	ND	0.10	04/02/18 22:23	
Endosulfan I	ug/L	ND	0.050	04/02/18 22:23	
Endosulfan II	ug/L	ND	0.10	04/02/18 22:23	
Endosulfan sulfate	ug/L	ND	0.10	04/02/18 22:23	
Endrin	ug/L	ND	0.10	04/02/18 22:23	
Endrin aldehyde	ug/L	ND	0.10	04/02/18 22:23	
Endrin ketone	ug/L	ND	0.10	04/02/18 22:23	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/02/18 22:23	
gamma-Chlordane	ug/L	ND	0.050	04/02/18 22:23	
Heptachlor	ug/L	ND	0.050	04/02/18 22:23	
Heptachlor epoxide	ug/L	ND	0.050	04/02/18 22:23	
Methoxychlor	ug/L	ND	0.50	04/02/18 22:23	
Toxaphene	ug/L	ND	1.5	04/02/18 22:23	
Decachlorobiphenyl (S)	%	78	30-143	04/02/18 22:23	
Tetrachloro-m-xylene (S)	%	95	62-125	04/02/18 22:23	

LABORATORY CONTROL SAMPLE & LCSD: 2869569

Parameter	Units	2869570							RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits				
4,4'-DDD	ug/L	1	1.1	1.1	108	113	67-125	5	20		
4,4'-DDE	ug/L	1	1.0	1.1	103	110	68-125	6	20		
4,4'-DDT	ug/L	1	1.0	1.1	105	111	66-125	5	20	CH	
Aldrin	ug/L	.5	0.40	0.44	80	88	46-125	10	20		
alpha-BHC	ug/L	.5	0.51	0.54	102	109	66-125	6	20		
alpha-Chlordane	ug/L	.5	0.49	0.52	97	104	72-125	6	20		
beta-BHC	ug/L	.5	0.51	0.53	101	107	72-125	5	20		
delta-BHC	ug/L	.5	0.50	0.53	100	106	37-141	6	20		
Dieldrin	ug/L	1	1.1	1.2	108	115	71-125	6	20		
Endosulfan I	ug/L	.5	0.44	0.46	88	93	69-125	6	20		
Endosulfan II	ug/L	1	1.0	1.1	104	110	73-125	5	20		
Endosulfan sulfate	ug/L	1	0.95	1.0	95	100	63-127	5	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Parameter	Units	2869569		2869570			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Endrin	ug/L	1	1.0	1.1	100	106	72-125	6	20	
Endrin aldehyde	ug/L	1	0.97	1.0	97	102	70-125	5	20	
Endrin ketone	ug/L	1	1.1	1.1	107	112	72-127	5	20	
gamma-BHC (Lindane)	ug/L	.5	0.51	0.54	103	109	69-125	6	20	
gamma-Chlordane	ug/L	.5	0.45	0.48	89	95	64-125	7	20	
Heptachlor	ug/L	.5	0.47	0.51	94	103	54-125	9	20	
Heptachlor epoxide	ug/L	.5	0.50	0.53	99	105	72-125	6	20	
Methoxychlor	ug/L	5	5.6	5.9	113	117	67-127	4	20	CH
Decachlorobiphenyl (S)	%.				79	80	30-143			
Tetrachloro-m-xylene (S)	%.				93	98	62-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 528740 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2869563 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	03/26/18 14:48	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	03/26/18 14:48	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	03/26/18 14:48	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	03/26/18 14:48	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	03/26/18 14:48	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	03/26/18 14:48	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	03/26/18 14:48	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	03/26/18 14:48	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	03/26/18 14:48	
Decachlorobiphenyl (S)	%	71	30-125	03/26/18 14:48	
Tetrachloro-m-xylene (S)	%	57	30-125	03/26/18 14:48	

LABORATORY CONTROL SAMPLE & LCSD: 2869564

Parameter	Units	2869565								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.4	1.4	70	68	47-125	3	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.5	1.5	73	74	54-125	0	20	
Decachlorobiphenyl (S)	%				76	75	30-125			
Tetrachloro-m-xylene (S)	%				64	59	30-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 528628 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2868857 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	03/29/18 23:33	
2,4-Dichlorophenol	ug/L	ND	10.0	03/29/18 23:33	
2,4-Dimethylphenol	ug/L	ND	50.0	03/29/18 23:33	
2,4-Dinitrophenol	ug/L	ND	10.0	03/29/18 23:33	
2-Chlorophenol	ug/L	ND	10.0	03/29/18 23:33	
2-Methylnaphthalene	ug/L	ND	10.0	03/29/18 23:33	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	03/29/18 23:33	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	03/29/18 23:33	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	03/29/18 23:33	
4-Bromophenylphenyl ether	ug/L	ND	10.0	03/29/18 23:33	
Acenaphthene	ug/L	ND	10.0	03/29/18 23:33	
Anthracene	ug/L	ND	10.0	03/29/18 23:33	
Benzo(a)pyrene	ug/L	ND	10.0	03/29/18 23:33	
Benzoic acid	ug/L	ND	50.0	03/29/18 23:33	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	03/29/18 23:33	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	03/29/18 23:33	
Butylbenzylphthalate	ug/L	ND	10.0	03/29/18 23:33	
Di-n-butylphthalate	ug/L	ND	10.0	03/29/18 23:33	
Di-n-octylphthalate	ug/L	ND	10.0	03/29/18 23:33	
Diethylphthalate	ug/L	ND	10.0	03/29/18 23:33	
Dimethylphthalate	ug/L	ND	10.0	03/29/18 23:33	
Fluoranthene	ug/L	ND	10.0	03/29/18 23:33	
Fluorene	ug/L	ND	10.0	03/29/18 23:33	
Hexachlorobenzene	ug/L	ND	10.0	03/29/18 23:33	
Hexachlorocyclopentadiene	ug/L	ND	50.0	03/29/18 23:33	
Hexachloroethane	ug/L	ND	10.0	03/29/18 23:33	
Isophorone	ug/L	ND	10.0	03/29/18 23:33	
N-Nitrosodiphenylamine	ug/L	ND	10.0	03/29/18 23:33	
Pentachlorophenol	ug/L	ND	20.0	03/29/18 23:33	
Phenanthrene	ug/L	ND	10.0	03/29/18 23:33	
Phenol	ug/L	ND	10.0	03/29/18 23:33	
Pyrene	ug/L	ND	10.0	03/29/18 23:33	
2,4,6-Tribromophenol (S)	%	72	65-125	03/29/18 23:33	
2-Fluorobiphenyl (S)	%	85	56-125	03/29/18 23:33	
2-Fluorophenol (S)	%	82	55-125	03/29/18 23:33	
Nitrobenzene-d5 (S)	%	79	60-125	03/29/18 23:33	
p-Terphenyl-d14 (S)	%	101	58-125	03/29/18 23:33	
Phenol-d6 (S)	%	83	58-125	03/29/18 23:33	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

LABORATORY CONTROL SAMPLE & LCSD: 2868858		2868859								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	39.6	39.4	79	79	74-125	0	20	
2,4-Dichlorophenol	ug/L	50	40.8	36.3	82	73	68-125	12	20	
2,4-Dimethylphenol	ug/L	50	34.5J	34J	69	68	33-125		20	
2,4-Dinitrophenol	ug/L	50	32.9	35.0	66	70	30-127	6	20	
2-Chlorophenol	ug/L	50	39.9	32.9	80	66	61-125	19	20	
2-Methylnaphthalene	ug/L	50	41.8	36.9	84	74	67-125	13	20	
2-Methylphenol(o-Cresol)	ug/L	50	38.3	33.6	77	67	63-125	13	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	39.2	35.2	78	70	67-125	11	20	
3,3'-Dichlorobenzidine	ug/L	50	45.4J	45J	91	90	60-125		20	
4-Bromophenylphenyl ether	ug/L	50	42.9	42.3	86	85	75-125	1	20	
Acenaphthene	ug/L	50	40.2	40.3	80	81	74-125	0	20	
Anthracene	ug/L	50	43.7	43.8	87	88	75-125	0	20	
Benzo(a)pyrene	ug/L	50	42.1	43.2	84	86	75-125	2	20	
Benzoic acid	ug/L	50	24.5J	26.5J	49	53	30-125		20	
bis(2-Chloroethyl) ether	ug/L	50	38.5	31.5	77	63	55-125	20	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	40.9	41.2	82	82	72-129	1	20	
Butylbenzylphthalate	ug/L	50	41.3	40.9	83	82	69-127	1	20	
Di-n-butylphthalate	ug/L	50	41.1	41.4	82	83	75-125	1	20	
Di-n-octylphthalate	ug/L	50	41.1	41.9	82	84	69-131	2	20	
Diethylphthalate	ug/L	50	41.6	42.4	83	85	75-125	2	20	
Dimethylphthalate	ug/L	50	41.2	42.4	82	85	75-125	3	20	
Fluoranthene	ug/L	50	42.9	43.8	86	88	75-125	2	20	
Fluorene	ug/L	50	41.4	42.1	83	84	75-125	2	20	
Hexachlorobenzene	ug/L	50	42.2	42.1	84	84	74-125	0	20	
Hexachlorocyclopentadiene	ug/L	50	19.3J	ND	39	34	30-125		20	
Hexachloroethane	ug/L	50	36.6	30.4	73	61	30-125	18	20	
Isophorone	ug/L	50	39.8	36.4	80	73	72-125	9	20	
N-Nitrosodiphenylamine	ug/L	50	41.9	41.3	84	83	75-125	1	20	
Pentachlorophenol	ug/L	50	36.3	37.3	73	75	52-125	3	20	
Phenanthrene	ug/L	50	42.7	43.5	85	87	75-125	2	20	
Phenol	ug/L	50	40.0	33.5	80	67	59-125	18	20	
Pyrene	ug/L	50	43.5	43.8	87	88	75-125	1	20	
2,4,6-Tribromophenol (S)	%				84	90	65-125			
2-Fluorobiphenyl (S)	%				90	87	56-125			
2-Fluorophenol (S)	%				85	71	55-125			
Nitrobenzene-d5 (S)	%				84	72	60-125			
p-Terphenyl-d14 (S)	%				95	98	58-125			
Phenol-d6 (S)	%				86	74	58-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 18993	Analysis Method: EPA 8315A
QC Batch Method: EPA 8315A	Analysis Description: 8315 GCSV Aldehydes
Associated Lab Samples: 10424447001	

METHOD BLANK: 75621 Matrix: Water

Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Formaldehyde	ug/L	ND	100	03/30/18 11:19	

LABORATORY CONTROL SAMPLE: 75622

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	400	403	101	44-176	

MATRIX SPIKE SAMPLE: 75623

Parameter	Units	40166480001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	1560	400	1620	17	35-167	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 528575 Analysis Method: Hach 10360 Rev 1.1
QC Batch Method: Hach 10360 Analysis Description: Hach 10360 Rev 1.1, BOD
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2868655 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	03/27/18 10:07	B4,B6

LABORATORY CONTROL SAMPLE: 2868657

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	235	119	85-115	B4,B6

SAMPLE DUPLICATE: 2868658

Parameter	Units	10424336001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	608	582	4	20	B4,B6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 529209 Analysis Method: EPA 1664A OG
QC Batch Method: EPA 1664A OG Analysis Description: 1664 HEM, Oil and Grease
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2872311 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	03/27/18 13:47	

LABORATORY CONTROL SAMPLE: 2872312

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	33.3	83	78-114	

MATRIX SPIKE SAMPLE: 2872313

Parameter	Units	10424341001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	ND	45.5	41.2	87	78-114	

SAMPLE DUPLICATE: 2872314

Parameter	Units	10424276001 Result	Dup Result	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	ND	ND		18	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 528669 Analysis Method: EPA 180.1

QC Batch Method: EPA 180.1 Analysis Description: 180.1 Turbidity

Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2869206 Matrix: Water

Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	03/22/18 16:58	

LABORATORY CONTROL SAMPLE: 2869207

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.2	98	90-110	

SAMPLE DUPLICATE: 2869208

Parameter	Units	10424447001 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	145	157	8	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 529149 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10424447002, 10424447003

METHOD BLANK: 2872133 Matrix: Water
Associated Lab Samples: 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	03/27/18 11:11	

LABORATORY CONTROL SAMPLE: 2872134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	84.0	84	80-120	

SAMPLE DUPLICATE: 2872135

Parameter	Units	10424556001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	19.0	18.0	5	10	

SAMPLE DUPLICATE: 2872136

Parameter	Units	10424561001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	839	832	1	10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 529277 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10424447001

METHOD BLANK: 2872638 Matrix: Water
Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	03/27/18 15:13	

LABORATORY CONTROL SAMPLE: 2872639

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	82.0	82	80-120	

SAMPLE DUPLICATE: 2872640

Parameter	Units	10424927021 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	132	129	2	10	H3

SAMPLE DUPLICATE: 2872641

Parameter	Units	10424927022 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	49.0	50.0	2	10	H3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 436075

Analysis Method: SM 4500-CIO2

QC Batch Method: SM 4500-CIO2

Analysis Description: 4500CIO2 Chlorine Dioxide

Associated Lab Samples: 10424447001

METHOD BLANK: 2368981

Matrix: Water

Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorine Dioxide	mg/L	ND	0.10	03/28/18 15:13	H6

LABORATORY CONTROL SAMPLE: 2368982

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorine Dioxide	mg/L	2.5	2.3	94	90-110	H6

SAMPLE DUPLICATE: 2368983

Parameter	Units	10424447001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	0.45	0.46	2	20	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 529218 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 10424447001, 10424447002, 10424447003

LABORATORY CONTROL SAMPLE: 2872361

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	100	98-102	H6

SAMPLE DUPLICATE: 2872362

Parameter	Units	10424592001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	10.6	10.6	0	3	H6

SAMPLE DUPLICATE: 2872363

Parameter	Units	92378064001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	5.4	5.4	0	3	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 529627 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2874679 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	ND	0.050	03/30/18 20:53	

LABORATORY CONTROL SAMPLE: 2874680

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	1	0.96	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874681 2874682

Parameter	Units	10424547001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Fluoride	mg/L	0.29	1	1.3	1	1.3	98	99	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874683 2874684

Parameter	Units	10424924002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Fluoride	mg/L	0.065	1	1.1	1	1.1	103	104	90-110	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 437078	Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1	Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10424447001	

METHOD BLANK: 2373461 Matrix: Water

Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorite	ug/L	ND	5.0	04/01/18 11:32	

LABORATORY CONTROL SAMPLE: 2373462

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	40	37.5	94	85-115	

MATRIX SPIKE SAMPLE: 2373464

Parameter	Units	35382915001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	638U	20000	18500	93	75-125	

SAMPLE DUPLICATE: 2373463

Parameter	Units	35382915001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorite	ug/L	638U	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 528552 Analysis Method: SM 3500-Cr D Modified
 QC Batch Method: SM 3500-Cr D Modified Analysis Description: Chromium, Hexavalent by 3500
 Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2868603 Matrix: Water

Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	03/22/18 10:36	FS

LABORATORY CONTROL SAMPLE: 2868604

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.20	100	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2868605 2868606

Parameter	Units	2868605		2868606		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10424447003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chromium, Hexavalent	mg/L	ND	.2	.2	.0057J	.0065J	1	1	85-115	20	FS,M3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 528718 Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 Analysis Description: 350.1 Ammonia
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2869504 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.040	03/23/18 10:34	

LABORATORY CONTROL SAMPLE: 2869505

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	0.99	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869506 2869507

Parameter	Units	10424422001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Nitrogen, Ammonia	mg/L	ND	1	1	1.0	1.0	100	102	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869508 2869509

Parameter	Units	10424547001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Nitrogen, Ammonia	mg/L	ND	1	1	1.1	1.0	103	98	90-110	5	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 528625 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2868845 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	03/22/18 15:44	FS
Nitrite as N	mg/L	ND	0.020	03/22/18 15:44	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	03/22/18 15:44	FS

LABORATORY CONTROL SAMPLE: 2868846

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	0.99	99	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	0.98	98	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2868847 2868848

Parameter	Units	10424302002		2868847		2868848		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
Nitrite as N	mg/L	<0.0062	1	1	0.97	1.0	97	102	90-110	5	20		
Nitrogen, NO2 plus NO3	mg/L	<0.0075	1	1	0.96	1.0	96	100	90-110	4	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 19623 Analysis Method: EPA 9016
 QC Batch Method: EPA 9016 Analysis Description: 9016 Free Cyanide
 Associated Lab Samples: 10424447001

METHOD BLANK: 77969 Matrix: Water
 Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/05/18 17:03	

LABORATORY CONTROL SAMPLE: 77970

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	151	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 77971 77972

Parameter	Units	10424606001		77971		77972		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Cyanide, Free	ug/L	ND	150	150	160	160	106	106	80-120	0	11

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 528953 Analysis Method: SM 4500-CN-E
 QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
 Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2870951 Matrix: Water

Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	03/26/18 11:40	

LABORATORY CONTROL SAMPLE: 2870952

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	255	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2870953 2870954

Parameter	Units	10424637001		2870953		2870954		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MS Result	MS Spike Conc.	MS Result	MS Spike Conc.				
Cyanide	ug/L	ND	250	250	5.4J	216	2	86	80-120	30	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 529144 Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2872122 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	03/27/18 11:58	

LABORATORY CONTROL SAMPLE: 2872123

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	1.0	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2872124 2872125

Parameter	Units	10424580001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Phosphorus	mg/L	920 ug/L	1	1	1.3	1.3	40	42	80-120	2	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2872126 2872127

Parameter	Units	10424861001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Phosphorus	mg/L	ND	1	1	1.2	1.2	114	119	80-120	5	30	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample: FD-A5 **Lab ID: 10424447001** Collected: 03/21/18 10:00 Received: 03/21/18 18:12 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	3.75 ± 7.77 (14.7) C:NA T:NA	pCi/L	03/29/18 18:15	12587-46-1	
Gross Beta	EPA 900.0	142 ± 26.9 (8.34) C:NA T:NA	pCi/L	03/29/18 18:15	12587-47-2	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch:	292947	Analysis Method:	EPA 900.0
QC Batch Method:	EPA 900.0	Analysis Description:	900.0 Gross Alpha/Beta
Associated Lab Samples:	10424447001		

METHOD BLANK:	1433553	Matrix:	Water
Associated Lab Samples:	10424447001		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.243 ± 0.706 (1.79) C:NA T:NA	pCi/L	03/30/18 08:54	
Gross Beta	1.53 ± 1.40 (2.86) C:NA T:NA	pCi/L	03/30/18 08:54	

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Act - Activity
Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).
Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)
(MDC) - Minimum Detectable Concentration
Trac - Tracer Recovery (%)
Carr - Carrier Recovery (%)
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan
PASI-I Pace Analytical Services - Indianapolis
PASI-M Pace Analytical Services - Minneapolis
PASI-O Pace Analytical Services - Ormond Beach
PASI-PA Pace Analytical Services - Greensburg

WORKORDER QUALIFIERS

WO: 10424447
[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 19125
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

BATCH QUALIFIERS

Batch: 529070

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

Batch: 529209

[BE] Batch extracted by solid phase extraction (SPE).

Batch: 529242

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

ANALYTE QUALIFIERS

- 1M Post-analysis pH measurement indicates insufficient VOA sample preservation. Therefore, analysis was conducted outside the recognized method holding time.
- 2M Sample was dark grey in color and grainy. Sample needed to be centrifuged and decanted. Emulsion was also present during extraction.
- 3M Sample was light grey in color and grainy. Sample needed to be centrifuged and decanted. Emulsion was also present during extraction.
- B4 The glucose/glutamic acid standard exceeded the range of 198 plus or minus 30.5 mg/L.
- B6 The calculated seed correction exceeded the range of 0.6 to 1.0 mg/L.
- CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
- D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
- FS The sample was filtered in the laboratory prior to analysis.
- H1 Analysis conducted outside the EPA method holding time.
- H1 Analysis conducted outside the recognized method holding time.
- H2 Extraction or preparation conducted outside EPA method holding time.
- H3 Sample was received or analysis requested beyond the recognized method holding time.
- H6 Analysis initiated outside of the 15 minute EPA required holding time.
- HS Results are from sample aliquot taken from VOA vial with headspace (air bubble greater than 6 mm diameter).
- L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- P4 Sample field preservation does not meet EPA or method recommendations for this analysis.
- R1 RPD value was outside control limits.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424447001	FD-A5	EPA 547	436495		
10424447001	FD-A5	EPA 549.2	435581	EPA 549.2	435759
10424447001	FD-A5	EPA 552.3	435937	EPA 552.3	436444
10424447001	FD-A5	EPA 8015 Alcohol-Glycol	435508		
10424447001	FD-A5	EPA 8015 Alcohol-Glycol	435081		
10424447001	FD-A5	EPA Mod. 3510C	528742	EPA 8081B	530201
10424447002	FD-B5	EPA Mod. 3510C	528742	EPA 8081B	530201
10424447003	FD-D5	EPA Mod. 3510C	528742	EPA 8081B	530201
10424447001	FD-A5	EPA Mod. 3510C	528740	EPA 8082A	529070
10424447002	FD-B5	EPA Mod. 3510C	528740	EPA 8082A	529070
10424447003	FD-D5	EPA Mod. 3510C	528740	EPA 8082A	529070
10424447001	FD-A5	EPA 8315A	18993	EPA 8315A	19125
10424447001	FD-A5	EPA 8316	19069		
10424447001	FD-A5	EPA 200.7	528712	EPA 200.7	528795
10424447002	FD-B5	EPA 200.7	528712	EPA 200.7	528795
10424447003	FD-D5	EPA 200.7	528712	EPA 200.7	528795
10424447001	FD-A5	EPA 200.8	528701	EPA 200.8	528991
10424447002	FD-B5	EPA 200.8	528701	EPA 200.8	528991
10424447003	FD-D5	EPA 200.8	528701	EPA 200.8	528991
10424447001	FD-A5	EPA 245.1	528713	EPA 245.1	528803
10424447002	FD-B5	EPA 245.1	528713	EPA 245.1	528803
10424447003	FD-D5	EPA 245.1	528713	EPA 245.1	528803
10424447001	FD-A5	EPA 3520	528628	EPA 8270D	529242
10424447002	FD-B5	EPA 3520	528628	EPA 8270D	529242
10424447003	FD-D5	EPA 3520	528628	EPA 8270D	529242
10424447001	FD-A5	EPA 524.2	530204		
10424447001	FD-A5	EPA 900.0	292947		
10424447001	FD-A5	Hach 10360	528575	Hach 10360 Rev 1.1	528774
10424447002	FD-B5	Hach 10360	528575	Hach 10360 Rev 1.1	528774
10424447003	FD-D5	Hach 10360	528575	Hach 10360 Rev 1.1	528774
10424447001	FD-A5	EPA 1664A OG	529209		
10424447002	FD-B5	EPA 1664A OG	529209		
10424447003	FD-D5	EPA 1664A OG	529209		
10424447001	FD-A5	EPA 180.1	528669		
10424447002	FD-B5	EPA 180.1	528669		
10424447003	FD-D5	EPA 180.1	528669		
10424447001	FD-A5	SM 2540D	529277		
10424447002	FD-B5	SM 2540D	529149		
10424447003	FD-D5	SM 2540D	529149		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424447001	FD-A5	SM 4500-CIO2	436075		
10424447001	FD-A5	SM 4500-H+B	529218		
10424447002	FD-B5	SM 4500-H+B	529218		
10424447003	FD-D5	SM 4500-H+B	529218		
10424447001	FD-A5	EPA 300.0	529627		
10424447002	FD-B5	EPA 300.0	529627		
10424447003	FD-D5	EPA 300.0	529627		
10424447001	FD-A5	EPA 300.1	437078		
10424447001	FD-A5	EPA 300.1	437079		
10424447001	FD-A5	SM 3500-Cr D Modified	528552		
10424447002	FD-B5	SM 3500-Cr D Modified	528552		
10424447003	FD-D5	SM 3500-Cr D Modified	528552		
10424447001	FD-A5	EPA 350.1	528718		
10424447002	FD-B5	EPA 350.1	528718		
10424447003	FD-D5	EPA 350.1	528718		
10424447001	FD-A5	EPA 353.2	528625		
10424447002	FD-B5	EPA 353.2	528625		
10424447003	FD-D5	EPA 353.2	528625		
10424447001	FD-A5	EPA 9016	19623	EPA 9016	19643
10424447001	FD-A5	SM 4500-CN-E	528953	SM 4500-CN-E	529003
10424447002	FD-B5	SM 4500-CN-E	528953	SM 4500-CN-E	529003
10424447003	FD-D5	SM 4500-CN-E	528953	SM 4500-CN-E	529003
10424447001	FD-A5	SM 4500-P B	529144	SM 4500-P E	529202
10424447002	FD-B5	SM 4500-P B	529144	SM 4500-P E	529202
10424447003	FD-D5	SM 4500-P B	529144	SM 4500-P E	529202

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Chain-of-Custody Form

Work Order Number:

Turnaround Time:

WO#: 10424447

10424447

PROJECT/CLIENT INFO

Facility Code: MPCA Freeway LF waters

Program Code (MDH Lab Only):

Lab Name:

Project Name: MPCA Freeway LF waters

Project Task Code:

Address: 18-00383

Project Manager:

EPIC Profile # 38710

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

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

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

LAB MATRIX CODES

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

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

FIELD MATRIX CODES

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

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS		Lab Sample No.	#
												PRESERV.			
FD-A5	S	3/21/18	1000	NA	NA	G	NW	Wt-Ground	N		33	X	List A+B	601	1
FD-B5	S	3/21/18	1320	NA	NA	G	NW	Wt-Ground	N		16		List A	602	2
FD-D5	S	3/21/18	1545	NA	NA	G	NW	Wt-Ground	N		16		X	603	3
															4
															5
															6
															7
															8
															9
															10

Sampled By: Chris Pelosi

Sampler's Signature: *Chiff Ph*

Phone #: 612-597-7254

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
<i>Chiff Ph</i> Pace	3/21/18 1811	<i>myself</i> Pace	3/21/18 1812

T=6.7, 9.4, 9.3, 7.1, 9.0°C

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO3	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals - Dissolved ①	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, hexavalent	SM3500CRB
Mercury	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260.LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

① metals - Dissolved per 3/19/18 email from Mark Umholtz. B6J-3/19/18

Sample Condition Upon Receipt

Client Name: Pace Field

Project #:

WO# : 10424447

PM: BM2 Due Date: 04/05/18
CLIENT: PAST-MNFLD

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

Tracking Number: _____

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

Optional: Proj. Due Date: _____ Proj. Name: _____

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

Thermometer Used: 151401163 65, 9.1, 9.2, 6.9 G87A9155100842 8.5
Type of Ice: Wet Blue None Dry Melted

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

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

USDA Regulated Soil (N/A, water sample)

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

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

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	12. <u>FD-D5 sample time 1540. COC says 1545</u>
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: <u>VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.</u>	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N Sample # <u>14/4 1-3 1/1 1-3 3/3</u> AS pH <u>10.8</u> <u>2-3 1/1</u> DS pH <u>10.8</u> Initial when completed: <u>SD</u> Lot # of added preservative: <u>117041</u>
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____

Date/Time: _____

Comments/Resolution: _____

Project Manager Review: _____

Date: _____

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

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424447 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 3/21/2018 Results Requested By: 4/5/2018

Report To: **Bob Michels** Subcontract To: **Pace Analytical Pittsburgh** Requested Analysis: **30247380**

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

Pace Analytical Pittsburgh
 1638 Roseytown Road
 Suites 2,3 & 4
 Greensburg, PA 15601
 Phone (724)850-5600

WO# : 30247380

30247380

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Gross Alpha/Beta EPA 900.0	LAB USE ONLY
						HNO3					
1	FD-A5	PS	3/21/2018 10:00	10424447001	Water	3				X	001
2											
3											
4											
5											

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	3/26/18/1645	<i>[Signature]</i>	3-27-18	020
2					
3					

Cooler Temperature on Receipt **2.8 °C** Custody Seal Y or **(N)** Received on Ice **(Y)** or N Samples Intact **(Y)** or N

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

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical Client Name: Pace PL Project# 60247380

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 7254

Label	<u>DS</u>
LIMS Login	<u>DS</u>

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

Thermometer Used 6 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 2.8 °C Correction Factor: 0.0 °C Final Temp: 2.8 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>DS 3-27-18</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>phed</u>
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
exceptions: VOA, coliform, TOC, O&G, Phenolics	Initial when completed: <u>DS</u>		Date/time of preservation	
	Lot # of added preservative			
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Rad Aqueous Samples Screened > 0.5 mrem/hr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>DS</u> Date: <u>3-27-18</u>

Client Notification/ Resolution:

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

A check in this box indicates that additional information has been stored in ereports.

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

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Chain of Custody

NO#: 35381956



Samples were sent

State Of Origin: MN



Workorder: 10424447

Workorder Name: 18-00383 MPCA Freeway LF Water

Owner Received Date: 3/21/2018 Results Requested By: 4/5/2018

Report To		Subcontract To		Requested Analysis																																																																																																						
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Ormond Beach 8 East Tower Circle Ormond Beach, FL 32174 Phone (386)672-5668		<table border="1"> <tr> <th colspan="4">Preserved Containers</th> <th>Bromate/Chlorite EPA 300.1</th> <th>Chlorine Dioxide SM4500ClO2</th> <th>Diquat EPA 549.2</th> <th>Glyphosate EPA 547</th> <th>Haloacetic acids, total (HAA5) EPA</th> <th colspan="4"></th> </tr> <tr> <th>Unpreserved</th> <th>Other</th> <th>HAZ3003</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th colspan="4">LAB USE ONLY</th> </tr> <tr> <td>2</td> <td>2</td> <td>1</td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td colspan="4"></td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td colspan="4"> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td colspan="4"> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td colspan="4"> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td colspan="4"> </td> </tr> </table>												Preserved Containers				Bromate/Chlorite EPA 300.1	Chlorine Dioxide SM4500ClO2	Diquat EPA 549.2	Glyphosate EPA 547	Haloacetic acids, total (HAA5) EPA					Unpreserved	Other	HAZ3003							LAB USE ONLY				2	2	1		X	X	X	X	X																																																								
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2	2	1		X	X	X	X	X																																																																																																		

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	3/26/18 1645	<i>[Signature]</i>	3/27/18 1240	*Diquat already in FL
2					
3					

Cooler Temperature on Receipt 1.6 °C Custody Seal or N Received on Ice or N Samples Intact or N

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



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #
Project Manager:
Client:

WO# : 35381956

PM: ADC Due Date: 04/05/18
CLIENT: PACMIN

Date and Initials of person:

Examining contents:
Label: _____
Deliver: _____
pH: _____

Thermometer Used: T-315 Date: 3-27-18 Time: 1040 Initials: NMP

State of Origin: _____

Cooler #1 Temp. °C 1.6 (Visual) +1 (Correction Factor) 1.6 (Actual)
Cooler #2 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #3 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #4 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #5 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #6 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)

- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____
Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9831 7265

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No Ice: Wet Blue Dry None
Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (If Yes, complete) Shorted Date: _____ Shorted Time: _____ Qty: _____

Comments:

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sufficient Volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____

Comments/ Resolution (use back for additional comments): _____

Project Manager Review: _____ Date: _____



SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: <u>Pace Minnesota</u>	Work Order #: <u>469928</u>
Receipt Record Page/Line #: <u>15-5</u>	Project Chemist: _____ Sample #: _____

Recorded by (initials/date): <u>PS 8/27/18</u>	<input checked="" type="checkbox"/> Cooler <input type="checkbox"/> Box <input type="checkbox"/> Other	Qty Received: <u>1</u>	<input checked="" type="checkbox"/> IR Gun (#202) <input type="checkbox"/> Thermometer Used <input type="checkbox"/> Digital Thermometer (#54) <input type="checkbox"/> Other (# _____)
--	--	------------------------	--

Cooler #	Time	Cooler #	Time	Cooler #	Time	Cooler #	Time
<u>Red</u>	<u>1030</u>						
Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None Coolant Location: <input checked="" type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative	
Observed °C	Correction Factor °C	Actual °C	Temp Blank	Observed °C	Correction Factor °C	Actual °C	Temp Blank
Sample 1: <u>1.8</u>	<u>1</u>	<u>1.8</u>		Sample 1:			
Sample 2: <u>1.7</u>		<u>1.7</u>		Sample 2:			
Sample 3: <u>1.0</u>		<u>1.0</u>		Sample 3:			
3 Sample Average °C: _____				3 Sample Average °C: _____			
<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?				<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?			

If any shaded areas checked, complete Sample Receiving Non-Conformance and/or Inventory Form

Paperwork Received

Yes No Chain of Custody record(s)? If No, Initiated By _____
 Received for Lab Signed/Date/Time? _____

Shipping document?
 Other _____

COC Information

Pace COC Other _____

COC ID Numbers: _____

Check COC for Accuracy

Yes No Analysis Requested?
 Sample ID matches COC?
 Sample Date and Time matches COC?
 Container type completed on COC?
 All container types indicated are received?

Sample Condition Summary

N/A Yes No

Broken containers/lids?
 Missing or incomplete labels?
 Illegible information on labels?
 Low volume received?
 Inappropriate or non-Pace containers received?
 VOC vials / TOX containers have headspace?
 Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A Yes No

Temperature Blank OR average sample temperature, ≥6° C?
 If either is ≥6° C, was thermal preservation required?
 If "Yes", Project Chemist Approval Initials: _____
 If "Yes" Completed Non Con Cooler - Cont Inventory Form?
 Completed Sample Preservation Verification Form?
 Samples chemically preserved correctly?
 If "No", added orange tag?
 Received pre-preserved VOC soils?
 MeOH Na₂SO₄

Check for Short Hold-Time Prep/Analyses

Bacteriological
 Air Bags
 EnCores / Methanol Pre-Preserved
 Formaldehyde/Aldehyde
 Green-tagged containers
 Yellow/White-tagged 1 L ambers (SV Prep-Lab)

AFTER HOURS ONLY:
 COPIES OF COC TO LAB AREA(S)
 NONE RECEIVED
 RECEIVED, COCs TO LAB(S)

Notes

Trip Blank received Trip Blank not listed on COC

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
<u>PS 8/27/18</u>	<u>PS 8/27/18</u>	Yes / No

AQUEOUS SAMPLE PRESERVATION VERIFICATION

Client: <u>Pace - Minnesota</u>	Work Order #: <u>469925</u>
Receipt Log #: <u>IS-S-1</u>	Completed By (initials/date): <u>TS 3/27/18</u>
Project Manager: _____	

COC ID # _____												Adjusted by: _____	
												Date: _____	
Container Type	5 / 23		4		13		6		15				
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1	<u>10</u>												
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

pH Strip Reagent or Lot #

HC727135

Other

Place a check mark in the Received box if pH is acceptable. If pH is not acceptable, document the Received and Adjusted pH values in the appropriate columns (all adjustments must be reviewed by the project manager). Never add more than 2x the default preservation volume (see table below for default volumes). Complete and attach an orange preservation tag to all adjusted samples. A Sample Receiving Non-Conformance Report must be completed if a pH adjustment was required.

Comments: _____

COC ID # _____												Adjusted by: _____	
												Date: _____	
Container Type	5 / 23		4		13		6		15				
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1													
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

Container Size (mL)	Default Preservative Volume (mL)
Container Types 5 / 23	NaOH
250	1.3
Container Type 4	H ₂ SO ₄
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H ₂ SO ₄
500	2.5
Container Types 6 / 15	HNO ₃
125	0.7
250	1.25
500	2.5
1000	5.0

Comments: _____



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50193063

Date/Time and Initials of person examining contents: 3/27/18 1550 DJ

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 7232

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

Packing Material: Bubble Wrap Bubble Bags None Other _____

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

Cooler Temperature: 1.4/1.5 Ice Visible in Sample Containers?: Yes No N/A

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

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

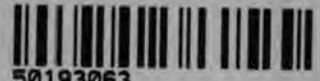
	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.			All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK,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

Comments:

Sample Container Count

CLIENT: Pace mn

WO# : 50193063



50193063

DC PAGE 1 of 1
DC ID# _____

Project # 50193063

SBS
Bulk
K

Sample Line Item	DC9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	DG9U	Matrix (Soil/Aque)	pH <2	pH >9	pH >12
1																			2	WT			
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
BGSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
W9AU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
W9FU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
J9FU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				



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April 04, 2018

Bob Michels
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414

RE: 18-00383 MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 03/23/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

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

Sincerely,

Jessica Esser
Project Manager

Certification List

			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



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Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Water - MN Project Number: 10424447 Project Manager: Bob Michels
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ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-A5 (10424447001)	A181209-01	Water	03/21/2018	03/23/2018

CASE NARRATIVE

Sample Receipt Information:

3 samples were received on 03/23/2018. Samples were received at 2.9 degrees Celsius. Samples were received in acceptable condition.

Analysis for samples A181209-02 and A181209-03 was put on hold per the client.

Please see the chain of custody (COC) document at the end of this report for additional information.

Laboratory Control Samples (LCS):

The LCS recovery indicates a potential high bias for 2,4,5-T, 2,4,5-TP (silvex) and triclopyr for sample A181209-01. Sample was less than the reporting limit for these analytes so no further action is required.

Continuing Calibration Verification (CCV):

CCV indicates a potential high bias for 2,4,5-TP, bentazon, dicamba, MCPA and triclopyr for sample A181209-01. Sample was less than the reporting limit for this analyte so no further action is required.

Additional Comments:

Sample A181209-01 had to be run at an initial dilution factor of 1:10 for the base neutral pesticides by GC/MS analysis, due to the sample matrix. The limit of detection and limit of quantitation have been raised accordingly.



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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10424447
 Project Manager: Bob Michels

FD-A5 (10424447001)

Date Sampled
03/21/2018 10:00

A181209-01 (Water)

Analyte	Result	Limit of Detection	Limit of Quantitation	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A803143

Acetochlor	ND	0.47	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Alachlor	ND	0.48	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Atrazine	ND	0.41	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Chlorpyrifos	ND	0.54	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Cyanazine	ND	0.91	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Desethylatrazine	ND	0.18	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Deisopropylatrazine	ND	0.52	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Dimethenamid	ND	0.23	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
EPTC	ND	0.61	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Ethalfuralin	ND	1.3	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Fonofos	ND	0.32	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Metolachlor	ND	0.28	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Metribuzin	ND	0.33	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Pendimethalin	ND	0.38	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Phorate	ND	0.58	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Prometon	ND	0.78	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Propachlor	ND	0.22	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Propazine	ND	0.65	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Simazine	ND	0.47	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Terbufos	ND	0.32	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Triallate	ND	0.59	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Trifluralin	ND	0.16	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	

Surrogate: Atrazine-d5			107 %	65.1-122		03/26/2018	03/29/2018 14:02	EPA 8270D	D
Surrogate: Parathion-d10			220 %	22.3-159		03/26/2018	03/29/2018 14:02	EPA 8270D	D, S
Surrogate: Triphenyl phosphate			264 %	65.2-151		03/26/2018	03/29/2018 14:02	EPA 8270D	D, S

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A803149

2,4-D	ND		0.50	ug/L	1	03/27/2018	03/30/2018 21:18	EPA 8151A	
2,4-DB	ND		0.50	ug/L	1	03/27/2018	03/30/2018 21:18	EPA 8151A	
2,4,5-T	ND		0.50	ug/L	1	03/27/2018	03/30/2018 21:18	EPA 8151A	
2,4,5-TP (Silvex)	ND		0.50	ug/L	1	03/27/2018	03/30/2018 21:18	EPA 8151A	
Bentazon	ND		0.50	ug/L	1	03/27/2018	03/30/2018 21:18	EPA 8151A	
Dicamba	ND		0.50	ug/L	1	03/27/2018	03/30/2018 21:18	EPA 8151A	
MCPA	ND		0.30	ug/L	1	03/27/2018	03/30/2018 21:18	EPA 8151A	
Picloram	ND		0.50	ug/L	1	03/27/2018	03/30/2018 21:18	EPA 8151A	
Triclopyr	ND		0.50	ug/L	1	03/27/2018	03/30/2018 21:18	EPA 8151A	

Surrogate: 2,4-D-d5			125 %	44.2-121		03/27/2018	03/30/2018 21:18	EPA 8151A	S
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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10424447
 Project Manager: Bob Michels

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Limit of Quantitation	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A803143 - EPA 3510C

Blank (A803143-BLK1)

Prepared: 03/26/2018 Analyzed: 03/28/2018 15:29

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	0.403		ug/L	0.5000		80.6	65.1-122			
<i>Surrogate: Parathion-d10</i>	0.367		ug/L	0.5000		73.4	22.3-159			
<i>Surrogate: Triphenyl phosphate</i>	0.508		ug/L	0.5000		102	65.2-151			

LCS (A803143-BS1)

Prepared: 03/26/2018 Analyzed: 03/28/2018 20:03

Acetochlor	0.894	0.50	ug/L	1.000		89.4	67.5-120			
Alachlor	0.900	0.50	ug/L	1.000		90.0	71.7-120			
Atrazine	1.01	0.50	ug/L	1.000		101	72.8-113			
Chlorpyrifos	0.976	0.50	ug/L	1.000		97.6	65.3-119			
Cyanazine	0.959	0.20	ug/L	1.000		95.9	49.5-140			
Desethylatrazine	0.922	0.50	ug/L	1.000		92.2	66.9-116			
Deisopropylatrazine	0.740	0.50	ug/L	1.000		74.0	44.3-110			
Dimethenamid	0.950	0.50	ug/L	1.000		95.0	63.8-116			
EPTC	0.791	0.50	ug/L	1.000		79.1	41.7-102			
Ethalfuralin	1.03	0.50	ug/L	1.000		103	41-127			
Fonofos	1.03	0.50	ug/L	1.000		103	59.7-118			
Metolachlor	0.975	0.50	ug/L	1.000		97.5	71.7-122			
Metribuzin	1.02	0.50	ug/L	1.000		102	66.6-128			
Pendimethalin	1.09	0.50	ug/L	1.000		109	55.5-137			
Phorate	0.646	0.30	ug/L	1.000		64.6	41.2-114			
Prometon	0.938	0.50	ug/L	1.000		93.8	66.3-120			
Propachlor	1.04	0.50	ug/L	1.000		104	65.8-119			



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Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Water - MN Project Number: 10424447 Project Manager: Bob Michels
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Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Limit of Quantitation	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A803143 - EPA 3510C

LCS (A803143-BS1)

Prepared: 03/26/2018 Analyzed: 03/28/2018 20:03

Propazine	1.00	0.50	ug/L	1.000		100	72-122			
Simazine	0.946	0.50	ug/L	1.000		94.6	72.8-113			
Terbufos	0.699	0.20	ug/L	1.000		69.9	38.6-115			
Triallate	1.00	0.50	ug/L	1.000		100	51.4-116			
Trifluralin	1.06	0.50	ug/L	1.000		106	46.1-134			
<i>Surrogate: Atrazine-d5</i>	<i>0.452</i>		<i>ug/L</i>	<i>0.5000</i>		<i>90.4</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.731</i>		<i>ug/L</i>	<i>0.5000</i>		<i>146</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.526</i>		<i>ug/L</i>	<i>0.5000</i>		<i>105</i>	<i>65.2-151</i>			

Matrix Spike (A803143-MS1)

Source: A181205-06

Prepared: 03/26/2018 Analyzed: 03/29/2018 12:36

Acetochlor	1.02	0.50	ug/L	0.9709	0.119	92.4	67.3-128			
Alachlor	0.864	0.50	ug/L	0.9709	ND	89.0	58.2-150			
Atrazine	0.901	0.50	ug/L	0.9709	0.0524	87.4	70.1-120			
Chlorpyrifos	0.918	0.50	ug/L	0.9709	ND	94.5	73.3-118			
Cyanazine	0.952	0.20	ug/L	0.9709	ND	98.0	60.6-140			
Desethylatrazine	1.02	0.50	ug/L	0.9709	0.187	86.2	69.7-122			
Deisopropylatrazine	0.706	0.50	ug/L	0.9709	ND	72.8	48-121			
Dimethenamid	0.918	0.50	ug/L	0.9709	0.0471	89.7	63.7-123			
EPTC	0.748	0.50	ug/L	0.9709	ND	77.0	58-109			
Ethalfluralin	0.736	0.50	ug/L	0.9709	ND	75.8	59.3-129			
Fonofos	0.786	0.50	ug/L	0.9709	ND	81.0	73.5-108			
Metolachlor	3.28	0.50	ug/L	0.9709	2.25	106	40.9-156			
Metribuzin	0.869	0.50	ug/L	0.9709	ND	89.5	70.9-136			
Pendimethalin	0.844	0.50	ug/L	0.9709	ND	86.9	55.4-155			
Phorate	0.672	0.30	ug/L	0.9709	ND	69.2	60.2-108			
Prometon	0.875	0.50	ug/L	0.9709	ND	90.1	74.7-124			
Propachlor	0.867	0.50	ug/L	0.9709	ND	89.3	72.3-115			
Propazine	0.884	0.50	ug/L	0.9709	ND	91.0	73.7-124			
Simazine	0.889	0.50	ug/L	0.9709	ND	91.5	74.8-114			
Terbufos	0.680	0.20	ug/L	0.9709	ND	70.1	56.1-114			
Triallate	0.822	0.50	ug/L	0.9709	ND	84.7	65.5-107			
Trifluralin	0.753	0.50	ug/L	0.9709	ND	77.6	58-149			
<i>Surrogate: Atrazine-d5</i>	<i>0.396</i>		<i>ug/L</i>	<i>0.4854</i>		<i>81.5</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.479</i>		<i>ug/L</i>	<i>0.4854</i>		<i>98.7</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.487</i>		<i>ug/L</i>	<i>0.4854</i>		<i>100</i>	<i>65.2-151</i>			

Matrix Spike Dup (A803143-MSD1)

Source: A181205-06

Prepared: 03/26/2018 Analyzed: 03/29/2018 13:04

Acetochlor	1.08	0.50	ug/L	1.000	0.119	96.1	67.3-128	6.13	20	
Alachlor	0.943	0.50	ug/L	1.000	ND	94.3	58.2-150	8.67	20	
Atrazine	0.974	0.50	ug/L	1.000	0.0524	92.2	70.1-120	7.79	20	
Chlorpyrifos	0.980	0.50	ug/L	1.000	ND	98.0	73.3-118	6.56	20	
Cyanazine	1.01	0.20	ug/L	1.000	ND	101	60.6-140	5.78	20	
Desethylatrazine	1.09	0.50	ug/L	1.000	0.187	90.2	69.7-122	6.23	20	
Deisopropylatrazine	0.778	0.50	ug/L	1.000	ND	77.8	48-121	9.68	20	
Dimethenamid	1.01	0.50	ug/L	1.000	0.0471	96.8	63.7-123	9.96	20	



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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10424447
 Project Manager: Bob Michels

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Limit of Quantitation	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A803143 - EPA 3510C

Matrix Spike Dup (A803143-MSD1)

Source: A181205-06

Prepared: 03/26/2018 Analyzed: 03/29/2018 13:04

EPTC	0.805	0.50	ug/L	1.000	ND	80.5	58-109	7.34	20	
Ethalfuralin	0.807	0.50	ug/L	1.000	ND	80.7	59.3-129	9.14	20	
Fonofos	0.851	0.50	ug/L	1.000	ND	85.1	73.5-108	7.88	20	
Metolachlor	3.49	0.50	ug/L	1.000	2.25	124	40.9-156	6.24	20	
Metribuzin	0.939	0.50	ug/L	1.000	ND	93.9	70.9-136	7.72	20	
Pendimethalin	0.912	0.50	ug/L	1.000	ND	91.2	55.4-155	7.75	20	
Phorate	0.732	0.30	ug/L	1.000	ND	73.2	60.2-108	8.56	20	
Prometon	0.965	0.50	ug/L	1.000	ND	96.5	74.7-124	9.86	20	
Propachlor	0.925	0.50	ug/L	1.000	ND	92.5	72.3-115	6.51	20	
Propazine	0.957	0.50	ug/L	1.000	ND	95.7	73.7-124	7.95	20	
Simazine	0.961	0.50	ug/L	1.000	ND	96.1	74.8-114	7.79	20	
Terbufos	0.733	0.20	ug/L	1.000	ND	73.3	56.1-114	7.38	20	
Triallate	0.876	0.50	ug/L	1.000	ND	87.6	65.5-107	6.42	20	
Trifluralin	0.839	0.50	ug/L	1.000	ND	83.9	58-149	10.8	20	
<i>Surrogate: Atrazine-d5</i>	<i>0.399</i>		<i>ug/L</i>	<i>0.5000</i>		<i>79.7</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.511</i>		<i>ug/L</i>	<i>0.5000</i>		<i>102</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.529</i>		<i>ug/L</i>	<i>0.5000</i>		<i>106</i>	<i>65.2-151</i>			



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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10424447
 Project Manager: Bob Michels

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Limit of Quantitation	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A803149 - EPA 3510C

Blank (A803149-BLK1)

Prepared: 03/27/2018 Analyzed: 03/30/2018 11:17

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							

Surrogate: 2,4-D-d5

1.99

ug/L

2.016

98.5

44.2-121

LCS (A803149-BS1)

Prepared: 03/27/2018 Analyzed: 03/30/2018 13:36

2,4-D	2.80	0.50	ug/L	2.000		140	64.6-148			
2,4-DB	2.75	0.50	ug/L	2.000		138	66.7-143			
2,4,5-T	2.49	0.50	ug/L	2.000		124	63.4-133			
2,4,5-TP (Silvex)	2.86	0.50	ug/L	2.000		143	63-145			
Bentazon	1.31	0.50	ug/L	1.000		131	52.5-139			
Dicamba	2.70	0.50	ug/L	2.000		135	55.4-143			
MCPA	2.79	0.30	ug/L	2.000		140	33.5-143			
Picloram	1.07	0.50	ug/L	1.000		107	47.9-113			
Triclopyr	2.85	0.50	ug/L	2.000		142	65.1-141			

Surrogate: 2,4-D-d5

2.15

ug/L

2.016

107

44.2-121

LCS Dup (A803149-BSD1)

Prepared: 03/27/2018 Analyzed: 03/30/2018 14:12

2,4-D	2.80	0.50	ug/L	2.000		140	64.6-148	0.204	20	
2,4-DB	2.85	0.50	ug/L	2.000		143	66.7-143	3.54	20	
2,4,5-T	2.72	0.50	ug/L	2.000		136	63.4-133	8.80	20	
2,4,5-TP (Silvex)	2.93	0.50	ug/L	2.000		147	63-145	2.34	20	
Bentazon	1.33	0.50	ug/L	1.000		133	52.5-139	1.38	20	
Dicamba	2.72	0.50	ug/L	2.000		136	55.4-143	0.745	20	
MCPA	2.81	0.30	ug/L	2.000		141	33.5-143	0.778	20	
Picloram	1.03	0.50	ug/L	1.000		103	47.9-113	3.16	20	
Triclopyr	2.78	0.50	ug/L	2.000		139	65.1-141	2.45	20	

Surrogate: 2,4-D-d5

2.25

ug/L

2.016

112

44.2-121



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Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Water - MN Project Number: 10424447 Project Manager: Bob Michels
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Notes and Definitions

- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- D Data reported from a dilution
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

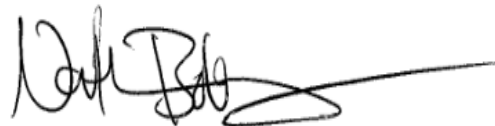
PaceProject#: 10424450
Sample Receipt Date: 03/21/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

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

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

This report has been reviewed by:



April 04, 2018

Nathan Boberg, Project Manager

(612) 607-6444 (fax)
nathan.boberg@pacelabs.com



Report of Laboratory Analysis

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

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

Report Prepared Date:

April 4, 2018

DISCUSSION

This report presents the results from the analyses performed on three samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration point and a nominal 1-Liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 79-86%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

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

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 98-99% with a relative percent difference of 1.0%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

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

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

WO# 10424450



10424450

 Minnesota Pollution Control Agency	Chain-of-Custody Form <small>PC-100-02-10-07</small>		Work Order Number:	
	PROJECT/CLIENT INFO		Turnaround Time:	
Facility Code: MPCA Freeway LF waters	Program Code (MDH Lab Only):		Lab Name:	
Project Name: MPCA Freeway LF waters	Project Task Code:		Address: 18-00383	
Project Manager:	Potential Hazard? If yes, add information to Sampler Comments Section		Phone No: EPIC Profile # 38716	

Lab Work Order Sticker

SAMPLE DETAILS											ANALYSIS REQUESTED																	
SAMPLE TYPE CODES				LAB MATRIX CODES				AR=AL			FIELD MATRIX CODES																	
Sample=Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample				QC-FB=Field Blank Sample QC-FR=Field Replicate Sample QC-TB=Trip Blank Sample				DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wpc			BL=Biological Material OT=Other TS=Tissue				Wtr-Ground=Groundwater Wtr-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample													
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	PRESERV.							Lab Sample No.	#							
FD-A5	S	3/21/18	1000	NA	NA	G	NW	Wtr-Ground	N		33	X								09	1							
FD-B5	S	3/21/18	1320	NA	NA	G	NW	Wtr-Ground	N		16									02	2							
FD-D5	S	3/21/18	1545	NA	NA	G	NW	Wtr-Ground	N		16									03	3							
																					4							
																						5						
																						6						
																						7						
																						8						
																						9						
																						10						

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

Receiving Comments:			
Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
Cliff Ph Pace	3/21/18 1811	Ang Vent Pace	3/21/18 1812

T=6.7, 9.7, 9.3, 7.1, 9.0°C

Sample Condition Upon Receipt Client Name: Pace Field Project #: UOR 10424450



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

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

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

Thermometer Used: 151401163 69.9, 9.2, 6.9 G87A9155100842 5.8 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): _____ Cooler Temp Corrected (°C): 6.7 - 9.2 = 19.0 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 5°C Correction Factor: 10.2 Date and Initials of Person Examining Contents: 3/21/18 JS

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

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. <u>ED-DS sample have 1545 COC says 1545</u>
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>14/4 1-3 1/1 1-3 3/6</u> Res pH <u>10.49</u>
(HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2-3 1/1 1-3 3/6 DO pH <u>10.15</u>
Headspace in VOA Vials (>5mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: <u>JS</u> Lot # of added preservative: <u>111111</u>
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): _____	

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

Project Manager Review: [Signature] Date: 03/22/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals - Dissolved (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, hexavalent	SM3500CRB
Mercury	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Malacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

(1) metals - Dissolved per 3/19/18 email from Mark Umholtz. B6J-3/19/18

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO3	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals - Dissolved Metals per 3/19/18 m. umol	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, hexavalent	SM3500CRB
Mercury	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
**VOCs*	
	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

-- Analysis by MDH Laboratory

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 81.51 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMs)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Reporting Flags

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

REPORT OF LABORATORY ANALYSIS

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Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-A5		
Lab Sample ID	10424450001		
Filename	U180402A_03		
Injected By	BAL		
Total Amount Extracted	494 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/21/2018 10:00
ICAL ID	U171222	Received	03/21/2018 18:12
CCal Filename(s)	U180401B_18	Extracted	03/23/2018 11:45
Method Blank ID	BLANK-61282	Analyzed	04/02/2018 05:16

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	84
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	96

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

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

R = Recovery outside target range
 E = Exceeds calibration range

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Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-B5		
Lab Sample ID	10424450002		
Filename	U180402A_04		
Injected By	BAL		
Total Amount Extracted	515 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/21/2018 13:20
ICAL ID	U171222	Received	03/21/2018 18:12
CCal Filename(s)	U180401B_18	Extracted	03/23/2018 11:45
Method Blank ID	BLANK-61282	Analyzed	04/02/2018 05:59

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	79
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	92

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

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

R = Recovery outside target range
 E = Exceeds calibration range

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Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-D5		
Lab Sample ID	10424450003		
Filename	U180402A_05		
Injected By	BAL		
Total Amount Extracted	494 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/21/2018 15:45
ICAL ID	U171222	Received	03/21/2018 18:12
CCal Filename(s)	U180401B_18	Extracted	03/23/2018 11:45
Method Blank ID	BLANK-61282	Analyzed	04/02/2018 06:41

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	86
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	94

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

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

R = Recovery outside target range
 E = Exceeds calibration range

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61282	Matrix	Water
Filename	U180329A_19	Dilution	NA
Total Amount Extracted	1010 mL	Extracted	03/23/2018 11:45
ICAL ID	U171222	Analyzed	03/29/2018 16:30
CCal Filename(s)	U180329A_06	Injected By	SMT

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	79
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	98

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

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61283	Matrix	Water
Filename	U180329A_20	Dilution	NA
Total Amount Extracted	949 mL	Extracted	03/23/2018 11:45
ICAL ID	U171222	Analyzed	03/29/2018 17:12
CCal Filename	U180329A_06	Injected By	SMT
Method Blank ID	BLANK-61282		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	9.8	7.3	14.6	98
2,3,7,8-TCDD-37Cl4	10	8.3	3.7	15.8	83
2,3,7,8-TCDD-13C	100	77	25.0	141.0	77

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61284	Matrix	Water
Filename	U180329A_21	Dilution	NA
Total Amount Extracted	983 mL	Extracted	03/23/2018 11:45
ICAL ID	U171222	Analyzed	03/29/2018 17:55
CCal Filename	U180329A_06	Injected By	SMT
Method Blank ID	BLANK-61282		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	9.9	7.3	14.6	99
2,3,7,8-TCDD-37Cl4	10	8.5	3.7	15.8	85
2,3,7,8-TCDD-13C	100	77	25.0	141.0	77

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61283
 Spike 1 Filename U180329A_20

Spike 2 ID LCSD-61284
 Spike 2 Filename U180329A_21

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	98	99	1.0

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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April 17, 2018

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

RE: Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

Dear Mr. Jacobson:

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

Unionized Ammonia was not calculated for sample FD-SB-E5 due to insufficient volume to conduct the field pH & Temperature..

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

Sincerely,



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

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

Minnesota Certification IDs

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

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

Virginia Minnesota Certification ID's

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

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

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad

Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133

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CERTIFICATIONS

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Pennsylvania Certification IDs

KY WW Permit #: KY0098221	Ohio EPA Rad Approval: #41249
KY WW Permit #: KY0000221	Oregon/TNI Certification #: PA200002-010
Louisiana DHH/TNI Certification #: LA180012	Pennsylvania/TNI Certification #: 65-00282
Louisiana DEQ/TNI Certification #: 4086	Puerto Rico Certification #: PA01457
Maine Certification #: 2017020	Rhode Island Certification #: 65-00282
Maryland Certification #: 308	South Dakota Certification
Massachusetts Certification #: M-PA1457	Tennessee Certification #: 02867
Michigan/PADEP Certification #: 9991	Texas/TNI Certification #: T104704188-17-3
Missouri Certification #: 235	Utah/TNI Certification #: PA014572017-9
Montana Certification #: Cert0082	USDA Soil Permit #: P330-17-00091
Nebraska Certification #: NE-OS-29-14	Vermont Dept. of Health: ID# VT-0282
Nevada Certification #: PA014572018-1	Virgin Island/PADEP Certification
New Hampshire/TNI Certification #: 297617	Virginia/VELAP Certification #: 9526
New Jersey/TNI Certification #: PA051	Washington Certification #: C868
New Mexico Certification #: PA01457	West Virginia DEP Certification #: 143
New York/TNI Certification #: 10888	West Virginia DHHR Certification #: 9964C
North Carolina Certification #: 42706	Wisconsin Approve List for Rad
North Dakota Certification #: R-190	Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174	Nebraska Certification: NE-OS-28-14
Alabama Certification #: 41320	Nevada Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216	New Hampshire Certification #: 2958
Delaware Certification: FL NELAC Reciprocity	New Jersey Certification #: FL022
Florida Certification #: E83079	New York Certification #: 11608
Georgia Certification #: 955	North Carolina Environmental Certificate #: 667
Guam Certification: FL NELAC Reciprocity	North Carolina Certification #: 12710
Hawaii Certification: FL NELAC Reciprocity	Oklahoma Certification #: D9947
Illinois Certification #: 200068	Pennsylvania Certification #: 68-00547
Indiana Certification: FL NELAC Reciprocity	Puerto Rico Certification #: FL01264
Kansas Certification #: E-10383	South Carolina Certification: #96042001
Kentucky Certification #: 90050	Tennessee Certification #: TN02974
Louisiana Certification #: FL NELAC Reciprocity	Texas Certification: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007	US Virgin Islands Certification: FL NELAC Reciprocity
Maryland Certification: #346	Virginia Environmental Certification #: 460165
Michigan Certification #: 9911	Wyoming Certification: FL NELAC Reciprocity
Mississippi Certification: FL NELAC Reciprocity	West Virginia Certification #: 9962C
Missouri Certification #: 236	Wisconsin Certification #: 399079670
Montana Certification #: Cert 0074	Wyoming (EPA Region 8): FL NELAC Reciprocity

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512	New York State Department of Health, Serial #56192 and 56193
Minnesota Department of Health, Certificate #1385941	North Carolina Division of Water Resources, Certificate #659
Arkansas Department of Environmental Quality, Certificate #17-046-0	Virginia Department of General Services, Certificate #9028
Georgia Environmental Protection Division, Stipulation	Wisconsin Department of Natural Resources, Laboratory #999472650
Illinois Environmental Protection Agency, Certificate #004325	U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278
Michigan Department of Environmental Quality, Laboratory #0034	

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CERTIFICATIONS

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

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SAMPLE SUMMARY

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10424606001	FD-SB-E5	Water	03/22/18 15:00	03/22/18 17:40

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10424606001	FD-SB-E5	EPA 531.1	AC1	3	PASI-O
		EPA 547	AC1	1	PASI-O
		EPA 549.2	WFH	1	PASI-O
		EPA 552.3	LJM	7	PASI-O
		EPA 8015 Alcohol-Glycol	BJW	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	PW1	1	PASI-M
		EPA 548.1	WFH	1	PASI-O
		EPA 8270D	AT1	38	PASI-M
		EPA 900.0	NEG	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		Hach 10360 Rev 1.1	DCL	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	AR3	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-CIO2	AGS	1	PASI-O
		SM 4500-H+B	JFP	1	PASI-M
		EPA 300.0	KEO	2	PASI-M
		EPA 300.1	CMD	1	PASI-O
		EPA 300.1	CMD	1	PASI-O
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		EPA 353.2	JFP	3	PASI-M
		EPA 9016	AMM	1	PASI-GRMI
SM 4500-CN-E	DCL	1	PASI-M		
SM 4500-P E	DCL	1	PASI-M		

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Waters

Project No.: 10424606

Sample: FD-SB-E5	Lab ID: 10424606001	Collected: 03/22/18 15:00	Received: 03/22/18 17:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
531.1 HPLC Carbamates								
Analytical Method: EPA 531.1								
Carbofuran	ND	ug/L	2.0	1		03/29/18 03:39	1563-66-2	L1
Oxamyl	ND	ug/L	2.0	1		03/29/18 03:39	23135-22-0	
Surrogates								
BDMC (S)	90	%	80-120	1		03/29/18 03:39		
547 HPLC Glyphosate								
Analytical Method: EPA 547								
Glyphosate	ND	ug/L	6.0	1		03/29/18 21:38		M1
549.2 HPLC Paraquat Diquat								
Analytical Method: EPA 549.2 Preparation Method: EPA 549.2								
Diquat	ND	ug/L	0.40	1	03/26/18 22:26	03/27/18 15:54	85-00-7	
552.3 Haloacetic Acids								
Analytical Method: EPA 552.3 Preparation Method: EPA 552.3								
Dibromoacetic Acid	ND	ug/L	1.0	1	03/30/18 22:46	04/03/18 04:05	631-64-1	
Dichloroacetic Acid	ND	ug/L	1.0	1	03/30/18 22:46	04/03/18 04:05	79-43-6	
Haloacetic Acids (Total)	ND	ug/L	1.0	1	03/30/18 22:46	04/03/18 04:05		
Monobromoacetic Acid	ND	ug/L	1.0	1	03/30/18 22:46	04/03/18 04:05	79-08-3	
Monochloroacetic Acid	ND	ug/L	1.0	1	03/30/18 22:46	04/03/18 04:05	79-11-8	
Trichloroacetic Acid	ND	ug/L	1.0	1	03/30/18 22:46	04/03/18 04:05	76-03-9	
Surrogates								
2,3-Dibromopropanoic Acid (S)	104	%	70-130	1	03/30/18 22:46	04/03/18 04:05	600-05-5	
8015M Alcohols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	mg/L	5.0	1		04/04/18 14:32	67-56-1	
8015M Glycols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/02/18 17:13	107-21-1	
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	309-00-2	
alpha-BHC	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	319-84-6	
beta-BHC	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	319-85-7	
delta-BHC	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	58-89-9	
Chlordane (Technical)	ND	ug/L	0.55	1	03/27/18 14:00	04/05/18 17:36	57-74-9	
alpha-Chlordane	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	5103-71-9	
gamma-Chlordane	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	5103-74-2	
4,4'-DDD	ND	ug/L	0.11	1	03/27/18 14:00	04/05/18 17:36	72-54-8	
4,4'-DDE	ND	ug/L	0.11	1	03/27/18 14:00	04/05/18 17:36	72-55-9	
4,4'-DDT	ND	ug/L	0.11	1	03/27/18 14:00	04/05/18 17:36	50-29-3	
Dieldrin	ND	ug/L	0.11	1	03/27/18 14:00	04/05/18 17:36	60-57-1	
Endosulfan I	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	959-98-8	
Endosulfan II	ND	ug/L	0.11	1	03/27/18 14:00	04/05/18 17:36	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.11	1	03/27/18 14:00	04/05/18 17:36	1031-07-8	
Endrin	ND	ug/L	0.11	1	03/27/18 14:00	04/05/18 17:36	72-20-8	
Endrin aldehyde	ND	ug/L	0.11	1	03/27/18 14:00	04/05/18 17:36	7421-93-4	
Endrin ketone	ND	ug/L	0.11	1	03/27/18 14:00	04/05/18 17:36	53494-70-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Sample: FD-SB-E5	Lab ID: 10424606001	Collected: 03/22/18 15:00	Received: 03/22/18 17:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Heptachlor	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	76-44-8	
Heptachlor epoxide	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	1024-57-3	
Methoxychlor	ND	ug/L	0.55	1	03/27/18 14:00	04/05/18 17:36	72-43-5	
Toxaphene	ND	ug/L	1.6	1	03/27/18 14:00	04/05/18 17:36	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	87	%	62-125	1	03/27/18 14:00	04/05/18 17:36	877-09-8	
Decachlorobiphenyl (S)	86	%	30-143	1	03/27/18 14:00	04/05/18 17:36	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:26	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:26	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:26	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:26	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:26	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:26	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:26	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:26	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:26	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	69	%	30-125	1	03/27/18 14:00	04/03/18 13:26	877-09-8	
Decachlorobiphenyl (S)	86	%	30-125	1	03/27/18 14:00	04/03/18 13:26	2051-24-3	
8315A GCSV Aldehydes								
Analytical Method: EPA 8315A Preparation Method: EPA 8315A								
Formaldehyde	ND	ug/L	100	1	03/29/18 09:32	03/30/18 11:44	50-00-0	H3
8316 W GCSV Acrylamide								
Analytical Method: EPA 8316								
Acrylamide	ND	ug/L	20.0	1		03/29/18 15:58	79-06-1	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	03/29/18 10:55	03/30/18 16:37	7429-90-5	
Barium, Dissolved	170	ug/L	10.0	1	03/29/18 10:55	03/30/18 16:37	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/29/18 10:55	03/30/18 16:37	7440-50-8	
Manganese, Dissolved	719	ug/L	5.0	1	03/29/18 10:55	03/30/18 16:37	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/29/18 10:55	03/30/18 16:37	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/29/18 10:55	03/30/18 16:37	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/29/18 10:55	03/30/18 16:37	7440-31-5	
Total Hardness by 2340B, Dissolved	717000	ug/L	3300	1	03/29/18 10:55	03/30/18 16:37		
Zinc, Dissolved	ND	ug/L	20.0	1	03/29/18 10:55	03/30/18 16:37	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	03/28/18 09:42	03/28/18 14:53	7440-36-0	
Arsenic, Dissolved	0.66	ug/L	0.50	1	03/28/18 09:42	03/28/18 14:53	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/28/18 09:42	03/28/18 14:53	7440-41-7	
Boron, Dissolved	1690	ug/L	25.0	5	03/28/18 09:42	03/28/18 14:56	7440-42-8	M1
Cadmium, Dissolved	ND	ug/L	0.080	1	03/28/18 09:42	03/28/18 14:53	7440-43-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Sample: FD-SB-E5	Lab ID: 10424606001	Collected: 03/22/18 15:00	Received: 03/22/18 17:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Chromium, Dissolved	0.56	ug/L	0.50	1	03/28/18 09:42	03/28/18 14:53	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	03/28/18 09:42	03/28/18 14:53	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/28/18 09:42	03/28/18 14:53	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/28/18 09:42	03/28/18 14:53	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/28/18 09:42	03/28/18 14:53	7440-28-0	
Uranium-238, Dissolved	3.3	ug/L	0.50	1	03/28/18 09:42	03/28/18 14:53	7440-61-1	
Vanadium, Dissolved	1.7	ug/L	1.0	1	03/28/18 09:42	03/28/18 14:53	7440-62-2	
245.1 Mercury, Dissolved		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND	ug/L	0.20	1	03/29/18 09:14	03/29/18 12:42	7439-97-6	
548.1 GCS Endothall		Analytical Method: EPA 548.1 Preparation Method: EPA 548.1						
Endothall	ND	ug/L	9.0	1	03/29/18 16:04	04/03/18 02:57		L2
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	83-32-9	
Anthracene	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	120-12-7	
Benzo(a)pyrene	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	50-32-8	
Benzoic acid	ND	ug/L	56.2	1	03/29/18 14:54	04/04/18 20:41	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	101-55-3	
Butylbenzylphthalate	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	111-44-4	
2-Chlorophenol	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	56.2	1	03/29/18 14:54	04/04/18 20:41	91-94-1	
2,4-Dichlorophenol	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	120-83-2	
Diethylphthalate	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	84-66-2	
2,4-Dimethylphenol	ND	ug/L	56.2	1	03/29/18 14:54	04/04/18 20:41	105-67-9	
Dimethylphthalate	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	131-11-3	
Di-n-butylphthalate	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	84-74-2	
2,4-Dinitrophenol	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	51-28-5	
Di-n-octylphthalate	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	117-81-7	
Fluoranthene	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	206-44-0	
Fluorene	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	86-73-7	
Hexachlorobenzene	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	56.2	1	03/29/18 14:54	04/04/18 20:41	77-47-4	
Hexachloroethane	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	67-72-1	
Isophorone	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	78-59-1	
2-Methylnaphthalene	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	22.5	1	03/29/18 14:54	04/04/18 20:41		
N-Nitrosodiphenylamine	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	86-30-6	
Pentachlorophenol	ND	ug/L	22.5	1	03/29/18 14:54	04/04/18 20:41	87-86-5	
Phenanthrene	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	85-01-8	
Phenol	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	108-95-2	
Pyrene	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	129-00-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Sample: FD-SB-E5	Lab ID: 10424606001	Collected: 03/22/18 15:00	Received: 03/22/18 17:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
2,4,6-Trichlorophenol	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	85	%.	60-125	1	03/29/18 14:54	04/04/18 20:41	4165-60-0	
2-Fluorobiphenyl (S)	63	%.	56-125	1	03/29/18 14:54	04/04/18 20:41	321-60-8	
p-Terphenyl-d14 (S)	98	%.	58-125	1	03/29/18 14:54	04/04/18 20:41	1718-51-0	
Phenol-d6 (S)	96	%.	58-125	1	03/29/18 14:54	04/04/18 20:41	13127-88-3	
2-Fluorophenol (S)	87	%.	55-125	1	03/29/18 14:54	04/04/18 20:41	367-12-4	
2,4,6-Tribromophenol (S)	97	%.	65-125	1	03/29/18 14:54	04/04/18 20:41	118-79-6	
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	2.3	mg/L	2.0	1	03/23/18 14:53	03/28/18 14:48		
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	5.6	1		03/29/18 12:52		
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	5.0	NTU	0.30	1		03/23/18 13:50		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	10.0	mg/L	10.0	1		03/27/18 15:13		
4500ClO2 Chlorine Dioxide								
Analytical Method: SM 4500-CIO2								
Chlorine Dioxide	0.25	mg/L	0.10	1		04/06/18 13:42		H6
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	7.0	Std. Units	0.10	1		03/27/18 14:29		H6
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	176	mg/L	6.0	5		03/31/18 08:34	16887-00-6	
Fluoride	0.16	mg/L	0.050	1		03/31/18 01:52	16984-48-8	
300.1 Oxihalide IC Anions 14d								
Analytical Method: EPA 300.1								
Chlorite	ND	ug/L	25.0	5		03/28/18 23:47		D3
300.1 Oxihalide IC Anions 28d								
Analytical Method: EPA 300.1								
Bromate	ND	ug/L	5.0	5		03/28/18 23:47	15541-45-4	D3
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr D Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		03/23/18 09:40		M3
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	2.0	mg/L	0.10	1	04/02/18 07:00	04/03/18 08:31	7664-41-7	M0
353.2 Nitrate + Nitrite								
Analytical Method: EPA 353.2								
Nitrate as N	ND	mg/L	0.020	1		03/23/18 11:41	14797-55-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Sample: FD-SB-E5	Lab ID: 10424606001	Collected: 03/22/18 15:00	Received: 03/22/18 17:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrite as N	ND	mg/L	0.020	1		03/23/18 11:41	14797-65-0	
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		03/23/18 11:41		
9016 Cyanide, Free	Analytical Method: EPA 9016 Preparation Method: EPA 9016							
Cyanide, Free	ND	ug/L	5.0	1	04/05/18 16:15	04/05/18 17:04		
SM4500CN-E Cyanide	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E							
Cyanide	13.2	ug/L	10.0	1	04/03/18 09:46	04/03/18 12:48	57-12-5	
SM4500P-E, Total Phosphorus	Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B							
Phosphorus	ND	mg/L	0.050	1	04/09/18 09:22	04/09/18 13:26	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 436284

Analysis Method: EPA 531.1

QC Batch Method: EPA 531.1

Analysis Description: 531.1 HPLC Carbamate

Associated Lab Samples: 10424606001

METHOD BLANK: 2369790

Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Carbofuran	ug/L	ND	2.0	03/29/18 10:40	
Oxamyl	ug/L	ND	2.0	03/29/18 10:40	
BDMC (S)	%	93	80-120	03/29/18 10:40	

LABORATORY CONTROL SAMPLE: 2369791

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Carbofuran	ug/L	10	12.2	122	80-120	L1
Oxamyl	ug/L	10	9.8	98	80-120	
BDMC (S)	%			91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2369792 2369793

Parameter	Units	35381896001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Carbofuran	ug/L				10.3	11.0				7	20	
Oxamyl	ug/L				8.1	8.2				1	20	
BDMC (S)	%						96	84	80-120			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 436495

Analysis Method: EPA 547

QC Batch Method: EPA 547

Analysis Description: 547 HPLC Glyphosate

Associated Lab Samples: 10424606001

METHOD BLANK: 2370792

Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Glyphosate	ug/L	ND	6.0	03/29/18 17:29	

LABORATORY CONTROL SAMPLE: 2370793

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Glyphosate	ug/L	50	45.7	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2370794 2370795

Parameter	Units	35382120001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	4.2U	50	50	43.8	45.2	88	90	80-120	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2370796 2370797

Parameter	Units	10424606001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	ND	50	50	36.4	36.2	73	72	80-120	0	30	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 435508 Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10424606001

METHOD BLANK: 2011284 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methanol	mg/L	ND	5.0	04/04/18 13:46	

LABORATORY CONTROL SAMPLE: 2011285

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methanol	mg/L	50	56.4	113	79-111	L3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2011376 2011377

Parameter	Units	60266710003 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec				
Methanol	mg/L	ND	50	50	46.8	46.4	94	93	43-138	1	20			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 435081	Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol	Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10424606001	

METHOD BLANK: 2009741 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylene glycol	mg/L	ND	5.0	04/02/18 16:08	

LABORATORY CONTROL SAMPLE: 2009742

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylene glycol	mg/L	25	24.8	99	55-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009945 2009946

Parameter	Units	2009945		2009946		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Ethylene glycol	mg/L	ND	25	25	14.4	25.6	58	103	38-154	56	20 R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 19069	Analysis Method: EPA 8316
QC Batch Method: EPA 8316	Analysis Description: 8316 W GCSV Acrylamide
Associated Lab Samples: 10424606001	

METHOD BLANK: 75864 Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acrylamide	ug/L	ND	20.0	03/29/18 15:20	

LABORATORY CONTROL SAMPLE: 75865

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acrylamide	ug/L	1000	1030	103	80-120	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 529562 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury - Dissolved
Associated Lab Samples: 10424606001

METHOD BLANK: 2874494 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	03/29/18 12:36	

LABORATORY CONTROL SAMPLE & LCSD: 2874495 2874496

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury, Dissolved	ug/L	5	5.4	5.5	107	110	85-115	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 529546	Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7	Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10424606001	

METHOD BLANK: 2874431 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	03/30/18 16:29	
Barium, Dissolved	ug/L	ND	10.0	03/30/18 16:29	
Copper, Dissolved	ug/L	ND	10.0	03/30/18 16:29	
Manganese, Dissolved	ug/L	ND	5.0	03/30/18 16:29	
Nickel, Dissolved	ug/L	ND	20.0	03/30/18 16:29	
Silver, Dissolved	ug/L	ND	10.0	03/30/18 16:29	
Tin, Dissolved	ug/L	ND	75.0	03/30/18 16:29	
Zinc, Dissolved	ug/L	ND	20.0	03/30/18 16:29	

LABORATORY CONTROL SAMPLE & LCSD: 2874432

2874433

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Aluminum, Dissolved	ug/L	20000	20700	20900	104	104	85-115	1	20	
Barium, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	
Copper, Dissolved	ug/L	1000	977	981	98	98	85-115	0	20	
Manganese, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	
Nickel, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	
Silver, Dissolved	ug/L	500	494	495	99	99	85-115	0	20	
Tin, Dissolved	ug/L	1000	983	981	98	98	85-115	0	20	
Zinc, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 529354 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
 Associated Lab Samples: 10424606001

METHOD BLANK: 2873346 Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Arsenic, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Beryllium, Dissolved	ug/L	ND	0.20	03/28/18 14:47	
Boron, Dissolved	ug/L	ND	5.0	03/28/18 14:47	
Cadmium, Dissolved	ug/L	ND	0.080	03/28/18 14:47	
Chromium, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Cobalt, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Lead, Dissolved	ug/L	ND	0.10	03/28/18 14:47	
Selenium, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Thallium, Dissolved	ug/L	ND	0.10	03/28/18 14:47	
Uranium-238, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Vanadium, Dissolved	ug/L	ND	1.0	03/28/18 14:47	

LABORATORY CONTROL SAMPLE: 2873347

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	102	102	85-115	
Arsenic, Dissolved	ug/L	100	104	104	85-115	
Beryllium, Dissolved	ug/L	100	108	108	85-115	
Boron, Dissolved	ug/L	100	115	115	85-115	
Cadmium, Dissolved	ug/L	100	104	104	85-115	
Chromium, Dissolved	ug/L	100	108	108	85-115	
Cobalt, Dissolved	ug/L	100	105	105	85-115	
Lead, Dissolved	ug/L	100	105	105	85-115	
Selenium, Dissolved	ug/L	100	105	105	85-115	
Thallium, Dissolved	ug/L	100	104	104	85-115	
Uranium-238, Dissolved	ug/L	100	109	109	85-115	
Vanadium, Dissolved	ug/L	100	107	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873348 2873349

Parameter	Units	10424606001		MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	MS Result	MSD Result							
Antimony, Dissolved	ug/L	ND	100	100	110	112	110	112	70-130	2	20		
Arsenic, Dissolved	ug/L	0.66	100	100	110	114	110	113	70-130	3	20		
Beryllium, Dissolved	ug/L	ND	100	100	116	117	116	117	70-130	1	20		
Boron, Dissolved	ug/L	1690	100	100	1850	1870	153	176	70-130	1	20	M1	
Cadmium, Dissolved	ug/L	ND	100	100	108	111	108	111	70-130	2	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873348												2873349	
Parameter	Units	10424606001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual		
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD			
Chromium, Dissolved	ug/L	0.56	100	100	113	115	112	115	70-130	2	20		
Cobalt, Dissolved	ug/L	ND	100	100	109	111	108	111	70-130	3	20		
Lead, Dissolved	ug/L	ND	100	100	109	113	109	113	70-130	3	20		
Selenium, Dissolved	ug/L	ND	100	100	107	108	107	108	70-130	2	20		
Thallium, Dissolved	ug/L	ND	100	100	109	112	109	112	70-130	3	20		
Uranium-238, Dissolved	ug/L	3.3	100	100	114	120	111	116	70-130	5	20		
Vanadium, Dissolved	ug/L	1.7	100	100	113	116	111	115	70-130	3	20		

MATRIX SPIKE SAMPLE: 2873350											
Parameter	Units	10425051001 Result	Spike	MS	MS	% Rec	Qualifiers				
			Conc.	Result	% Rec	Limits					
Antimony, Dissolved	ug/L	ND	100	111	111	70-130					
Arsenic, Dissolved	ug/L	ND	100	114	111	70-130					
Beryllium, Dissolved	ug/L	ND	100	117	117	70-130					
Boron, Dissolved	ug/L	245	100	344	99	70-130					
Cadmium, Dissolved	ug/L	ND	100	107	107	70-130					
Chromium, Dissolved	ug/L	ND	100	118	114	70-130					
Cobalt, Dissolved	ug/L	ND	100	108	108	70-130					
Lead, Dissolved	ug/L	ND	100	111	111	70-130					
Selenium, Dissolved	ug/L	ND	100	115	111	70-130					
Thallium, Dissolved	ug/L	ND	100	110	109	70-130					
Uranium-238, Dissolved	ug/L	5.1	100	118	113	70-130					
Vanadium, Dissolved	ug/L	ND	100	120	115	70-130					

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 436264 Analysis Method: EPA 548.1
QC Batch Method: EPA 548.1 Analysis Description: 548 GCS Endothall
Associated Lab Samples: 10424606001

METHOD BLANK: 2369618 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Endothall	ug/L	ND	9.0	04/02/18 22:58	

LABORATORY CONTROL SAMPLE: 2369619

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	50	9.6	19	80-120	L2

LABORATORY CONTROL SAMPLE: 2369620

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	9	8.8J	97	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2370435 2370436

Parameter	Units	7046265001 Result	2370435		2370436		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Endothall	ug/L	<9.0	50	50	6.2J	5.1J	12	10	64-137		30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2370437 2370438

Parameter	Units	7046265002 Result	2370437		2370438		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Endothall	ug/L	<9.0	50	50	43.2	6.1J	86	12	64-137		30	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 435581 Analysis Method: EPA 549.2
 QC Batch Method: EPA 549.2 Analysis Description: 549 HPLC Paraquat Diquat
 Associated Lab Samples: 10424606001

METHOD BLANK: 2366828 Matrix: Water
 Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diquat	ug/L	ND	0.40	03/27/18 10:27	

LABORATORY CONTROL SAMPLE: 2366829

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	2	1.5	77	70-130	

LABORATORY CONTROL SAMPLE: 2366830

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	.4	.33J	83	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2367284 2367285

Parameter	Units	35381489001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Diquat	ug/L	<0.30	2	2	1.6	1.5	79	76	70-130	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2367286 2367287

Parameter	Units	35381489002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Diquat	ug/L	<0.30	2	2	1.6	1.6	79	81	70-130	3	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 436904 Analysis Method: EPA 552.3
QC Batch Method: EPA 552.3 Analysis Description: 5523 Haloacetic Acids
Associated Lab Samples: 10424606001

METHOD BLANK: 2372587 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromoacetic Acid	ug/L	ND	1.0	04/02/18 22:41	
Dichloroacetic Acid	ug/L	ND	1.0	04/02/18 22:41	
Haloacetic Acids (Total)	ug/L	ND	1.0	04/02/18 22:41	
Monobromoacetic Acid	ug/L	ND	1.0	04/02/18 22:41	
Monochloroacetic Acid	ug/L	ND	1.0	04/02/18 22:41	
Trichloroacetic Acid	ug/L	ND	1.0	04/02/18 22:41	
2,3-Dibromopropanoic Acid (S)	%	95	70-130	04/02/18 22:41	

LABORATORY CONTROL SAMPLE: 2372588

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromoacetic Acid	ug/L	10	9.7	97	70-130	
Dichloroacetic Acid	ug/L	10	8.8	88	70-130	
Haloacetic Acids (Total)	ug/L	50	46.7	93		
Monobromoacetic Acid	ug/L	10	9.0	90	70-130	
Monochloroacetic Acid	ug/L	10	9.5	95	70-130	
Trichloroacetic Acid	ug/L	10	9.8	98	70-130	
2,3-Dibromopropanoic Acid (S)	%			107	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2373050 2373051

Parameter	Units	35380905001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec				
Dibromoacetic Acid	ug/L	0.96J	10	10	12.1	12.5	111	115	70-130	3	30		
Dichloroacetic Acid	ug/L	<0.24	10	10	9.9	10.1	99	101	70-130	2	30		
Haloacetic Acids (Total)	ug/L	0.96J	50	50	54.9	55.8	108	110		2	30		
Monobromoacetic Acid	ug/L	<0.29	10	10	11.2	11.2	112	112	70-130	0	30		
Monochloroacetic Acid	ug/L	<0.90	10	10	10.7	10.4	107	104	70-130	2	30		
Trichloroacetic Acid	ug/L	<0.26	10	10	11.0	11.5	110	115	70-130	4	30		
2,3-Dibromopropanoic Acid (S)	%						106	107	70-130		30		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2373052 2373053

Parameter	Units	35380908001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec				
Dibromoacetic Acid	ug/L	<0.43	10	10	11.4	11.4	114	114	70-130	0	30		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Parameter	Units	2373052		2373053		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		35380908001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Dichloroacetic Acid	ug/L	<0.24	10	10	10.1	10.1	101	101	70-130	0	30	
Haloacetic Acids (Total)	ug/L	<0.67	50	50	54.0	53.9	108	108		0	30	
Monobromoacetic Acid	ug/L	<0.29	10	10	10.1	10.1	101	101	70-130	1	30	
Monochloroacetic Acid	ug/L	<0.90	10	10	10.8	10.8	108	108	70-130	0	30	
Trichloroacetic Acid	ug/L	<0.26	10	10	11.6	11.5	116	115	70-130	0	30	
2,3-Dibromopropanoic Acid (S)	%						103	101	70-130		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 529156	Analysis Method: EPA 8081B
QC Batch Method: EPA Mod. 3510C	Analysis Description: 8081B GCS Pesticides
Associated Lab Samples: 10424606001	

METHOD BLANK: 2872152 Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/05/18 16:23	
4,4'-DDE	ug/L	ND	0.10	04/05/18 16:23	
4,4'-DDT	ug/L	ND	0.10	04/05/18 16:23	
Aldrin	ug/L	ND	0.050	04/05/18 16:23	
alpha-BHC	ug/L	ND	0.050	04/05/18 16:23	
alpha-Chlordane	ug/L	ND	0.050	04/05/18 16:23	
beta-BHC	ug/L	ND	0.050	04/05/18 16:23	
Chlordane (Technical)	ug/L	ND	0.50	04/05/18 16:23	
delta-BHC	ug/L	ND	0.050	04/05/18 16:23	
Dieldrin	ug/L	ND	0.10	04/05/18 16:23	
Endosulfan I	ug/L	ND	0.050	04/05/18 16:23	
Endosulfan II	ug/L	ND	0.10	04/05/18 16:23	
Endosulfan sulfate	ug/L	ND	0.10	04/05/18 16:23	
Endrin	ug/L	ND	0.10	04/05/18 16:23	
Endrin aldehyde	ug/L	ND	0.10	04/05/18 16:23	
Endrin ketone	ug/L	ND	0.10	04/05/18 16:23	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/05/18 16:23	
gamma-Chlordane	ug/L	ND	0.050	04/05/18 16:23	
Heptachlor	ug/L	ND	0.050	04/05/18 16:23	
Heptachlor epoxide	ug/L	ND	0.050	04/05/18 16:23	
Methoxychlor	ug/L	ND	0.50	04/05/18 16:23	
Toxaphene	ug/L	ND	1.5	04/05/18 16:23	
Decachlorobiphenyl (S)	%	92	30-143	04/05/18 16:23	
Tetrachloro-m-xylene (S)	%	93	62-125	04/05/18 16:23	

LABORATORY CONTROL SAMPLE & LCSD: 2872153

2872154

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
4,4'-DDD	ug/L	1	1.0	1.0	100	102	67-125	1	20	
4,4'-DDE	ug/L	1	0.97	0.99	97	99	68-125	1	20	
4,4'-DDT	ug/L	1	1.0	1.0	101	101	66-125	1	20	
Aldrin	ug/L	.5	0.43	0.43	87	86	46-125	1	20	
alpha-BHC	ug/L	.5	0.45	0.45	90	90	66-125	1	20	
alpha-Chlordane	ug/L	.5	0.47	0.47	94	94	72-125	0	20	
beta-BHC	ug/L	.5	0.47	0.47	94	94	72-125	0	20	
delta-BHC	ug/L	.5	0.30	0.30	59	60	37-141	1	20	
Dieldrin	ug/L	1	1.0	1.0	104	105	71-125	0	20	
Endosulfan I	ug/L	.5	0.45	0.44	89	89	69-125	0	20	
Endosulfan II	ug/L	1	1.0	1.0	102	102	73-125	0	20	
Endosulfan sulfate	ug/L	1	0.85	0.86	85	86	63-127	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Parameter	Units	2872153		2872154			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Endrin	ug/L	1	0.96	0.97	96	97	72-125	1	20	
Endrin aldehyde	ug/L	1	0.96	0.97	96	97	70-125	2	20	
Endrin ketone	ug/L	1	1.0	1.1	105	106	72-127	1	20	
gamma-BHC (Lindane)	ug/L	.5	0.46	0.47	93	94	69-125	1	20	
gamma-Chlordane	ug/L	.5	0.42	0.42	84	84	64-125	0	20	
Heptachlor	ug/L	.5	0.47	0.46	94	93	54-125	2	20	
Heptachlor epoxide	ug/L	.5	0.47	0.47	95	94	72-125	0	20	
Methoxychlor	ug/L	5	5.0	5.1	100	102	67-127	2	20	
Decachlorobiphenyl (S)	%.				86	89	30-143			
Tetrachloro-m-xylene (S)	%.				90	90	62-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 529157

Analysis Method: EPA 8082A

QC Batch Method: EPA Mod. 3510C

Analysis Description: 8082A GCS PCB

Associated Lab Samples: 10424606001

METHOD BLANK: 2872155

Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/03/18 12:39	
Decachlorobiphenyl (S)	%	91	30-125	04/03/18 12:39	
Tetrachloro-m-xylene (S)	%	67	30-125	04/03/18 12:39	

LABORATORY CONTROL SAMPLE & LCSD: 2872156

2872157

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.6	1.5	80	75	47-125	6	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.7	1.6	83	82	54-125	1	20	
Decachlorobiphenyl (S)	%				85	84	30-125			
Tetrachloro-m-xylene (S)	%				77	74	30-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 529677

Analysis Method: EPA 8270D

QC Batch Method: EPA 3520

Analysis Description: 8270D Water MSSV

Associated Lab Samples: 10424606001

METHOD BLANK: 2874915

Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/03/18 17:31	
2,4-Dichlorophenol	ug/L	ND	10.0	04/03/18 17:31	
2,4-Dimethylphenol	ug/L	ND	50.0	04/03/18 17:31	
2,4-Dinitrophenol	ug/L	ND	10.0	04/03/18 17:31	
2-Chlorophenol	ug/L	ND	10.0	04/03/18 17:31	
2-Methylnaphthalene	ug/L	ND	10.0	04/03/18 17:31	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/03/18 17:31	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/03/18 17:31	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/03/18 17:31	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/03/18 17:31	
Acenaphthene	ug/L	ND	10.0	04/03/18 17:31	
Anthracene	ug/L	ND	10.0	04/03/18 17:31	
Benzo(a)pyrene	ug/L	ND	10.0	04/03/18 17:31	
Benzoic acid	ug/L	ND	50.0	04/03/18 17:31	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/03/18 17:31	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/03/18 17:31	
Butylbenzylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Di-n-butylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Di-n-octylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Diethylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Dimethylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Fluoranthene	ug/L	ND	10.0	04/03/18 17:31	
Fluorene	ug/L	ND	10.0	04/03/18 17:31	
Hexachlorobenzene	ug/L	ND	10.0	04/03/18 17:31	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/03/18 17:31	
Hexachloroethane	ug/L	ND	10.0	04/03/18 17:31	
Isophorone	ug/L	ND	10.0	04/03/18 17:31	
N-Nitrosodiphenylamine	ug/L	ND	10.0	04/03/18 17:31	
Pentachlorophenol	ug/L	ND	20.0	04/03/18 17:31	
Phenanthrene	ug/L	ND	10.0	04/03/18 17:31	
Phenol	ug/L	ND	10.0	04/03/18 17:31	
Pyrene	ug/L	ND	10.0	04/03/18 17:31	
2,4,6-Tribromophenol (S)	%	81	65-125	04/03/18 17:31	
2-Fluorobiphenyl (S)	%	74	56-125	04/03/18 17:31	
2-Fluorophenol (S)	%	83	55-125	04/03/18 17:31	
Nitrobenzene-d5 (S)	%	81	60-125	04/03/18 17:31	
p-Terphenyl-d14 (S)	%	107	58-125	04/03/18 17:31	
Phenol-d6 (S)	%	87	58-125	04/03/18 17:31	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

LABORATORY CONTROL SAMPLE & LCSD: 2874916

2874917

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	41.4	42.1	83	84	74-125	2	20	
2,4-Dichlorophenol	ug/L	50	39.2	39.7	78	79	68-125	1	20	
2,4-Dimethylphenol	ug/L	50	28.9J	31J	58	62	33-125		20	
2,4-Dinitrophenol	ug/L	50	34.2	36.8	68	74	30-127	7	20	
2-Chlorophenol	ug/L	50	38.3	37.2	77	74	61-125	3	20	
2-Methylnaphthalene	ug/L	50	38.0	38.8	76	78	67-125	2	20	
2-Methylphenol(o-Cresol)	ug/L	50	36.4	35.0	73	70	63-125	4	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	37.3	36.8	75	74	67-125	1	20	
3,3'-Dichlorobenzidine	ug/L	50	45.7J	48.1J	91	96	60-125		20	
4-Bromophenylphenyl ether	ug/L	50	43.2	43.6	86	87	75-125	1	20	
Acenaphthene	ug/L	50	40.1	40.9	80	82	74-125	2	20	
Anthracene	ug/L	50	43.5	43.9	87	88	75-125	1	20	
Benzo(a)pyrene	ug/L	50	42.7	42.4	85	85	75-125	1	20	
Benzoic acid	ug/L	50	21.9J	22.1J	44	44	30-125		20	1M
bis(2-Chloroethyl) ether	ug/L	50	35.4	34.0	71	68	55-125	4	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	41.0	41.6	82	83	72-129	1	20	
Butylbenzylphthalate	ug/L	50	41.2	41.2	82	82	69-127	0	20	
Di-n-butylphthalate	ug/L	50	41.5	42.0	83	84	75-125	1	20	
Di-n-octylphthalate	ug/L	50	41.6	41.4	83	83	69-131	1	20	
Diethylphthalate	ug/L	50	42.5	43.0	85	86	75-125	1	20	
Dimethylphthalate	ug/L	50	42.6	43.0	85	86	75-125	1	20	
Fluoranthene	ug/L	50	42.6	44.2	85	88	75-125	4	20	
Fluorene	ug/L	50	41.7	42.4	83	85	75-125	2	20	
Hexachlorobenzene	ug/L	50	42.0	42.3	84	85	74-125	1	20	
Hexachlorocyclopentadiene	ug/L	50	ND	ND	30	31	30-125		20	
Hexachloroethane	ug/L	50	28.9	26.6	58	53	30-125	9	20	
Isophorone	ug/L	50	37.8	38.4	76	77	72-125	2	20	
N-Nitrosodiphenylamine	ug/L	50	41.5	41.7	83	83	75-125	0	20	
Pentachlorophenol	ug/L	50	35.5	36.9	71	74	52-125	4	20	
Phenanthrene	ug/L	50	43.3	43.5	87	87	75-125	1	20	
Phenol	ug/L	50	38.0	36.7	76	73	59-125	3	20	
Pyrene	ug/L	50	44.1	44.3	88	89	75-125	0	20	
2,4,6-Tribromophenol (S)	%				90	92	65-125			
2-Fluorobiphenyl (S)	%				80	82	56-125			
2-Fluorophenol (S)	%				80	77	55-125			
Nitrobenzene-d5 (S)	%				76	77	60-125			
p-Terphenyl-d14 (S)	%				99	101	58-125			
Phenol-d6 (S)	%				82	81	58-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 18993 Analysis Method: EPA 8315A
QC Batch Method: EPA 8315A Analysis Description: 8315 GCSV Aldehydes
Associated Lab Samples: 10424606001

METHOD BLANK: 75621 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Formaldehyde	ug/L	ND	100	03/30/18 11:19	

LABORATORY CONTROL SAMPLE: 75622

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	400	403	101	44-176	

MATRIX SPIKE SAMPLE: 75623

Parameter	Units	40166480001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	1560	400	1620	17	35-167	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 528769	Analysis Method: Hach 10360 Rev 1.1
QC Batch Method: Hach 10360	Analysis Description: Hach 10360 Rev 1.1, BOD
Associated Lab Samples: 10424606001	

METHOD BLANK: 2869664 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	03/28/18 14:31	

LABORATORY CONTROL SAMPLE & LCSD: 2869666 2869822

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	198	198	208	100	105	85-115	5	20	

SAMPLE DUPLICATE: 2869667

Parameter	Units	10424571001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	177	252	35	20	D6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 529575	Analysis Method: EPA 1664A OG
QC Batch Method: EPA 1664A OG	Analysis Description: 1664 HEM, Oil and Grease
Associated Lab Samples: 10424606001	

METHOD BLANK: 2874530 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	03/29/18 09:21	

LABORATORY CONTROL SAMPLE: 2874531

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	34.3	86	78-114	

MATRIX SPIKE SAMPLE: 2874532

Parameter	Units	10424522001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	ND	40.4	30.7	72	78-114	M1

SAMPLE DUPLICATE: 2874533

Parameter	Units	10424970001 Result	Dup Result	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	ND	ND		18	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 529277

Analysis Method: SM 2540D

QC Batch Method: SM 2540D

Analysis Description: 2540D Total Suspended Solids

Associated Lab Samples: 10424606001

METHOD BLANK: 2872638

Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	03/27/18 15:13	

LABORATORY CONTROL SAMPLE: 2872639

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	82.0	82	80-120	

SAMPLE DUPLICATE: 2872640

Parameter	Units	10424927021 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	132	129	2	10	H3

SAMPLE DUPLICATE: 2872641

Parameter	Units	10424927022 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	49.0	50.0	2	10	H3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 438356	Analysis Method: SM 4500-CIO2
QC Batch Method: SM 4500-CIO2	Analysis Description: 4500CIO2 Chlorine Dioxide
Associated Lab Samples: 10424606001	

METHOD BLANK: 2380118 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorine Dioxide	mg/L	ND	0.10	04/06/18 13:42	H6

LABORATORY CONTROL SAMPLE: 2380119

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorine Dioxide	mg/L	2.5	2.3	94	90-110	H6

SAMPLE DUPLICATE: 2380120

Parameter	Units	10424606001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	0.25	0.25	0	20	H6

SAMPLE DUPLICATE: 2380121

Parameter	Units	7584977001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	0.95	0.96	1	20	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 529218 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 10424606001

LABORATORY CONTROL SAMPLE: 2872361

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	100	98-102	H6

SAMPLE DUPLICATE: 2872362

Parameter	Units	10424592001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	10.6	10.6	0	3	H6

SAMPLE DUPLICATE: 2872363

Parameter	Units	92378064001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	5.4	5.4	0	3	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 529627 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10424606001

METHOD BLANK: 2874679 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	03/30/18 20:53	
Fluoride	mg/L	ND	0.050	03/30/18 20:53	

LABORATORY CONTROL SAMPLE: 2874680

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	11.6	93	90-110	
Fluoride	mg/L	1	0.96	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874681 2874682

Parameter	Units	10424547001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Chloride	mg/L	8.6	12.5	12.5	19.8	19.8	89	90	90-110	0	20	M1
Fluoride	mg/L	0.29	1	1	1.3	1.3	98	99	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874683 2874684

Parameter	Units	10424924002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Chloride	mg/L	156	62.5	62.5	207	207	81	81	90-110	0	20	M1
Fluoride	mg/L	0.065	1	1	1.1	1.1	103	104	90-110	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 436295	Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1	Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10424606001	

METHOD BLANK: 2369867 Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorite	ug/L	ND	5.0	03/28/18 13:23	

LABORATORY CONTROL SAMPLE: 2369868

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	40	40.0	100	85-115	

MATRIX SPIKE SAMPLE: 2369870

Parameter	Units	60266407002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	ND	4000	3870	97	75-125	

SAMPLE DUPLICATE: 2369869

Parameter	Units	60266407002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorite	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 436294 Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1 Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10424606001

METHOD BLANK: 2369861 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromate	ug/L	ND	1.0	03/28/18 13:23	

LABORATORY CONTROL SAMPLE: 2369862

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	8	7.6	95	85-115	

MATRIX SPIKE SAMPLE: 2369864

Parameter	Units	60266407002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	ND	800	773	97	75-125	

SAMPLE DUPLICATE: 2369863

Parameter	Units	60266407002 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromate	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 528739	Analysis Method: SM 3500-Cr D Modified
QC Batch Method: SM 3500-Cr D Modified	Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10424606001	

METHOD BLANK: 2869559 Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	03/23/18 09:10	

LABORATORY CONTROL SAMPLE: 2869560

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.20	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869561 2869562

Parameter	Units	10424606001		2869561		2869562		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result				
Chromium, Hexavalent	mg/L	ND	.2	.2	.0031J	.0029J	1	1	85-115	20	M3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 139700 Analysis Method: EPA 350.1 rev. 2 (1993)
QC Batch Method: EPA 350.1 rev. 2 (1993) Analysis Description: 350.1 Ammonia Distilled
Associated Lab Samples: 10424606001

METHOD BLANK: 553300 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	04/03/18 08:30	

LABORATORY CONTROL SAMPLE: 553301

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	10	10.3	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553302 553303

Parameter	Units	10424606001		553302		553303		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Nitrogen, Ammonia	mg/L	2.0	10	10	10	9.8	10.0	78	80	90-110	2	10 M0

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 528772	Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2	Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 10424606001	

METHOD BLANK: 2869690 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	03/23/18 11:44	
Nitrite as N	mg/L	ND	0.020	03/23/18 11:44	
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	03/23/18 11:44	

LABORATORY CONTROL SAMPLE: 2869691

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	0.98	98	90-110	
Nitrogen, NO2 plus NO3	mg/L	1	0.99	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869692 2869693

Parameter	Units	10424606001		2869692		2869693		% Rec Limits	RPD	Max RPD	Qual	
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec					MSD % Rec
Nitrite as N	mg/L	ND	1	1	0.93	0.94	93	94	90-110	1	20	
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	0.95	1.0	95	101	90-110	6	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 19623 Analysis Method: EPA 9016
QC Batch Method: EPA 9016 Analysis Description: 9016 Free Cyanide
Associated Lab Samples: 10424606001

METHOD BLANK: 77969 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/05/18 17:03	

LABORATORY CONTROL SAMPLE: 77970

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	151	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 77971 77972

Parameter	Units	10424606001		MS		MSD		% Rec		Max		Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
Cyanide, Free	ug/L	ND	150	150	150	160	160	106	106	80-120	0	11

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 530296 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10424606001

METHOD BLANK: 2878424 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/03/18 12:40	

LABORATORY CONTROL SAMPLE: 2878425

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	241	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878426 2878427

Parameter	Units	10423797004 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Cyanide	ug/L	1.5 mg/L	250	250	1950	1840	172	128	80-120	6	30	H3,M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878428 2878429

Parameter	Units	10425152001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Cyanide	ug/L	38.4	250	250	269	268	92	92	80-120	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 531266	Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B	Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10424606001	

METHOD BLANK: 2884792 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	04/09/18 13:24	

LABORATORY CONTROL SAMPLE: 2884793

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	1.1	110	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2884794 2884795

Parameter	Units	10426344001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec				
Phosphorus	mg/L	0.17	1	1	1.2	1.2	104	104	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2884796 2884797

Parameter	Units	10426048001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec				
Phosphorus	mg/L	3.8	1	1	4.7	4.7	90	90	80-120	0	30	

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Sample: FD-SB-E5 **Lab ID: 10424606001** Collected: 03/22/18 15:00 Received: 03/22/18 17:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	3.06 ± 1.90 (2.97) C:NA T:NA	pCi/L	04/05/18 08:56	12587-46-1	
Gross Beta	EPA 900.0	5.90 ± 2.23 (3.40) C:NA T:NA	pCi/L	04/05/18 08:56	12587-47-2	
Radium-226	EPA 903.1	0.681 ± 0.580 (0.815) C:NA T:84%	pCi/L	04/11/18 20:47	13982-63-3	
Radium-228	EPA 904.0	0.937 ± 0.493 (0.908) C:71% T:83%	pCi/L	04/10/18 13:21	15262-20-1	
Total Radium	Total Radium Calculation	1.62 ± 1.07 (1.72)	pCi/L	04/17/18 13:46	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 293327

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 10424606001

METHOD BLANK: 1435510

Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.436 ± 0.363 (0.727) C:77% T:72%	pCi/L	04/10/18 13:21	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch:	293307	Analysis Method:	EPA 900.0
QC Batch Method:	EPA 900.0	Analysis Description:	900.0 Gross Alpha/Beta
Associated Lab Samples:	10424606001		

METHOD BLANK:	1435471	Matrix:	Water
Associated Lab Samples:	10424606001		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.025 ± 0.367 (1.14) C:NA T:NA	pCi/L	04/05/18 08:54	
Gross Beta	0.724 ± 0.848 (1.83) C:NA T:NA	pCi/L	04/05/18 08:54	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 293579

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 10424606001

METHOD BLANK: 1437154

Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.147 ± 0.352 (0.681) C:NA T:88%	pCi/L	04/11/18 20:17	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-O Pace Analytical Services - Ormond Beach

PASI-PA Pace Analytical Services - Greensburg

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10424606

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

BATCH QUALIFIERS

Batch: 19125

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

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

BATCH QUALIFIERS

Batch: 529575

[BE] Batch extracted by solid phase extraction (SPE).

Batch: 530078

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

Batch: 530399

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

Batch: 530440

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

ANALYTE QUALIFIERS

- 1M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
- D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
- D6 The precision between the sample and sample duplicate exceeded laboratory control limits.
- H3 Sample was received or analysis requested beyond the recognized method holding time.
- H6 Analysis initiated outside of the 15 minute EPA required holding time.
- L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
- L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
- L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- R1 RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424606001	FD-SB-E5	EPA 531.1	436284		
10424606001	FD-SB-E5	EPA 547	436495		
10424606001	FD-SB-E5	EPA 549.2	435581	EPA 549.2	435759
10424606001	FD-SB-E5	EPA 552.3	436904	EPA 552.3	437225
10424606001	FD-SB-E5	EPA 8015 Alcohol-Glycol	435508		
10424606001	FD-SB-E5	EPA 8015 Alcohol-Glycol	435081		
10424606001	FD-SB-E5	EPA Mod. 3510C	529156	EPA 8081B	530399
10424606001	FD-SB-E5	EPA Mod. 3510C	529157	EPA 8082A	530078
10424606001	FD-SB-E5	EPA 8315A	18993	EPA 8315A	19125
10424606001	FD-SB-E5	EPA 8316	19069		
10424606001	FD-SB-E5	EPA 200.7	529546	EPA 200.7	529681
10424606001	FD-SB-E5	EPA 200.8	529354	EPA 200.8	529496
10424606001	FD-SB-E5	EPA 245.1	529562	EPA 245.1	529636
10424606001	FD-SB-E5	EPA 548.1	436264	EPA 548.1	436842
10424606001	FD-SB-E5	EPA 3520	529677	EPA 8270D	530440
10424606001	FD-SB-E5	EPA 900.0	293307		
10424606001	FD-SB-E5	EPA 903.1	293579		
10424606001	FD-SB-E5	EPA 904.0	293327		
10424606001	FD-SB-E5	Total Radium Calculation	294961		
10424606001	FD-SB-E5	Hach 10360	528769	Hach 10360 Rev 1.1	528875
10424606001	FD-SB-E5	EPA 1664A OG	529575		
10424606001	FD-SB-E5	EPA 180.1	528828		
10424606001	FD-SB-E5	SM 2540D	529277		
10424606001	FD-SB-E5	SM 4500-CIO2	438356		
10424606001	FD-SB-E5	SM 4500-H+B	529218		
10424606001	FD-SB-E5	EPA 300.0	529627		
10424606001	FD-SB-E5	EPA 300.1	436295		
10424606001	FD-SB-E5	EPA 300.1	436294		
10424606001	FD-SB-E5	SM 3500-Cr D Modified	528739		
10424606001	FD-SB-E5	EPA 350.1 rev. 2 (1993)	139700	EPA 350.1 rev. 2 (1993)	139774
10424606001	FD-SB-E5	EPA 353.2	528772		
10424606001	FD-SB-E5	EPA 9016	19623	EPA 9016	19643
10424606001	FD-SB-E5	SM 4500-CN-E	530296	SM 4500-CN-E	530376

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424606001	FD-SB-E5	SM 4500-P B	531266	SM 4500-P E	531337

REPORT OF LABORATORY ANALYSIS

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LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO3	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals - Dissolved Metals per 3/19/18 M. W. P. L.	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, hexavalent	SM3500CRB
Mercury	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500ClO2
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Sample Condition Upon Receipt

Client Name: Pace-Field

Project #: **WO# : 10424606**
 PM: BM2 Due Date: 04/06/18
 CLIENT: PASI-MNFLD

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

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

Thermometer 151401163 G87A9155100842
 Used: 151401163 G87A9155100842
 Type of Ice: Wet Blue None Dry Melted
 Cooler Temp Read (°C): 4.5/5.6 Cooler Temp Corrected (°C): 8.8/4.7
 Temp should be above freezing to 6°C Correction Factor: 20.2
 Biological Tissue Frozen? Yes No N/A
 Date and Initials of Person Examining Contents: 3/22/18 JP

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

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <u>3/22/18 JP</u> <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Containers Intact? <u>3/22/18 JP</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <u>JP</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <u>WT</u> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. <u>Notice on samples</u>
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):	

CLIENT NOTIFICATION/RESOLUTION

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

Project Manager Review: BA. N Date: 3/27/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Sample Condition Upon Receipt

Client Name: Pace - MPLS.

Project #: **WO#: 12106409**
 PM: HRZ Due Date: 04/11/18
 CLIENT: PACE MPLS

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

Tracking Number: _____

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

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

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

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

Comments: CPB 3/28/18

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

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____

Heather ZTD

Date: 3/28/18

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



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50193171 **Date/Time and Initials of person examining contents:** 3/28/18 1415 DJ

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 7405

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

Packing Material: Bubble Wrap Bubble Bags None Other _____

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

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

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

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

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

Comments:

Chain of Custody

WO#: 35381955



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424606 Workorder Name: MPCA Freeway LF Waters Owner Received Date: 3/22/2018 Results Requested By: 4/6/2018

Report To		Subcontract To				Requested Analysis																						
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Ormond Beach 8 East Tower Circle Ormond Beach, FL 32174 Phone (386)672-5668																										
						Diquat EPA 5-19.2		Endothall EPA 5-18.1																				
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved	Preserved Containers				LAB USE ONLY																	
1	FD-SB-E5	PS	3/22/2018 15:00	10424606001	Water	2					X	X																
2																												
3																												
4																												
5																												
												Comments																
Transfers	Released By	Date/Time	Received By	Date/Time																								
1	<i>[Signature]</i>	3/23/18 16:30	<i>[Signature]</i>	3/24/18 11:18																								
2																												
3																												
Cooler Temperature on Receipt		Custody Seal		Received on Ice		Samples Intact																						
2.3 °C		Y or (N)		Y or N		Y or N																						

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



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

(SCUR)

WO# : 35381955

Project #
Project Manager:
Client:

PM: ADC **Due Date: 04/06/18**
CLIENT: PACMIN

Date and Initials of person:
Examining contents: _____
Label: _____
Deliver: _____
pH: _____

Thermometer Used: T315 Date: 3/24/18 Time: 1118 Initials: ALP

State of Origin: _____

Cooler #1 Temp. °C 1.3 (Visual) 1.0 (Correction Factor) 2.3 (Actual)
Cooler #2 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #3 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #4 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #5 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #6 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)

- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____
Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9831 0957

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No Ice: Wet Blue Dry None

Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (if Yes, complete) Shorted Date: _____ Shorted Time: _____ Qty: _____

Comments:

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution:
Person Contacted: _____ Date/Time: _____

Comments/ Resolution (use back for additional comments):

Project Manager Review: _____

Date: _____



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

NO#: 35381955

Project #
Project Manager:
Client:

PM: ADC Due Date: 04/06/18
CLIENT: PACMIN

Date and Initials of person:
Examining contents: _____
Label: _____
Deliver: _____
pH: _____

Thermometer Used: T315 Date: 3/28/18 Time: 1130 Initials: AKP

State of Origin: _____

- | | |
|---|--|
| Cooler #1 Temp.°C <u>2.1</u> (Visual) <u>+1.0</u> (Correction Factor) <u>3.1</u> (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #2 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #3 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #4 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #5 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #6 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____
Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9831 7449

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No Ice: Wet Blue Dry None

Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (If Yes, complete) Shorted Date: _____ Shorted Time: _____ Qty: _____

Comments:

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Preservation Information: Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution:
Person Contacted: _____ Date/Time: _____

Comments/ Resolution (use back for additional comments):

Project Manager Review: _____ Date: _____

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424606 Workorder Name: 18-00383 MPCA FreewayLF Waters Owner Received Date: 3/22/2018 Results Requested By: 4/6/2018

Report To: **Bob Michels** Subcontract To: **Pace Analytical Pittsburgh** Requested Analysis:

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

Pace Analytical Pittsburgh
 1638 Roseytown Road
 Suites 2,3 & 4
 Greensburg, PA 15601
 Phone (724)850-5600

WO#: 30247544

30247544

Gross Alpha/Beta
 Radium 226
 Radium 228
 Radium, total

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Gross Alpha/Beta	Radium 226	Radium 228	Radium, total	LAB USE ONLY
						HNO3								
1	FD-SB-E5	PS	3/22/2018 15:00	10424606001	Water	2				X	X	X	X	027
2														
3														
4														
5														

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	3/22/18 15:00	<i>[Signature]</i>	3/28/18 10:10	
2					
3					

Cooler Temperature on Receipt N/A °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

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

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: Pace MN

Project # 30247544

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 74759831747

Label <u>PH</u>
LIMS Login

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

Thermometer Used WIA Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C
Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>10D1071</u>	<u>PH 3/28/18</u>
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Hex Cr Aqueous Compliance/NPDES sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed <u>PH</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Rad Aqueous Samples Screened > 0.5 mrem/hr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>PH</u>	Date: <u>3/28/18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

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

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

AQUEOUS SAMPLE PRESERVATION VERIFICATION

Client: <u>Pace - Minnesota</u>	Work Order #: <u>469989</u>
Receipt Log #: <u>17-5</u>	Completed By (initials/date): <u>RS 3/28/18</u>
Project Manager: _____	

COC ID #: <u>19261</u>										Adjusted by: _____			
										Date: _____			
Container Type	5 ⁽²³⁾		4		13		6		15				
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1	✓	NA											
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

pH Strip Reagent or Lot #
<input checked="" type="checkbox"/> HC727135
<input type="checkbox"/> Other

Place a check mark in the Received box if pH is acceptable. If pH is not acceptable, document the Received and Adjusted pH values in the appropriate columns (all adjustments must be reviewed by the project manager). Never add more than 2x the default preservation volume (see table below for default volumes). Complete and attach an orange preservation tag to all adjusted samples. A Sample Receiving Non-Conformance Report must be completed if a pH adjustment was required.

Comments: _____

COC ID #										Adjusted by: _____			
										Date: _____			
Container Type	5 / 23		4		13		6		15				
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1													
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

Container Size (mL)	Default Preservative Volume (mL)
Container Types 5 / 23	NaOH
250	1.3
Container Type 4	H ₂ SO ₄
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H ₂ SO ₄
500	2.5
Container Types 6 / 15	HNO ₃
125	0.7
250	1.25
500	2.5
1000	5.0

Comments: _____



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 04, 2018

Bob Michels
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 03/28/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

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

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Water - MN Project Number: 10424606 Project Manager: Bob Michels
--	--

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-SB-E5 (10424606001)	A181311-01	Water	03/22/2018	03/28/2018

CASE NARRATIVE

Sample Receipt Information:

1 sample was received on 03/28/2018. Sample was received at 1.1 degrees Celsius. Sample was received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Continuing Calibration Verification (CCV):

CCV indicates a potential high bias for 2,4,5-TP, bentazon, dicamba, MCPA and triclopyr for sample A181311-01. Sample was less than the reporting limit for this analyte so no further action is required.



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10424606
 Project Manager: Bob Michels

FD-SB-E5 (10424606001)

Date Sampled

A181311-01 (Water)

03/22/2018 15:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
---------	--------	-----------------	-------	----------	----------	----------	--------	------------

Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A803161

Acetochlor	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
EPTC	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Phorate	ND	0.30	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Prometon	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Propazine	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Simazine	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Triallate	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	

Surrogate: Atrazine-d5 87.4 % 65.1-122 03/28/2018 03/29/2018 14:59 EPA 8270D

Surrogate: Parathion-d10 125 % 22.3-159 03/28/2018 03/29/2018 14:59 EPA 8270D

Surrogate: Triphenyl phosphate 126 % 65.2-151 03/28/2018 03/29/2018 14:59 EPA 8270D

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A803163

2,4-D	ND	0.50	ug/L	1	03/29/2018	03/30/2018 20:07	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	03/29/2018	03/30/2018 20:07	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	03/29/2018	03/30/2018 20:07	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	03/29/2018	03/30/2018 20:07	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	03/29/2018	03/30/2018 20:07	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	03/29/2018	03/30/2018 20:07	EPA 8151A	
MCPA	ND	0.30	ug/L	1	03/29/2018	03/30/2018 20:07	EPA 8151A	
Picloram	ND	0.50	ug/L	1	03/29/2018	03/30/2018 20:07	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	03/29/2018	03/30/2018 20:07	EPA 8151A	

Surrogate: 2,4-D-d5 109 % 44.2-121 03/29/2018 03/30/2018 20:07 EPA 8151A



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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10424606
 Project Manager: Bob Michels

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A803161 - EPA 3510C

Blank (A803161-BLK1)

Prepared: 03/28/2018 Analyzed: 03/29/2018 14:30

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>85.0</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.511</i>		<i>ug/L</i>	<i>0.5000</i>		<i>102</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>90.6</i>	<i>65.2-151</i>			

LCS (A803161-BS1)

Prepared: 03/28/2018 Analyzed: 03/29/2018 15:55

Acetochlor	0.951	0.50	ug/L	1.000		95.1	67.5-120			
Alachlor	0.935	0.50	ug/L	1.000		93.5	71.7-120			
Atrazine	0.935	0.50	ug/L	1.000		93.5	72.8-113			
Chlorpyrifos	0.958	0.50	ug/L	1.000		95.8	65.3-119			
Cyanazine	1.00	0.20	ug/L	1.000		100	49.5-140			
Desethylatrazine	0.924	0.50	ug/L	1.000		92.4	66.9-116			
Deisopropylatrazine	0.798	0.50	ug/L	1.000		79.8	44.3-110			
Dimethenamid	0.954	0.50	ug/L	1.000		95.4	63.8-116			
EPTC	0.789	0.50	ug/L	1.000		78.9	41.7-102			
Ethalfuralin	0.926	0.50	ug/L	1.000		92.6	41-127			
Fonofos	0.968	0.50	ug/L	1.000		96.8	59.7-118			
Metolachlor	0.996	0.50	ug/L	1.000		99.6	71.7-122			
Metribuzin	0.942	0.50	ug/L	1.000		94.2	66.6-128			
Pendimethalin	0.876	0.50	ug/L	1.000		87.6	55.5-137			
Phorate	0.737	0.30	ug/L	1.000		73.7	41.2-114			
Prometon	0.984	0.50	ug/L	1.000		98.4	66.3-120			
Propachlor	1.02	0.50	ug/L	1.000		102	65.8-119			



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Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10424606
Project Manager: Bob Michels

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A803161 - EPA 3510C

LCS (A803161-BS1)

Prepared: 03/28/2018 Analyzed: 03/29/2018 15:55

Propazine	0.958	0.50	ug/L	1.000		95.8	72-122			
Simazine	0.961	0.50	ug/L	1.000		96.1	72.8-113			
Terbufos	0.729	0.20	ug/L	1.000		72.9	38.6-115			
Triallate	0.945	0.50	ug/L	1.000		94.5	51.4-116			
Trifluralin	0.849	0.50	ug/L	1.000		84.9	46.1-134			
Surrogate: Atrazine-d5	0.454		ug/L	0.5000		90.8	65.1-122			
Surrogate: Parathion-d10	0.577		ug/L	0.5000		115	22.3-159			
Surrogate: Triphenyl phosphate	0.507		ug/L	0.5000		101	65.2-151			

LCS Dup (A803161-BS1)

Prepared: 03/28/2018 Analyzed: 03/29/2018 16:23

Acetochlor	0.998	0.50	ug/L	1.000		99.8	67.5-120	4.84	20	
Alachlor	0.986	0.50	ug/L	1.000		98.6	71.7-120	5.26	20	
Atrazine	0.985	0.50	ug/L	1.000		98.5	72.8-113	5.11	20	
Chlorpyrifos	1.01	0.50	ug/L	1.000		101	65.3-119	5.51	20	
Cyanazine	1.04	0.20	ug/L	1.000		104	49.5-140	4.32	20	
Desethylatrazine	0.984	0.50	ug/L	1.000		98.4	66.9-116	6.22	20	
Deisopropylatrazine	0.879	0.50	ug/L	1.000		87.9	44.3-110	9.63	20	
Dimethenamid	0.990	0.50	ug/L	1.000		99.0	63.8-116	3.78	20	
EPTC	0.837	0.50	ug/L	1.000		83.7	41.7-102	5.97	20	
Ethalfluralin	1.11	0.50	ug/L	1.000		111	41-127	18.4	20	
Fonofos	1.17	0.50	ug/L	1.000		117	59.7-118	18.9	20	
Metolachlor	1.03	0.50	ug/L	1.000		103	71.7-122	3.59	20	
Metribuzin	0.975	0.50	ug/L	1.000		97.5	66.6-128	3.48	20	
Pendimethalin	0.932	0.50	ug/L	1.000		93.2	55.5-137	6.25	20	
Phorate	0.722	0.30	ug/L	1.000		72.2	41.2-114	2.06	20	
Prometon	1.02	0.50	ug/L	1.000		102	66.3-120	3.16	20	
Propachlor	1.02	0.50	ug/L	1.000		102	65.8-119	0.397	20	
Propazine	0.976	0.50	ug/L	1.000		97.6	72-122	1.86	20	
Simazine	1.00	0.50	ug/L	1.000		100	72.8-113	4.37	20	
Terbufos	0.713	0.20	ug/L	1.000		71.3	38.6-115	2.29	20	
Triallate	1.14	0.50	ug/L	1.000		114	51.4-116	18.8	20	
Trifluralin	0.857	0.50	ug/L	1.000		85.7	46.1-134	0.979	20	
Surrogate: Atrazine-d5	0.432		ug/L	0.5000		86.4	65.1-122			
Surrogate: Parathion-d10	0.646		ug/L	0.5000		129	22.3-159			
Surrogate: Triphenyl phosphate	0.491		ug/L	0.5000		98.1	65.2-151			



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Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10424606
Project Manager: Bob Michels

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A803163 - EPA 3510C

Blank (A803163-BLK1)

Prepared: 03/29/2018 Analyzed: 03/30/2018 11:52

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							

Surrogate: 2,4-D-d5 2.18 ug/L 2.016 108 44.2-121

LCS (A803163-BS1)

Prepared: 03/29/2018 Analyzed: 03/30/2018 12:27

2,4-D	2.64	0.50	ug/L	2.000		132	64.6-148			
2,4-DB	2.62	0.50	ug/L	2.000		131	66.7-143			
2,4,5-T	2.34	0.50	ug/L	2.000		117	63.4-133			
2,4,5-TP (Silvex)	2.77	0.50	ug/L	2.000		139	63-145			
Bentazon	1.24	0.50	ug/L	1.000		124	52.5-139			
Dicamba	2.65	0.50	ug/L	2.000		132	55.4-143			
MCPA	2.57	0.30	ug/L	2.000		129	33.5-143			
Picloram	1.01	0.50	ug/L	1.000		101	47.9-113			
Triclopyr	2.66	0.50	ug/L	2.000		133	65.1-141			

Surrogate: 2,4-D-d5 2.06 ug/L 2.016 102 44.2-121

LCS Dup (A803163-BSD1)

Prepared: 03/29/2018 Analyzed: 03/30/2018 13:01

2,4-D	2.61	0.50	ug/L	2.000		130	64.6-148	1.32	20	
2,4-DB	2.67	0.50	ug/L	2.000		133	66.7-143	1.69	20	
2,4,5-T	2.43	0.50	ug/L	2.000		121	63.4-133	3.68	20	
2,4,5-TP (Silvex)	2.68	0.50	ug/L	2.000		134	63-145	3.57	20	
Bentazon	1.24	0.50	ug/L	1.000		124	52.5-139	0.330	20	
Dicamba	2.48	0.50	ug/L	2.000		124	55.4-143	6.66	20	
MCPA	2.51	0.30	ug/L	2.000		126	33.5-143	2.32	20	
Picloram	1.03	0.50	ug/L	1.000		103	47.9-113	1.93	20	
Triclopyr	2.61	0.50	ug/L	2.000		131	65.1-141	1.60	20	

Surrogate: 2,4-D-d5 1.98 ug/L 2.016 98.0 44.2-121



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Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10424606
Project Manager: Bob Michels

Notes and Definitions

- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

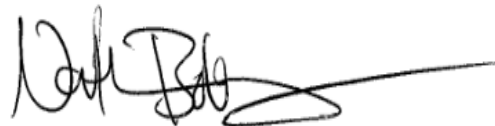
Pace Project #: 10424608
Sample Receipt Date: 03/22/2018
Client Project #: MPCA Freeway LF Wat
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

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

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

This report has been reviewed by:



April 04, 2018

Nathan Boberg, Project Manager

(612) 607-6444 (fax)
nathan.boberg@pacelabs.com



Report of Laboratory Analysis

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

Report Prepared Date:

April 2, 2018

DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of PACE Minnesota Field. The sample was analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration points and a nominal 1-liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The sample was received above the recommended temperature range of 0-6 degrees Celsius.

The isotopically-labeled TCDD internal standard in the sample extract was recovered at 75%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

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

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 98-99% with a relative percent difference of 1.0%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

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

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

Sample Condition Upon Receipt

Client Name: Pace - Field Project #: _____

WO# : 10424608

PM: SCU Due Date: 04/13/18
CLIENT: PASI-MNFLD

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

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

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

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

Cooler Temp Read (°C): 7.5/9.6 Cooler Temp Corrected (°C): 8.8/4.7 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: 3/22/18 JP

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

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

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: Received during cool down process.

Project Manager Review: [Signature]

Date: 03/23/18

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

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO3	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals - Dissolved Metals per 3/19/18 m-umo	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, hexavalent	SM3500CRB
Mercury	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

*- * Analysis by MDH Laboratory

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Reporting Flags

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

REPORT OF LABORATORY ANALYSIS

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Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-E5		
Lab Sample ID	10424608001		
Filename	Y180330B_06		
Injected By	BAL		
Total Amount Extracted	945 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/22/2018 15:00
ICAL ID	Y180204	Received	03/22/2018 17:40
CCal Filename(s)	Y180330B_01	Extracted	03/23/2018 11:45
Method Blank ID	BLANK-61282	Analyzed	03/30/2018 17:24

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	75
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	80

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

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

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61282	Matrix	Water
Filename	U180329A_19	Dilution	NA
Total Amount Extracted	1010 mL	Extracted	03/23/2018 11:45
ICAL ID	U171222	Analyzed	03/29/2018 16:30
CCal Filename(s)	U180329A_06	Injected By	SMT

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	79
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	98

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

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61283	Matrix	Water
Filename	U180329A_20	Dilution	NA
Total Amount Extracted	949 mL	Extracted	03/23/2018 11:45
ICAL ID	U171222	Analyzed	03/29/2018 17:12
CCal Filename	U180329A_06	Injected By	SMT
Method Blank ID	BLANK-61282		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	9.8	7.3	14.6	98
2,3,7,8-TCDD-37Cl4	10	8.3	3.7	15.8	83
2,3,7,8-TCDD-13C	100	77	25.0	141.0	77

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61284	Matrix	Water
Filename	U180329A_21	Dilution	NA
Total Amount Extracted	983 mL	Extracted	03/23/2018 11:45
ICAL ID	U171222	Analyzed	03/29/2018 17:55
CCal Filename	U180329A_06	Injected By	SMT
Method Blank ID	BLANK-61282		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	9.9	7.3	14.6	99
2,3,7,8-TCDD-37Cl4	10	8.5	3.7	15.8	85
2,3,7,8-TCDD-13C	100	77	25.0	141.0	77

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61283
Spike 1 Filename U180329A_20

Spike 2 ID LCSD-61284
Spike 2 Filename U180329A_21

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	98	99	1.0

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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May 03, 2018

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

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

Dear Mr. Jacobson:

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

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

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

Sincerely,



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

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

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

Minnesota Certification IDs

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

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

Virginia Minnesota Certification ID's

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

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

Duluth Minnesota Certification ID's

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

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

Green Bay Certification IDs

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

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

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CERTIFICATIONS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

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

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

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

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

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SAMPLE ANALYTE COUNT

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

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

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

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

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

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

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

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

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

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

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

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	5960	1	03/27/18 12:47	03/30/18 13:18		
Naphthalene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	91-20-3	
2-Nitroaniline	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	88-74-4	
3-Nitroaniline	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	99-09-2	
4-Nitroaniline	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	100-01-6	
Nitrobenzene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	98-95-3	
2-Nitrophenol	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	88-75-5	
4-Nitrophenol	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	86-30-6	
Pentachlorophenol	ND	ug/kg	6050	1	03/27/18 12:47	03/30/18 13:18	87-86-5	
Phenanthrene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	85-01-8	
Phenol	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	108-95-2	
Pyrene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	78	%.	43-125	1	03/27/18 12:47	03/30/18 13:18	4165-60-0	
2-Fluorobiphenyl (S)	81	%.	30-132	1	03/27/18 12:47	03/30/18 13:18	321-60-8	
p-Terphenyl-d14 (S)	100	%.	62-125	1	03/27/18 12:47	03/30/18 13:18	1718-51-0	
Phenol-d6 (S)	79	%.	48-125	1	03/27/18 12:47	03/30/18 13:18	13127-88-3	
2-Fluorophenol (S)	74	%.	40-125	1	03/27/18 12:47	03/30/18 13:18	367-12-4	
2,4,6-Tribromophenol (S)	92	%.	60-125	1	03/27/18 12:47	03/30/18 13:18	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	83-32-9	
Acenaphthylene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	208-96-8	
Anthracene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	120-12-7	
Benzo(a)anthracene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	56-55-3	
Benzo(a)pyrene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	207-08-9	
Chrysene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	53-70-3	
Fluoranthene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	206-44-0	
Fluorene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	193-39-5	
Naphthalene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	91-20-3	
Phenanthrene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	85-01-8	
Pyrene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	63	%.	42-125	1	03/26/18 11:34	03/27/18 17:56	321-60-8	
p-Terphenyl-d14 (S)	78	%.	57-125	1	03/26/18 11:34	03/27/18 17:56	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: **FD-SB-A4 (26-32.5)** Lab ID: **10424609001** Collected: 03/22/18 11:25 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	25057-89-0	
2,4-D	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	94-75-7	
2,4-DB	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	94-82-6	
Dicamba	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	1918-00-9	
Dinoseb	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	88-85-7	
MCPA	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	94-74-6	
Pentachlorophenol	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	87-86-5	
Picloram	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	1918-02-1	
2,4,5-T	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	93-72-1	
Triclopyr	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	55335-06-3	
Surrogates								
2,4-DCAA (S)	65	%.	46-125	1	03/29/18 07:30	04/04/18 15:04	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	7400	1	03/26/18 10:26	03/26/18 11:14	67-64-1	
Allyl chloride	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	107-05-1	
Benzene	1370	ug/kg	148	1	03/26/18 10:26	03/26/18 11:14	71-43-2	
Bromobenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	108-86-1	
Bromochloromethane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	74-97-5	
Bromodichloromethane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	75-27-4	
Bromoform	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	75-25-2	
Bromomethane	ND	ug/kg	3700	1	03/26/18 10:26	03/26/18 11:14	74-83-9	
2-Butanone (MEK)	ND	ug/kg	1850	1	03/26/18 10:26	03/26/18 11:14	78-93-3	
n-Butylbenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	104-51-8	
sec-Butylbenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	135-98-8	
tert-Butylbenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	98-06-6	
Carbon tetrachloride	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	56-23-5	
Chlorobenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	108-90-7	
Chloroethane	ND	ug/kg	3700	1	03/26/18 10:26	03/26/18 11:14	75-00-3	
Chloroform	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	67-66-3	
Chloromethane	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	74-87-3	
2-Chlorotoluene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	95-49-8	
4-Chlorotoluene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	3700	1	03/26/18 10:26	03/26/18 11:14	96-12-8	
Dibromochloromethane	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	106-93-4	
Dibromomethane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	75-71-8	
1,1-Dichloroethane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	75-34-3	
1,2-Dichloroethane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	107-06-2	
1,1-Dichloroethene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	156-59-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-A4 (26-32.5) **Lab ID: 10424609001** Collected: 03/22/18 11:25 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
trans-1,2-Dichloroethene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	156-60-5	
Dichlorofluoromethane	ND	ug/kg	3700	1	03/26/18 10:26	03/26/18 11:14	75-43-4	
1,2-Dichloropropane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	78-87-5	
1,3-Dichloropropane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	142-28-9	
2,2-Dichloropropane	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	594-20-7	
1,1-Dichloropropene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	60-29-7	
Ethylbenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	1850	1	03/26/18 10:26	03/26/18 11:14	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	98-82-8	
p-Isopropyltoluene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	99-87-6	
Methylene Chloride	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	1850	1	03/26/18 10:26	03/26/18 11:14	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	1634-04-4	
Naphthalene	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	91-20-3	
n-Propylbenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	103-65-1	
Styrene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	79-34-5	N2
Tetrachloroethene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	127-18-4	
Tetrahydrofuran	ND	ug/kg	14800	1	03/26/18 10:26	03/26/18 11:14	109-99-9	
Toluene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	79-00-5	
Trichloroethene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	108-67-8	
Vinyl chloride	ND	ug/kg	148	1	03/26/18 10:26	03/26/18 11:14	75-01-4	
Xylene (Total)	ND	ug/kg	1110	1	03/26/18 10:26	03/26/18 11:14	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	89	%	75-125	1	03/26/18 10:26	03/26/18 11:14	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	03/26/18 10:26	03/26/18 11:14	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125	1	03/26/18 10:26	03/26/18 11:14	460-00-4	

7196 Chromium, Hexavalent

Analytical Method: EPA 7196A Preparation Method: EPA 3060A

Chromium, Hexavalent ND mg/kg 305 50 03/30/18 14:00 04/03/18 11:34 18540-29-9 D3

Trivalent Chromium Calculation

Analytical Method: Trivalent Chromium Calculation

Chromium, Trivalent ND mg/kg 1.0 1 04/05/18 08:57 16065-83-1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-A4 (26-32.5) **Lab ID: 10424609001** Collected: 03/22/18 11:25 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
9012 Cyanide, Total Analytical Method: EPA 9012 Preparation Method: EPA 9012A								
Cyanide	ND	mg/kg	1.1	1	03/29/18 10:55	03/29/18 13:05	57-12-5	
9056 IC Anions Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Fluoride	ND	mg/kg	0.98	1	03/29/18 15:45	03/30/18 21:53	16984-48-8	

Sample: FD-SB-B4-WM (3-20 WM) **Lab ID: 10424609002** Collected: 03/22/18 13:20 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	17.1	1	03/30/18 11:35	04/02/18 15:26	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	309-00-2	
alpha-BHC	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	319-84-6	
beta-BHC	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	319-85-7	
delta-BHC	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	58-89-9	
Chlordane (Technical)	ND	ug/kg	256	10	03/26/18 07:27	04/04/18 01:04	57-74-9	
alpha-Chlordane	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	5103-71-9	
gamma-Chlordane	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	5103-74-2	
4,4'-DDD	ND	ug/kg	51.0	10	03/26/18 07:27	04/04/18 01:04	72-54-8	
4,4'-DDE	ND	ug/kg	51.0	10	03/26/18 07:27	04/04/18 01:04	72-55-9	
4,4'-DDT	ND	ug/kg	51.0	10	03/26/18 07:27	04/04/18 01:04	50-29-3	
Dieldrin	ND	ug/kg	51.0	10	03/26/18 07:27	04/04/18 01:04	60-57-1	
Endosulfan I	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	959-98-8	
Endosulfan II	ND	ug/kg	51.0	10	03/26/18 07:27	04/04/18 01:04	33213-65-9	
Endosulfan sulfate	ND	ug/kg	51.0	10	03/26/18 07:27	04/04/18 01:04	1031-07-8	
Endrin	ND	ug/kg	51.0	10	03/26/18 07:27	04/04/18 01:04	72-20-8	
Endrin aldehyde	ND	ug/kg	51.0	10	03/26/18 07:27	04/04/18 01:04	7421-93-4	
Endrin ketone	ND	ug/kg	51.0	10	03/26/18 07:27	04/04/18 01:04	53494-70-5	
Heptachlor	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	76-44-8	
Heptachlor epoxide	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	1024-57-3	
Methoxychlor	ND	ug/kg	256	10	03/26/18 07:27	04/04/18 01:04	72-43-5	
Toxaphene	ND	ug/kg	765	10	03/26/18 07:27	04/04/18 01:04	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	10	03/26/18 07:27	04/04/18 01:04	877-09-8	5M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	10	03/26/18 07:27	04/04/18 01:04	2051-24-3	S4
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	50.5	1	03/23/18 16:00	03/26/18 19:00	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	50.5	1	03/23/18 16:00	03/26/18 19:00	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	50.5	1	03/23/18 16:00	03/26/18 19:00	11141-16-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-B4-WM (3-20 WM) Lab ID: 10424609002 Collected: 03/22/18 13:20 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1242 (Aroclor 1242)	3330	ug/kg	101	2	03/23/18 16:00	03/27/18 08:04	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	50.5	1	03/23/18 16:00	03/26/18 19:00	12672-29-6	
PCB-1254 (Aroclor 1254)	887	ug/kg	50.5	1	03/23/18 16:00	03/26/18 19:00	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	50.5	1	03/23/18 16:00	03/26/18 19:00	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	50.5	1	03/23/18 16:00	03/26/18 19:00	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	50.5	1	03/23/18 16:00	03/26/18 19:00	11100-14-4	
PCB, Total	4220	ug/kg	101	2	03/23/18 16:00	03/27/18 08:04	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	94	%.	48-125	1	03/23/18 16:00	03/26/18 19:00	877-09-8	
Decachlorobiphenyl (S)	73	%.	30-134	1	03/23/18 16:00	03/26/18 19:00	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	1570	mg/kg	153	10	03/28/18 12:37	03/29/18 16:15		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	10	03/28/18 12:37	03/29/18 16:15	638-68-6	7M, S4
WIGRO GCV								
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	243	mg/kg	29.3	1	03/30/18 14:11	03/31/18 00:32		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%.	80-150	1	03/30/18 14:11	03/31/18 00:32	98-08-8	
6010C MET ICP								
Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	7510	mg/kg	15.2	1	03/26/18 05:53	03/29/18 18:02	7429-90-5	
Barium	194	mg/kg	0.76	1	03/26/18 05:53	03/29/18 18:02	7440-39-3	
Boron	112	mg/kg	11.4	1	03/26/18 05:53	03/29/18 18:02	7440-42-8	
Copper	474	mg/kg	0.76	1	03/26/18 05:53	03/29/18 18:02	7440-50-8	
Iron	32100	mg/kg	19.0	5	03/26/18 05:53	03/30/18 10:32	7439-89-6	
Manganese	270	mg/kg	0.38	1	03/26/18 05:53	03/29/18 18:02	7439-96-5	
Nickel	30.3	mg/kg	1.5	1	03/26/18 05:53	03/29/18 18:02	7440-02-0	
Silver	2.0	mg/kg	0.76	1	03/26/18 05:53	03/29/18 18:02	7440-22-4	
Tin	42.9	mg/kg	5.7	1	03/26/18 05:53	03/29/18 18:02	7440-31-5	
Titanium	260	mg/kg	1.9	1	03/26/18 05:53	03/29/18 18:02	7440-32-6	
Zinc	692	mg/kg	1.5	1	03/26/18 05:53	03/29/18 18:02	7440-66-6	
6020 MET ICPMS								
Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	35.9	mg/kg	1.5	5	03/30/18 09:43	03/31/18 04:52	7440-47-3	N2
6020A MET ICPMS								
Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	5.0	mg/kg	0.72	20	03/26/18 09:32	04/02/18 11:40	7440-36-0	
Arsenic	12.2	mg/kg	0.72	20	03/26/18 09:32	04/02/18 11:40	7440-38-2	
Beryllium	1.6	mg/kg	0.29	20	03/26/18 09:32	04/02/18 11:40	7440-41-7	
Cadmium	4.0	mg/kg	0.11	20	03/26/18 09:32	04/02/18 11:40	7440-43-9	
Cobalt	10	mg/kg	0.72	20	03/26/18 09:32	04/02/18 11:40	7440-48-4	
Lead	575	mg/kg	0.14	20	03/26/18 09:32	04/02/18 11:40	7439-92-1	
Lithium	10.3	mg/kg	0.72	20	03/26/18 09:32	04/02/18 11:40	7439-93-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-B4-WM (3-20 WM) Lab ID: 10424609002 Collected: 03/22/18 13:20 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Selenium	3.5	mg/kg	0.72	20	03/26/18 09:32	04/02/18 11:40	7782-49-2	
Strontium	176	mg/kg	0.72	20	03/26/18 09:32	04/02/18 11:40	7440-24-6	
Vanadium	44.6	mg/kg	1.4	20	03/26/18 09:32	04/02/18 11:40	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.52	mg/kg	0.030	1	03/30/18 08:32	03/30/18 11:28	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	34.7	%	0.10	1		03/26/18 14:26		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	83-32-9	
Acenaphthylene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	208-96-8	
Anthracene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	120-12-7	
Benzo(a)anthracene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	56-55-3	
Benzo(a)pyrene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	50-32-8	
Benzo(b)fluoranthene	650	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	101-55-3	
Butylbenzylphthalate	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	85-68-7	
Carbazole	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	59-50-7	
4-Chloroaniline	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	108-60-1	
2-Chloronaphthalene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	91-58-7	
2-Chlorophenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	7005-72-3	
Chrysene	558	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	53-70-3	
Dibenzofuran	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	120-83-2	
Diethylphthalate	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	105-67-9	
Dimethylphthalate	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	131-11-3	
Di-n-butylphthalate	516	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2590	1	03/27/18 12:47	03/30/18 15:20	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	121-14-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: **FD-SB-B4-WM (3-20 WM)** Lab ID: **10424609002** Collected: 03/22/18 13:20 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2,6-Dinitrotoluene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	606-20-2	
Di-n-octylphthalate	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	122-66-7	
bis(2-Ethylhexyl)phthalate	7900	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	117-81-7	
Fluoranthene	1560	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	206-44-0	
Fluorene	666	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	87-68-3	
Hexachlorobenzene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	118-74-1	
Hexachloroethane	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	193-39-5	
Isophorone	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	78-59-1	
1-Methylnaphthalene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	90-12-0	
2-Methylnaphthalene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1010	1	03/27/18 12:47	03/30/18 15:20		
Naphthalene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	91-20-3	
2-Nitroaniline	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	88-74-4	
3-Nitroaniline	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	99-09-2	
4-Nitroaniline	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	100-01-6	
Nitrobenzene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	98-95-3	
2-Nitrophenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	88-75-5	
4-Nitrophenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	621-64-7	
N-Nitrosodiphenylamine	759	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	86-30-6	
Pentachlorophenol	ND	ug/kg	1020	1	03/27/18 12:47	03/30/18 15:20	87-86-5	
Phenanthrene	2410	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	85-01-8	
Phenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	108-95-2	
Pyrene	1100	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	56	%	43-125	1	03/27/18 12:47	03/30/18 15:20	4165-60-0	
2-Fluorobiphenyl (S)	67	%	30-132	1	03/27/18 12:47	03/30/18 15:20	321-60-8	
p-Terphenyl-d14 (S)	58	%	62-125	1	03/27/18 12:47	03/30/18 15:20	1718-51-0	S5
Phenol-d6 (S)	58	%	48-125	1	03/27/18 12:47	03/30/18 15:20	13127-88-3	
2-Fluorophenol (S)	53	%	40-125	1	03/27/18 12:47	03/30/18 15:20	367-12-4	
2,4,6-Tribromophenol (S)	63	%	60-125	1	03/27/18 12:47	03/30/18 15:20	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	514	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	83-32-9	
Acenaphthylene	ND	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	208-96-8	
Anthracene	1080	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	120-12-7	
Benzo(a)anthracene	2620	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	56-55-3	
Benzo(a)pyrene	2430	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	50-32-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-B4-WM (3-20 WM) **Lab ID: 10424609002** Collected: 03/22/18 13:20 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Benzo(b)fluoranthene	2860	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	205-99-2	
Benzo(g,h,i)perylene	1640	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	191-24-2	
Benzo(k)fluoranthene	1120	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	207-08-9	
Chrysene	2750	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	218-01-9	
Dibenz(a,h)anthracene	368	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	53-70-3	
Fluoranthene	5350	ug/kg	305	20	03/26/18 11:34	03/28/18 12:31	206-44-0	
Fluorene	974	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	86-73-7	
Indeno(1,2,3-cd)pyrene	1270	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	193-39-5	
Naphthalene	746	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	91-20-3	
Phenanthrene	4450	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	85-01-8	
Pyrene	4740	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%.	42-125	10	03/26/18 11:34	03/27/18 20:30	321-60-8	D3,S4
p-Terphenyl-d14 (S)	0	%.	57-125	10	03/26/18 11:34	03/27/18 20:30	1718-51-0	S4
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	25057-89-0	
2,4-D	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	94-75-7	
2,4-DB	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	94-82-6	
Dicamba	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	1918-00-9	
Dinoseb	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	88-85-7	
MCPA	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	94-74-6	
Pentachlorophenol	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	87-86-5	
Picloram	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	1918-02-1	
2,4,5-T	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	93-72-1	
Triclopyr	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	55335-06-3	
Surrogates								
2,4-DCAA (S)	53	%.	46-125	1	03/29/18 07:30	04/04/18 15:18	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	2870	1	03/26/18 09:03	03/26/18 13:44	67-64-1	
Allyl chloride	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	107-05-1	
Benzene	ND	ug/kg	57.5	1	03/26/18 09:03	03/26/18 13:44	71-43-2	
Bromobenzene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	108-86-1	
Bromochloromethane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	74-97-5	
Bromodichloromethane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	75-27-4	
Bromoform	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	75-25-2	
Bromomethane	ND	ug/kg	1440	1	03/26/18 09:03	03/26/18 13:44	74-83-9	
2-Butanone (MEK)	ND	ug/kg	718	1	03/26/18 09:03	03/26/18 13:44	78-93-3	
n-Butylbenzene	989	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	104-51-8	
sec-Butylbenzene	663	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	135-98-8	
tert-Butylbenzene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	98-06-6	
Carbon tetrachloride	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	56-23-5	
Chlorobenzene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	108-90-7	
Chloroethane	ND	ug/kg	1440	1	03/26/18 09:03	03/26/18 13:44	75-00-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: **FD-SB-B4-WM (3-20 WM)** Lab ID: **10424609002** Collected: 03/22/18 13:20 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Chloroform	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	67-66-3	
Chloromethane	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	74-87-3	
2-Chlorotoluene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	95-49-8	
4-Chlorotoluene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1440	1	03/26/18 09:03	03/26/18 13:44	96-12-8	
Dibromochloromethane	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	106-93-4	
Dibromomethane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	74-95-3	
1,2-Dichlorobenzene	259	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	541-73-1	
1,4-Dichlorobenzene	810	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	75-71-8	
1,1-Dichloroethane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	75-34-3	
1,2-Dichloroethane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	107-06-2	
1,1-Dichloroethene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1440	1	03/26/18 09:03	03/26/18 13:44	75-43-4	
1,2-Dichloropropane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	78-87-5	
1,3-Dichloropropane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	142-28-9	
2,2-Dichloropropane	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	594-20-7	
1,1-Dichloropropene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	60-29-7	
Ethylbenzene	1380	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	718	1	03/26/18 09:03	03/26/18 13:44	87-68-3	
Isopropylbenzene (Cumene)	412	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	98-82-8	
p-Isopropyltoluene	5250	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	99-87-6	
Methylene Chloride	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	718	1	03/26/18 09:03	03/26/18 13:44	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	1634-04-4	
Naphthalene	3240	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	91-20-3	
n-Propylbenzene	880	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	103-65-1	
Styrene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	79-34-5	N2
Tetrachloroethene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	127-18-4	
Tetrahydrofuran	ND	ug/kg	5750	1	03/26/18 09:03	03/26/18 13:44	109-99-9	
Toluene	208	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	79-00-5	
Trichloroethene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	75-69-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-B4-WM (3-20 WM) Lab ID: 10424609002 Collected: 03/22/18 13:20 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,2,3-Trichloropropane	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	76-13-1	
1,2,4-Trimethylbenzene	6930	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	95-63-6	
1,3,5-Trimethylbenzene	2230	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	108-67-8	
Vinyl chloride	ND	ug/kg	57.5	1	03/26/18 09:03	03/26/18 13:44	75-01-4	
Xylene (Total)	5100	ug/kg	431	1	03/26/18 09:03	03/26/18 13:44	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%.	75-125	1	03/26/18 09:03	03/26/18 13:44	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1	03/26/18 09:03	03/26/18 13:44	2037-26-5	
4-Bromofluorobenzene (S)	115	%.	75-125	1	03/26/18 09:03	03/26/18 13:44	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	30.3	10	03/30/18 14:00	04/03/18 11:34	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	35.9	mg/kg	1.0	1		04/05/18 08:57	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.47	mg/kg	0.37	1	03/29/18 10:55	03/29/18 13:09	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	03/29/18 15:45	03/30/18 22:32	16984-48-8	

Sample: FD-SB-C4-WM (5-20 WM) Lab ID: 10424609003 Collected: 03/22/18 15:00 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury		Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)						
Methyl Mercury	ND	ng/g	11.1	1	03/30/18 11:35	04/02/18 15:32	7439-97-6	N3
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA 3550						
Aldrin	ND	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	309-00-2	
alpha-BHC	ND	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	319-84-6	
beta-BHC	159	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	319-85-7	
delta-BHC	146	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	58-89-9	
Chlordane (Technical)	ND	ug/kg	1040	50	03/26/18 07:27	04/04/18 01:40	57-74-9	
alpha-Chlordane	ND	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	5103-71-9	
gamma-Chlordane	161	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	5103-74-2	
4,4'-DDD	ND	ug/kg	207	50	03/26/18 07:27	04/04/18 01:40	72-54-8	
4,4'-DDE	277	ug/kg	207	50	03/26/18 07:27	04/04/18 01:40	72-55-9	
4,4'-DDT	767	ug/kg	207	50	03/26/18 07:27	04/04/18 01:40	50-29-3	
Dieldrin	ND	ug/kg	207	50	03/26/18 07:27	04/04/18 01:40	60-57-1	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Project No.: 10424609

Sample: **FD-SB-C4-WM (5-20 WM)** Lab ID: **10424609003** Collected: 03/22/18 15:00 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Endosulfan I	ND	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	959-98-8	
Endosulfan II	ND	ug/kg	207	50	03/26/18 07:27	04/04/18 01:40	33213-65-9	
Endosulfan sulfate	ND	ug/kg	207	50	03/26/18 07:27	04/04/18 01:40	1031-07-8	
Endrin	ND	ug/kg	207	50	03/26/18 07:27	04/04/18 01:40	72-20-8	
Endrin aldehyde	ND	ug/kg	207	50	03/26/18 07:27	04/04/18 01:40	7421-93-4	
Endrin ketone	ND	ug/kg	207	50	03/26/18 07:27	04/04/18 01:40	53494-70-5	
Heptachlor	ND	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	76-44-8	
Heptachlor epoxide	ND	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	1024-57-3	
Methoxychlor	ND	ug/kg	1040	50	03/26/18 07:27	04/04/18 01:40	72-43-5	
Toxaphene	ND	ug/kg	3120	50	03/26/18 07:27	04/04/18 01:40	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	50	03/26/18 07:27	04/04/18 01:40	877-09-8	4M, D4, S4
Decachlorobiphenyl (S)	0	%	30-150	50	03/26/18 07:27	04/04/18 01:40	2051-24-3	S4
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	41.2	1	03/23/18 16:00	03/26/18 19:16	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	41.2	1	03/23/18 16:00	03/26/18 19:16	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	41.2	1	03/23/18 16:00	03/26/18 19:16	11141-16-5	
PCB-1242 (Aroclor 1242)	39900	ug/kg	2060	50	03/23/18 16:00	03/27/18 08:20	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	41.2	1	03/23/18 16:00	03/26/18 19:16	12672-29-6	
PCB-1254 (Aroclor 1254)	5350	ug/kg	2060	50	03/23/18 16:00	03/27/18 08:20	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	41.2	1	03/23/18 16:00	03/26/18 19:16	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	41.2	1	03/23/18 16:00	03/26/18 19:16	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	41.2	1	03/23/18 16:00	03/26/18 19:16	11100-14-4	
PCB, Total	45200	ug/kg	2060	50	03/23/18 16:00	03/27/18 08:20	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	205	%	48-125	1	03/23/18 16:00	03/26/18 19:16	877-09-8	S0
Decachlorobiphenyl (S)	65	%	30-134	1	03/23/18 16:00	03/26/18 19:16	2051-24-3	
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	1160	mg/kg	124	10	03/28/18 12:37	03/29/18 10:49		T6
Surrogates								
n-Triacontane (S)	0	%	50-150	10	03/28/18 12:37	03/29/18 10:49	638-68-6	7M, S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	104	mg/kg	13.3	1	03/30/18 14:11	03/30/18 18:05		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	03/30/18 14:11	03/30/18 18:05	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	3810	mg/kg	11.9	1	03/26/18 05:53	03/29/18 18:06	7429-90-5	
Barium	227	mg/kg	0.59	1	03/26/18 05:53	03/29/18 18:06	7440-39-3	
Boron	87.4	mg/kg	8.9	1	03/26/18 05:53	03/29/18 18:06	7440-42-8	
Copper	51.6	mg/kg	0.59	1	03/26/18 05:53	03/29/18 18:06	7440-50-8	
Iron	42300	mg/kg	29.7	10	03/26/18 05:53	03/30/18 10:36	7439-89-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-C4-WM (5-20 WM) **Lab ID: 10424609003** Collected: 03/22/18 15:00 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
2-Chloronaphthalene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	91-58-7	
2-Chlorophenol	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	7005-72-3	
Chrysene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	53-70-3	
Dibenzofuran	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	120-83-2	
Diethylphthalate	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	105-67-9	
Dimethylphthalate	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	131-11-3	
Di-n-butylphthalate	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2120	1	03/27/18 12:47	03/31/18 18:35	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	606-20-2	
Di-n-octylphthalate	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	122-66-7	
bis(2-Ethylhexyl)phthalate	1220	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	117-81-7	
Fluoranthene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	206-44-0	
Fluorene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	87-68-3	
Hexachlorobenzene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	118-74-1	
Hexachloroethane	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	193-39-5	
Isophorone	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	78-59-1	
1-Methylnaphthalene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	90-12-0	
2-Methylnaphthalene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	823	1	03/27/18 12:47	03/31/18 18:35		
Naphthalene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	91-20-3	
2-Nitroaniline	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	88-74-4	
3-Nitroaniline	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	99-09-2	
4-Nitroaniline	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	100-01-6	
Nitrobenzene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	98-95-3	
2-Nitrophenol	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	88-75-5	
4-Nitrophenol	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	86-30-6	
Pentachlorophenol	ND	ug/kg	836	1	03/27/18 12:47	03/31/18 18:35	87-86-5	
Phenanthrene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	85-01-8	
Phenol	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	108-95-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: **FD-SB-C4-WM (5-20 WM)** Lab ID: **10424609003** Collected: 03/22/18 15:00 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

Pyrene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	58	%	43-125	1	03/27/18 12:47	03/31/18 18:35	4165-60-0	
2-Fluorobiphenyl (S)	76	%	30-132	1	03/27/18 12:47	03/31/18 18:35	321-60-8	
p-Terphenyl-d14 (S)	83	%	62-125	1	03/27/18 12:47	03/31/18 18:35	1718-51-0	
Phenol-d6 (S)	71	%	48-125	1	03/27/18 12:47	03/31/18 18:35	13127-88-3	
2-Fluorophenol (S)	55	%	40-125	1	03/27/18 12:47	03/31/18 18:35	367-12-4	
2,4,6-Tribromophenol (S)	79	%	60-125	1	03/27/18 12:47	03/31/18 18:35	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	191	ug/kg	124	10	03/26/18 11:34	03/27/18 20:52	83-32-9	
Acenaphthylene	ND	ug/kg	124	10	03/26/18 11:34	03/27/18 20:52	208-96-8	
Anthracene	284	ug/kg	124	10	03/26/18 11:34	03/27/18 20:52	120-12-7	
Benzo(a)anthracene	461	ug/kg	124	10	03/26/18 11:34	03/27/18 20:52	56-55-3	
Benzo(a)pyrene	411	ug/kg	124	10	03/26/18 11:34	03/27/18 20:52	50-32-8	
Benzo(b)fluoranthene	618	ug/kg	124	10	03/26/18 11:34	03/27/18 20:52	205-99-2	
Benzo(g,h,i)perylene	294	ug/kg	124	10	03/26/18 11:34	03/27/18 20:52	191-24-2	
Benzo(k)fluoranthene	205	ug/kg	124	10	03/26/18 11:34	03/27/18 20:52	207-08-9	
Chrysene	562	ug/kg	124	10	03/26/18 11:34	03/27/18 20:52	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	124	10	03/26/18 11:34	03/27/18 20:52	53-70-3	
Fluoranthene	1450	ug/kg	124	10	03/26/18 11:34	03/27/18 20:52	206-44-0	
Fluorene	435	ug/kg	124	10	03/26/18 11:34	03/27/18 20:52	86-73-7	
Indeno(1,2,3-cd)pyrene	230	ug/kg	124	10	03/26/18 11:34	03/27/18 20:52	193-39-5	
Naphthalene	429	ug/kg	124	10	03/26/18 11:34	03/27/18 20:52	91-20-3	
Phenanthrene	1860	ug/kg	124	10	03/26/18 11:34	03/27/18 20:52	85-01-8	
Pyrene	1110	ug/kg	124	10	03/26/18 11:34	03/27/18 20:52	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%	42-125	10	03/26/18 11:34	03/27/18 20:52	321-60-8	D3,S4
p-Terphenyl-d14 (S)	0	%	57-125	10	03/26/18 11:34	03/27/18 20:52	1718-51-0	S4

8270D MSSV MDA LIST 2

Analytical Method: EPA 8270D Preparation Method: EPA 3546

Bentazon	ND	mg/kg	0.082	1	03/29/18 07:30	04/04/18 15:33	25057-89-0	
2,4-D	0.16	mg/kg	0.082	1	03/29/18 07:30	04/04/18 15:33	94-75-7	
2,4-DB	ND	mg/kg	0.082	1	03/29/18 07:30	04/04/18 15:33	94-82-6	
Dicamba	ND	mg/kg	0.082	1	03/29/18 07:30	04/04/18 15:33	1918-00-9	
Dinoseb	ND	mg/kg	0.082	1	03/29/18 07:30	04/04/18 15:33	88-85-7	
MCPA	ND	mg/kg	0.082	1	03/29/18 07:30	04/04/18 15:33	94-74-6	
Pentachlorophenol	0.085	mg/kg	0.082	1	03/29/18 07:30	04/04/18 15:33	87-86-5	
Picloram	ND	mg/kg	0.082	1	03/29/18 07:30	04/04/18 15:33	1918-02-1	
2,4,5-T	ND	mg/kg	0.082	1	03/29/18 07:30	04/04/18 15:33	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.082	1	03/29/18 07:30	04/04/18 15:33	93-72-1	
Triclopyr	ND	mg/kg	0.082	1	03/29/18 07:30	04/04/18 15:33	55335-06-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-C4-WM (5-20 WM) **Lab ID: 10424609003** Collected: 03/22/18 15:00 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Surrogates								
2,4-DCAA (S)	71	%	46-125	1	03/29/18 07:30	04/04/18 15:33	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1380	1	03/26/18 09:03	03/26/18 14:01	67-64-1	
Allyl chloride	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	107-05-1	
Benzene	70.9	ug/kg	27.5	1	03/26/18 09:03	03/26/18 14:01	71-43-2	
Bromobenzene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	108-86-1	
Bromochloromethane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	74-97-5	
Bromodichloromethane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	75-27-4	
Bromoform	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	75-25-2	
Bromomethane	ND	ug/kg	688	1	03/26/18 09:03	03/26/18 14:01	74-83-9	
2-Butanone (MEK)	ND	ug/kg	344	1	03/26/18 09:03	03/26/18 14:01	78-93-3	
n-Butylbenzene	1120	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	104-51-8	
sec-Butylbenzene	520	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	135-98-8	
tert-Butylbenzene	79.8	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	98-06-6	
Carbon tetrachloride	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	56-23-5	
Chlorobenzene	122	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	108-90-7	
Chloroethane	ND	ug/kg	688	1	03/26/18 09:03	03/26/18 14:01	75-00-3	
Chloroform	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	67-66-3	
Chloromethane	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	74-87-3	
2-Chlorotoluene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	95-49-8	
4-Chlorotoluene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	688	1	03/26/18 09:03	03/26/18 14:01	96-12-8	
Dibromochloromethane	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	106-93-4	
Dibromomethane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	74-95-3	
1,2-Dichlorobenzene	506	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	541-73-1	
1,4-Dichlorobenzene	590	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	75-71-8	
1,1-Dichloroethane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	75-34-3	
1,2-Dichloroethane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	107-06-2	
1,1-Dichloroethene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	156-60-5	
Dichlorofluoromethane	ND	ug/kg	688	1	03/26/18 09:03	03/26/18 14:01	75-43-4	
1,2-Dichloropropane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	78-87-5	
1,3-Dichloropropane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	142-28-9	
2,2-Dichloropropane	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	594-20-7	
1,1-Dichloropropene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	60-29-7	
Ethylbenzene	3310	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	344	1	03/26/18 09:03	03/26/18 14:01	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-C4-WM (5-20 WM) Lab ID: 10424609003 Collected: 03/22/18 15:00 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	1030	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	98-82-8	
p-Isopropyltoluene	1760	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	99-87-6	
Methylene Chloride	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	344	1	03/26/18 09:03	03/26/18 14:01	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	1634-04-4	
Naphthalene	5570	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	91-20-3	
n-Propylbenzene	1130	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	103-65-1	
Styrene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	79-34-5	N2
Tetrachloroethene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	127-18-4	
Tetrahydrofuran	ND	ug/kg	2750	1	03/26/18 09:03	03/26/18 14:01	109-99-9	
Toluene	288	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	79-00-5	
Trichloroethene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	76-13-1	
1,2,4-Trimethylbenzene	5820	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	95-63-6	
1,3,5-Trimethylbenzene	1920	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	108-67-8	
Vinyl chloride	ND	ug/kg	27.5	1	03/26/18 09:03	03/26/18 14:01	75-01-4	
Xylene (Total)	6550	ug/kg	206	1	03/26/18 09:03	03/26/18 14:01	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	92	%	75-125	1	03/26/18 09:03	03/26/18 14:01	17060-07-0	
Toluene-d8 (S)	99	%	75-125	1	03/26/18 09:03	03/26/18 14:01	2037-26-5	
4-Bromofluorobenzene (S)	109	%	75-125	1	03/26/18 09:03	03/26/18 14:01	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	25.1	10	03/30/18 14:00	04/03/18 11:34	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	31.2	mg/kg	1.0	1		04/05/18 08:57	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.53	1	03/29/18 10:55	03/29/18 13:09	57-12-5	M0
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	03/29/18 15:45	03/30/18 23:12	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-D4-WM (5-20) **Lab ID: 10424609004** Collected: 03/22/18 15:50 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	9.68	1	03/30/18 11:35	04/02/18 15:39	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	309-00-2	M6
alpha-BHC	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	319-84-6	M6
beta-BHC	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	319-85-7	M6
delta-BHC	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	58-89-9	M6
Chlordane (Technical)	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	57-74-9	
alpha-Chlordane	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	5103-71-9	
gamma-Chlordane	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	5103-74-2	M6
4,4'-DDD	ND	ug/kg	88.0	20	03/26/18 07:27	04/03/18 21:06	72-54-8	M6
4,4'-DDE	ND	ug/kg	88.0	20	03/26/18 07:27	04/03/18 21:06	72-55-9	
4,4'-DDT	ND	ug/kg	88.0	20	03/26/18 07:27	04/03/18 21:06	50-29-3	
Dieldrin	ND	ug/kg	88.0	20	03/26/18 07:27	04/03/18 21:06	60-57-1	M6
Endosulfan I	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	959-98-8	M6
Endosulfan II	ND	ug/kg	88.0	20	03/26/18 07:27	04/03/18 21:06	33213-65-9	
Endosulfan sulfate	ND	ug/kg	88.0	20	03/26/18 07:27	04/03/18 21:06	1031-07-8	
Endrin	ND	ug/kg	88.0	20	03/26/18 07:27	04/03/18 21:06	72-20-8	M6
Endrin aldehyde	ND	ug/kg	88.0	20	03/26/18 07:27	04/03/18 21:06	7421-93-4	M6
Endrin ketone	ND	ug/kg	88.0	20	03/26/18 07:27	04/03/18 21:06	53494-70-5	
Heptachlor	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	76-44-8	M6
Heptachlor epoxide	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	1024-57-3	
Methoxychlor	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	72-43-5	
Toxaphene	ND	ug/kg	1320	20	03/26/18 07:27	04/03/18 21:06	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	03/26/18 07:27	04/03/18 21:06	877-09-8	3M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	20	03/26/18 07:27	04/03/18 21:06	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	11141-16-5	
PCB-1242 (Aroclor 1242)	306	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	12672-29-6	
PCB-1254 (Aroclor 1254)	91.8	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	11100-14-4	
PCB, Total	398	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	40	%	48-125	1	03/23/18 16:00	03/26/18 19:32	877-09-8	S0
Decachlorobiphenyl (S)	42	%	30-134	1	03/23/18 16:00	03/26/18 19:32	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-D4-WM (5-20) **Lab ID: 10424609004** Collected: 03/22/18 15:50 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	383	mg/kg	81.8	5	03/28/18 12:37	03/29/18 16:29		T6
Surrogates								
n-Triacontane (S)	95	%	50-150	5	03/28/18 12:37	03/29/18 16:29	638-68-6	7M
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	257	mg/kg	20.6	1	03/30/18 14:11	03/31/18 00:56		
Surrogates								
a,a,a-Trifluorotoluene (S)	96	%	80-150	1	03/30/18 14:11	03/31/18 00:56	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	5710	mg/kg	12.8	1	03/26/18 05:53	03/29/18 18:10	7429-90-5	
Barium	177	mg/kg	0.64	1	03/26/18 05:53	03/29/18 18:10	7440-39-3	
Boron	62.7	mg/kg	9.6	1	03/26/18 05:53	03/29/18 18:10	7440-42-8	
Copper	64.6	mg/kg	0.64	1	03/26/18 05:53	03/29/18 18:10	7440-50-8	
Iron	65700	mg/kg	32.1	10	03/26/18 05:53	03/30/18 10:42	7439-89-6	
Manganese	532	mg/kg	0.32	1	03/26/18 05:53	03/29/18 18:10	7439-96-5	
Nickel	33.3	mg/kg	1.3	1	03/26/18 05:53	03/29/18 18:10	7440-02-0	
Silver	2.4	mg/kg	0.64	1	03/26/18 05:53	03/29/18 18:10	7440-22-4	
Tin	49.5	mg/kg	4.8	1	03/26/18 05:53	03/29/18 18:10	7440-31-5	
Titanium	244	mg/kg	1.6	1	03/26/18 05:53	03/29/18 18:10	7440-32-6	
Zinc	1360	mg/kg	1.3	1	03/26/18 05:53	03/29/18 18:10	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	36.8	mg/kg	1.2	5	03/30/18 09:43	03/31/18 05:28	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.1	mg/kg	0.62	20	03/26/18 09:32	04/02/18 11:50	7440-36-0	
Arsenic	15.1	mg/kg	0.62	20	03/26/18 09:32	04/02/18 11:50	7440-38-2	
Beryllium	1.3	mg/kg	0.25	20	03/26/18 09:32	04/02/18 11:50	7440-41-7	
Cadmium	1.4	mg/kg	0.099	20	03/26/18 09:32	04/02/18 11:50	7440-43-9	
Cobalt	7.5	mg/kg	0.62	20	03/26/18 09:32	04/02/18 11:50	7440-48-4	
Lead	178	mg/kg	0.12	20	03/26/18 09:32	04/02/18 11:50	7439-92-1	
Lithium	11.8	mg/kg	0.62	20	03/26/18 09:32	04/02/18 11:50	7439-93-2	
Selenium	2.6	mg/kg	0.62	20	03/26/18 09:32	04/02/18 11:50	7782-49-2	
Strontium	70.1	mg/kg	0.62	20	03/26/18 09:32	04/02/18 11:50	7440-24-6	
Vanadium	64.1	mg/kg	1.2	20	03/26/18 09:32	04/02/18 11:50	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.97	mg/kg	0.025	1	03/30/18 08:32	03/30/18 11:42	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	24.4	%	0.10	1		03/26/18 14:27		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-D4-WM (5-20) **Lab ID: 10424609004** Collected: 03/22/18 15:50 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	208-96-8	
Anthracene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	120-12-7	
Benzo(a)anthracene	2230	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	56-55-3	
Benzo(a)pyrene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	50-32-8	
Benzo(b)fluoranthene	2530	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	101-55-3	
Butylbenzylphthalate	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	85-68-7	
Carbazole	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	59-50-7	
4-Chloroaniline	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	108-60-1	
2-Chloronaphthalene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	91-58-7	
2-Chlorophenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	7005-72-3	
Chrysene	2250	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	53-70-3	
Dibenzofuran	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	120-83-2	
Diethylphthalate	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	105-67-9	
Dimethylphthalate	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	131-11-3	
Di-n-butylphthalate	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	11200	5	03/27/18 12:47	03/30/18 22:24	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	606-20-2	
Di-n-octylphthalate	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	117-81-7	
Fluoranthene	5620	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	206-44-0	
Fluorene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	87-68-3	
Hexachlorobenzene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	118-74-1	
Hexachloroethane	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	193-39-5	
Isophorone	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	78-59-1	
1-Methylnaphthalene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	90-12-0	
2-Methylnaphthalene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: **FD-SB-D4-WM (5-20)** Lab ID: **10424609004** Collected: 03/22/18 15:50 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	4360	5	03/27/18 12:47	03/30/18 22:24		
Naphthalene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	91-20-3	
2-Nitroaniline	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	88-74-4	
3-Nitroaniline	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	99-09-2	
4-Nitroaniline	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	100-01-6	
Nitrobenzene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	98-95-3	
2-Nitrophenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	88-75-5	
4-Nitrophenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	86-30-6	
Pentachlorophenol	ND	ug/kg	4420	5	03/27/18 12:47	03/30/18 22:24	87-86-5	
Phenanthrene	5730	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	85-01-8	
Phenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	108-95-2	
Pyrene	4640	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	64	%	43-125	5	03/27/18 12:47	03/30/18 22:24	4165-60-0	D4
2-Fluorobiphenyl (S)	78	%	30-132	5	03/27/18 12:47	03/30/18 22:24	321-60-8	
p-Terphenyl-d14 (S)	78	%	62-125	5	03/27/18 12:47	03/30/18 22:24	1718-51-0	
Phenol-d6 (S)	69	%	48-125	5	03/27/18 12:47	03/30/18 22:24	13127-88-3	
2-Fluorophenol (S)	60	%	40-125	5	03/27/18 12:47	03/30/18 22:24	367-12-4	
2,4,6-Tribromophenol (S)	70	%	60-125	5	03/27/18 12:47	03/30/18 22:24	118-79-6	
8270D MSSV PAH by SIM								
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	3710	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	83-32-9	
Acenaphthylene	ND	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	208-96-8	
Anthracene	5750	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	120-12-7	
Benzo(a)anthracene	5690	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	56-55-3	
Benzo(a)pyrene	4250	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	50-32-8	
Benzo(b)fluoranthene	4130	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	205-99-2	
Benzo(g,h,i)perylene	2030	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	191-24-2	
Benzo(k)fluoranthene	1680	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	207-08-9	
Chrysene	4660	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	53-70-3	
Fluoranthene	13200	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	206-44-0	
Fluorene	4140	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	86-73-7	
Indeno(1,2,3-cd)pyrene	1690	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	193-39-5	
Naphthalene	8120	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	91-20-3	
Phenanthrene	15000	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	85-01-8	
Pyrene	10200	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	129-00-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-D4-WM (5-20) **Lab ID: 10424609004** Collected: 03/22/18 15:50 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Surrogates								
2-Fluorobiphenyl (S)	0	%.	42-125	10	03/26/18 11:34	03/27/18 21:14	321-60-8	D3,P3, S4
p-Terphenyl-d14 (S)	0	%.	57-125	10	03/26/18 11:34	03/27/18 21:14	1718-51-0	S4
8270D MSSV MDA LIST 2 Analytical Method: EPA 8270D Preparation Method: EPA 3546								
Bentazon	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	25057-89-0	
2,4-D	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	94-75-7	
2,4-DB	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	94-82-6	
Dicamba	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	1918-00-9	
Dinoseb	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	88-85-7	
MCPA	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	94-74-6	
Pentachlorophenol	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	87-86-5	
Picloram	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	1918-02-1	
2,4,5-T	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	93-72-1	
Triclopyr	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	55335-06-3	
Surrogates								
2,4-DCAA (S)	64	%.	46-125	1	03/29/18 07:30	04/04/18 15:48	19719-28-9	
8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Acetone	ND	ug/kg	1650	1	03/26/18 09:03	03/26/18 14:17	67-64-1	
Allyl chloride	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	107-05-1	
Benzene	ND	ug/kg	32.9	1	03/26/18 09:03	03/26/18 14:17	71-43-2	
Bromobenzene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	108-86-1	
Bromochloromethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	74-97-5	
Bromodichloromethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	75-27-4	
Bromoform	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	75-25-2	
Bromomethane	ND	ug/kg	824	1	03/26/18 09:03	03/26/18 14:17	74-83-9	
2-Butanone (MEK)	ND	ug/kg	412	1	03/26/18 09:03	03/26/18 14:17	78-93-3	
n-Butylbenzene	1130	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	104-51-8	
sec-Butylbenzene	696	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	135-98-8	
tert-Butylbenzene	84.4	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	98-06-6	
Carbon tetrachloride	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	56-23-5	
Chlorobenzene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	108-90-7	
Chloroethane	ND	ug/kg	824	1	03/26/18 09:03	03/26/18 14:17	75-00-3	
Chloroform	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	67-66-3	
Chloromethane	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	74-87-3	
2-Chlorotoluene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	95-49-8	
4-Chlorotoluene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	824	1	03/26/18 09:03	03/26/18 14:17	96-12-8	
Dibromochloromethane	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	106-93-4	
Dibromomethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	541-73-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: **FD-SB-D4-WM (5-20)** Lab ID: **10424609004** Collected: 03/22/18 15:50 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,4-Dichlorobenzene	262	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	75-71-8	
1,1-Dichloroethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	75-34-3	
1,2-Dichloroethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	107-06-2	
1,1-Dichloroethene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	156-60-5	
Dichlorofluoromethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	75-43-4	
1,2-Dichloropropane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	78-87-5	
1,3-Dichloropropane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	142-28-9	
2,2-Dichloropropane	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	594-20-7	
1,1-Dichloropropene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	60-29-7	
Ethylbenzene	231	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	412	1	03/26/18 09:03	03/26/18 14:17	87-68-3	
Isopropylbenzene (Cumene)	401	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	98-82-8	
p-Isopropyltoluene	998	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	99-87-6	
Methylene Chloride	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	412	1	03/26/18 09:03	03/26/18 14:17	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	1634-04-4	
Naphthalene	4360	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	91-20-3	
n-Propylbenzene	684	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	103-65-1	
Styrene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	79-34-5	N2
Tetrachloroethene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	127-18-4	
Tetrahydrofuran	ND	ug/kg	3290	1	03/26/18 09:03	03/26/18 14:17	109-99-9	
Toluene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	79-00-5	
Trichloroethene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	76-13-1	
1,2,4-Trimethylbenzene	5480	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	95-63-6	
1,3,5-Trimethylbenzene	1590	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	108-67-8	
Vinyl chloride	ND	ug/kg	32.9	1	03/26/18 09:03	03/26/18 14:17	75-01-4	
Xylene (Total)	14900	ug/kg	247	1	03/26/18 09:03	03/26/18 14:17	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%	75-125	1	03/26/18 09:03	03/26/18 14:17	17060-07-0	
Toluene-d8 (S)	99	%	75-125	1	03/26/18 09:03	03/26/18 14:17	2037-26-5	
4-Bromofluorobenzene (S)	105	%	75-125	1	03/26/18 09:03	03/26/18 14:17	460-00-4	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-D4-WM (5-20) Lab ID: 10424609004 Collected: 03/22/18 15:50 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
7196 Chromium, Hexavalent Analytical Method: EPA 7196A Preparation Method: EPA 3060A								
Chromium, Hexavalent	ND	mg/kg	13.2	5	03/30/18 14:00	04/03/18 11:35	18540-29-9	D3
Trivalent Chromium Calculation Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	36.8	mg/kg	1.0	1		04/05/18 08:57	16065-83-1	
9012 Cyanide, Total Analytical Method: EPA 9012 Preparation Method: EPA 9012A								
Cyanide	0.47	mg/kg	0.34	1	03/29/18 10:55	03/29/18 13:13	57-12-5	
9056 IC Anions Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Fluoride	1.1	mg/kg	0.99	1	03/29/18 15:45	03/30/18 22:52	16984-48-8	

Sample: FD-SB-E4-WM (3-21) Lab ID: 10424609005 Collected: 03/22/18 16:30 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	15.7	1	03/30/18 11:35	04/02/18 15:59	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	309-00-2	
alpha-BHC	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	319-84-6	
beta-BHC	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	319-85-7	
delta-BHC	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	58-89-9	
Chlordane (Technical)	ND	ug/kg	433	20	03/26/18 07:27	04/04/18 01:22	57-74-9	
alpha-Chlordane	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	5103-71-9	
gamma-Chlordane	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	5103-74-2	
4,4'-DDD	ND	ug/kg	86.4	20	03/26/18 07:27	04/04/18 01:22	72-54-8	
4,4'-DDE	ND	ug/kg	86.4	20	03/26/18 07:27	04/04/18 01:22	72-55-9	
4,4'-DDT	ND	ug/kg	86.4	20	03/26/18 07:27	04/04/18 01:22	50-29-3	
Dieldrin	ND	ug/kg	86.4	20	03/26/18 07:27	04/04/18 01:22	60-57-1	
Endosulfan I	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	959-98-8	
Endosulfan II	ND	ug/kg	86.4	20	03/26/18 07:27	04/04/18 01:22	33213-65-9	
Endosulfan sulfate	ND	ug/kg	86.4	20	03/26/18 07:27	04/04/18 01:22	1031-07-8	
Endrin	ND	ug/kg	86.4	20	03/26/18 07:27	04/04/18 01:22	72-20-8	
Endrin aldehyde	ND	ug/kg	86.4	20	03/26/18 07:27	04/04/18 01:22	7421-93-4	
Endrin ketone	ND	ug/kg	86.4	20	03/26/18 07:27	04/04/18 01:22	53494-70-5	
Heptachlor	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	76-44-8	
Heptachlor epoxide	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	1024-57-3	
Methoxychlor	ND	ug/kg	433	20	03/26/18 07:27	04/04/18 01:22	72-43-5	
Toxaphene	ND	ug/kg	1300	20	03/26/18 07:27	04/04/18 01:22	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	03/26/18 07:27	04/04/18 01:22	877-09-8	3M, D3, S4

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-E4-WM (3-21) **Lab ID:** 10424609005 Collected: 03/22/18 16:30 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Surrogates								
Decachlorobiphenyl (S)	0	%.	30-150	20	03/26/18 07:27	04/04/18 01:22	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	11141-16-5	
PCB-1242 (Aroclor 1242)	247	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	12672-29-6	
PCB-1254 (Aroclor 1254)	174	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	11100-14-4	
PCB, Total	421	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	86	%.	48-125	1	03/23/18 16:00	03/26/18 19:47	877-09-8	
Decachlorobiphenyl (S)	75	%.	30-134	1	03/23/18 16:00	03/26/18 19:47	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	745	mg/kg	232	20	03/26/18 14:27	03/27/18 20:54		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	20	03/26/18 14:27	03/27/18 20:54	638-68-6	S4
WIGRO GCV								
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	90.2	mg/kg	17.1	1	03/30/18 14:11	03/31/18 01:20		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	03/30/18 14:11	03/31/18 01:20	98-08-8	
6010C MET ICP								
Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	7660	mg/kg	12.6	1	03/26/18 05:53	03/29/18 18:14	7429-90-5	
Barium	1510	mg/kg	0.63	1	03/26/18 05:53	03/29/18 18:14	7440-39-3	
Boron	99.3	mg/kg	9.5	1	03/26/18 05:53	03/29/18 18:14	7440-42-8	
Copper	207	mg/kg	0.63	1	03/26/18 05:53	03/29/18 18:14	7440-50-8	
Iron	28800	mg/kg	15.8	5	03/26/18 05:53	03/30/18 10:46	7439-89-6	
Manganese	1640	mg/kg	0.32	1	03/26/18 05:53	03/29/18 18:14	7439-96-5	
Nickel	65.8	mg/kg	1.3	1	03/26/18 05:53	03/29/18 18:14	7440-02-0	
Silver	ND	mg/kg	0.63	1	03/26/18 05:53	03/29/18 18:14	7440-22-4	
Tin	16.6	mg/kg	4.7	1	03/26/18 05:53	03/29/18 18:14	7440-31-5	
Titanium	410	mg/kg	1.6	1	03/26/18 05:53	03/29/18 18:14	7440-32-6	
Zinc	565	mg/kg	1.3	1	03/26/18 05:53	03/29/18 18:14	7440-66-6	
6020 MET ICPMS								
Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	32.5	mg/kg	1.2	5	03/30/18 09:43	03/31/18 05:33	7440-47-3	N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-E4-WM (3-21) **Lab ID: 10424609005** Collected: 03/22/18 16:30 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	2.1	mg/kg	0.63	20	03/26/18 09:32	04/02/18 12:30	7440-36-0	
Arsenic	9.7	mg/kg	0.63	20	03/26/18 09:32	04/02/18 12:30	7440-38-2	
Beryllium	0.96	mg/kg	0.25	20	03/26/18 09:32	04/02/18 12:30	7440-41-7	
Cadmium	1.3	mg/kg	0.10	20	03/26/18 09:32	04/02/18 12:30	7440-43-9	
Cobalt	7.3	mg/kg	0.63	20	03/26/18 09:32	04/02/18 12:30	7440-48-4	
Lead	141	mg/kg	0.13	20	03/26/18 09:32	04/02/18 12:30	7439-92-1	
Lithium	8.4	mg/kg	0.63	20	03/26/18 09:32	04/02/18 12:30	7439-93-2	
Selenium	2.2	mg/kg	0.63	20	03/26/18 09:32	04/02/18 12:30	7782-49-2	
Strontium	50.7	mg/kg	0.63	20	03/26/18 09:32	04/02/18 12:30	7440-24-6	
Vanadium	50.3	mg/kg	1.3	20	03/26/18 09:32	04/02/18 12:30	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.21	mg/kg	0.022	1	03/30/18 08:32	03/30/18 11:44	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	23.0	%	0.10	1		03/26/18 14:27		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	83-32-9	
Acenaphthylene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	208-96-8	
Anthracene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	120-12-7	
Benzo(a)anthracene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	56-55-3	
Benzo(a)pyrene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	101-55-3	
Butylbenzylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	85-68-7	
Carbazole	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	59-50-7	
4-Chloroaniline	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	108-60-1	
2-Chloronaphthalene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	91-58-7	
2-Chlorophenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	7005-72-3	
Chrysene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	53-70-3	
Dibenzofuran	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	120-83-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: **FD-SB-E4-WM (3-21)** Lab ID: **10424609005** Collected: 03/22/18 16:30 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Diethylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	105-67-9	
Dimethylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	131-11-3	
Di-n-butylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2210	1	03/27/18 12:47	03/31/18 19:05	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	606-20-2	
Di-n-octylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	117-81-7	
Fluoranthene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	206-44-0	
Fluorene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	87-68-3	
Hexachlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	118-74-1	
Hexachloroethane	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	193-39-5	
Isophorone	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	78-59-1	
1-Methylnaphthalene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	90-12-0	
2-Methylnaphthalene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	856	1	03/27/18 12:47	03/31/18 19:05		
Naphthalene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	91-20-3	
2-Nitroaniline	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	88-74-4	
3-Nitroaniline	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	99-09-2	
4-Nitroaniline	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	100-01-6	
Nitrobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	98-95-3	
2-Nitrophenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	88-75-5	
4-Nitrophenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	86-30-6	
Pentachlorophenol	ND	ug/kg	869	1	03/27/18 12:47	03/31/18 19:05	87-86-5	
Phenanthrene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	85-01-8	
Phenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	108-95-2	
Pyrene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	58	%	43-125	1	03/27/18 12:47	03/31/18 19:05	4165-60-0	
2-Fluorobiphenyl (S)	65	%	30-132	1	03/27/18 12:47	03/31/18 19:05	321-60-8	
p-Terphenyl-d14 (S)	62	%	62-125	1	03/27/18 12:47	03/31/18 19:05	1718-51-0	
Phenol-d6 (S)	63	%	48-125	1	03/27/18 12:47	03/31/18 19:05	13127-88-3	
2-Fluorophenol (S)	51	%	40-125	1	03/27/18 12:47	03/31/18 19:05	367-12-4	
2,4,6-Tribromophenol (S)	38	%	60-125	1	03/27/18 12:47	03/31/18 19:05	118-79-6	S5

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: **FD-SB-E4-WM (3-21)** Lab ID: **10424609005** Collected: 03/22/18 16:30 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Acenaphthene	267	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	83-32-9	
Acenaphthylene	134	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	208-96-8	
Anthracene	373	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	120-12-7	
Benzo(a)anthracene	701	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	56-55-3	
Benzo(a)pyrene	585	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	50-32-8	
Benzo(b)fluoranthene	584	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	205-99-2	
Benzo(g,h,i)perylene	413	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	191-24-2	
Benzo(k)fluoranthene	303	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	207-08-9	
Chrysene	660	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	53-70-3	
Fluoranthene	1410	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	206-44-0	
Fluorene	229	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	86-73-7	
Indeno(1,2,3-cd)pyrene	301	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	193-39-5	
Naphthalene	239	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	91-20-3	
Phenanthrene	996	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	85-01-8	
Pyrene	1410	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%.	42-125	10	03/26/18 11:34	03/27/18 21:36	321-60-8	D3,S4
p-Terphenyl-d14 (S)	0	%.	57-125	10	03/26/18 11:34	03/27/18 21:36	1718-51-0	S4
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	25057-89-0	
2,4-D	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	94-75-7	
2,4-DB	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	94-82-6	
Dicamba	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	1918-00-9	
Dinoseb	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	88-85-7	
MCPA	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	94-74-6	
Pentachlorophenol	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	87-86-5	
Picloram	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	1918-02-1	
2,4,5-T	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	93-72-1	
Triclopyr	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	55335-06-3	
Surrogates								
2,4-DCAA (S)	64	%.	46-125	1	03/29/18 07:30	04/04/18 16:02	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1500	1	03/26/18 09:03	03/26/18 14:34	67-64-1	
Allyl chloride	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	107-05-1	
Benzene	211	ug/kg	30.0	1	03/26/18 09:03	03/26/18 14:34	71-43-2	
Bromobenzene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	108-86-1	
Bromochloromethane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	74-97-5	
Bromodichloromethane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	75-27-4	
Bromoform	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	75-25-2	
Bromomethane	ND	ug/kg	750	1	03/26/18 09:03	03/26/18 14:34	74-83-9	
2-Butanone (MEK)	ND	ug/kg	375	1	03/26/18 09:03	03/26/18 14:34	78-93-3	
n-Butylbenzene	307	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	104-51-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-E4-WM (3-21) **Lab ID: 10424609005** Collected: 03/22/18 16:30 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
sec-Butylbenzene	214	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	135-98-8	
tert-Butylbenzene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	98-06-6	
Carbon tetrachloride	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	56-23-5	
Chlorobenzene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	108-90-7	
Chloroethane	ND	ug/kg	750	1	03/26/18 09:03	03/26/18 14:34	75-00-3	
Chloroform	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	67-66-3	
Chloromethane	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	74-87-3	
2-Chlorotoluene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	95-49-8	
4-Chlorotoluene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	750	1	03/26/18 09:03	03/26/18 14:34	96-12-8	
Dibromochloromethane	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	106-93-4	
Dibromomethane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	74-95-3	
1,2-Dichlorobenzene	585	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	541-73-1	
1,4-Dichlorobenzene	192	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	75-71-8	
1,1-Dichloroethane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	75-34-3	
1,2-Dichloroethane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	107-06-2	
1,1-Dichloroethene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	156-60-5	
Dichlorofluoromethane	ND	ug/kg	750	1	03/26/18 09:03	03/26/18 14:34	75-43-4	
1,2-Dichloropropane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	78-87-5	
1,3-Dichloropropane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	142-28-9	
2,2-Dichloropropane	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	594-20-7	
1,1-Dichloropropene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	60-29-7	
Ethylbenzene	639	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	375	1	03/26/18 09:03	03/26/18 14:34	87-68-3	
Isopropylbenzene (Cumene)	182	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	98-82-8	
p-Isopropyltoluene	140	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	99-87-6	
Methylene Chloride	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	375	1	03/26/18 09:03	03/26/18 14:34	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	1634-04-4	
Naphthalene	2500	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	91-20-3	
n-Propylbenzene	249	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	103-65-1	
Styrene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	630-20-6	
1,1,1,2,2-Tetrachloroethane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	79-34-5	N2
Tetrachloroethene	125	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	127-18-4	
Tetrahydrofuran	ND	ug/kg	3000	1	03/26/18 09:03	03/26/18 14:34	109-99-9	
Toluene	302	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	87-61-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-E4-WM (3-21) **Lab ID: 10424609005** Collected: 03/22/18 16:30 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,2,4-Trichlorobenzene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	79-00-5	
Trichloroethene	82.5	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	76-13-1	
1,2,4-Trimethylbenzene	1060	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	95-63-6	
1,3,5-Trimethylbenzene	116	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	108-67-8	
Vinyl chloride	ND	ug/kg	30.0	1	03/26/18 09:03	03/26/18 14:34	75-01-4	
Xylene (Total)	545	ug/kg	225	1	03/26/18 09:03	03/26/18 14:34	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	95	%.	75-125	1	03/26/18 09:03	03/26/18 14:34	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1	03/26/18 09:03	03/26/18 14:34	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	75-125	1	03/26/18 09:03	03/26/18 14:34	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	26.1	10	03/30/18 14:00	04/03/18 11:35	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	32.5	mg/kg	1.0	1		04/05/18 08:57	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.18	1	03/29/18 10:55	03/29/18 13:13	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	2.9	mg/kg	0.99	1	03/29/18 15:45	03/30/18 23:31	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report
Pace Project No.: 10424609

QC Batch: 139779 Analysis Method: EPA 1630 (1998)
QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 553598 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.16	04/02/18 14:39	N3

METHOD BLANK: 553599 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.14	04/02/18 14:46	N3

METHOD BLANK: 553600 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.19	04/02/18 14:52	N3

LABORATORY CONTROL SAMPLE: 553601

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	104	109	105	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553602 553603

Parameter	Units	10424249001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	22.5	480	482	389	390	76	76	65-135	0	35	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553604 553605

Parameter	Units	10424609001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	1000	932	788	743	79	80	65-135	6	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 529815 Analysis Method: WI MOD GRO
QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2875655 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	03/30/18 17:39	
a,a,a-Trifluorotoluene (S)	%	100	80-150	03/30/18 17:39	

LABORATORY CONTROL SAMPLE & LCSD: 2875656

Parameter	Units	2875657								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	46.3	44.7	93	89	80-120	4	20	
a,a,a-Trifluorotoluene (S)	%				99	99	80-150			

MATRIX SPIKE SAMPLE: 2876408

Parameter	Units	10424443005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers	
Gasoline Range Organics	mg/kg		ND	60.8	115	187	80-120	C0,M1
a,a,a-Trifluorotoluene (S)	%				98	80-150		

SAMPLE DUPLICATE: 2876409

Parameter	Units	10424609003 Result	Dup Result	RPD	Max RPD	Qualifiers	
Gasoline Range Organics	mg/kg	104	107	3	20		
a,a,a-Trifluorotoluene (S)	%	99	99	0			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 529743 Analysis Method: EPA 7471
 QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2875322 Matrix: Solid
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.018	03/30/18 10:50	

LABORATORY CONTROL SAMPLE: 2875323

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.44	0.51	115	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875635 2875636

Parameter	Units	10424609001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	ND	1.5	1.5	1.7	1.6	110	109	80-120	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 528915 Analysis Method: EPA 6010C
 QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2870798 Matrix: Solid
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.8	03/29/18 17:03	
Barium	mg/kg	ND	0.49	03/29/18 17:03	
Boron	mg/kg	ND	7.4	03/29/18 17:03	
Copper	mg/kg	ND	0.49	03/29/18 17:03	
Iron	mg/kg	ND	2.5	03/29/18 17:03	
Manganese	mg/kg	ND	0.25	03/29/18 17:03	
Nickel	mg/kg	ND	0.98	03/29/18 17:03	
Silver	mg/kg	ND	0.49	03/29/18 17:03	
Tin	mg/kg	ND	3.7	03/29/18 17:03	
Titanium	mg/kg	ND	1.2	03/29/18 17:03	
Zinc	mg/kg	ND	0.98	03/29/18 17:03	

LABORATORY CONTROL SAMPLE: 2870799

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	980	929	95	80-120	
Barium	mg/kg	49	49.2	100	80-120	
Boron	mg/kg	49	46.3	94	80-120	
Copper	mg/kg	49	47.6	97	80-120	
Iron	mg/kg	980	964	98	80-120	
Manganese	mg/kg	49	49.0	100	80-120	
Nickel	mg/kg	49	48.2	98	80-120	
Silver	mg/kg	24.5	23.0	94	80-120	
Tin	mg/kg	49	49.7	101	80-120	
Titanium	mg/kg	49	48.8	100	80-120	
Zinc	mg/kg	49	48.1	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2870800 2870801

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424443001 Result	Spike Conc.	Spike Conc.	Result							
Aluminum	mg/kg	11900	1370	1380	26800	10300	1090	-120	75-125	89	20	P6,R1
Barium	mg/kg	292	68.3	69	388	431	140	202	75-125	11	20	P6
Boron	mg/kg	26.6	68.3	69	122	132	140	152	75-125	7	20	M1
Copper	mg/kg	228	68.3	69	6980	1110	9880	1280	75-125	145	20	M6,R1
Iron	mg/kg	15900	1370	1380	60900	98200	3290	5960	75-125	47	20	M6,R1
Manganese	mg/kg	249	68.3	69	729	664	703	601	75-125	9	20	P6
Nickel	mg/kg	112	68.3	69	2360	141	3290	41	75-125	177	20	M6,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Parameter	Units	2870800		2870801		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10424443001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Silver	mg/kg	1.8	34.2	34.5	34.1	34.9	94	96	75-125	2	20		
Tin	mg/kg	186	68.3	69	237	238	74	76	75-125	1	20	M1	
Titanium	mg/kg	275	68.3	69	265	560	-14	413	75-125	71	20	M1, R1	
Zinc	mg/kg	86700	68.3	69	3680	9550	-121000	-112000	75-125	89	20	M6, R1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 434613 Analysis Method: EPA 6020

QC Batch Method: EPA 3050B Analysis Description: 6020 MET

Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2007430 Matrix: Solid

Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.18	03/31/18 04:29	N2

LABORATORY CONTROL SAMPLE: 2007431

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.7	3.6	97	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2007432 2007433

Parameter	Units	2007432		2007433		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10424609003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chromium	mg/kg	31.2	4.74	4.74	36.1	22.7	103	-179	75-125	46	20 1M, M0, N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 528917 Analysis Method: EPA 6020A
QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2870806 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.50	04/02/18 10:52	
Arsenic	mg/kg	ND	0.50	04/02/18 10:52	
Beryllium	mg/kg	ND	0.20	04/02/18 10:52	
Cadmium	mg/kg	ND	0.079	04/02/18 10:52	
Cobalt	mg/kg	ND	0.50	04/02/18 10:52	
Lead	mg/kg	ND	0.099	04/02/18 10:52	
Lithium	mg/kg	ND	0.50	04/02/18 10:52	
Selenium	mg/kg	ND	0.50	04/02/18 10:52	
Strontium	mg/kg	ND	0.50	04/02/18 10:52	
Vanadium	mg/kg	ND	0.99	04/02/18 10:52	

LABORATORY CONTROL SAMPLE: 2870807

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	49.5	51.0	103	80-120	
Arsenic	mg/kg	49.5	50.2	101	80-120	
Beryllium	mg/kg	49.5	50.1	101	80-120	
Cadmium	mg/kg	49.5	51.4	104	80-120	
Cobalt	mg/kg	49.5	52.1	105	80-120	
Lead	mg/kg	49.5	51.3	104	80-120	
Lithium	mg/kg	49.5	50.5	102	80-120	
Selenium	mg/kg	49.5	49.8	101	80-120	
Strontium	mg/kg	49.5	51.6	104	80-120	
Vanadium	mg/kg	49.5	52.6	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2870808 2870809

Parameter	Units	10424443001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Antimony	mg/kg	3.0	67	67.7	45.3	52.2	63	73	75-125	14	20	M6	
Arsenic	mg/kg	14.3	67	67.7	84.2	84.6	104	104	75-125	1	20		
Beryllium	mg/kg	0.36	67	67.7	67.8	70.7	101	104	75-125	4	20		
Cadmium	mg/kg	4.6	67	67.7	78.7	77.4	110	107	75-125	2	20		
Cobalt	mg/kg	37.4	67	67.7	80.0	109	63	106	75-125	31	20	M6,R1	
Lead	mg/kg	724	67	67.7	971	483	368	-356	75-125	67	20	M6,R1	
Lithium	mg/kg	6.7	67	67.7	74.4	78.1	101	105	75-125	5	20		
Selenium	mg/kg	0.82	67	67.7	64.9	71.0	96	104	75-125	9	20		
Strontium	mg/kg	106	67	67.7	182	192	114	127	75-125	5	20	M6	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

		2870808			2870809							
Parameter	Units	10424443001	MS Spike	MSD Spike	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Conc.	Result	Result	% Rec	% Rec				
Vanadium	mg/kg	27.4	67	67.7	104	101	114	108	75-125	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch:	528989	Analysis Method:	ASTM D2974
QC Batch Method:	ASTM D2974	Analysis Description:	Dry Weight / %M by ASTM D2974
Associated Lab Samples:	10424609001, 10424609002, 10424609003, 10424609004, 10424609005		

SAMPLE DUPLICATE: 2871261

Parameter	Units	10424609001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	67.6	68.4	1	30	

SAMPLE DUPLICATE: 2871439

Parameter	Units	10424778006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	35.6	36.0	1	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 528973 Analysis Method: EPA 8260B
 QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2871002 Matrix: Solid
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,1,1-Trichloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	03/26/18 10:56	N2
1,1,2-Trichloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	03/26/18 10:56	
1,1-Dichloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,1-Dichloroethene	ug/kg	ND	50.0	03/26/18 10:56	
1,1-Dichloropropene	ug/kg	ND	50.0	03/26/18 10:56	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,2,3-Trichloropropane	ug/kg	ND	200	03/26/18 10:56	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	03/26/18 10:56	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	03/26/18 10:56	
1,2-Dichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,2-Dichloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,2-Dichloropropane	ug/kg	ND	50.0	03/26/18 10:56	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,3-Dichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,3-Dichloropropane	ug/kg	ND	50.0	03/26/18 10:56	
1,4-Dichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
2,2-Dichloropropane	ug/kg	ND	200	03/26/18 10:56	
2-Butanone (MEK)	ug/kg	ND	250	03/26/18 10:56	
2-Chlorotoluene	ug/kg	ND	50.0	03/26/18 10:56	
4-Chlorotoluene	ug/kg	ND	50.0	03/26/18 10:56	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	03/26/18 10:56	
Acetone	ug/kg	ND	1000	03/26/18 10:56	
Allyl chloride	ug/kg	ND	200	03/26/18 10:56	
Benzene	ug/kg	ND	20.0	03/26/18 10:56	
Bromobenzene	ug/kg	ND	50.0	03/26/18 10:56	
Bromochloromethane	ug/kg	ND	50.0	03/26/18 10:56	
Bromodichloromethane	ug/kg	ND	50.0	03/26/18 10:56	
Bromoform	ug/kg	ND	200	03/26/18 10:56	
Bromomethane	ug/kg	ND	500	03/26/18 10:56	
Carbon tetrachloride	ug/kg	ND	50.0	03/26/18 10:56	
Chlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
Chloroethane	ug/kg	ND	500	03/26/18 10:56	
Chloroform	ug/kg	ND	50.0	03/26/18 10:56	
Chloromethane	ug/kg	ND	200	03/26/18 10:56	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	03/26/18 10:56	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	03/26/18 10:56	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

METHOD BLANK: 2871002

Matrix: Solid

Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	03/26/18 10:56	
Dibromomethane	ug/kg	ND	50.0	03/26/18 10:56	
Dichlorodifluoromethane	ug/kg	ND	200	03/26/18 10:56	
Dichlorofluoromethane	ug/kg	ND	500	03/26/18 10:56	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	03/26/18 10:56	
Ethylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
Hexachloro-1,3-butadiene	ug/kg	ND	250	03/26/18 10:56	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	03/26/18 10:56	
Methyl-tert-butyl ether	ug/kg	ND	50.0	03/26/18 10:56	
Methylene Chloride	ug/kg	ND	200	03/26/18 10:56	
n-Butylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
n-Propylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
Naphthalene	ug/kg	ND	200	03/26/18 10:56	
p-Isopropyltoluene	ug/kg	ND	50.0	03/26/18 10:56	
sec-Butylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
Styrene	ug/kg	ND	50.0	03/26/18 10:56	
tert-Butylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
Tetrachloroethene	ug/kg	ND	50.0	03/26/18 10:56	
Tetrahydrofuran	ug/kg	ND	2000	03/26/18 10:56	
Toluene	ug/kg	ND	50.0	03/26/18 10:56	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	03/26/18 10:56	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	03/26/18 10:56	
Trichloroethene	ug/kg	ND	50.0	03/26/18 10:56	N2
Trichlorofluoromethane	ug/kg	ND	200	03/26/18 10:56	
Vinyl chloride	ug/kg	ND	20.0	03/26/18 10:56	
Xylene (Total)	ug/kg	ND	150	03/26/18 10:56	
1,2-Dichloroethane-d4 (S)	%	90	75-125	03/26/18 10:56	
4-Bromofluorobenzene (S)	%	99	75-125	03/26/18 10:56	
Toluene-d8 (S)	%	98	75-125	03/26/18 10:56	

LABORATORY CONTROL SAMPLE & LCSD: 2871003

2871004

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	828	958	83	96	59-125	15	20	
1,1,1-Trichloroethane	ug/kg	1000	802	933	80	93	59-125	15	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	803	971	80	97	58-125	19	20	N2
1,1,2-Trichloroethane	ug/kg	1000	778	897	78	90	64-125	14	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	776	922	78	92	65-125	17	20	
1,1-Dichloroethane	ug/kg	1000	754	861	75	86	63-125	13	20	
1,1-Dichloroethene	ug/kg	1000	790	968	79	97	59-125	20	20	
1,1-Dichloropropene	ug/kg	1000	799	946	80	95	64-125	17	20	
1,2,3-Trichlorobenzene	ug/kg	1000	776	965	78	97	55-126	22	20	R1
1,2,3-Trichloropropane	ug/kg	1000	736	872	74	87	62-125	17	20	
1,2,4-Trichlorobenzene	ug/kg	1000	804	961	80	96	62-125	18	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

LABORATORY CONTROL SAMPLE & LCSD: 2871003		2871004								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	1000	793	931	79	93	59-125	16	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	1890	2200	76	88	54-125	15	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	781	899	78	90	64-125	14	20	
1,2-Dichlorobenzene	ug/kg	1000	765	890	76	89	63-125	15	20	
1,2-Dichloroethane	ug/kg	1000	684	807	68	81	57-125	17	20	
1,2-Dichloropropane	ug/kg	1000	779	896	78	90	67-125	14	20	
1,3,5-Trimethylbenzene	ug/kg	1000	811	936	81	94	59-125	14	20	
1,3-Dichlorobenzene	ug/kg	1000	738	884	74	88	64-125	18	20	
1,3-Dichloropropane	ug/kg	1000	757	878	76	88	64-125	15	20	
1,4-Dichlorobenzene	ug/kg	1000	766	874	77	87	63-125	13	20	
2,2-Dichloropropane	ug/kg	1000	860	973	86	97	37-126	12	20	
2-Butanone (MEK)	ug/kg	5000	3740	4230	75	85	48-125	12	20	
2-Chlorotoluene	ug/kg	1000	777	890	78	89	62-125	13	20	
4-Chlorotoluene	ug/kg	1000	763	893	76	89	63-125	16	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	3630	4290	73	86	52-135	17	20	
Acetone	ug/kg	5000	5390	6150	108	123	65-125	13	20	
Allyl chloride	ug/kg	1000	747	873	75	87	52-125	16	20	
Benzene	ug/kg	1000	765	859	76	86	61-125	12	20	
Bromobenzene	ug/kg	1000	794	916	79	92	64-125	14	20	
Bromochloromethane	ug/kg	1000	791	915	79	91	65-125	15	20	
Bromodichloromethane	ug/kg	1000	832	969	83	97	57-125	15	20	
Bromoform	ug/kg	1000	784	903	78	90	57-125	14	20	
Bromomethane	ug/kg	1000	777	845	78	85	60-125	8	20	
Carbon tetrachloride	ug/kg	1000	848	960	85	96	58-125	12	20	
Chlorobenzene	ug/kg	1000	782	883	78	88	66-125	12	20	
Chloroethane	ug/kg	1000	825	870	83	87	62-125	5	20	
Chloroform	ug/kg	1000	701	786	70	79	59-125	11	20	
Chloromethane	ug/kg	1000	733	791	73	79	50-125	8	20	
cis-1,2-Dichloroethene	ug/kg	1000	761	895	76	89	61-125	16	20	
cis-1,3-Dichloropropene	ug/kg	1000	794	937	79	94	61-125	17	20	
Dibromochloromethane	ug/kg	1000	790	890	79	89	60-125	12	20	
Dibromomethane	ug/kg	1000	808	948	81	95	69-125	16	20	
Dichlorodifluoromethane	ug/kg	1000	672	702	67	70	38-125	4	20	
Dichlorofluoromethane	ug/kg	1000	765	803	76	80	67-125	5	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	1390	1250	139	125	60-125	11	20 L3	
Ethylbenzene	ug/kg	1000	775	906	78	91	62-125	16	20	
Hexachloro-1,3-butadiene	ug/kg	1000	810	968	81	97	56-125	18	20	
Isopropylbenzene (Cumene)	ug/kg	1000	836	962	84	96	65-125	14	20	
Methyl-tert-butyl ether	ug/kg	1000	731	855	73	86	59-125	16	20	
Methylene Chloride	ug/kg	1000	774	888	77	89	64-125	14	20	
n-Butylbenzene	ug/kg	1000	802	976	80	98	59-125	20	20	
n-Propylbenzene	ug/kg	1000	808	931	81	93	61-125	14	20	
Naphthalene	ug/kg	1000	818	982	82	98	53-125	18	20	
p-Isopropyltoluene	ug/kg	1000	794	949	79	95	63-125	18	20	
sec-Butylbenzene	ug/kg	1000	819	960	82	96	62-125	16	20	
Styrene	ug/kg	1000	816	950	82	95	66-125	15	20	
tert-Butylbenzene	ug/kg	1000	806	939	81	94	64-125	15	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

LABORATORY CONTROL SAMPLE & LCSD: 2871003		2871004									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Tetrachloroethene	ug/kg	1000	810	941	81	94	67-125	15	20		
Tetrahydrofuran	ug/kg	10000	11200	12700	112	127	62-125	12	20	L3	
Toluene	ug/kg	1000	798	905	80	91	61-125	13	20		
trans-1,2-Dichloroethene	ug/kg	1000	807	948	81	95	64-125	16	20		
trans-1,3-Dichloropropene	ug/kg	1000	809	946	81	95	56-125	16	20		
Trichloroethene	ug/kg	1000	767	896	77	90	67-125	15	20	N2	
Trichlorofluoromethane	ug/kg	1000	782	818	78	82	65-125	5	20		
Vinyl chloride	ug/kg	1000	805	843	81	84	57-125	5	20		
Xylene (Total)	ug/kg	3000	2420	2790	81	93	62-125	14	20		
1,2-Dichloroethane-d4 (S)	%				91	91	75-125				
4-Bromofluorobenzene (S)	%				101	100	75-125				
Toluene-d8 (S)	%				99	98	75-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 528957 Analysis Method: EPA 8081B
QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2870967 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/03/18 20:29	
4,4'-DDE	ug/kg	ND	3.3	04/03/18 20:29	
4,4'-DDT	ug/kg	ND	3.3	04/03/18 20:29	
Aldrin	ug/kg	ND	1.7	04/03/18 20:29	
alpha-BHC	ug/kg	ND	1.7	04/03/18 20:29	
alpha-Chlordane	ug/kg	ND	1.7	04/03/18 20:29	
beta-BHC	ug/kg	ND	1.7	04/03/18 20:29	
Chlordane (Technical)	ug/kg	ND	16.7	04/03/18 20:29	
delta-BHC	ug/kg	ND	1.7	04/03/18 20:29	
Dieldrin	ug/kg	ND	3.3	04/03/18 20:29	
Endosulfan I	ug/kg	ND	1.7	04/03/18 20:29	
Endosulfan II	ug/kg	ND	3.3	04/03/18 20:29	
Endosulfan sulfate	ug/kg	ND	3.3	04/03/18 20:29	
Endrin	ug/kg	ND	3.3	04/03/18 20:29	
Endrin aldehyde	ug/kg	ND	3.3	04/03/18 20:29	
Endrin ketone	ug/kg	ND	3.3	04/03/18 20:29	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/03/18 20:29	
gamma-Chlordane	ug/kg	ND	1.7	04/03/18 20:29	
Heptachlor	ug/kg	ND	1.7	04/03/18 20:29	
Heptachlor epoxide	ug/kg	ND	1.7	04/03/18 20:29	
Methoxychlor	ug/kg	ND	16.7	04/03/18 20:29	
Toxaphene	ug/kg	ND	50.0	04/03/18 20:29	
Decachlorobiphenyl (S)	%	89	30-150	04/03/18 20:29	
Tetrachloro-m-xylene (S)	%	95	30-150	04/03/18 20:29	

LABORATORY CONTROL SAMPLE: 2870968

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	36.7	110	62-127	
4,4'-DDE	ug/kg	33.3	36.5	110	66-125	
4,4'-DDT	ug/kg	33.3	38.7	116	67-128	
Aldrin	ug/kg	16.7	16.5	99	66-125	
alpha-BHC	ug/kg	16.7	16.8	101	64-125	
alpha-Chlordane	ug/kg	16.7	16.9	102	68-125	
beta-BHC	ug/kg	16.7	17.1	103	69-125	
delta-BHC	ug/kg	16.7	10.8	65	42-133	
Dieldrin	ug/kg	33.3	37.4	112	69-126	
Endosulfan I	ug/kg	16.7	15.5	93	63-125	
Endosulfan II	ug/kg	33.3	36.0	108	69-125	
Endosulfan sulfate	ug/kg	33.3	30.0	90	56-137	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

LABORATORY CONTROL SAMPLE: 2870968

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	34.6	104	69-125	
Endrin aldehyde	ug/kg	33.3	34.2	103	65-125	
Endrin ketone	ug/kg	33.3	36.6	110	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	17.3	104	67-125	
gamma-Chlordane	ug/kg	16.7	15.4	93	63-125	
Heptachlor	ug/kg	16.7	18.1	108	69-125	
Heptachlor epoxide	ug/kg	16.7	17.2	103	68-125	
Methoxychlor	ug/kg	167	189	114	65-134	
Decachlorobiphenyl (S)	%			94	30-150	
Tetrachloro-m-xylene (S)	%			104	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2871047 2871048

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10424609004 Result	Spike Conc.	Spike Conc.	MS Result						
4,4'-DDD	ug/kg	ND	43.9	43.9	68.1J	70.1J	155	159	56-125	20	M6
4,4'-DDE	ug/kg	ND	43.9	43.9	58.9J	59J	134	134	32-150	20	
4,4'-DDT	ug/kg	ND	43.9	43.9	54.9J	51.6J	125	117	60-132	20	
Aldrin	ug/kg	ND	22	22	33.3J	32J	151	146	56-125	20	M6
alpha-BHC	ug/kg	ND	22	22	24.9J	30.5J	114	139	54-136	20	M6
alpha-Chlordane	ug/kg	ND	22	22	22.2J	20.5J	101	93	54-133	20	
beta-BHC	ug/kg	ND	22	22	39.4J	39.3J	179	179	30-150	20	M6
delta-BHC	ug/kg	ND	22	22	18.1J	17.2J	82	78	45-145	20	
Dieldrin	ug/kg	ND	43.9	43.9	79.1J	65.5J	180	149	47-150	20	M6
Endosulfan I	ug/kg	ND	22	22	37J	33.1J	169	151	35-145	20	M6
Endosulfan II	ug/kg	ND	43.9	43.9	50.1J	50.9J	114	116	50-147	20	
Endosulfan sulfate	ug/kg	ND	43.9	43.9	43.1J	41.2J	98	94	54-132	20	
Endrin	ug/kg	ND	43.9	43.9	7.4J	48.7J	17	111	62-125	20	M6
Endrin aldehyde	ug/kg	ND	43.9	43.9	58.9J	69J	134	157	33-150	20	M6
Endrin ketone	ug/kg	ND	43.9	43.9	50.9J	53.6J	116	122	56-144	20	
gamma-BHC (Lindane)	ug/kg	ND	22	22	27.3J	27.6J	124	126	63-125	20	M6
gamma-Chlordane	ug/kg	ND	22	22	39.2J	38.8J	179	176	45-132	20	M6
Heptachlor	ug/kg	ND	22	22	27.3J	34.4J	124	157	51-142	20	M6
Heptachlor epoxide	ug/kg	ND	22	22	20.6J	21.9J	94	100	50-142	20	
Methoxychlor	ug/kg	ND	220	220	255J	252J	116	114	58-139	20	
Decachlorobiphenyl (S)	%						0	0	30-150		S4
Tetrachloro-m-xylene (S)	%						0	0	30-150		3M, D3, S4

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report
Pace Project No.: 10424609

QC Batch: 528834 Analysis Method: EPA 8082A
QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2870017 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	03/26/18 16:38	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	03/26/18 16:38	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	03/26/18 16:38	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	03/26/18 16:38	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	03/26/18 16:38	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	03/26/18 16:38	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	03/26/18 16:38	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	03/26/18 16:38	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	03/26/18 16:38	
Decachlorobiphenyl (S)	%.	87	30-134	03/26/18 16:38	
Tetrachloro-m-xylene (S)	%.	82	48-125	03/26/18 16:38	

LABORATORY CONTROL SAMPLE: 2870018

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	562	84	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	571	86	62-125	
Decachlorobiphenyl (S)	%.			89	30-134	
Tetrachloro-m-xylene (S)	%.			86	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2870019 2870020

Parameter	Units	10424607001		2870019		2870020		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS Result	MSD Result						
PCB-1016 (Aroclor 1016)	ug/kg	ND	847	847	459	692	54	82	30-150	40	30	R1	
PCB-1260 (Aroclor 1260)	ug/kg	ND	847	847	460	699	54	82	30-138	41	30	R1	
Decachlorobiphenyl (S)	%.						56	81	30-134				
Tetrachloro-m-xylene (S)	%.						59	87	48-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 529268 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2872570 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1,2-Dichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1,2-Diphenylhydrazine	ug/kg	ND	330	03/30/18 11:47	
1,3-Dichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1,4-Dichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1-Methylnaphthalene	ug/kg	ND	330	03/30/18 11:47	
2,4,5-Trichlorophenol	ug/kg	ND	330	03/30/18 11:47	
2,4,6-Trichlorophenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dichlorophenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dimethylphenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dinitrophenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dinitrotoluene	ug/kg	ND	330	03/30/18 11:47	
2,6-Dinitrotoluene	ug/kg	ND	330	03/30/18 11:47	
2-Chloronaphthalene	ug/kg	ND	330	03/30/18 11:47	
2-Chlorophenol	ug/kg	ND	330	03/30/18 11:47	
2-Methylnaphthalene	ug/kg	ND	330	03/30/18 11:47	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	03/30/18 11:47	
2-Nitroaniline	ug/kg	ND	330	03/30/18 11:47	
2-Nitrophenol	ug/kg	ND	330	03/30/18 11:47	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	03/30/18 11:47	
3,3'-Dichlorobenzidine	ug/kg	ND	330	03/30/18 11:47	
3-Nitroaniline	ug/kg	ND	330	03/30/18 11:47	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	03/30/18 11:47	
4-Bromophenylphenyl ether	ug/kg	ND	330	03/30/18 11:47	
4-Chloro-3-methylphenol	ug/kg	ND	330	03/30/18 11:47	
4-Chloroaniline	ug/kg	ND	330	03/30/18 11:47	
4-Chlorophenylphenyl ether	ug/kg	ND	330	03/30/18 11:47	
4-Nitroaniline	ug/kg	ND	330	03/30/18 11:47	
4-Nitrophenol	ug/kg	ND	330	03/30/18 11:47	
Acenaphthene	ug/kg	ND	330	03/30/18 11:47	
Acenaphthylene	ug/kg	ND	330	03/30/18 11:47	
Anthracene	ug/kg	ND	330	03/30/18 11:47	
Benzo(a)anthracene	ug/kg	ND	330	03/30/18 11:47	
Benzo(a)pyrene	ug/kg	ND	330	03/30/18 11:47	
Benzo(b)fluoranthene	ug/kg	ND	330	03/30/18 11:47	
Benzo(g,h,i)perylene	ug/kg	ND	330	03/30/18 11:47	
Benzo(k)fluoranthene	ug/kg	ND	330	03/30/18 11:47	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	03/30/18 11:47	
bis(2-Chloroethyl) ether	ug/kg	ND	330	03/30/18 11:47	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	03/30/18 11:47	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	03/30/18 11:47	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

METHOD BLANK: 2872570

Matrix: Solid

Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	03/30/18 11:47	
Carbazole	ug/kg	ND	330	03/30/18 11:47	
Chrysene	ug/kg	ND	330	03/30/18 11:47	
Di-n-butylphthalate	ug/kg	ND	330	03/30/18 11:47	
Di-n-octylphthalate	ug/kg	ND	330	03/30/18 11:47	
Dibenz(a,h)anthracene	ug/kg	ND	330	03/30/18 11:47	
Dibenzofuran	ug/kg	ND	330	03/30/18 11:47	
Diethylphthalate	ug/kg	ND	330	03/30/18 11:47	
Dimethylphthalate	ug/kg	ND	330	03/30/18 11:47	
Fluoranthene	ug/kg	ND	330	03/30/18 11:47	
Fluorene	ug/kg	ND	330	03/30/18 11:47	
Hexachloro-1,3-butadiene	ug/kg	ND	330	03/30/18 11:47	
Hexachlorobenzene	ug/kg	ND	330	03/30/18 11:47	
Hexachloroethane	ug/kg	ND	330	03/30/18 11:47	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	03/30/18 11:47	
Isophorone	ug/kg	ND	330	03/30/18 11:47	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	03/30/18 11:47	
N-Nitrosodimethylamine	ug/kg	ND	330	03/30/18 11:47	
N-Nitrosodiphenylamine	ug/kg	ND	330	03/30/18 11:47	
Naphthalene	ug/kg	ND	330	03/30/18 11:47	
Nitrobenzene	ug/kg	ND	330	03/30/18 11:47	
Pentachlorophenol	ug/kg	ND	670	03/30/18 11:47	
Phenanthrene	ug/kg	ND	330	03/30/18 11:47	
Phenol	ug/kg	ND	330	03/30/18 11:47	
Pyrene	ug/kg	ND	330	03/30/18 11:47	
2,4,6-Tribromophenol (S)	%	73	60-125	03/30/18 11:47	
2-Fluorobiphenyl (S)	%	58	30-132	03/30/18 11:47	
2-Fluorophenol (S)	%	55	40-125	03/30/18 11:47	
Nitrobenzene-d5 (S)	%	54	43-125	03/30/18 11:47	
p-Terphenyl-d14 (S)	%	90	62-125	03/30/18 11:47	
Phenol-d6 (S)	%	56	48-125	03/30/18 11:47	

LABORATORY CONTROL SAMPLE: 2872571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1020	61	46-125	
1,2-Dichlorobenzene	ug/kg	1670	999	60	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1310	78	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1010	61	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1010	61	39-125	
1-Methylnaphthalene	ug/kg	1670	1080	65	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1220	73	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1200	72	61-125	
2,4-Dichlorophenol	ug/kg	1670	1060	64	57-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

LABORATORY CONTROL SAMPLE: 2872571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1030	62	51-125	
2,4-Dinitrophenol	ug/kg	1670	1200	72	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1250	75	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1240	74	63-125	
2-Chloronaphthalene	ug/kg	1670	1130	68	61-125	
2-Chlorophenol	ug/kg	1670	1020	61	46-125	
2-Methylnaphthalene	ug/kg	1670	1080	65	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1080	65	50-125	
2-Nitroaniline	ug/kg	1670	1380	83	61-125	
2-Nitrophenol	ug/kg	1670	1030	62	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1080	65	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1290	78	47-125	
3-Nitroaniline	ug/kg	1670	1220	73	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1380J	83	30-141	
4-Bromophenylphenyl ether	ug/kg	1670	1350	81	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1180	71	64-125	
4-Chloroaniline	ug/kg	1670	944	57	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1210	73	64-125	
4-Nitroaniline	ug/kg	1670	1180	71	59-125	
4-Nitrophenol	ug/kg	1670	1320	79	54-125	
Acenaphthene	ug/kg	1670	1190	72	62-125	
Acenaphthylene	ug/kg	1670	1140	69	61-125	
Anthracene	ug/kg	1670	1280	77	66-125	
Benzo(a)anthracene	ug/kg	1670	1300	78	69-125	
Benzo(a)pyrene	ug/kg	1670	1310	79	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1380	83	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1320	79	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1300	78	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1120	67	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1090	65	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1180	71	37-125	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1330	80	69-131	
Butylbenzylphthalate	ug/kg	1670	1340	81	69-129	
Carbazole	ug/kg	1670	1290	77	66-125	
Chrysene	ug/kg	1670	1300	78	68-125	
Di-n-butylphthalate	ug/kg	1670	1360	81	69-125	
Di-n-octylphthalate	ug/kg	1670	1310	79	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1340	81	64-125	
Dibenzofuran	ug/kg	1670	1200	72	65-125	
Diethylphthalate	ug/kg	1670	1280	77	67-125	
Dimethylphthalate	ug/kg	1670	1240	75	67-125	
Fluoranthene	ug/kg	1670	1280	77	66-125	
Fluorene	ug/kg	1670	1190	71	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1040	62	40-125	
Hexachlorobenzene	ug/kg	1670	1320	79	62-125	
Hexachloroethane	ug/kg	1670	1010	61	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1320	79	64-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

LABORATORY CONTROL SAMPLE: 2872571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1130	68	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1150	69	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1090	65	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1320	79	65-125	
Naphthalene	ug/kg	1670	1050	63	48-125	
Nitrobenzene	ug/kg	1670	1130	68	48-125	
Pentachlorophenol	ug/kg	1670	1220	73	41-125	
Phenanthrene	ug/kg	1670	1300	78	66-125	
Phenol	ug/kg	1670	1110	67	46-125	
Pyrene	ug/kg	1670	1360	82	69-125	
2,4,6-Tribromophenol (S)	%			85	60-125	
2-Fluorobiphenyl (S)	%			76	30-132	
2-Fluorophenol (S)	%			69	40-125	
Nitrobenzene-d5 (S)	%			71	43-125	
p-Terphenyl-d14 (S)	%			89	62-125	
Phenol-d6 (S)	%			72	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2872788 2872789

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424792001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,2,4-Trichlorobenzene	ug/kg	ND	1720	1710	1460J	1420J	85	83	30-127		30	
1,2-Dichlorobenzene	ug/kg	ND	1720	1710	1360J	1370J	79	80	30-125		30	
1,2-Diphenylhydrazine	ug/kg	ND	1720	1710	1710	1620J	100	95	30-150		30	
1,3-Dichlorobenzene	ug/kg	ND	1720	1710	1400J	1320J	82	77	30-125		30	
1,4-Dichlorobenzene	ug/kg	ND	1720	1710	1400J	1350J	82	79	30-125		30	
1-Methylnaphthalene	ug/kg	ND	1720	1710	1540J	1510J	90	88	42-125		30	
2,4,5-Trichlorophenol	ug/kg	ND	1720	1710	1470J	1350J	86	79	30-150		30	
2,4,6-Trichlorophenol	ug/kg	ND	1720	1710	1330J	1320J	78	77	30-150		30	
2,4-Dichlorophenol	ug/kg	ND	1720	1710	1550J	1480J	91	87	30-135		30	
2,4-Dimethylphenol	ug/kg	ND	1720	1710	1440J	1430J	84	84	30-148		30	
2,4-Dinitrophenol	ug/kg	ND	1720	1710	ND	ND	5	4	30-125		30	M1
2,4-Dinitrotoluene	ug/kg	ND	1720	1710	1560J	1560J	91	92	30-150		30	
2,6-Dinitrotoluene	ug/kg	ND	1720	1710	1650J	1720	96	100	30-150		30	
2-Chloronaphthalene	ug/kg	ND	1720	1710	1580J	1500J	92	88	30-138		30	
2-Chlorophenol	ug/kg	ND	1720	1710	1500J	1450J	88	85	30-130		30	
2-Methylnaphthalene	ug/kg	ND	1720	1710	1530J	1640J	89	96	46-125		30	
2-Methylphenol(o-Cresol)	ug/kg	ND	1720	1710	1590J	1490J	93	87	30-133		30	
2-Nitroaniline	ug/kg	ND	1720	1710	1650J	1750	97	103	30-150		30	
2-Nitrophenol	ug/kg	ND	1720	1710	1360J	1410J	79	83	30-134		30	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	1720	1710	1600J	1590J	94	93	30-138		30	
3,3'-Dichlorobenzidine	ug/kg	ND	1720	1710	1340J	1500J	78	88	30-149		30	6M
3-Nitroaniline	ug/kg	ND	1720	1710	1300J	1180J	76	69	30-150		30	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1720	1710	ND	ND	19	20	30-133		30	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2872788			2872789									
Parameter	Units	10424792001	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual	
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD		
4-Bromophenylphenyl ether	ug/kg	ND	1720	1710	1670J	1600J	97	94	44-125		30	
4-Chloro-3-methylphenol	ug/kg	ND	1720	1710	1580J	ND	92	99	30-150		30	
4-Chloroaniline	ug/kg	ND	1720	1710	1010J	930J	59	54	30-125		30	
4-Chlorophenylphenyl ether	ug/kg	ND	1720	1710	1630J	1540J	95	90	44-125		30	
4-Nitroaniline	ug/kg	ND	1720	1710	1500J	1440J	87	84	30-150		30	
4-Nitrophenol	ug/kg	ND	1720	1710	1450J	1370J	85	80	30-150		30	
Acenaphthene	ug/kg	ND	1720	1710	1490J	1430J	87	84	40-125		30	
Acenaphthylene	ug/kg	ND	1720	1710	1560J	1470J	91	86	30-150		30	
Anthracene	ug/kg	ND	1720	1710	1770	1800	103	106	30-150	2	30	
Benzo(a)anthracene	ug/kg	ND	1720	1710	1970	1970	115	115	30-150	0	30	
Benzo(a)pyrene	ug/kg	ND	1720	1710	1860	1850	109	108	30-150	1	30	
Benzo(b)fluoranthene	ug/kg	ND	1720	1710	1560J	1770	91	104	30-150		30	
Benzo(g,h,i)perylene	ug/kg	ND	1720	1710	1600J	1710	93	100	30-150		30	
Benzo(k)fluoranthene	ug/kg	ND	1720	1710	1660J	1550J	97	91	30-150		30	
bis(2-Chloroethoxy)methane	ug/kg	ND	1720	1710	1520J	1460J	89	85	30-134		30	
bis(2-Chloroethyl) ether	ug/kg	ND	1720	1710	1570J	1550J	91	91	30-125		30 6M	
bis(2-Chloroisopropyl) ether	ug/kg	ND	1720	1710	1780	1600J	104	94	30-125		30 6M	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	1720	1710	1780	1880	104	110	30-150	5	30	
Butylbenzylphthalate	ug/kg	ND	1720	1710	1740	1790	102	105	30-150	3	30	
Carbazole	ug/kg	ND	1720	1710	1660J	1710	97	100	41-125		30	
Chrysene	ug/kg	ND	1720	1710	2070	2030	121	119	30-150	2	30	
Di-n-butylphthalate	ug/kg	ND	1720	1710	1730	1740	101	102	30-150	0	30	
Di-n-octylphthalate	ug/kg	ND	1720	1710	1840	1870	108	110	30-150	2	30	
Dibenz(a,h)anthracene	ug/kg	ND	1720	1710	1540J	1680J	90	98	30-150		30	
Dibenzofuran	ug/kg	ND	1720	1710	1620J	1590J	95	93	45-125		30	
Diethylphthalate	ug/kg	ND	1720	1710	1680J	1660J	98	97	30-150		30	
Dimethylphthalate	ug/kg	ND	1720	1710	1650J	1630J	97	96	30-150		30	
Fluoranthene	ug/kg	ND	1720	1710	1750	1740	102	102	30-150	0	30	
Fluorene	ug/kg	ND	1720	1710	1620J	1660J	95	97	30-150		30	
Hexachloro-1,3-butadiene	ug/kg	ND	1720	1710	1380J	1460J	80	86	30-128		30	
Hexachlorobenzene	ug/kg	ND	1720	1710	1500J	1500J	87	88	30-150		30	
Hexachloroethane	ug/kg	ND	1720	1710	1440J	1350J	84	79	30-125		30	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	1720	1710	1500J	1650J	88	97	30-150		30	
Isophorone	ug/kg	ND	1720	1710	1570J	1550J	92	91	30-140		30	
N-Nitroso-di-n-propylamine	ug/kg	ND	1720	1710	1680J	1570J	98	92	30-147		30 6M	
N-Nitrosodimethylamine	ug/kg	ND	1720	1710	1420J	1330J	83	78	30-125		30	
N-Nitrosodiphenylamine	ug/kg	ND	1720	1710	1610J	1720	94	101	30-150		30	
Naphthalene	ug/kg	ND	1720	1710	1520J	1480J	89	86	44-125		30	
Nitrobenzene	ug/kg	ND	1720	1710	1580J	1550J	92	91	30-136		30	
Pentachlorophenol	ug/kg	ND	1720	1710	ND	ND	23	22	30-150		30 M1	
Phenanthrene	ug/kg	ND	1720	1710	1890	1950	110	114	30-150	3	30	
Phenol	ug/kg	ND	1720	1710	1530J	1490J	89	87	30-129		30	
Pyrene	ug/kg	ND	1720	1710	2160	2260	126	132	30-150	4	30	
2,4,6-Tribromophenol (S)	%						86	83	60-125			
2-Fluorobiphenyl (S)	%						98	95	30-132			
2-Fluorophenol (S)	%						95	88	40-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Parameter	Units	2872788		2872789		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Nitrobenzene-d5 (S)	%.	10424792001				93	93	43-125			
p-Terphenyl-d14 (S)	%.					97	103	62-125			
Phenol-d6 (S)	%.					95	93	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 528955 Analysis Method: EPA 8270D by SIM
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2870959 Matrix: Solid
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	03/27/18 13:28	
Acenaphthylene	ug/kg	ND	10.0	03/27/18 13:28	
Anthracene	ug/kg	ND	10.0	03/27/18 13:28	
Benzo(a)anthracene	ug/kg	ND	10.0	03/27/18 13:28	
Benzo(a)pyrene	ug/kg	ND	10.0	03/27/18 13:28	
Benzo(b)fluoranthene	ug/kg	ND	10.0	03/27/18 13:28	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	03/27/18 13:28	
Benzo(k)fluoranthene	ug/kg	ND	10.0	03/27/18 13:28	
Chrysene	ug/kg	ND	10.0	03/27/18 13:28	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	03/27/18 13:28	
Fluoranthene	ug/kg	ND	10.0	03/27/18 13:28	
Fluorene	ug/kg	ND	10.0	03/27/18 13:28	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	03/27/18 13:28	
Naphthalene	ug/kg	ND	10.0	03/27/18 13:28	
Phenanthrene	ug/kg	ND	10.0	03/27/18 13:28	
Pyrene	ug/kg	ND	10.0	03/27/18 13:28	
2-Fluorobiphenyl (S)	%	78	42-125	03/27/18 13:28	
p-Terphenyl-d14 (S)	%	87	57-125	03/27/18 13:28	

LABORATORY CONTROL SAMPLE: 2870960

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	22.8	68	52-125	
Acenaphthylene	ug/kg	33.3	24.9	75	50-125	
Anthracene	ug/kg	33.3	29.1	87	65-125	
Benzo(a)anthracene	ug/kg	33.3	30.7	92	60-125	
Benzo(a)pyrene	ug/kg	33.3	30.7	92	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	31.4	94	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	24.5	73	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	27.4	82	67-125	
Chrysene	ug/kg	33.3	28.3	85	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	22.8	68	63-125	
Fluoranthene	ug/kg	33.3	30.9	93	75-125	
Fluorene	ug/kg	33.3	23.1	69	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	23.9	72	63-125	
Naphthalene	ug/kg	33.3	25.1	75	49-125	
Phenanthrene	ug/kg	33.3	23.8	71	65-125	
Pyrene	ug/kg	33.3	29.6	89	64-125	
2-Fluorobiphenyl (S)	%			73	42-125	
p-Terphenyl-d14 (S)	%			89	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Parameter	Units	2871138		2871139		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		10424835001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						MSD Result
Acenaphthene	ug/kg	ND	34.2	34.2	22.3	22.6	65	66	30-125	1	30
Acenaphthylene	ug/kg	ND	34.2	34.2	23.2	23.2	68	68	30-133	0	30
Anthracene	ug/kg	ND	34.2	34.2	28.2	26.5	83	77	30-150	6	30
Benzo(a)anthracene	ug/kg	ND	34.2	34.2	28.8	28.3	84	83	30-150	2	30
Benzo(a)pyrene	ug/kg	ND	34.2	34.2	29.2	28.1	85	82	30-150	4	30
Benzo(b)fluoranthene	ug/kg	ND	34.2	34.2	27.5	27.1	80	79	30-150	1	30
Benzo(g,h,i)perylene	ug/kg	ND	34.2	34.2	28.6	27.6	84	81	30-150	4	30
Benzo(k)fluoranthene	ug/kg	ND	34.2	34.2	25.8	24.0	75	70	30-150	7	30
Chrysene	ug/kg	ND	34.2	34.2	27.3	26.0	80	76	30-150	5	30
Dibenz(a,h)anthracene	ug/kg	ND	34.2	34.2	23.7	23.3	69	68	30-131	2	30
Fluoranthene	ug/kg	ND	34.2	34.2	28.6	27.7	84	81	30-150	3	30
Fluorene	ug/kg	ND	34.2	34.2	24.0	22.4	70	66	30-147	7	30
Indeno(1,2,3-cd)pyrene	ug/kg	ND	34.2	34.2	26.5	25.3	78	74	30-150	5	30
Naphthalene	ug/kg	ND	34.2	34.2	21.6	22.6	63	66	30-131	4	30
Phenanthrene	ug/kg	ND	34.2	34.2	23.6	22.8	69	67	30-150	3	30
Pyrene	ug/kg	ND	34.2	34.2	28.6	27.3	84	80	30-150	5	30
2-Fluorobiphenyl (S)	%.						66	65	42-125		
p-Terphenyl-d14 (S)	%.						82	81	57-125		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 529569 Analysis Method: EPA 8270D
QC Batch Method: EPA 3546 Analysis Description: MDA2 Solid MSSV
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2874519 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,5-T	mg/kg	ND	0.033	04/04/18 13:35	
2,4,5-TP (Silvex)	mg/kg	ND	0.033	04/04/18 13:35	
2,4-D	mg/kg	ND	0.033	04/04/18 13:35	
2,4-DB	mg/kg	ND	0.033	04/04/18 13:35	
Bentazon	mg/kg	ND	0.033	04/04/18 13:35	
Dicamba	mg/kg	ND	0.033	04/04/18 13:35	
Dinoseb	mg/kg	ND	0.033	04/04/18 13:35	
MCPA	mg/kg	ND	0.033	04/04/18 13:35	
Pentachlorophenol	mg/kg	ND	0.033	04/04/18 13:35	
Picloram	mg/kg	ND	0.033	04/04/18 13:35	
Triclopyr	mg/kg	ND	0.033	04/04/18 13:35	
2,4-DCAA (S)	%	78	46-125	04/04/18 13:35	

LABORATORY CONTROL SAMPLE: 2874520

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,5-T	mg/kg	.33	0.28	83	60-125	
2,4,5-TP (Silvex)	mg/kg	.33	0.26	79	61-125	
2,4-D	mg/kg	.33	0.29	86	63-125	
2,4-DB	mg/kg	.33	0.28	83	59-125	
Bentazon	mg/kg	.33	0.25	76	58-125	
Dicamba	mg/kg	.33	0.27	80	52-125	
Dinoseb	mg/kg	.33	0.18	53	35-126	
MCPA	mg/kg	.33	0.27	82	57-125	
Pentachlorophenol	mg/kg	.33	0.21	63	48-125	
Picloram	mg/kg	.33	0.24	72	47-125	
Triclopyr	mg/kg	.33	0.28	83	68-125	
2,4-DCAA (S)	%			77	46-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874521 2874522

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10425111006 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
2,4,5-T	mg/kg	ND	.45	.45	0.19	0.21	42	45	30-145	8	20	
2,4,5-TP (Silvex)	mg/kg	ND	.45	.45	0.28	0.26	63	58	30-130	7	20	
2,4-D	mg/kg	ND	.45	.45	0.18	0.20	40	44	30-150	9	20	
2,4-DB	mg/kg	ND	.45	.45	0.35	0.33	77	72	45-126	7	20	
Bentazon	mg/kg	ND	.45	.45	0.33	0.32	73	71	30-133	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874521		2874522		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10425111006 Result	MS Spike Conc.	MSD Spike Conc.									
Dicamba	mg/kg	ND	.45	.45	0.13	0.17	29	38	30-140	28	20	M1, R1	
Dinoseb	mg/kg	ND	.45	.45	0.39	0.31	86	69	30-136	23	20	R1	
MCPA	mg/kg	ND	.45	.45	0.24	0.22	53	49	30-136	9	20		
Pentachlorophenol	mg/kg	ND	.45	.45	0.28	0.25	63	55	44-125	13	20		
Picloram	mg/kg	ND	.45	.45	.016J	0.098	3	22	30-125		20	M1	
Triclopyr	mg/kg	ND	.45	.45	0.23	0.22	51	50	30-149	3	20		
2,4-DCAA (S)	%.						65	60	46-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 529084	Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO	Analysis Description: WIDRO GCS
Associated Lab Samples: 10424609005	

METHOD BLANK: 2871419 Matrix: Solid

Associated Lab Samples: 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	03/27/18 20:40	
n-Triacontane (S)	%.	89	50-150	03/27/18 20:40	

LABORATORY CONTROL SAMPLE & LCSD: 2871420

2871421

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	79.1	72.1	99	90	70-120	9	20	
n-Triacontane (S)	%.				91	89	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 529461 Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS

Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004

METHOD BLANK: 2873677 Matrix: Solid

Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	03/29/18 10:21	
n-Triacontane (S)	%.	80	50-150	03/29/18 10:21	

LABORATORY CONTROL SAMPLE & LCSD: 2873678

2873679

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	69.1	90.2	86	113	70-120	26	20	R1
n-Triacontane (S)	%.				82	75	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report
Pace Project No.: 10424609

QC Batch: 434844 Analysis Method: EPA 7196A
QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2008420 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/03/18 11:09	

LABORATORY CONTROL SAMPLE: 2008421

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1090	929	85	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2008432 2008433

Parameter	Units	50193104001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	2190	2230	ND	ND	0	0	75-125		20	2M, M3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2008434 2008435

Parameter	Units	50193104001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	79.1	80.9	4.7J	6.3J	2	4	75-125		20	M3

SAMPLE DUPLICATE: 2008431

Parameter	Units	469837006 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 284583 Analysis Method: EPA 9012
 QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 1665486 Matrix: Solid
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	03/29/18 12:56	

LABORATORY CONTROL SAMPLE: 1665487

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665488 1665489

Parameter	Units	10424609003 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Cyanide	mg/kg	ND	3.62	2.8	3.62	3.2	66	77	80-120	13	20	M0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665490 1665491

Parameter	Units	10424937006 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Cyanide	mg/kg	0.56	4.11	4.2	4.26	4.0	89	81	80-120	5	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 139574

Analysis Method: EPA 9056A

QC Batch Method: EPA 300.0

Analysis Description: 9056 IC Anions, Soil

Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 552775

Matrix: Solid

Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	1.0	03/30/18 17:59	

LABORATORY CONTROL SAMPLE: 552774

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	48.5	49.5	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 552776 552777

Parameter	Units	12106344002		552776		552777		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Result	MS Conc.	MSD Conc.	MS Result	MSD Result					
Fluoride	mg/kg	3.3	49	49.8	53.1	53.4	102	101	80-120	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 552778 552779

Parameter	Units	12106344011		552778		552779		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Result	MS Conc.	MSD Conc.	MS Result	MSD Result					
Fluoride	mg/kg	2.1	49.2	49.8	47.4	47.0	92	90	80-120	1	20	

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QUALIFIERS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report
Pace Project No.: 10424609

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth
PASI-G Pace Analytical Services - Green Bay
PASI-I Pace Analytical Services - Indianapolis
PASI-M Pace Analytical Services - Minneapolis
PASI-V Pace Analytical Services - Virginia

BATCH QUALIFIERS

Batch: 529212

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1M RPD value is outside control limits due to sample non-homogeneity.
2M Redox (25 mv) and pH (7.84) values indicate a naturally reducing matrix. This accounts for poor recovery values on the sample per method Eh/pH phase diagram.
3M Sample was black in color and needed to be centrifuged and decanted prior to analysis.
4M Sample was black in color and slightly viscous. Sample needed to be centrifuged and decanted prior to analysis.
5M Sample was dark brown in color.
6M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
7M The sample was re-weighed into a new container because the original container had no tare weight.
C0 Result confirmed by second analysis.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

ANALYTE QUALIFIERS

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
D4	Sample was diluted due to the presence of high levels of target analytes.
L3	Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M3	Matrix spike recovery was outside laboratory control limits due to matrix interferences.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
N2	The lab does not hold NELAC/TNI accreditation for this parameter.
N3	Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
P3	Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
R1	RPD value was outside control limits.
S0	Surrogate recovery outside laboratory control limits.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
T6	High boiling point hydrocarbons are present in the sample.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424609001	FD-SB-A4 (26-32.5)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424609004	FD-SB-D4-WM (5-20)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424609005	FD-SB-E4-WM (3-21)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424609001	FD-SB-A4 (26-32.5)	EPA 3550	528957	EPA 8081B	530398
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 3550	528957	EPA 8081B	530398
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 3550	528957	EPA 8081B	530398
10424609004	FD-SB-D4-WM (5-20)	EPA 3550	528957	EPA 8081B	530398
10424609005	FD-SB-E4-WM (3-21)	EPA 3550	528957	EPA 8081B	530398
10424609001	FD-SB-A4 (26-32.5)	EPA 3550	528834	EPA 8082A	529071
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 3550	528834	EPA 8082A	529071
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 3550	528834	EPA 8082A	529071
10424609004	FD-SB-D4-WM (5-20)	EPA 3550	528834	EPA 8082A	529071
10424609005	FD-SB-E4-WM (3-21)	EPA 3550	528834	EPA 8082A	529071
10424609001	FD-SB-A4 (26-32.5)	WI MOD DRO	529461	WI MOD DRO	529593
10424609002	FD-SB-B4-WM (3-20 WM)	WI MOD DRO	529461	WI MOD DRO	529593
10424609003	FD-SB-C4-WM (5-20 WM)	WI MOD DRO	529461	WI MOD DRO	529593
10424609004	FD-SB-D4-WM (5-20)	WI MOD DRO	529461	WI MOD DRO	529593
10424609005	FD-SB-E4-WM (3-21)	WI MOD DRO	529084	WI MOD DRO	529165
10424609001	FD-SB-A4 (26-32.5)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424609004	FD-SB-D4-WM (5-20)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424609005	FD-SB-E4-WM (3-21)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424609001	FD-SB-A4 (26-32.5)	EPA 3050	528915	EPA 6010C	528992
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 3050	528915	EPA 6010C	528992
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 3050	528915	EPA 6010C	528992
10424609004	FD-SB-D4-WM (5-20)	EPA 3050	528915	EPA 6010C	528992
10424609005	FD-SB-E4-WM (3-21)	EPA 3050	528915	EPA 6010C	528992
10424609001	FD-SB-A4 (26-32.5)	EPA 3050B	434613	EPA 6020	434971
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 3050B	434613	EPA 6020	434971
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 3050B	434613	EPA 6020	434971
10424609004	FD-SB-D4-WM (5-20)	EPA 3050B	434613	EPA 6020	434971
10424609005	FD-SB-E4-WM (3-21)	EPA 3050B	434613	EPA 6020	434971
10424609001	FD-SB-A4 (26-32.5)	EPA 3050	528917	EPA 6020A	529111
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 3050	528917	EPA 6020A	529111
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 3050	528917	EPA 6020A	529111
10424609004	FD-SB-D4-WM (5-20)	EPA 3050	528917	EPA 6020A	529111
10424609005	FD-SB-E4-WM (3-21)	EPA 3050	528917	EPA 6020A	529111
10424609001	FD-SB-A4 (26-32.5)	EPA 7471	529743	EPA 7471	529845
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 7471	529743	EPA 7471	529845
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 7471	529743	EPA 7471	529845
10424609004	FD-SB-D4-WM (5-20)	EPA 7471	529743	EPA 7471	529845

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424609005	FD-SB-E4-WM (3-21)	EPA 7471	529743	EPA 7471	529845
10424609001	FD-SB-A4 (26-32.5)	ASTM D2974	528989		
10424609002	FD-SB-B4-WM (3-20 WM)	ASTM D2974	528989		
10424609003	FD-SB-C4-WM (5-20 WM)	ASTM D2974	528989		
10424609004	FD-SB-D4-WM (5-20)	ASTM D2974	528989		
10424609005	FD-SB-E4-WM (3-21)	ASTM D2974	528989		
10424609001	FD-SB-A4 (26-32.5)	EPA 3550	529268	EPA 8270D	529887
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 3550	529268	EPA 8270D	529887
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 3550	529268	EPA 8270D	529887
10424609004	FD-SB-D4-WM (5-20)	EPA 3550	529268	EPA 8270D	529887
10424609005	FD-SB-E4-WM (3-21)	EPA 3550	529268	EPA 8270D	529887
10424609001	FD-SB-A4 (26-32.5)	EPA 3550	528955	EPA 8270D by SIM	529226
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 3550	528955	EPA 8270D by SIM	529226
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 3550	528955	EPA 8270D by SIM	529226
10424609004	FD-SB-D4-WM (5-20)	EPA 3550	528955	EPA 8270D by SIM	529226
10424609005	FD-SB-E4-WM (3-21)	EPA 3550	528955	EPA 8270D by SIM	529226
10424609001	FD-SB-A4 (26-32.5)	EPA 3546	529569	EPA 8270D	530638
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 3546	529569	EPA 8270D	530638
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 3546	529569	EPA 8270D	530638
10424609004	FD-SB-D4-WM (5-20)	EPA 3546	529569	EPA 8270D	530638
10424609005	FD-SB-E4-WM (3-21)	EPA 3546	529569	EPA 8270D	530638
10424609001	FD-SB-A4 (26-32.5)	EPA 5035/5030B	528973	EPA 8260B	529212
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 5035/5030B	528973	EPA 8260B	529212
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 5035/5030B	528973	EPA 8260B	529212
10424609004	FD-SB-D4-WM (5-20)	EPA 5035/5030B	528973	EPA 8260B	529212
10424609005	FD-SB-E4-WM (3-21)	EPA 5035/5030B	528973	EPA 8260B	529212
10424609001	FD-SB-A4 (26-32.5)	EPA 3060A	434844	EPA 7196A	435162
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 3060A	434844	EPA 7196A	435162
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 3060A	434844	EPA 7196A	435162
10424609004	FD-SB-D4-WM (5-20)	EPA 3060A	434844	EPA 7196A	435162
10424609005	FD-SB-E4-WM (3-21)	EPA 3060A	434844	EPA 7196A	435162
10424609001	FD-SB-A4 (26-32.5)	Trivalent Chromium Calculation	435725		
10424609002	FD-SB-B4-WM (3-20 WM)	Trivalent Chromium Calculation	435725		
10424609003	FD-SB-C4-WM (5-20 WM)	Trivalent Chromium Calculation	435725		
10424609004	FD-SB-D4-WM (5-20)	Trivalent Chromium Calculation	435725		
10424609005	FD-SB-E4-WM (3-21)	Trivalent Chromium Calculation	435725		
10424609001	FD-SB-A4 (26-32.5)	EPA 9012A	284583	EPA 9012	284661
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 9012A	284583	EPA 9012	284661
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 9012A	284583	EPA 9012	284661
10424609004	FD-SB-D4-WM (5-20)	EPA 9012A	284583	EPA 9012	284661
10424609005	FD-SB-E4-WM (3-21)	EPA 9012A	284583	EPA 9012	284661

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424609001	FD-SB-A4 (26-32.5)	EPA 300.0	139574	EPA 9056A	139586
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 300.0	139574	EPA 9056A	139586
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 300.0	139574	EPA 9056A	139586
10424609004	FD-SB-D4-WM (5-20)	EPA 300.0	139574	EPA 9056A	139586
10424609005	FD-SB-E4-WM (3-21)	EPA 300.0	139574	EPA 9056A	139586

REPORT OF LABORATORY ANALYSIS

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Minnesota Pollution Control Agency

Chain-of-Custody Form

Work Order Number:

COC Type:

10424609

Turnaround Time:

COC ID:

PROJECT/CLIENT INFO

LABORATORY

ONLY

Facility Code: MPCA - Free Way LF Solids Program Code (MDH Lab Only):

Lab Name:

Project Name: MPCA - Free Way LF Solids Project Task Code:

Address: 18-00383

Project Manager:

EPIC Proj # 38716

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 Sample-Routine Sample
 S-IVP-Integrated Vertical Profile Sample
 S-CWOP-Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES
 DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES
 Wt-Ground=Groundwater
 Wt-Surf=Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	Lab Sample No.	#	
FD-SB-A4 (26-32.5)	S	3/22/18	125	26"	32"	C	SD				13	X	X								001	1
FD-SB-B4-WM (3-20 W.M.)	S	3/22/18	130	3'	20'	C	SD				13	X	X								002	2
FD-SB-C4-WM (5-20 W.M.)	S	3/22/18	150	5'	20'	C	SD				13	X	X								003	3
FD-SB-D4-WM (5-20)	S	3/22/18	150	5'	20'	C	SD				13	X	X								004	4
FD-SB-E4-WM (3-21)	S	3/22/18	1630	3'	21'	C	SD				13	X	X								005	5
																						6
																						7
																						8
																						9
																						10

Sampled By: David Anderson

Sampler's Signature: David Anderson

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) David Anderson / Pace Analytical	3/22/18 / 1730	[Signature] Grace	3-22-18 1740

T=4.9°C

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluorine, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Sample Condition Upon Receipt **Client Name:** Pace-Field **Project #:** **WO# : 10424609**

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____

Tracking Number: _____

PM: BM2 **Due Date:** 04/06/18
CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer 151401163 **Type of Ice:** Wet Blue None Dry Melted
Used: G87A9155100842

Cooler Temp Read (°C): 4.9 **Cooler Temp Corrected (°C):** 4.9 **Biological Tissue Frozen?** Yes No N/A
Temp should be above freezing to 6°C **Correction Factor:** +0.8 **Date and Initials of Person Examining Contents:** 3/22/18 JD

USDA Regulated Soil (N/A, water sample)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <u>3/22/18 JD</u>	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. <u>No time on samples</u>
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
(HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed:
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		


CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: BA VC **Date:** 3/23/18


Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 31Jan2018
	Document No.: F-GB-C-031-rev.06	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace MN Project #: _____
Courier: CS Logistics Fed Ex Speedee UPS Waltco
 Client Pace Other: _____
Tracking #: 1674108-1
Custody Seal on Cooler/Box Present: yes no **Seals intact:** yes no
Custody Seal on Samples Present: yes no **Seals intact:** yes no
Packing Material: Bubble Wrap Bubble Bags None Other
Thermometer Used SR - 75 **Type of Ice:** Wet Blue Dry None Samples on ice, cooling process has begun
Cooler Temperature Uncorr: 2 / Corr: 2

WO#: 40166401



40166401

Temp Blank Present: yes no **Biological Tissue is Frozen:** yes no
 Temp should be above freezing to 6°C.
 Biota Samples may be received at ≤ 0°C.

Person examining contents:
 Date: 3/24/18
 Initials: SK

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>FRWO</u> <u>SK 3/24/18</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time: _____
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<u>SK 3/24/18</u>
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	10. <u>CO5 - lid cracked upon receipt - replaced by kb</u>
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. <u>SK 3/24/18</u>
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>No times on client labels</u>
-Includes date/time/ID/Analysis Matrix: <u>S</u>		<u>SK 3/24/18</u>
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution: _____ If checked, see attached form for additional comments
 Person Contacted: _____ Date/Time: _____
 Comments/ Resolution: _____

Project Manager Review: CE Date: 3/26/18



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50193059

Date/Time and Initials of person examining contents: 3/22/18 1950 JG

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 7232

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: ① 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 1.4/1.6 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.			All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl. All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)						
Chain of Custody Present:			Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:			Dissolved Metals field filtered?:			
Short Hold Time Analysis (<72hr)? Analysis:			Headspace Wisconsin Sulfide			
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608) Residual Chlorine Check (Total/Amenable/Free Cyanide)	Present	Absent	N/A
Rush TAT Requested:			Headspace in VOA Vials (>6mm):			
Containers Intact?:			Trip Blank Present?:			
Sample Labels Match COC?: Except TCs, which only require sample ID			Trip Blank Custody Seals?:			

Comments:

Chain of Custody

WO#: 12106317
 PM: HRZ Due Date: 04/06/18
 CLIENT: PACE MPLS

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: M

Workorder: 10424609 Workorder Name: 18-00383 MPCA FreewayLF Solids Owner Received Date: 3/22/2018 Results Requested By: 4/6/2018

Report To		Subcontract To					Requested Analysis																			
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Duluth 4730 Oneota St. Duluth, MN 55807 Phone (218)727-6380					Methyl Mercury by EPA 1630																			
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved	Preserved Containers				LAB USE ONLY															
1	FD-SB-A4 (26-32.5)	PS	3/22/2018 11:25	10424609001	Solid	1																				
2	FD-SB-B4-WM (3-20 WM)	PS	3/22/2018 13:20	10424609002	Solid	1																				
3	FD-SB-C4-WM (5-20 WM)	PS	3/22/2018 15:00	10424609003	Solid	1																				
4	FD-SB-D4-WM (5-20)	PS	3/22/2018 15:50	10424609004	Solid	1																				
5	FD-SB-E4-WM (3-21)	PS	3/22/2018 16:30	10424609005	Solid	1																				
Transfers		Released By	Date/Time	Received By		Date/Time		Comments																		
1		<i>Ray Paul Pace</i>	<i>3/26/18 16:35</i>	<i>[Signature]</i>		<i>3/27/18 10:30</i>																				
2																										
3																										
Cooler Temperature on Receipt		0.4 °C		Custody Seal <input checked="" type="radio"/> Y or N		Received on Ice <input checked="" type="radio"/> Y or N		Samples Intact <input checked="" type="radio"/> Y or N																		

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace-Mpls Project #: _____

WO#: 12106317

PM: HRZ Due Date: 04/06/18
CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 01339252/1710 IR-1 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.4 Cooler Temp Corrected °C: 0.4 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6°C Correction Factor: 0.0 Date and Initials of Person Examining Contents: al 3/27/18

If temperature is ≤0°C, is there evidence of ice formation? Yes No NA

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N Heater JTD TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____ Date: 3/27/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Sample Condition Upon Receipt

Client Name: Pace Mpls Project #: _____

WO#: 12106317
 PM: HRZ Due Date: 04/06/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: SD

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.0 Cooler Temp Corrected °C: 1.3 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 10.3 Date and Initials of Person Examining Contents: Bm 3/27/18

Comments: _____

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 3/27/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

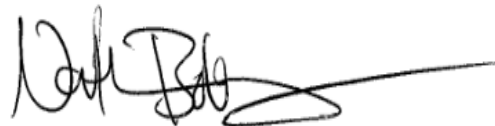
PaceProject#: 10424611
Sample Receipt Date: 03/22/2018
Client Project #: MPCA - Freeway LF Sol
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 04, 2018

Nathan Boberg, Project Manager

(612) 607-6444 (fax)
nathan.boberg@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

April 4, 2018



DISCUSSION

This report presents the results from the analyses performed on three samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 61-73%. All of the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

Laboratory and matrix spike samples were also prepared with the sample batch using clean reference matrix or sample matrix that had been fortified with native standard materials. The results show that the spiked native TCDD was recovered at 94-102% with a relative percent difference of 0.1%. These results were within the target ranges for the method.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE	MN002
Arkansas	88-0680	New York (NEL	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

WO#: 10424611



10424611



Minnesota Pollution Control Agency

Chain-of-Custody Form

Work Order Number:

Turnaround Time:

COC ID:

FOR LAB USE ONLY

PROJECT/CLIENT INFO

LABORATORY

Facility Code: *MPCA-Free way LF solids* Program Code (MDH Lab Only):

Lab Name:

Project Name: *MPCA-Free way LF solids* Project Task Code:

Address:

Project Manager:

*18-00383
EPIC PDA/107 38716*

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 Sample=Routine Sample
 S-IVP=Integrated Vertical Profile Sample
 S-CWOP=Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES
 DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES
 Wt-Ground=Groundwater
 Wt-Surf=Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS PRESERV.	Lab Sample No.	#
<i>FD-SB-A4 (26-32.5)</i>	<i>S</i>	<i>3/22/18</i>	<i>125</i>	<i>26"</i>	<i>32"</i>	<i>C</i>	<i>SD</i>				<i>13</i>	<i>see attached sheet for 26-32.5/waste (-Dioxins)</i>	<i>001</i>	<i>1</i>
<i>FD-SB-B4-WM (3-20 WM)</i>	<i>S</i>	<i>3/22/18</i>	<i>130</i>	<i>3"</i>	<i>20"</i>	<i>C</i>	<i>SD</i>				<i>13</i>	<i>+ Dioxins</i>		<i>2</i>
<i>FD-SB-C4-WM (5-20 WM)</i>	<i>S</i>	<i>3/22/18</i>	<i>150</i>	<i>5'</i>	<i>20'</i>	<i>C</i>	<i>SD</i>				<i>13</i>		<i>002</i>	<i>3</i>
<i>FD-SB-D4-WM (5-20)</i>	<i>S</i>	<i>3/22/18</i>	<i>150</i>	<i>5'</i>	<i>20'</i>	<i>C</i>	<i>SD</i>				<i>13</i>			<i>4</i>
<i>FD-SB-E4-WM (3-21)</i>	<i>S</i>	<i>3/22/18</i>	<i>163</i>	<i>3'</i>	<i>21'</i>	<i>C</i>	<i>SD</i>				<i>13</i>		<i>003</i>	<i>5</i>
														<i>6</i>
														<i>7</i>
														<i>8</i>
														<i>9</i>
														<i>10</i>

Sampled By: *David Anderson*

Sampler's Signature: *David Anderson*

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
<i>David Anderson / Pace Analytical</i>	<i>3/22/18/1730</i>	<i>[Signature]</i>	<i>3-22-18 1740</i>

T=4.9°C

Sample Condition Upon Receipt Client Name: Pace Field Project #: **WO#: 10424611**
 Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____
 Tracking Number: _____

Optional: Proj. Due Date: _____ Proj. Name: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No
 Thermometer 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted
 Cooler Temp Read (°C): 4.9 Cooler Temp Corrected (°C): 4.9 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.5 Date and Initials of Person Examining Contents: 3/22/18 SD

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. No time on samples
-Includes Date/Time/ID/Analysis Matrix: <u>SD</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
(HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)		Initial when completed: _____ Lot # of added preservative: _____
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: [Signature] Date: 03/23/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluorine, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA-8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-A4 (26-325)		
Lab Sample ID	10424611001		
Filename	F180402B_16		
Injected By	SMT		
Total Amount Extracted	14.3 g	Matrix	Solid
% Moisture	67.7	Dilution	NA
Dry Weight Extracted	4.62 g	Collected	03/22/2018 11:25
ICAL ID	F180329	Received	03/22/2018 17:40
CCal Filename(s)	F180402B_04 & F180402B_21	Extracted	03/26/2018 15:05
Method Blank ID	BLANK-61315	Analyzed	04/03/2018 01:22

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	73
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	75

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-C4-WM (5-20 WM)		
Lab Sample ID	10424611002		
Filename	F180402B_17		
Injected By	SMT		
Total Amount Extracted	14.5 g	Matrix	Solid
% Moisture	19.9	Dilution	NA
Dry Weight Extracted	11.6 g	Collected	03/22/2018 15:00
ICAL ID	F180329	Received	03/22/2018 17:40
CCal Filename(s)	F180402B_04 & F180402B_21	Extracted	03/26/2018 15:05
Method Blank ID	BLANK-61315	Analyzed	04/03/2018 02:07

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	4.8	----	1.0	2,3,7,8-TCDD-13C	2.00	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	66

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-E4-WM (3-21)		
Lab Sample ID	10424611003		
Filename	F180402B_18		
Injected By	SMT		
Total Amount Extracted	14.4 g	Matrix	Solid
% Moisture	23.0	Dilution	NA
Dry Weight Extracted	11.1 g	Collected	03/22/2018 16:30
ICAL ID	F180329	Received	03/22/2018 17:40
CCal Filename(s)	F180402B_04 & F180402B_21	Extracted	03/26/2018 15:05
Method Blank ID	BLANK-61315	Analyzed	04/03/2018 02:52

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	66
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	68

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61315	Matrix	Solid
Filename	F180329A_17	Dilution	NA
Total Amount Extracted	75.1 g	Extracted	03/26/2018 15:05
ICAL ID	F180329	Analyzed	03/29/2018 23:16
CCal Filename(s)	F180329A_12 & F180329A_26	Injected By	SMT

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	57
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	59

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61316	Matrix	Solid
Filename	Y180329A_06	Dilution	NA
Total Amount Extracted	75.9 g	Extracted	03/26/2018 15:05
ICAL ID	Y180204	Analyzed	03/29/2018 17:06
CCal Filename(s)	Y180329A_01 & Y180329A_16	Injected By	SMT
Method Blank ID	BLANK-61315		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.19	94	2,3,7,8-TCDD-13C	2.0	50
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	49

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 8290 Spiked Sample Report

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-A4 (26-325)		
Lab Sample ID	10424611001-MS		
Filename	F180402B_19	Matrix	Solid
Total Amount Extracted	14.4 g	Dilution	NA
ICAL ID	F180329	Extracted	03/26/2018 15:05
CCal Filename(s)	F180402B_04 & F180402B_21	Analyzed	04/03/2018 03:37
Method Blank ID	BLANK-61315	Injected By	SMT

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.20	102	2,3,7,8-TCDD-37Cl4	0.20	73
				2,3,7,8-TCDD-13C	2.00	71

Qs = Quantity Spiked

Qm = Quantity Measured

Rec. = Recovery (Expressed as Percent)

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Spiked Sample Report

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-A4 (26-325)		
Lab Sample ID	10424611001-MSD		
Filename	F180403B_04	Matrix	Solid
Total Amount Extracted	14.3 g	Dilution	NA
ICAL ID	F180329	Extracted	03/26/2018 15:05
CCal Filename(s)	F180403B_01 & F180403B_18	Analyzed	04/03/2018 16:33
Method Blank ID	BLANK-61315	Injected By	SMT

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.20	102	2,3,7,8-TCDD-37Cl4	0.20	77
				2,3,7,8-TCDD-13C	2.00	76

Qs = Quantity Spiked

Qm = Quantity Measured

Rec. = Recovery (Expressed as Percent)

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Spike Sample Results

Client - PACE Minnesota Field

Client Sample ID	FD-SB-A4 (26-325)			<u>Dry Weights</u>	
Lab Sample ID	10424611001	Sample Filename	F180402B_16	Sample Amount	4.62 g
MS ID	10424611001-MS	MS Filename	F180402B_19	MS Amount	4.7 g
MSD ID	10424611001-MSD	MSD Filename	F180403B_04	MSD Amount	4.6 g

Analyte	Sample Conc. ng/Kg	MS/MSD Qs (ng)	MS Qm (ng)	MSD Qm (ng)	RPD	Background Subtracted		
						MS % Rec.	MSD % Rec.	RPD
2,3,7,8-TCDD	0.000	0.20	0.20	0.20	0.1	102	102	0.1

Definitions

MS = Matrix Spike	CDD = Chlorinated dibenzo-p-dioxin
MSD = Matrix Spike Duplicate	CDF = Chlorinated dibenzo-p-furan
Qm = Quantity Measured	T = Tetra
Qs = Quantity Spiked	Pe = Penta
% Rec. = Percent Recovery	Hx = Hexa
RPD = Relative Percent Difference	Hp = Hepta
NA = Not Applicable	O = Octa
NC = Not Calculated	

April 12, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 23, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Unionized Ammonia was not calculated for sample FD-SB-B4 due to insufficient volume to conduct the field pH & Temperature

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Bob Michels
bob.michels@pacelabs.com
(612)607-6452
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Montana Certificate #CERT0103
California Certification #2973
California Certification #2973
Alaska Certification UST-107
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512
Minnesota Department of Health, Certificate #1385941
Arkansas Department of Environmental Quality, Certificate #17-046-0
Georgia Environmental Protection Division, Stipulation
Illinois Environmental Protection Agency, Certificate #004325
Michigan Department of Environmental Quality, Laboratory #0034

New York State Department of Health, Serial #56192 and 56193
North Carolina Division of Water Resources, Certificate #659
Virginia Department of General Services, Certificate #9028
Wisconsin Department of Natural Resources, Laboratory #999472650
U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10424766001	FD-SB-B4	Water	03/23/18 15:00	03/23/18 16:00
10424766002	FD-SB-D4	Water	03/23/18 15:30	03/23/18 16:00

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10424766001	FD-SB-B4	EPA 200.7	DM	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	PW1	1	PASI-M
		Hach 10360 Rev 1.1	DCL	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-H+B	JFP	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		EPA 353.2	JFP	3	PASI-M
		SM 4500-P E	DCL	1	PASI-M
		10424766002	FD-SB-D4	EPA 8081B	XV1
EPA 8082A	RAG			11	PASI-M
EPA 200.7	DM			8	PASI-M
EPA 200.8	TT3			2	PASI-M
EPA 200.8	TT3			12	PASI-M
EPA 245.1	PW1			1	PASI-M
EPA 8270D	JRH			38	PASI-M
	HRZ			2	PASI-V
Hach 10360 Rev 1.1	DCL			1	PASI-M
EPA 1664A OG	AR3			1	PASI-M
EPA 180.1	JFP			1	PASI-M
SM 2540D	NAS			1	PASI-M
SM 4500-H+B	JFP			1	PASI-M
Trivalent Chromium Calculation	KEO			1	PASI-M
EPA 300.0	KEO			1	PASI-M
SM 3500-Cr D Modified	JFP			1	PASI-M
EPA 350.1	HRZ			1	PASI-V
EPA 350.1 rev. 2 (1993)	DMB			1	PASI-V
EPA 353.2	JFP			3	PASI-M
EPA 9016	AMM			1	PASI-GRMI
SM 4500-CN-E	DCL	1	PASI-M		
SM 4500-P E	DCL	1	PASI-M		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

Sample: FD-SB-B4	Lab ID: 10424766001	Collected: 03/23/18 15:00	Received: 03/23/18 16:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	03/29/18 10:55	03/30/18 16:40	7429-90-5	
Barium, Dissolved	490	ug/L	10.0	1	03/29/18 10:55	03/30/18 16:40	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/29/18 10:55	03/30/18 16:40	7440-50-8	
Manganese, Dissolved	1300	ug/L	5.0	1	03/29/18 10:55	03/30/18 16:40	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/29/18 10:55	03/30/18 16:40	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/29/18 10:55	03/30/18 16:40	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/29/18 10:55	03/30/18 16:40	7440-31-5	
Zinc, Dissolved	ND	ug/L	20.0	1	03/29/18 10:55	03/30/18 16:40	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	20.0	ug/L	2.5	5	03/28/18 10:49	03/29/18 00:12	7440-47-3	
Total Hardness by 2340B	1100000	ug/L	14100	100	03/28/18 10:49	03/29/18 00:15		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	1.7	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:21	7440-36-0	
Arsenic, Dissolved	3.5	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:21	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/28/18 09:42	03/28/18 15:21	7440-41-7	
Boron, Dissolved	15200	ug/L	500	100	03/28/18 09:42	03/29/18 10:00	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/28/18 09:42	03/28/18 15:21	7440-43-9	
Chromium, Dissolved	3.2	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:21	7440-47-3	
Cobalt, Dissolved	0.96	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:21	7440-48-4	
Lead, Dissolved	0.42	ug/L	0.10	1	03/28/18 09:42	03/28/18 15:21	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:21	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/28/18 09:42	03/28/18 15:21	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:21	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/28/18 09:42	03/28/18 15:21	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	03/29/18 09:14	03/29/18 12:45	7439-97-6	
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	79.3	mg/L	20.0	10	03/23/18 18:23	03/28/18 14:57		
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	18400	NTU	150	500		03/24/18 11:28		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	22200	mg/L	66.7	1		03/29/18 10:40		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	6.7	Std. Units	0.10	1		03/27/18 14:30		H6
Trivalent Chromium Calculation								
Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	ND	mg/L	0.010	1		04/04/18 10:29		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

Sample: FD-SB-B4		Lab ID: 10424766001	Collected: 03/23/18 15:00	Received: 03/23/18 16:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions		Analytical Method: EPA 300.0						
Fluoride	ND	mg/L	0.050	1		03/31/18 02:07	16984-48-8	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr D Modified						
Chromium, Hexavalent	0.060	mg/L	0.010	1		03/24/18 11:24		FS,M3
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	32.4	mg/L	1.0	1	04/02/18 07:00	04/03/18 08:35	7664-41-7	
353.2 Nitrate + Nitrite		Analytical Method: EPA 353.2						
Nitrate as N	ND	mg/L	0.020	1		03/24/18 11:17	14797-55-8	FS
Nitrite as N	0.027	mg/L	0.020	1		03/24/18 11:17	14797-65-0	FS
Nitrogen, NO2 plus NO3	0.032	mg/L	0.020	1		03/24/18 11:17		FS
SM4500P-E, Total Phosphorus		Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B						
Phosphorus	6.1	mg/L	0.25	5	04/03/18 10:29	04/03/18 17:12	7723-14-0	

Sample: FD-SB-D4		Lab ID: 10424766002	Collected: 03/23/18 15:30	Received: 03/23/18 16:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C						
Aldrin	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	309-00-2	
alpha-BHC	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	319-84-6	
beta-BHC	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	319-85-7	
delta-BHC	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	58-89-9	
Chlordane (Technical)	ND	ug/L	5.4	10	03/27/18 14:00	04/05/18 17:18	57-74-9	
alpha-Chlordane	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	5103-71-9	
gamma-Chlordane	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	5103-74-2	
4,4'-DDD	ND	ug/L	1.1	10	03/27/18 14:00	04/05/18 17:18	72-54-8	
4,4'-DDE	ND	ug/L	1.1	10	03/27/18 14:00	04/05/18 17:18	72-55-9	
4,4'-DDT	ND	ug/L	1.1	10	03/27/18 14:00	04/05/18 17:18	50-29-3	
Dieldrin	ND	ug/L	1.1	10	03/27/18 14:00	04/05/18 17:18	60-57-1	
Endosulfan I	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	959-98-8	
Endosulfan II	ND	ug/L	1.1	10	03/27/18 14:00	04/05/18 17:18	33213-65-9	
Endosulfan sulfate	ND	ug/L	1.1	10	03/27/18 14:00	04/05/18 17:18	1031-07-8	
Endrin	ND	ug/L	1.1	10	03/27/18 14:00	04/05/18 17:18	72-20-8	
Endrin aldehyde	ND	ug/L	1.1	10	03/27/18 14:00	04/05/18 17:18	7421-93-4	
Endrin ketone	ND	ug/L	1.1	10	03/27/18 14:00	04/05/18 17:18	53494-70-5	
Heptachlor	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	76-44-8	
Heptachlor epoxide	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	1024-57-3	
Methoxychlor	ND	ug/L	5.4	10	03/27/18 14:00	04/05/18 17:18	72-43-5	
Toxaphene	ND	ug/L	16.1	10	03/27/18 14:00	04/05/18 17:18	8001-35-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

Sample: FD-SB-D4	Lab ID: 10424766002	Collected: 03/23/18 15:30	Received: 03/23/18 16:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Surrogates								
Tetrachloro-m-xylene (S)	0	%.	62-125	10	03/27/18 14:00	04/05/18 17:18	877-09-8	2M, D3, S4
Decachlorobiphenyl (S)	0	%.	30-143	10	03/27/18 14:00	04/05/18 17:18	2051-24-3	S4
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:11	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:11	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:11	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:11	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:11	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:11	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:11	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:11	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:11	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	68	%.	30-125	1	03/27/18 14:00	04/03/18 13:11	877-09-8	
Decachlorobiphenyl (S)	35	%.	30-125	1	03/27/18 14:00	04/03/18 13:11	2051-24-3	
200.7 MET ICP, Dissolved Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	03/29/18 10:55	03/30/18 16:43	7429-90-5	
Barium, Dissolved	694	ug/L	10.0	1	03/29/18 10:55	03/30/18 16:43	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/29/18 10:55	03/30/18 16:43	7440-50-8	
Manganese, Dissolved	351	ug/L	5.0	1	03/29/18 10:55	03/30/18 16:43	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/29/18 10:55	03/30/18 16:43	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/29/18 10:55	03/30/18 16:43	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/29/18 10:55	03/30/18 16:43	7440-31-5	
Zinc, Dissolved	ND	ug/L	20.0	1	03/29/18 10:55	03/30/18 16:43	7440-66-6	
200.8 MET ICPMS Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	6.0	ug/L	2.5	5	03/28/18 10:49	03/29/18 00:18	7440-47-3	
Total Hardness by 2340B	1030000	ug/L	14100	100	03/28/18 10:49	03/29/18 00:21		
200.8 MET ICPMS, Dissolved Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:25	7440-36-0	
Arsenic, Dissolved	8.1	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:25	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/28/18 09:42	03/28/18 15:25	7440-41-7	
Boron, Dissolved	19500	ug/L	500	100	03/28/18 09:42	03/29/18 10:03	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/28/18 09:42	03/28/18 15:25	7440-43-9	
Chromium, Dissolved	4.7	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:25	7440-47-3	
Cobalt, Dissolved	2.3	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:25	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/28/18 09:42	03/28/18 15:25	7439-92-1	
Selenium, Dissolved	0.81	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:25	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/28/18 09:42	03/28/18 15:25	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:25	7440-61-1	
Vanadium, Dissolved	1.7	ug/L	1.0	1	03/28/18 09:42	03/28/18 15:25	7440-62-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

Sample: FD-SB-D4	Lab ID: 10424766002	Collected: 03/23/18 15:30	Received: 03/23/18 16:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	03/29/18 09:14	03/29/18 12:47	7439-97-6	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	83-32-9	
Anthracene	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	50-32-8	
Benzoic acid	ND	ug/L	53.8	1	03/26/18 15:13	03/30/18 10:59	65-85-0	3M
4-Bromophenylphenyl ether	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	111-44-4	
2-Chlorophenol	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	53.8	1	03/26/18 15:13	03/30/18 10:59	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	120-83-2	
Diethylphthalate	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	84-66-2	
2,4-Dimethylphenol	ND	ug/L	53.8	1	03/26/18 15:13	03/30/18 10:59	105-67-9	
Dimethylphthalate	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	117-81-7	
Fluoranthene	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	206-44-0	
Fluorene	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	86-73-7	
Hexachlorobenzene	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	53.8	1	03/26/18 15:13	03/30/18 10:59	77-47-4	
Hexachloroethane	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	67-72-1	
Isophorone	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	21.5	1	03/26/18 15:13	03/30/18 10:59		
N-Nitrosodiphenylamine	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	86-30-6	
Pentachlorophenol	ND	ug/L	21.5	1	03/26/18 15:13	03/30/18 10:59	87-86-5	
Phenanthrene	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	85-01-8	
Phenol	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	108-95-2	
Pyrene	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	73	%	60-125	1	03/26/18 15:13	03/30/18 10:59	4165-60-0	
2-Fluorobiphenyl (S)	79	%	56-125	1	03/26/18 15:13	03/30/18 10:59	321-60-8	
p-Terphenyl-d14 (S)	87	%	58-125	1	03/26/18 15:13	03/30/18 10:59	1718-51-0	
Phenol-d6 (S)	84	%	58-125	1	03/26/18 15:13	03/30/18 10:59	13127-88-3	
2-Fluorophenol (S)	75	%	55-125	1	03/26/18 15:13	03/30/18 10:59	367-12-4	
2,4,6-Tribromophenol (S)	86	%	65-125	1	03/26/18 15:13	03/30/18 10:59	118-79-6	

Field Data

Analytical Method:

Field pH	6.9	Std. Units	1	03/22/18 00:00
Field Temperature	10.0	deg C	1	03/22/18 00:00

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

Sample: FD-SB-D4	Lab ID: 10424766002	Collected: 03/23/18 15:30	Received: 03/23/18 16:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	24.0	mg/L	20.0	10	03/23/18 18:23	03/28/18 14:59		
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	5.7	1		04/02/18 09:56		1M
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	309	NTU	30.0	100		03/24/18 11:29		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	220	mg/L	10.0	1		03/29/18 10:40		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	6.6	Std. Units	0.10	1		03/29/18 15:58		H6
Trivalent Chromium Calculation								
Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	ND	mg/L	0.010	1		04/04/18 10:29		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Fluoride	0.14	mg/L	0.050	1		03/31/18 02:37	16984-48-8	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr D Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		03/24/18 11:24		FS
350.1 Ammonia, Unionized								
Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	0.15	mg/L	0.010	1		04/10/18 12:42		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	99.2	mg/L	0.80	8	04/02/18 07:00	04/03/18 08:56	7664-41-7	
353.2 Nitrate + Nitrite								
Analytical Method: EPA 353.2								
Nitrate as N	ND	mg/L	0.020	1		03/24/18 11:18	14797-55-8	FS
Nitrite as N	ND	mg/L	0.020	1		03/24/18 11:18	14797-65-0	FS
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		03/24/18 11:18		FS,M1
9016 Cyanide, Free								
Analytical Method: EPA 9016 Preparation Method: EPA 9016								
Cyanide, Free	ND	ug/L	5.0	1	04/05/18 16:15	04/05/18 17:15		
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	26.0	ug/L	10.0	1	04/03/18 09:46	04/03/18 12:48	57-12-5	
SM4500P-E, Total Phosphorus								
Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B								
Phosphorus	0.29	mg/L	0.050	1	04/03/18 10:29	04/03/18 16:22	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 529562 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury - Dissolved
Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2874494 Matrix: Water
Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	03/29/18 12:36	

LABORATORY CONTROL SAMPLE & LCSD: 2874495 2874496

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury, Dissolved	ug/L	5	5.4	5.5	107	110	85-115	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 529546 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2874431 Matrix: Water
Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	03/30/18 16:29	
Barium, Dissolved	ug/L	ND	10.0	03/30/18 16:29	
Copper, Dissolved	ug/L	ND	10.0	03/30/18 16:29	
Manganese, Dissolved	ug/L	ND	5.0	03/30/18 16:29	
Nickel, Dissolved	ug/L	ND	20.0	03/30/18 16:29	
Silver, Dissolved	ug/L	ND	10.0	03/30/18 16:29	
Tin, Dissolved	ug/L	ND	75.0	03/30/18 16:29	
Zinc, Dissolved	ug/L	ND	20.0	03/30/18 16:29	

LABORATORY CONTROL SAMPLE & LCSD: 2874432

Parameter	Units	2874433								Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	
Aluminum, Dissolved	ug/L	20000	20700	20900	104	104	85-115	1	20	
Barium, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	
Copper, Dissolved	ug/L	1000	977	981	98	98	85-115	0	20	
Manganese, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	
Nickel, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	
Silver, Dissolved	ug/L	500	494	495	99	99	85-115	0	20	
Tin, Dissolved	ug/L	1000	983	981	98	98	85-115	0	20	
Zinc, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 529357 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2873355 Matrix: Water
Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	0.50	03/29/18 00:00	

LABORATORY CONTROL SAMPLE: 2873356

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	100	112	112	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873357 2873358

Parameter	Units	30247016001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Chromium	ug/L	0.42J	100	100	114	115	114	115	70-130	1	20	

MATRIX SPIKE SAMPLE: 2873359

Parameter	Units	10425051001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	12.6	100	123	110	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 529354 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2873346 Matrix: Water
Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Arsenic, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Beryllium, Dissolved	ug/L	ND	0.20	03/28/18 14:47	
Boron, Dissolved	ug/L	ND	5.0	03/28/18 14:47	
Cadmium, Dissolved	ug/L	ND	0.080	03/28/18 14:47	
Chromium, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Cobalt, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Lead, Dissolved	ug/L	ND	0.10	03/28/18 14:47	
Selenium, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Thallium, Dissolved	ug/L	ND	0.10	03/28/18 14:47	
Uranium-238, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Vanadium, Dissolved	ug/L	ND	1.0	03/28/18 14:47	

LABORATORY CONTROL SAMPLE: 2873347

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	102	102	85-115	
Arsenic, Dissolved	ug/L	100	104	104	85-115	
Beryllium, Dissolved	ug/L	100	108	108	85-115	
Boron, Dissolved	ug/L	100	115	115	85-115	
Cadmium, Dissolved	ug/L	100	104	104	85-115	
Chromium, Dissolved	ug/L	100	108	108	85-115	
Cobalt, Dissolved	ug/L	100	105	105	85-115	
Lead, Dissolved	ug/L	100	105	105	85-115	
Selenium, Dissolved	ug/L	100	105	105	85-115	
Thallium, Dissolved	ug/L	100	104	104	85-115	
Uranium-238, Dissolved	ug/L	100	109	109	85-115	
Vanadium, Dissolved	ug/L	100	107	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873348 2873349

Parameter	Units	10424606001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Antimony, Dissolved	ug/L	ND	100	100	110	112	110	112	70-130	2	20		
Arsenic, Dissolved	ug/L	0.66	100	100	110	114	110	113	70-130	3	20		
Beryllium, Dissolved	ug/L	ND	100	100	116	117	116	117	70-130	1	20		
Boron, Dissolved	ug/L	1690	100	100	1850	1870	153	176	70-130	1	20	M1	
Cadmium, Dissolved	ug/L	ND	100	100	108	111	108	111	70-130	2	20		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873348												2873349	
Parameter	Units	10424606001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual		
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD			
Chromium, Dissolved	ug/L	0.56	100	100	113	115	112	115	70-130	2	20		
Cobalt, Dissolved	ug/L	ND	100	100	109	111	108	111	70-130	3	20		
Lead, Dissolved	ug/L	ND	100	100	109	113	109	113	70-130	3	20		
Selenium, Dissolved	ug/L	ND	100	100	107	108	107	108	70-130	2	20		
Thallium, Dissolved	ug/L	ND	100	100	109	112	109	112	70-130	3	20		
Uranium-238, Dissolved	ug/L	3.3	100	100	114	120	111	116	70-130	5	20		
Vanadium, Dissolved	ug/L	1.7	100	100	113	116	111	115	70-130	3	20		

MATRIX SPIKE SAMPLE: 2873350											
Parameter	Units	10425051001 Result	Spike	MS	MS	% Rec	Qualifiers				
			Conc.	Result	% Rec	Limits					
Antimony, Dissolved	ug/L	ND	100	111	111	70-130					
Arsenic, Dissolved	ug/L	ND	100	114	111	70-130					
Beryllium, Dissolved	ug/L	ND	100	117	117	70-130					
Boron, Dissolved	ug/L	245	100	344	99	70-130					
Cadmium, Dissolved	ug/L	ND	100	107	107	70-130					
Chromium, Dissolved	ug/L	ND	100	118	114	70-130					
Cobalt, Dissolved	ug/L	ND	100	108	108	70-130					
Lead, Dissolved	ug/L	ND	100	111	111	70-130					
Selenium, Dissolved	ug/L	ND	100	115	111	70-130					
Thallium, Dissolved	ug/L	ND	100	110	109	70-130					
Uranium-238, Dissolved	ug/L	5.1	100	118	113	70-130					
Vanadium, Dissolved	ug/L	ND	100	120	115	70-130					

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

QC Batch: 529156

Analysis Method: EPA 8081B

QC Batch Method: EPA Mod. 3510C

Analysis Description: 8081B GCS Pesticides

Associated Lab Samples: 10424766002

METHOD BLANK: 2872152

Matrix: Water

Associated Lab Samples: 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/05/18 16:23	
4,4'-DDE	ug/L	ND	0.10	04/05/18 16:23	
4,4'-DDT	ug/L	ND	0.10	04/05/18 16:23	
Aldrin	ug/L	ND	0.050	04/05/18 16:23	
alpha-BHC	ug/L	ND	0.050	04/05/18 16:23	
alpha-Chlordane	ug/L	ND	0.050	04/05/18 16:23	
beta-BHC	ug/L	ND	0.050	04/05/18 16:23	
Chlordane (Technical)	ug/L	ND	0.50	04/05/18 16:23	
delta-BHC	ug/L	ND	0.050	04/05/18 16:23	
Dieldrin	ug/L	ND	0.10	04/05/18 16:23	
Endosulfan I	ug/L	ND	0.050	04/05/18 16:23	
Endosulfan II	ug/L	ND	0.10	04/05/18 16:23	
Endosulfan sulfate	ug/L	ND	0.10	04/05/18 16:23	
Endrin	ug/L	ND	0.10	04/05/18 16:23	
Endrin aldehyde	ug/L	ND	0.10	04/05/18 16:23	
Endrin ketone	ug/L	ND	0.10	04/05/18 16:23	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/05/18 16:23	
gamma-Chlordane	ug/L	ND	0.050	04/05/18 16:23	
Heptachlor	ug/L	ND	0.050	04/05/18 16:23	
Heptachlor epoxide	ug/L	ND	0.050	04/05/18 16:23	
Methoxychlor	ug/L	ND	0.50	04/05/18 16:23	
Toxaphene	ug/L	ND	1.5	04/05/18 16:23	
Decachlorobiphenyl (S)	%	92	30-143	04/05/18 16:23	
Tetrachloro-m-xylene (S)	%	93	62-125	04/05/18 16:23	

LABORATORY CONTROL SAMPLE & LCSD: 2872153

2872154

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
4,4'-DDD	ug/L	1	1.0	1.0	100	102	67-125	1	20	
4,4'-DDE	ug/L	1	0.97	0.99	97	99	68-125	1	20	
4,4'-DDT	ug/L	1	1.0	1.0	101	101	66-125	1	20	
Aldrin	ug/L	.5	0.43	0.43	87	86	46-125	1	20	
alpha-BHC	ug/L	.5	0.45	0.45	90	90	66-125	1	20	
alpha-Chlordane	ug/L	.5	0.47	0.47	94	94	72-125	0	20	
beta-BHC	ug/L	.5	0.47	0.47	94	94	72-125	0	20	
delta-BHC	ug/L	.5	0.30	0.30	59	60	37-141	1	20	
Dieldrin	ug/L	1	1.0	1.0	104	105	71-125	0	20	
Endosulfan I	ug/L	.5	0.45	0.44	89	89	69-125	0	20	
Endosulfan II	ug/L	1	1.0	1.0	102	102	73-125	0	20	
Endosulfan sulfate	ug/L	1	0.85	0.86	85	86	63-127	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

Parameter	Units	2872153		2872154			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Endrin	ug/L	1	0.96	0.97	96	97	72-125	1	20	
Endrin aldehyde	ug/L	1	0.96	0.97	96	97	70-125	2	20	
Endrin ketone	ug/L	1	1.0	1.1	105	106	72-127	1	20	
gamma-BHC (Lindane)	ug/L	.5	0.46	0.47	93	94	69-125	1	20	
gamma-Chlordane	ug/L	.5	0.42	0.42	84	84	64-125	0	20	
Heptachlor	ug/L	.5	0.47	0.46	94	93	54-125	2	20	
Heptachlor epoxide	ug/L	.5	0.47	0.47	95	94	72-125	0	20	
Methoxychlor	ug/L	5	5.0	5.1	100	102	67-127	2	20	
Decachlorobiphenyl (S)	%				86	89	30-143			
Tetrachloro-m-xylene (S)	%				90	90	62-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

QC Batch: 529059

Analysis Method: EPA 8270D

QC Batch Method: EPA 3520

Analysis Description: 8270D Water MSSV

Associated Lab Samples: 10424766002

METHOD BLANK: 2871273

Matrix: Water

Associated Lab Samples: 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	03/29/18 22:06	
2,4-Dichlorophenol	ug/L	ND	10.0	03/29/18 22:06	
2,4-Dimethylphenol	ug/L	ND	50.0	03/29/18 22:06	
2,4-Dinitrophenol	ug/L	ND	10.0	03/29/18 22:06	
2-Chlorophenol	ug/L	ND	10.0	03/29/18 22:06	
2-Methylnaphthalene	ug/L	ND	10.0	03/29/18 22:06	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	03/29/18 22:06	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	03/29/18 22:06	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	03/29/18 22:06	
4-Bromophenylphenyl ether	ug/L	ND	10.0	03/29/18 22:06	
Acenaphthene	ug/L	ND	10.0	03/29/18 22:06	
Anthracene	ug/L	ND	10.0	03/29/18 22:06	
Benzo(a)pyrene	ug/L	ND	10.0	03/29/18 22:06	
Benzoic acid	ug/L	ND	50.0	03/29/18 22:06	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	03/29/18 22:06	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	03/29/18 22:06	
Butylbenzylphthalate	ug/L	ND	10.0	03/29/18 22:06	
Di-n-butylphthalate	ug/L	ND	10.0	03/29/18 22:06	
Di-n-octylphthalate	ug/L	ND	10.0	03/29/18 22:06	
Diethylphthalate	ug/L	ND	10.0	03/29/18 22:06	
Dimethylphthalate	ug/L	ND	10.0	03/29/18 22:06	
Fluoranthene	ug/L	ND	10.0	03/29/18 22:06	
Fluorene	ug/L	ND	10.0	03/29/18 22:06	
Hexachlorobenzene	ug/L	ND	10.0	03/29/18 22:06	
Hexachlorocyclopentadiene	ug/L	ND	50.0	03/29/18 22:06	
Hexachloroethane	ug/L	ND	10.0	03/29/18 22:06	
Isophorone	ug/L	ND	10.0	03/29/18 22:06	
N-Nitrosodiphenylamine	ug/L	ND	10.0	03/29/18 22:06	
Pentachlorophenol	ug/L	ND	20.0	03/29/18 22:06	
Phenanthrene	ug/L	ND	10.0	03/29/18 22:06	
Phenol	ug/L	ND	10.0	03/29/18 22:06	
Pyrene	ug/L	ND	10.0	03/29/18 22:06	
2,4,6-Tribromophenol (S)	%	73	65-125	03/29/18 22:06	
2-Fluorobiphenyl (S)	%	75	56-125	03/29/18 22:06	
2-Fluorophenol (S)	%	71	55-125	03/29/18 22:06	
Nitrobenzene-d5 (S)	%	69	60-125	03/29/18 22:06	
p-Terphenyl-d14 (S)	%	103	58-125	03/29/18 22:06	
Phenol-d6 (S)	%	73	58-125	03/29/18 22:06	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

LABORATORY CONTROL SAMPLE & LCSD: 2871274		2871275									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
2,4,6-Trichlorophenol	ug/L	50	39.2	38.3	78	77	74-125	2	20		
2,4-Dichlorophenol	ug/L	50	36.4	37.8	73	76	68-125	4	20		
2,4-Dimethylphenol	ug/L	50	32.2J	33.1J	64	66	33-125		20		
2,4-Dinitrophenol	ug/L	50	31.8	32.6	64	65	30-127	3	20		
2-Chlorophenol	ug/L	50	32.8	34.4	66	69	61-125	5	20		
2-Methylnaphthalene	ug/L	50	36.4	37.4	73	75	67-125	3	20		
2-Methylphenol(o-Cresol)	ug/L	50	32.9	34.3	66	69	63-125	4	20		
3&4-Methylphenol(m&p Cresol)	ug/L	50	34.5	36.0	69	72	67-125	4	20		
3,3'-Dichlorobenzidine	ug/L	50	50.1	48.1J	100	96	60-125		20		
4-Bromophenylphenyl ether	ug/L	50	41.5	40.2	83	80	75-125	3	20		
Acenaphthene	ug/L	50	39.1	38.3	78	77	74-125	2	20		
Anthracene	ug/L	50	43.0	40.3	86	81	75-125	7	20		
Benzo(a)pyrene	ug/L	50	41.7	40.2	83	80	75-125	4	20		
Benzoic acid	ug/L	50	17.9J	22.6J	36	45	30-125		20		
bis(2-Chloroethyl) ether	ug/L	50	31.1	32.4	62	65	55-125	4	20		
bis(2-Ethylhexyl)phthalate	ug/L	50	40.1	38.9	80	78	72-129	3	20		
Butylbenzylphthalate	ug/L	50	40.6	38.9	81	78	69-127	4	20		
Di-n-butylphthalate	ug/L	50	40.3	39.4	81	79	75-125	2	20		
Di-n-octylphthalate	ug/L	50	41.0	39.6	82	79	69-131	3	20		
Diethylphthalate	ug/L	50	41.6	40.1	83	80	75-125	4	20		
Dimethylphthalate	ug/L	50	41.0	39.4	82	79	75-125	4	20		
Fluoranthene	ug/L	50	42.4	40.8	85	82	75-125	4	20		
Fluorene	ug/L	50	40.5	39.1	81	78	75-125	3	20		
Hexachlorobenzene	ug/L	50	41.0	39.3	82	79	74-125	4	20		
Hexachlorocyclopentadiene	ug/L	50	20.3J	20.7J	41	41	30-125		20		
Hexachloroethane	ug/L	50	31.3	32.6	63	65	30-125	4	20		
Isophorone	ug/L	50	36.9	36.6	74	73	72-125	1	20		
N-Nitrosodiphenylamine	ug/L	50	40.6	39.1	81	78	75-125	4	20		
Pentachlorophenol	ug/L	50	35.6	35.6	71	71	52-125	0	20		
Phenanthrene	ug/L	50	42.3	40.2	85	80	75-125	5	20		
Phenol	ug/L	50	32.8	35.2	66	70	59-125	7	20		
Pyrene	ug/L	50	42.3	40.9	85	82	75-125	3	20		
2,4,6-Tribromophenol (S)	%				83	80	65-125				
2-Fluorobiphenyl (S)	%				79	78	56-125				
2-Fluorophenol (S)	%				67	70	55-125				
Nitrobenzene-d5 (S)	%				69	71	60-125				
p-Terphenyl-d14 (S)	%				91	89	58-125				
Phenol-d6 (S)	%				71	75	58-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 530075 Analysis Method: EPA 1664A OG
QC Batch Method: EPA 1664A OG Analysis Description: 1664 HEM, Oil and Grease
Associated Lab Samples: 10424766002

METHOD BLANK: 2877442 Matrix: Water
Associated Lab Samples: 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	04/02/18 09:56	

LABORATORY CONTROL SAMPLE & LCSD: 2877443

Parameter	Units	2877444								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	40	32.9	31.6	82	79	78-114	4	18	

MATRIX SPIKE SAMPLE: 2877445

Parameter	Units	10424683004					
		Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers	
Oil and Grease	mg/L	30.2	43.5	70.0	92	78-114	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

QC Batch: 528880

Analysis Method: EPA 180.1

QC Batch Method: EPA 180.1

Analysis Description: 180.1 Turbidity

Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2870624

Matrix: Water

Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	03/24/18 11:24	

LABORATORY CONTROL SAMPLE: 2870625

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.4	102	90-110	

SAMPLE DUPLICATE: 2870626

Parameter	Units	10424809001 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	30.2	29.0	4	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 529572 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2874524 Matrix: Water
Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	03/29/18 10:40	

LABORATORY CONTROL SAMPLE: 2874525

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	90.0	90	80-120	

SAMPLE DUPLICATE: 2874526

Parameter	Units	10424772001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	<5.0	ND		10	

SAMPLE DUPLICATE: 2874527

Parameter	Units	10424814001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	151	150	1	10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

QC Batch: 529218 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 10424766001

LABORATORY CONTROL SAMPLE: 2872361

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	100	98-102	H6

SAMPLE DUPLICATE: 2872362

Parameter	Units	10424592001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	10.6	10.6	0	3	H6

SAMPLE DUPLICATE: 2872363

Parameter	Units	92378064001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	5.4	5.4	0	3	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

QC Batch: 529639 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 10424766002

LABORATORY CONTROL SAMPLE: 2874718

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	99	98-102	H6

SAMPLE DUPLICATE: 2874719

Parameter	Units	10425318005 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.6	7.6	0	3	H6

SAMPLE DUPLICATE: 2874720

Parameter	Units	10425318006 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.0	7.0	0	3	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 529627 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2874679 Matrix: Water
Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	ND	0.050	03/30/18 20:53	

LABORATORY CONTROL SAMPLE: 2874680

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	1	0.96	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874681 2874682

Parameter	Units	10424547001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Fluoride	mg/L	0.29	1	1	1.3	1.3	98	99	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874683 2874684

Parameter	Units	10424924002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Fluoride	mg/L	0.065	1	1	1.1	1.1	103	104	90-110	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

QC Batch: 528877 Analysis Method: SM 3500-Cr D Modified
 QC Batch Method: SM 3500-Cr D Modified Analysis Description: Chromium, Hexavalent by 3500
 Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2870604 Matrix: Water

Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	03/24/18 11:24	FS

LABORATORY CONTROL SAMPLE: 2870605

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.20	100	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2870606 2870607

Parameter	Units	10424766001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/L	0.060	.2	.2	0.038	0.036	-11	-12	85-115	6	20	FS,M3

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

QC Batch: 139700 Analysis Method: EPA 350.1 rev. 2 (1993)
 QC Batch Method: EPA 350.1 rev. 2 (1993) Analysis Description: 350.1 Ammonia Distilled
 Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 553300 Matrix: Water

Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	04/03/18 08:30	

LABORATORY CONTROL SAMPLE: 553301

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	10	10.3	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553302 553303

Parameter	Units	10424606001		553302		553303		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Nitrogen, Ammonia	mg/L	2.0	10	10	10	9.8	10.0	78	80	90-110	2	10 M0

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 528878 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2870608 Matrix: Water
Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	03/24/18 11:22	FS
Nitrite as N	mg/L	ND	0.020	03/24/18 11:22	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	03/24/18 11:22	FS

LABORATORY CONTROL SAMPLE: 2870609

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	0.95	95	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	1.0	102	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2870610 2870611

Parameter	Units	10424766002		2870610		2870611		% Rec Limits	RPD	Max RPD	Qual	
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec					MSD % Rec
Nitrite as N	mg/L	ND	1	1	0.94	0.94	93	94	90-110	1	20	FS
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	0.89	0.96	89	96	90-110	8	20	FS,M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 19623 Analysis Method: EPA 9016
QC Batch Method: EPA 9016 Analysis Description: 9016 Free Cyanide
Associated Lab Samples: 10424766002

METHOD BLANK: 77969 Matrix: Water
Associated Lab Samples: 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/05/18 17:03	

LABORATORY CONTROL SAMPLE: 77970

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	151	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 77971 77972

Parameter	Units	10424606001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	ND	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Cyanide, Free	ug/L	ND	150	150	160	160	106	106	80-120	0	11				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

QC Batch: 530296 Analysis Method: SM 4500-CN-E
 QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
 Associated Lab Samples: 10424766002

METHOD BLANK: 2878424 Matrix: Water

Associated Lab Samples: 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/03/18 12:40	

LABORATORY CONTROL SAMPLE: 2878425

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	241	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878426 2878427

Parameter	Units	10423797004 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Cyanide	ug/L	1.5 mg/L	250	250	1950	1840	172	128	80-120	6	30	H3,M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878428 2878429

Parameter	Units	10425152001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Cyanide	ug/L	38.4	250	250	269	268	92	92	80-120	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 530336 Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2878501 Matrix: Water
Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	04/03/18 16:05	

LABORATORY CONTROL SAMPLE: 2878502

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	1.0	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878503 2878504

Parameter	Units	10425125001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Phosphorus	mg/L	0.070	1	1	1.2	1.2	115	116	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878505 2878506

Parameter	Units	10425125002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Phosphorus	mg/L	11.8	1	1	12.6	12.5	78	70	80-120	1	30	M6

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10424766

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 529648

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 530075

[BE] Batch extracted by solid phase extraction (SPE).

Batch: 530078

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 530399

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

ANALYTE QUALIFIERS

- 1M Sample pH adjusted using 1mL 6N HCl.
- 2M Sample was yellow in color. Emulsion was also present during the extraction process.
- 3M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
- D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
- D6 The precision between the sample and sample duplicate exceeded laboratory control limits.
- FS The sample was filtered in the laboratory prior to analysis.
- H3 Sample was received or analysis requested beyond the recognized method holding time.
- H6 Analysis initiated outside of the 15 minute EPA required holding time.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424766002	FD-SB-D4	EPA Mod. 3510C	529156	EPA 8081B	530399
10424766002	FD-SB-D4	EPA Mod. 3510C	529157	EPA 8082A	530078
10424766001	FD-SB-B4	EPA 200.7	529546	EPA 200.7	529681
10424766002	FD-SB-D4	EPA 200.7	529546	EPA 200.7	529681
10424766001	FD-SB-B4	EPA 200.8	529357	EPA 200.8	529494
10424766002	FD-SB-D4	EPA 200.8	529357	EPA 200.8	529494
10424766001	FD-SB-B4	EPA 200.8	529354	EPA 200.8	529496
10424766002	FD-SB-D4	EPA 200.8	529354	EPA 200.8	529496
10424766001	FD-SB-B4	EPA 245.1	529562	EPA 245.1	529636
10424766002	FD-SB-D4	EPA 245.1	529562	EPA 245.1	529636
10424766002	FD-SB-D4	EPA 3520	529059	EPA 8270D	529648
10424766002	FD-SB-D4				
10424766001	FD-SB-B4	Hach 10360	528769	Hach 10360 Rev 1.1	528875
10424766002	FD-SB-D4	Hach 10360	528769	Hach 10360 Rev 1.1	528875
10424766002	FD-SB-D4	EPA 1664A OG	530075		
10424766001	FD-SB-B4	EPA 180.1	528880		
10424766002	FD-SB-D4	EPA 180.1	528880		
10424766001	FD-SB-B4	SM 2540D	529572		
10424766002	FD-SB-D4	SM 2540D	529572		
10424766001	FD-SB-B4	SM 4500-H+B	529218		
10424766002	FD-SB-D4	SM 4500-H+B	529639		
10424766001	FD-SB-B4	Trivalent Chromium Calculation	530596		
10424766002	FD-SB-D4	Trivalent Chromium Calculation	530596		
10424766001	FD-SB-B4	EPA 300.0	529627		
10424766002	FD-SB-D4	EPA 300.0	529627		
10424766001	FD-SB-B4	SM 3500-Cr D Modified	528877		
10424766002	FD-SB-D4	SM 3500-Cr D Modified	528877		
10424766002	FD-SB-D4	EPA 350.1			
10424766001	FD-SB-B4	EPA 350.1 rev. 2 (1993)	139700	EPA 350.1 rev. 2 (1993)	139774
10424766002	FD-SB-D4	EPA 350.1 rev. 2 (1993)	139700	EPA 350.1 rev. 2 (1993)	139774
10424766001	FD-SB-B4	EPA 353.2	528878		
10424766002	FD-SB-D4	EPA 353.2	528878		
10424766002	FD-SB-D4	EPA 9016	19623	EPA 9016	19643
10424766002	FD-SB-D4	SM 4500-CN-E	530296	SM 4500-CN-E	530376
10424766001	FD-SB-B4	SM 4500-P B	530336	SM 4500-P E	530390
10424766002	FD-SB-D4	SM 4500-P B	530336	SM 4500-P E	530390

REPORT OF LABORATORY ANALYSIS

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WO#: 10424766



Chain-of-Custody Form

Work
Tu

PROJECT/CLIENT INFO

Facility Code:	MPCA FREEWAY LE WATERS	Program Code (MDH Lab Only):	Lab Name:
Project Name:	MPCA FREEWAY LE WATERS	Project Task Code:	Address: 18-00383
Project Manager:			EPIC Profile # 38716
Potential Hazard?	If yes, add information to Sampler Comments Section		Phone No:

FOR LAB USE ONLY

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES				LAB MATRIX CODES				FIELD MATRIX CODES				ANALYSIS	PRESERV.	Lab Sample No.	#
Sample	Type	Date	Time	Start Depth	End Depth	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments	# of Coats				
FD-SB-A4		3/23/18								No sample	17				1
FD-SB-B4	S	3/23/18	1500			G	NW				5				2
FD-SB-D4	S	3/23/18	1530			G	NW				17				3
															4
															5
															6
															7
															8
															9
															10

Sampled By: David Anderson Sampler's Signature: David Anderson Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
David Anderson / Pace	3/23/18 / 1600	Pace	3/23/18 / 1600

T=8.7

(1) For FD-SB-B4 collected partial list of List A, (2) 1 L GN / (1) HAN3 filtered, (1) HNO3 UNFILT, (1) 250 H2504

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigaiton Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO3	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals: Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

-- Analysis by MDH Laboratory

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500ClO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA). BGJ-Pace

Sample Condition Upon Receipt

Client Name: MPCA

Project #: _____

WO# : 10424766

PM: BM2

Due Date: 04/06/18

CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No

Seals Intact? Yes No

Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____

Temp Blank? Yes No

Thermometer 151401163
Used: G87A9155100842

Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 8.5 Cooler Temp Corrected (°C): 8.7

Biological Tissue Frozen? Yes No N/A

Temp should be above freezing to 6°C

Correction Factor: +0.2

Date and Initials of Person Examining Contents: ME 3/23/18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>W.F.</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1 3/2</u> <u>1</u>
(HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>2 3/2</u> <u>1</u> <u>1</u>
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: <u>ME</u> Lot # of added preservative: <u>3116093</u>
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____

Date/Time: _____

Comments/Resolution: _____

Project Manager Review: BA VC

Date: 3/26/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Sample Condition Upon Receipt

Client Name: Pace Mpls Project #: _____

WO# : 12106323
 PM: HRZ Due Date: 04/06/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: SD

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.0 Cooler Temp Corrected °C: 1.3 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 10.3 Date and Initials of Person Examining Contents: Bm 3/27/18

Comments: _____

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N Skoller JTD TEMPERATURE WAIVER ON FILE Y N
 Project Manager Review: _____ Date: 3/27/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



SAMPLE RECEIVING / LOG-IN CHECKLIST

Client <i>Pace Minnesota</i>	Work Order #: <i>469926</i>
Receipt Record Page/Line # <i>15-5</i>	Project Chemist / Sample #s

Recorded by (initials/date) <i>PS 8/27/18</i>	<input type="checkbox"/> Cooler <input type="checkbox"/> Box <input type="checkbox"/> Other	Qty Received <i>1</i>	<input checked="" type="checkbox"/> IR Gun (#202) Thermometer Used <input type="checkbox"/> Digital Thermometer (#54) <input type="checkbox"/> See Additional Cooler Information Form <input type="checkbox"/> Other (#)
--	---	--------------------------	---

Cooler #	Time	Cooler #	Time	Cooler #	Time	Cooler #	Time
<i>Reel</i>	<i>1030</i>						
Custody Seals: <input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact	
Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None	
Coolant Location: <input checked="" type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom	
Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No	
If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative	
Observed °C	Correction Factor °C	Actual °C	Temp Blank:	Observed °C	Correction Factor °C	Actual °C	Temp Blank:
Sample 1: <i>1.8</i>		<i>1.8</i>		Sample 1:			
Sample 2: <i>1.7</i>		<i>1.7</i>		Sample 2:			
Sample 3: <i>1.0</i>		<i>1.0</i>		Sample 3:			
3 Sample Average °C:				3 Sample Average °C:			
<input type="checkbox"/> Cooler ID on COC?				<input type="checkbox"/> Cooler ID on COC?			
<input type="checkbox"/> VOC Trip Blank received?				<input type="checkbox"/> VOC Trip Blank received?			

If any shaded areas checked, complete Sample Receiving Non-Conformance and/or Inventory Form

Paperwork Received

Yes	No	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Chain of Custody record(s)? If No, Initiated By _____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Received for Lab Signed/Date/Time?
<input type="checkbox"/>	<input type="checkbox"/>	Shipping document?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other _____

COC Information

Pace COC Other _____

COC ID Numbers:

Check COC for Accuracy

Yes	No	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Analysis Requested?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID matches COC?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample Date and Time matches COC?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Container type completed on COC?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	All container types indicated are received?

Sample Condition Summary

N/A	Yes	No	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Broken containers/lids?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Missing or incomplete labels?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Illegible information on labels?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Low volume received?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Inappropriate or non-Pace containers received?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	VOC vials / TOX containers have headspace?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Temperature Blank OR average sample temperature, ≥6° C?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If either is ≥6° C, was thermal preservation required?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If "Yes", Project Chemist Approval Initials: _____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If "Yes" Completed Non Con Cooler - Cont Inventory Form?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Completed Sample Preservation Verification Form?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Samples chemically preserved correctly?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If "No", added orange tag?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Received pre-preserved VOC soils?
	<input type="checkbox"/>	<input type="checkbox"/>	MeOH <input type="checkbox"/> Na ₂ SO ₄

Check for Short Hold-Time Prep/Analyses

<input type="checkbox"/>	Bacteriological
<input type="checkbox"/>	Air Bags
<input type="checkbox"/>	EnCores / Methanol Pre-Preserved
<input type="checkbox"/>	Formaldehyde/Aldehyde
<input type="checkbox"/>	Green-tagged containers
<input type="checkbox"/>	Yellow/White-tagged 1 L ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
 NONE RECEIVED
 RECEIVED, COCs TO LAB(S)

Notes

Trip Blank received Trip Blank not listed on COC

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
<i>PS 8/27/18</i>	<i>PS 8/27/18</i>	Yes / No

AQUEOUS SAMPLE PRESERVATION VERIFICATION

Client <i>Pace - Minnesota</i>	Work Order # <i>469926</i>
Receipt Log # <i>15-5-2</i>	Completed By (initials/date) <i>JS 3/27/18</i>
Project Manager	

COC ID #												Adjusted by: _____	
												Date: _____	
Container Type	5 / 23		4		13		6		15				
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1	✓	N/A											
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

pH Strip Reagent or Lot # <input checked="" type="checkbox"/> HC727135 <input type="checkbox"/> Other
--

Place a check mark in the Received box if pH is acceptable. If pH is not acceptable, document the Received and Adjusted pH values in the appropriate columns (all adjustments must be reviewed by the project manager). Never add more than 2x the default preservation volume (see table below for default volumes). Complete and attach an orange preservation tag to all adjusted samples. A Sample Receiving Non-Conformance Report must be completed if a pH adjustment was required.

Comments:

COC ID #												Adjusted by: _____	
												Date: _____	
Container Type	5 / 23		4		13		6		15				
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1													
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

Container Size (mL)	Default Preservative Volume (mL)
Container Types 5 / 23	NaOH
250	1.3
Container Type 4	H ₂ SO ₄
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H ₂ SO ₄
500	2.5
Container Types 6 / 15	HNO ₃
125	0.7
250	1.25
500	2.5
1000	5.0

Comments:

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

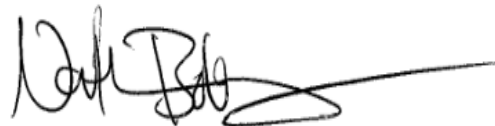
Pace Project #: 10424768
Sample Receipt Date: 03/23/2018
Client Project #: MPCA Freeway LF Wat
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 05, 2018

Nathan Boberg, Project Manager

(612) 607-6444 (fax)
nathan.boberg@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

April 5, 2018



DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of PACE Minnesota Field. The sample was analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration points and a nominal 1-liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The sample was received above the recommended temperature range of 0-6 degrees Celsius.

The isotopically-labeled TCDD internal standard in the sample extract was recovered at 54%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 121-124% with a relative percent difference of 2.4%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE	MN002
Arkansas	88-0680	New York (NEL	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

Sample Condition Upon Receipt

Client Name: MPCA

Project #: WO# : 10424768

WO# : 10424768

PM: SCU

Due Date: 04/06/18

CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 887A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 8.5 Cooler Temp Corrected (°C): 8.5 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: ME 3/23/18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH>9 Sulfide, NaOH>12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature]

Date: 03/23/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-D4		
Lab Sample ID	10424768001		
Filename	U180401B_17		
Injected By	BAL		
Total Amount Extracted	970 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/23/2018 15:30
ICAL ID	U171222	Received	03/23/2018 16:00
CCal Filename(s)	U180401B_01	Extracted	03/28/2018 13:35
Method Blank ID	BLANK-61371	Analyzed	04/02/2018 02:27

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	54
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	90

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61371	Matrix	Water
Filename	F180401B_06	Dilution	NA
Total Amount Extracted	1010 mL	Extracted	03/28/2018 13:35
ICAL ID	F180329	Analyzed	04/01/2018 15:28
CCal Filename(s)	F180401B_01	Injected By	BAL

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	74
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	87

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61372	Matrix	Water
Filename	F180401B_03	Dilution	NA
Total Amount Extracted	996 mL	Extracted	03/28/2018 13:35
ICAL ID	F180329	Analyzed	04/01/2018 13:13
CCal Filename	F180401B_01	Injected By	BAL
Method Blank ID	BLANK-61371		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	12	7.3	14.6	121
2,3,7,8-TCDD-37Cl4	10	8.7	3.7	15.8	87
2,3,7,8-TCDD-13C	100	72	25.0	141.0	72

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61373	Matrix	Water
Filename	F180401B_04	Dilution	NA
Total Amount Extracted	992 mL	Extracted	03/28/2018 13:35
ICAL ID	F180329	Analyzed	04/01/2018 13:58
CCal Filename	F180401B_01	Injected By	BAL
Method Blank ID	BLANK-61371		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	12	7.3	14.6	124
2,3,7,8-TCDD-37Cl4	10	7.4	3.7	15.8	74
2,3,7,8-TCDD-13C	100	54	25.0	141.0	54

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61372
 Spike 1 Filename F180401B_03

Spike 2 ID LCSD-61373
 Spike 2 Filename F180401B_04

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	121	124	2.4

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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April 13, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA FreewayLF Solids
Pace Project No.: 10424793

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 23, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Bob Michels
bob.michels@pacelabs.com
(612)607-6452
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



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CERTIFICATIONS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

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SAMPLE SUMMARY

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10424793001	FD-SB-A3-S (30-35)	Solid	03/23/18 12:30	03/23/18 16:00
10424793002	FD-SB-B3-WM (5-26)	Solid	03/23/18 13:30	03/23/18 16:00
10424793003	FD-SB-C3-WM (5-20)	Solid	03/23/18 14:30	03/23/18 16:00

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10424793001	FD-SB-A3-S (30-35)	EPA 1630 (1998)	CPK	1	PASI-M
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	LPM	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-M
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	PW1	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	JRH	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 9012	DAW	1	PASI-M
		EPA 9056A	MCT	1	PASI-M
		10424793002	FD-SB-B3-WM (5-26)	EPA 1630 (1998)	CPK
EPA 8081B	XV1			24	PASI-M
EPA 8082A	RAG			12	PASI-M
WI MOD DRO	EC2			2	PASI-M
WI MOD GRO	LPM			2	PASI-M
EPA 6010C	DM			11	PASI-M
EPA 6020	DMT			1	PASI-M
EPA 6020A	RJS			10	PASI-M
EPA 7471	PW1			1	PASI-M
ASTM D2974	JDL			1	PASI-M
EPA 8270D	JLR, JRH			72	PASI-M
EPA 8270D by SIM	STB			18	PASI-M
EPA 8270D	STB			12	PASI-M
EPA 8260B	CD2			70	PASI-M
EPA 9012	DAW			1	PASI-M
EPA 9056A	MCT			1	PASI-M
10424793003	FD-SB-C3-WM (5-20)			EPA 1630 (1998)	CPK
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	LPM	2	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-M
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	PW1	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	JRH	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-M
		Trivalent Chromium Calculation	SLB	1	PASI-M
		EPA 9012	DAW	1	PASI-M
		EPA 9056A	MCT	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-A3-S (30-35) **Lab ID: 10424793001** Collected: 03/23/18 12:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	43.9	1	04/04/18 10:58	04/06/18 15:25		N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	309-00-2	
alpha-BHC	ND	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	319-84-6	
beta-BHC	64.3	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	319-85-7	M1
delta-BHC	ND	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	58-89-9	
Chlordane (Technical)	ND	ug/kg	166	2	03/28/18 12:51	04/05/18 18:51	57-74-9	
alpha-Chlordane	147	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	5103-71-9	M1
gamma-Chlordane	129	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	5103-74-2	M1
4,4'-DDD	ND	ug/kg	33.1	2	03/28/18 12:51	04/05/18 18:51	72-54-8	
4,4'-DDE	ND	ug/kg	33.1	2	03/28/18 12:51	04/05/18 18:51	72-55-9	
4,4'-DDT	ND	ug/kg	33.1	2	03/28/18 12:51	04/05/18 18:51	50-29-3	
Dieldrin	ND	ug/kg	33.1	2	03/28/18 12:51	04/05/18 18:51	60-57-1	
Endosulfan I	ND	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	959-98-8	
Endosulfan II	ND	ug/kg	33.1	2	03/28/18 12:51	04/05/18 18:51	33213-65-9	
Endosulfan sulfate	ND	ug/kg	33.1	2	03/28/18 12:51	04/05/18 18:51	1031-07-8	
Endrin	ND	ug/kg	33.1	2	03/28/18 12:51	04/05/18 18:51	72-20-8	
Endrin aldehyde	ND	ug/kg	33.1	2	03/28/18 12:51	04/05/18 18:51	7421-93-4	
Endrin ketone	ND	ug/kg	33.1	2	03/28/18 12:51	04/05/18 18:51	53494-70-5	
Heptachlor	ND	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	76-44-8	R1
Heptachlor epoxide	ND	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	1024-57-3	
Methoxychlor	ND	ug/kg	166	2	03/28/18 12:51	04/05/18 18:51	72-43-5	
Toxaphene	ND	ug/kg	497	2	03/28/18 12:51	04/05/18 18:51	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	37	%	30-150	2	03/28/18 12:51	04/05/18 18:51	877-09-8	4M, D4
Decachlorobiphenyl (S)	31	%	30-150	2	03/28/18 12:51	04/05/18 18:51	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	11100-14-4	
PCB, Total	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	86	%	48-125	1	03/28/18 12:51	04/02/18 10:43	877-09-8	
Decachlorobiphenyl (S)	87	%	30-134	1	03/28/18 12:51	04/02/18 10:43	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	ND	mg/kg	67.6	1	03/27/18 16:31	03/30/18 14:50		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-A3-S (30-35) **Lab ID: 10424793001** Collected: 03/23/18 12:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	120-12-7	
Benzo(a)anthracene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	56-55-3	
Benzo(a)pyrene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	101-55-3	
Butylbenzylphthalate	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	85-68-7	
Carbazole	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	59-50-7	
4-Chloroaniline	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	108-60-1	
2-Chloronaphthalene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	91-58-7	
2-Chlorophenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	7005-72-3	
Chrysene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	53-70-3	
Dibenzofuran	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	120-83-2	
Diethylphthalate	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	105-67-9	
Dimethylphthalate	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	131-11-3	
Di-n-butylphthalate	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	8430	1	03/27/18 12:47	03/30/18 14:19	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	606-20-2	
Di-n-octylphthalate	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	117-81-7	
Fluoranthene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	206-44-0	
Fluorene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	87-68-3	
Hexachlorobenzene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	118-74-1	
Hexachloroethane	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	193-39-5	
Isophorone	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	78-59-1	
1-Methylnaphthalene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	90-12-0	
2-Methylnaphthalene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: **FD-SB-A3-S (30-35)** Lab ID: **10424793001** Collected: 03/23/18 12:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	3270	1	03/27/18 12:47	03/30/18 14:19		
Naphthalene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	91-20-3	
2-Nitroaniline	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	88-74-4	
3-Nitroaniline	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	99-09-2	
4-Nitroaniline	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	100-01-6	
Nitrobenzene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	98-95-3	
2-Nitrophenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	88-75-5	
4-Nitrophenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	86-30-6	
Pentachlorophenol	ND	ug/kg	3320	1	03/27/18 12:47	03/30/18 14:19	87-86-5	
Phenanthrene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	85-01-8	
Phenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	108-95-2	
Pyrene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	62	%.	43-125	1	03/27/18 12:47	03/30/18 14:19	4165-60-0	
2-Fluorobiphenyl (S)	75	%.	30-132	1	03/27/18 12:47	03/30/18 14:19	321-60-8	
p-Terphenyl-d14 (S)	100	%.	62-125	1	03/27/18 12:47	03/30/18 14:19	1718-51-0	
Phenol-d6 (S)	69	%.	48-125	1	03/27/18 12:47	03/30/18 14:19	13127-88-3	
2-Fluorophenol (S)	61	%.	40-125	1	03/27/18 12:47	03/30/18 14:19	367-12-4	
2,4,6-Tribromophenol (S)	88	%.	60-125	1	03/27/18 12:47	03/30/18 14:19	118-79-6	
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	83-32-9	
Acenaphthylene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	208-96-8	
Anthracene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	120-12-7	
Benzo(a)anthracene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	56-55-3	
Benzo(a)pyrene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	207-08-9	
Chrysene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	53-70-3	
Fluoranthene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	206-44-0	
Fluorene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	193-39-5	
Naphthalene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	91-20-3	
Phenanthrene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	85-01-8	
Pyrene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	68	%.	42-125	1	03/27/18 15:20	04/02/18 22:27	321-60-8	
p-Terphenyl-d14 (S)	88	%.	57-125	1	03/27/18 15:20	04/02/18 22:27	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-A3-S (30-35) **Lab ID: 10424793001** Collected: 03/23/18 12:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	25057-89-0	
2,4-D	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	94-75-7	
2,4-DB	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	94-82-6	
Dicamba	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	1918-00-9	
Dinoseb	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	88-85-7	
MCPA	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	94-74-6	
Pentachlorophenol	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	87-86-5	
Picloram	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	1918-02-1	
2,4,5-T	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	93-72-1	
Triclopyr	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	55335-06-3	
Surrogates								
2,4-DCAA (S)	71	%.	46-125	1	03/29/18 07:30	04/04/18 16:17	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	8250	1	03/27/18 14:03	03/27/18 16:51	67-64-1	
Allyl chloride	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	107-05-1	
Benzene	256	ug/kg	165	1	03/27/18 14:03	03/27/18 16:51	71-43-2	
Bromobenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	108-86-1	
Bromochloromethane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	74-97-5	
Bromodichloromethane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	75-27-4	
Bromoform	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	75-25-2	
Bromomethane	ND	ug/kg	4120	1	03/27/18 14:03	03/27/18 16:51	74-83-9	
2-Butanone (MEK)	ND	ug/kg	2060	1	03/27/18 14:03	03/27/18 16:51	78-93-3	
n-Butylbenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	104-51-8	
sec-Butylbenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	135-98-8	
tert-Butylbenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	98-06-6	
Carbon tetrachloride	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	56-23-5	
Chlorobenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	108-90-7	
Chloroethane	ND	ug/kg	4120	1	03/27/18 14:03	03/27/18 16:51	75-00-3	
Chloroform	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	67-66-3	
Chloromethane	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	74-87-3	
2-Chlorotoluene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	95-49-8	
4-Chlorotoluene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	4120	1	03/27/18 14:03	03/27/18 16:51	96-12-8	
Dibromochloromethane	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	106-93-4	
Dibromomethane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	75-71-8	
1,1-Dichloroethane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	75-34-3	
1,2-Dichloroethane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	107-06-2	
1,1-Dichloroethene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	156-59-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-A3-S (30-35) **Lab ID: 10424793001** Collected: 03/23/18 12:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
trans-1,2-Dichloroethene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	156-60-5	
Dichlorofluoromethane	ND	ug/kg	4120	1	03/27/18 14:03	03/27/18 16:51	75-43-4	
1,2-Dichloropropane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	78-87-5	
1,3-Dichloropropane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	142-28-9	
2,2-Dichloropropane	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	594-20-7	
1,1-Dichloropropene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	60-29-7	
Ethylbenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	2060	1	03/27/18 14:03	03/27/18 16:51	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	98-82-8	
p-Isopropyltoluene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	99-87-6	
Methylene Chloride	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	2060	1	03/27/18 14:03	03/27/18 16:51	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	1634-04-4	
Naphthalene	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	91-20-3	
n-Propylbenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	103-65-1	
Styrene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	79-34-5	N2
Tetrachloroethene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	127-18-4	
Tetrahydrofuran	ND	ug/kg	16500	1	03/27/18 14:03	03/27/18 16:51	109-99-9	
Toluene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	79-00-5	
Trichloroethene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	108-67-8	
Vinyl chloride	ND	ug/kg	165	1	03/27/18 14:03	03/27/18 16:51	75-01-4	
Xylene (Total)	ND	ug/kg	1240	1	03/27/18 14:03	03/27/18 16:51	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	91	%	75-125	1	03/27/18 14:03	03/27/18 16:51	17060-07-0	
Toluene-d8 (S)	96	%	75-125	1	03/27/18 14:03	03/27/18 16:51	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125	1	03/27/18 14:03	03/27/18 16:51	460-00-4	

9012 Cyanide, Total

Analytical Method: EPA 9012 Preparation Method: EPA 9012A

Cyanide	ND	mg/kg	1.7	1	04/05/18 10:35	04/05/18 14:44	57-12-5	
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9056 IC Anions

Analytical Method: EPA 9056A Preparation Method: EPA 300.0

Fluoride	ND	mg/kg	0.99	1	04/05/18 12:00	04/05/18 18:34	16984-48-8	
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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-B3-WM (5-26) **Lab ID:** 10424793002 Collected: 03/23/18 13:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.1	1	04/04/18 10:58	04/06/18 15:31		N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	309-00-2	
alpha-BHC	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	319-84-6	
beta-BHC	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	319-85-7	
delta-BHC	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	58-89-9	
Chlordane (Technical)	ND	ug/kg	117	5	03/28/18 12:51	04/10/18 14:33	57-74-9	
alpha-Chlordane	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	5103-71-9	
gamma-Chlordane	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	5103-74-2	
4,4'-DDD	ND	ug/kg	23.3	5	03/28/18 12:51	04/10/18 14:33	72-54-8	
4,4'-DDE	ND	ug/kg	23.3	5	03/28/18 12:51	04/10/18 14:33	72-55-9	
4,4'-DDT	24.5	ug/kg	23.3	5	03/28/18 12:51	04/10/18 14:33	50-29-3	
Dieldrin	ND	ug/kg	23.3	5	03/28/18 12:51	04/10/18 14:33	60-57-1	
Endosulfan I	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	959-98-8	
Endosulfan II	ND	ug/kg	23.3	5	03/28/18 12:51	04/10/18 14:33	33213-65-9	
Endosulfan sulfate	ND	ug/kg	23.3	5	03/28/18 12:51	04/10/18 14:33	1031-07-8	
Endrin	ND	ug/kg	23.3	5	03/28/18 12:51	04/10/18 14:33	72-20-8	
Endrin aldehyde	ND	ug/kg	23.3	5	03/28/18 12:51	04/10/18 14:33	7421-93-4	
Endrin ketone	ND	ug/kg	23.3	5	03/28/18 12:51	04/10/18 14:33	53494-70-5	
Heptachlor	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	76-44-8	
Heptachlor epoxide	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	1024-57-3	
Methoxychlor	ND	ug/kg	117	5	03/28/18 12:51	04/10/18 14:33	72-43-5	
Toxaphene	ND	ug/kg	349	5	03/28/18 12:51	04/10/18 14:33	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	85	%	30-150	5	03/28/18 12:51	04/10/18 14:33	877-09-8	3M,D4
Decachlorobiphenyl (S)	99	%	30-150	5	03/28/18 12:51	04/10/18 14:33	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	12672-29-6	
PCB-1254 (Aroclor 1254)	551	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	11100-14-4	
PCB, Total	551	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	72	%	48-125	1	03/28/18 12:51	04/02/18 12:49	877-09-8	
Decachlorobiphenyl (S)	73	%	30-134	1	03/28/18 12:51	04/02/18 12:49	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	23.3	mg/kg	22.2	1	03/27/18 16:31	03/30/18 14:22		T6,T7

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-B3-WM (5-26) **Lab ID: 10424793002** Collected: 03/23/18 13:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	59	%	50-150	1	03/27/18 16:31	03/30/18 14:22	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	35.5	1	03/30/18 14:11	03/31/18 02:09		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	03/30/18 14:11	03/31/18 02:09	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	9250	mg/kg	13.7	1	03/28/18 04:51	04/02/18 12:46	7429-90-5	
Barium	84.4	mg/kg	0.68	1	03/28/18 04:51	04/02/18 12:46	7440-39-3	
Boron	216	mg/kg	10.3	1	03/28/18 04:51	04/02/18 12:46	7440-42-8	
Copper	24.7	mg/kg	0.68	1	03/28/18 04:51	04/02/18 12:46	7440-50-8	
Iron	40200	mg/kg	34.2	10	03/28/18 04:51	04/02/18 13:32	7439-89-6	
Manganese	141	mg/kg	0.34	1	03/28/18 04:51	04/02/18 12:46	7439-96-5	
Nickel	58.3	mg/kg	1.4	1	03/28/18 04:51	04/02/18 12:46	7440-02-0	
Silver	5.5	mg/kg	0.68	1	03/28/18 04:51	04/02/18 12:46	7440-22-4	
Tin	7.4	mg/kg	5.1	1	03/28/18 04:51	04/02/18 12:46	7440-31-5	
Titanium	416	mg/kg	1.7	1	03/28/18 04:51	04/02/18 12:46	7440-32-6	
Zinc	215	mg/kg	1.4	1	03/28/18 04:51	04/02/18 12:46	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	3.6	mg/kg	1.3	5	04/04/18 17:21	04/08/18 15:42	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.1	mg/kg	0.66	20	03/28/18 04:52	03/30/18 17:07	7440-36-0	
Arsenic	16.1	mg/kg	0.66	20	03/28/18 04:52	03/30/18 17:07	7440-38-2	
Beryllium	2.2	mg/kg	0.27	20	03/28/18 04:52	03/30/18 17:07	7440-41-7	
Cadmium	1.1	mg/kg	0.11	20	03/28/18 04:52	03/30/18 17:07	7440-43-9	
Cobalt	9.0	mg/kg	0.66	20	03/28/18 04:52	03/30/18 17:07	7440-48-4	
Lead	67.9	mg/kg	0.13	20	03/28/18 04:52	03/30/18 17:07	7439-92-1	
Lithium	8.5	mg/kg	0.66	20	03/28/18 04:52	03/30/18 17:07	7439-93-2	
Selenium	5.3	mg/kg	0.66	20	03/28/18 04:52	03/30/18 17:07	7782-49-2	
Strontium	49.6	mg/kg	0.66	20	03/28/18 04:52	03/30/18 17:07	7440-24-6	
Vanadium	239	mg/kg	1.3	20	03/28/18 04:52	03/30/18 17:07	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.072	mg/kg	0.025	1	03/28/18 04:53	03/30/18 12:47	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	28.4	%	0.10	1		03/28/18 12:44		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	461	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	83-32-9	
Acenaphthylene	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: **FD-SB-B3-WM (5-26)** Lab ID: **10424793002** Collected: 03/23/18 13:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Anthracene	885	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	120-12-7	
Benzo(a)anthracene	1780	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	56-55-3	
Benzo(a)pyrene	1190	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	50-32-8	
Benzo(b)fluoranthene	2010	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	205-99-2	
Benzo(g,h,i)perylene	782	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	191-24-2	
Benzo(k)fluoranthene	689	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	101-55-3	
Butylbenzylphthalate	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	85-68-7	
Carbazole	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	59-50-7	
4-Chloroaniline	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	108-60-1	
2-Chloronaphthalene	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	91-58-7	
2-Chlorophenol	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	7005-72-3	
Chrysene	2180	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	53-70-3	
Dibenzofuran	515	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	120-83-2	
Diethylphthalate	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	105-67-9	
Dimethylphthalate	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	131-11-3	
Di-n-butylphthalate	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2370	1	03/27/18 12:47	03/30/18 15:50	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	606-20-2	
Di-n-octylphthalate	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	122-66-7	
bis(2-Ethylhexyl)phthalate	1660	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	117-81-7	
Fluoranthene	6860	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	206-44-0	
Fluorene	933	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	87-68-3	
Hexachlorobenzene	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	118-74-1	
Hexachloroethane	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	67-72-1	
Indeno(1,2,3-cd)pyrene	676	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	193-39-5	
Isophorone	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	78-59-1	
1-Methylnaphthalene	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	90-12-0	
2-Methylnaphthalene	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: **FD-SB-B3-WM (5-26)** Lab ID: **10424793002** Collected: 03/23/18 13:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	1120	ug/kg	921	1	03/27/18 12:47	03/30/18 15:50		
Naphthalene	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	91-20-3	
2-Nitroaniline	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	88-74-4	
3-Nitroaniline	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	99-09-2	
4-Nitroaniline	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	100-01-6	
Nitrobenzene	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	98-95-3	
2-Nitrophenol	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	88-75-5	
4-Nitrophenol	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	86-30-6	
Pentachlorophenol	ND	ug/kg	935	1	03/27/18 12:47	03/30/18 15:50	87-86-5	
Phenanthrene	7060	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	85-01-8	
Phenol	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	108-95-2	
Pyrene	3740	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	64	%.	43-125	5	03/27/18 12:47	03/30/18 20:23	4165-60-0	D3
2-Fluorobiphenyl (S)	76	%.	30-132	1	03/27/18 12:47	03/30/18 15:50	321-60-8	
p-Terphenyl-d14 (S)	59	%.	62-125	1	03/27/18 12:47	03/30/18 15:50	1718-51-0	S5
Phenol-d6 (S)	66	%.	48-125	1	03/27/18 12:47	03/30/18 15:50	13127-88-3	
2-Fluorophenol (S)	66	%.	40-125	1	03/27/18 12:47	03/30/18 15:50	367-12-4	
2,4,6-Tribromophenol (S)	67	%.	60-125	1	03/27/18 12:47	03/30/18 15:50	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	83-32-9	
Acenaphthylene	ND	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	208-96-8	
Anthracene	1510	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	120-12-7	
Benzo(a)anthracene	4020	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	56-55-3	
Benzo(a)pyrene	2730	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	50-32-8	
Benzo(b)fluoranthene	4020	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	205-99-2	
Benzo(g,h,i)perylene	1670	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	191-24-2	
Benzo(k)fluoranthene	1260	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	207-08-9	
Chrysene	3660	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	53-70-3	
Fluoranthene	10600	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	206-44-0	
Fluorene	861	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	86-73-7	
Indeno(1,2,3-cd)pyrene	1590	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	193-39-5	
Naphthalene	ND	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	91-20-3	
Phenanthrene	7760	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	85-01-8	
Pyrene	8170	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%.	42-125	50	03/27/18 15:20	04/04/18 12:25	321-60-8	D4,S4
p-Terphenyl-d14 (S)	0	%.	57-125	50	03/27/18 15:20	04/04/18 12:25	1718-51-0	S4

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-B3-WM (5-26) **Lab ID: 10424793002** Collected: 03/23/18 13:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	25057-89-0	
2,4-D	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	94-75-7	
2,4-DB	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	94-82-6	
Dicamba	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	1918-00-9	
Dinoseb	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	88-85-7	
MCPA	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	94-74-6	
Pentachlorophenol	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	87-86-5	
Picloram	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	1918-02-1	
2,4,5-T	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	93-72-1	
Triclopyr	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	55335-06-3	
Surrogates								
2,4-DCAA (S)	71	%.	46-125	1	03/29/18 07:30	04/04/18 16:32	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	3470	1	03/27/18 14:03	03/27/18 17:08	67-64-1	
Allyl chloride	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	107-05-1	
Benzene	ND	ug/kg	69.3	1	03/27/18 14:03	03/27/18 17:08	71-43-2	
Bromobenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	108-86-1	
Bromochloromethane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	74-97-5	
Bromodichloromethane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	75-27-4	
Bromoform	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	75-25-2	
Bromomethane	ND	ug/kg	1730	1	03/27/18 14:03	03/27/18 17:08	74-83-9	
2-Butanone (MEK)	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 17:08	78-93-3	
n-Butylbenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	104-51-8	
sec-Butylbenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	135-98-8	
tert-Butylbenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	98-06-6	
Carbon tetrachloride	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	56-23-5	
Chlorobenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	108-90-7	
Chloroethane	ND	ug/kg	1730	1	03/27/18 14:03	03/27/18 17:08	75-00-3	
Chloroform	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	67-66-3	
Chloromethane	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	74-87-3	
2-Chlorotoluene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	95-49-8	
4-Chlorotoluene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1730	1	03/27/18 14:03	03/27/18 17:08	96-12-8	
Dibromochloromethane	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	106-93-4	
Dibromomethane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	75-71-8	
1,1-Dichloroethane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	75-34-3	
1,2-Dichloroethane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	107-06-2	
1,1-Dichloroethene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	156-59-2	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: **FD-SB-B3-WM (5-26)** Lab ID: **10424793002** Collected: 03/23/18 13:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
trans-1,2-Dichloroethene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1730	1	03/27/18 14:03	03/27/18 17:08	75-43-4	
1,2-Dichloropropane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	78-87-5	
1,3-Dichloropropane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	142-28-9	
2,2-Dichloropropane	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	594-20-7	
1,1-Dichloropropene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	60-29-7	
Ethylbenzene	535	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 17:08	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	98-82-8	
p-Isopropyltoluene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	99-87-6	
Methylene Chloride	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 17:08	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	1634-04-4	
Naphthalene	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	91-20-3	
n-Propylbenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	103-65-1	
Styrene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	79-34-5	N2
Tetrachloroethene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	127-18-4	
Tetrahydrofuran	ND	ug/kg	6930	1	03/27/18 14:03	03/27/18 17:08	109-99-9	
Toluene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	79-00-5	
Trichloroethene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	108-67-8	
Vinyl chloride	ND	ug/kg	69.3	1	03/27/18 14:03	03/27/18 17:08	75-01-4	
Xylene (Total)	1440	ug/kg	520	1	03/27/18 14:03	03/27/18 17:08	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	91	%	75-125	1	03/27/18 14:03	03/27/18 17:08	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	03/27/18 14:03	03/27/18 17:08	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125	1	03/27/18 14:03	03/27/18 17:08	460-00-4	

9012 Cyanide, Total

Analytical Method: EPA 9012 Preparation Method: EPA 9012A

Cyanide	ND	mg/kg	0.39	1	04/05/18 10:35	04/05/18 14:47	57-12-5	
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9056 IC Anions

Analytical Method: EPA 9056A Preparation Method: EPA 300.0

Fluoride	1.7	mg/kg	0.99	1	04/05/18 12:00	04/05/18 17:36	16984-48-8	M1
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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-C3-WM (5-20) **Lab ID: 10424793003** Collected: 03/23/18 14:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	9.57	1	04/04/18 10:58	04/06/18 15:38		N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	309-00-2	
alpha-BHC	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	319-84-6	
beta-BHC	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	319-85-7	
delta-BHC	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	58-89-9	
Chlordane (Technical)	ND	ug/kg	434	20	03/28/18 12:51	04/06/18 00:20	57-74-9	
alpha-Chlordane	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	5103-71-9	
gamma-Chlordane	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	5103-74-2	
4,4'-DDD	ND	ug/kg	86.6	20	03/28/18 12:51	04/06/18 00:20	72-54-8	
4,4'-DDE	ND	ug/kg	86.6	20	03/28/18 12:51	04/06/18 00:20	72-55-9	
4,4'-DDT	ND	ug/kg	86.6	20	03/28/18 12:51	04/06/18 00:20	50-29-3	
Dieldrin	ND	ug/kg	86.6	20	03/28/18 12:51	04/06/18 00:20	60-57-1	
Endosulfan I	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	959-98-8	
Endosulfan II	ND	ug/kg	86.6	20	03/28/18 12:51	04/06/18 00:20	33213-65-9	
Endosulfan sulfate	ND	ug/kg	86.6	20	03/28/18 12:51	04/06/18 00:20	1031-07-8	
Endrin	ND	ug/kg	86.6	20	03/28/18 12:51	04/06/18 00:20	72-20-8	
Endrin aldehyde	ND	ug/kg	86.6	20	03/28/18 12:51	04/06/18 00:20	7421-93-4	
Endrin ketone	ND	ug/kg	86.6	20	03/28/18 12:51	04/06/18 00:20	53494-70-5	
Heptachlor	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	76-44-8	
Heptachlor epoxide	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	1024-57-3	
Methoxychlor	ND	ug/kg	434	20	03/28/18 12:51	04/06/18 00:20	72-43-5	
Toxaphene	ND	ug/kg	1300	20	03/28/18 12:51	04/06/18 00:20	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%.	30-150	20	03/28/18 12:51	04/06/18 00:20	877-09-8	2M, D3, S4
Decachlorobiphenyl (S)	0	%.	30-150	20	03/28/18 12:51	04/06/18 00:20	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	12672-29-6	
PCB-1254 (Aroclor 1254)	144	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	11100-14-4	
PCB, Total	144	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	82	%.	48-125	1	03/28/18 12:51	04/02/18 10:59	877-09-8	
Decachlorobiphenyl (S)	84	%.	30-134	1	03/28/18 12:51	04/02/18 10:59	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-C3-WM (5-20) **Lab ID:** 10424793003 Collected: 03/23/18 14:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS		Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO						
WDRO C10-C28	222	mg/kg	126	1	03/27/18 16:31	03/30/18 14:14		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	1	03/27/18 16:31	03/30/18 14:14	638-68-6	S4
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil						
Gasoline Range Organics	ND	mg/kg	15.5	1	03/30/18 14:11	03/31/18 02:33		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	03/30/18 14:11	03/31/18 02:33	98-08-8	
6010C MET ICP		Analytical Method: EPA 6010C Preparation Method: EPA 3050						
Aluminum	8090	mg/kg	12.6	1	03/28/18 04:51	04/02/18 12:48	7429-90-5	
Barium	235	mg/kg	0.63	1	03/28/18 04:51	04/02/18 12:48	7440-39-3	
Boron	75.4	mg/kg	9.5	1	03/28/18 04:51	04/02/18 12:48	7440-42-8	
Copper	119	mg/kg	0.63	1	03/28/18 04:51	04/02/18 12:48	7440-50-8	
Iron	47000	mg/kg	31.6	10	03/28/18 04:51	04/02/18 13:34	7439-89-6	
Manganese	951	mg/kg	3.2	10	03/28/18 04:51	04/02/18 13:34	7439-96-5	
Nickel	29.5	mg/kg	1.3	1	03/28/18 04:51	04/02/18 12:48	7440-02-0	
Silver	1.0	mg/kg	0.63	1	03/28/18 04:51	04/02/18 12:48	7440-22-4	
Tin	114	mg/kg	4.7	1	03/28/18 04:51	04/02/18 12:48	7440-31-5	
Titanium	238	mg/kg	1.6	1	03/28/18 04:51	04/02/18 12:48	7440-32-6	
Zinc	799	mg/kg	1.3	1	03/28/18 04:51	04/02/18 12:48	7440-66-6	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3050B						
Chromium	118	mg/kg	1.2	5	04/04/18 17:21	04/08/18 15:47	7440-47-3	N2
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	0.96	mg/kg	0.64	20	03/28/18 04:52	03/30/18 17:12	7440-36-0	
Arsenic	7.9	mg/kg	0.64	20	03/28/18 04:52	03/30/18 17:12	7440-38-2	
Beryllium	0.43	mg/kg	0.26	20	03/28/18 04:52	03/30/18 17:12	7440-41-7	
Cadmium	2.0	mg/kg	0.10	20	03/28/18 04:52	03/30/18 17:12	7440-43-9	
Cobalt	4.8	mg/kg	0.64	20	03/28/18 04:52	03/30/18 17:12	7440-48-4	
Lead	151	mg/kg	0.13	20	03/28/18 04:52	03/30/18 17:12	7439-92-1	
Lithium	4.2	mg/kg	0.64	20	03/28/18 04:52	03/30/18 17:12	7439-93-2	
Selenium	1.2	mg/kg	0.64	20	03/28/18 04:52	03/30/18 17:12	7782-49-2	
Strontium	31.8	mg/kg	0.64	20	03/28/18 04:52	03/30/18 17:12	7440-24-6	
Vanadium	30.5	mg/kg	1.3	20	03/28/18 04:52	03/30/18 17:12	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.44	mg/kg	0.024	1	03/28/18 04:53	03/30/18 12:53	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	23.1	%	0.10	1		03/28/18 12:44		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-C3-WM (5-20) **Lab ID: 10424793003** Collected: 03/23/18 14:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	208-96-8	
Anthracene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	120-12-7	
Benzo(a)anthracene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	56-55-3	
Benzo(a)pyrene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	50-32-8	
Benzo(b)fluoranthene	475	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	101-55-3	
Butylbenzylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	85-68-7	
Carbazole	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	59-50-7	
4-Chloroaniline	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	108-60-1	
2-Chloronaphthalene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	91-58-7	
2-Chlorophenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	7005-72-3	
Chrysene	449	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	53-70-3	
Dibenzofuran	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	120-83-2	
Diethylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	105-67-9	
Dimethylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	131-11-3	
Di-n-butylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2200	1	03/27/18 12:47	03/30/18 16:21	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	606-20-2	
Di-n-octylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	122-66-7	
bis(2-Ethylhexyl)phthalate	1490	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	117-81-7	
Fluoranthene	747	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	206-44-0	
Fluorene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	87-68-3	
Hexachlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	118-74-1	
Hexachloroethane	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	193-39-5	
Isophorone	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	78-59-1	
1-Methylnaphthalene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	90-12-0	
2-Methylnaphthalene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	91-57-6	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-C3-WM (5-20) **Lab ID: 10424793003** Collected: 03/23/18 14:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	855	1	03/27/18 12:47	03/30/18 16:21		
Naphthalene	1710	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	91-20-3	
2-Nitroaniline	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	88-74-4	
3-Nitroaniline	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	99-09-2	
4-Nitroaniline	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	100-01-6	
Nitrobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	98-95-3	
2-Nitrophenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	88-75-5	
4-Nitrophenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	86-30-6	
Pentachlorophenol	ND	ug/kg	868	1	03/27/18 12:47	03/30/18 16:21	87-86-5	
Phenanthrene	822	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	85-01-8	
Phenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	108-95-2	
Pyrene	724	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	57	%	43-125	1	03/27/18 12:47	03/30/18 16:21	4165-60-0	
2-Fluorobiphenyl (S)	73	%	30-132	1	03/27/18 12:47	03/30/18 16:21	321-60-8	
p-Terphenyl-d14 (S)	70	%	62-125	1	03/27/18 12:47	03/30/18 16:21	1718-51-0	
Phenol-d6 (S)	59	%	48-125	1	03/27/18 12:47	03/30/18 16:21	13127-88-3	
2-Fluorophenol (S)	59	%	40-125	1	03/27/18 12:47	03/30/18 16:21	367-12-4	
2,4,6-Tribromophenol (S)	63	%	60-125	1	03/27/18 12:47	03/30/18 16:21	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	1090	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	83-32-9	
Acenaphthylene	ND	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	208-96-8	
Anthracene	831	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	120-12-7	
Benzo(a)anthracene	351	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	56-55-3	
Benzo(a)pyrene	378	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	50-32-8	
Benzo(b)fluoranthene	483	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	207-08-9	
Chrysene	439	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	53-70-3	
Fluoranthene	1640	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	206-44-0	
Fluorene	1020	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	193-39-5	
Naphthalene	3510	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	91-20-3	
Phenanthrene	3430	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	85-01-8	
Pyrene	1120	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	129-00-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-C3-WM (5-20) **Lab ID: 10424793003** Collected: 03/23/18 14:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Surrogates								
2-Fluorobiphenyl (S)	0	%.	42-125	5	03/27/18 15:20	04/03/18 23:44	321-60-8	D3,P3, S4
p-Terphenyl-d14 (S)	0	%.	57-125	5	03/27/18 15:20	04/03/18 23:44	1718-51-0	S4
8270D MSSV MDA LIST 2 Analytical Method: EPA 8270D Preparation Method: EPA 3546								
Bentazon	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	25057-89-0	
2,4-D	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	94-75-7	
2,4-DB	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	94-82-6	
Dicamba	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	1918-00-9	
Dinoseb	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	88-85-7	
MCPA	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	94-74-6	
Pentachlorophenol	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	87-86-5	
Picloram	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	1918-02-1	
2,4,5-T	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	93-72-1	
Triclopyr	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	55335-06-3	
Surrogates								
2,4-DCAA (S)	61	%.	46-125	5	03/29/18 07:30	04/04/18 19:13	19719-28-9	D3
8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Acetone	ND	ug/kg	1370	1	03/27/18 14:03	03/27/18 17:25	67-64-1	
Allyl chloride	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	107-05-1	
Benzene	ND	ug/kg	27.4	1	03/27/18 14:03	03/27/18 17:25	71-43-2	
Bromobenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	108-86-1	
Bromochloromethane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	74-97-5	
Bromodichloromethane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	75-27-4	
Bromoform	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	75-25-2	
Bromomethane	ND	ug/kg	684	1	03/27/18 14:03	03/27/18 17:25	74-83-9	
2-Butanone (MEK)	ND	ug/kg	342	1	03/27/18 14:03	03/27/18 17:25	78-93-3	
n-Butylbenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	104-51-8	
sec-Butylbenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	135-98-8	
tert-Butylbenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	98-06-6	
Carbon tetrachloride	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	56-23-5	
Chlorobenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	108-90-7	
Chloroethane	ND	ug/kg	684	1	03/27/18 14:03	03/27/18 17:25	75-00-3	
Chloroform	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	67-66-3	
Chloromethane	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	74-87-3	
2-Chlorotoluene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	95-49-8	
4-Chlorotoluene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	684	1	03/27/18 14:03	03/27/18 17:25	96-12-8	
Dibromochloromethane	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	106-93-4	
Dibromomethane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	541-73-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-C3-WM (5-20) **Lab ID: 10424793003** Collected: 03/23/18 14:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,4-Dichlorobenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	75-71-8	
1,1-Dichloroethane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	75-34-3	
1,2-Dichloroethane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	107-06-2	
1,1-Dichloroethene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	156-60-5	
Dichlorofluoromethane	ND	ug/kg	684	1	03/27/18 14:03	03/27/18 17:25	75-43-4	
1,2-Dichloropropane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	78-87-5	
1,3-Dichloropropane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	142-28-9	
2,2-Dichloropropane	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	594-20-7	
1,1-Dichloropropene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	60-29-7	
Ethylbenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	342	1	03/27/18 14:03	03/27/18 17:25	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	98-82-8	
p-Isopropyltoluene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	99-87-6	
Methylene Chloride	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	342	1	03/27/18 14:03	03/27/18 17:25	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	1634-04-4	
Naphthalene	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	91-20-3	
n-Propylbenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	103-65-1	
Styrene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	79-34-5	N2
Tetrachloroethene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	127-18-4	
Tetrahydrofuran	ND	ug/kg	2740	1	03/27/18 14:03	03/27/18 17:25	109-99-9	
Toluene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	79-00-5	
Trichloroethene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	108-67-8	
Vinyl chloride	ND	ug/kg	27.4	1	03/27/18 14:03	03/27/18 17:25	75-01-4	
Xylene (Total)	ND	ug/kg	205	1	03/27/18 14:03	03/27/18 17:25	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	91	%	75-125	1	03/27/18 14:03	03/27/18 17:25	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	03/27/18 14:03	03/27/18 17:25	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125	1	03/27/18 14:03	03/27/18 17:25	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-C3-WM (5-20) **Lab ID: 10424793003** Collected: 03/23/18 14:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
7196 Chromium, Hexavalent								
Analytical Method: EPA 7196A Preparation Method: EPA 3060A								
Chromium, Hexavalent	ND	mg/kg	12.8	5	04/05/18 08:00	04/06/18 13:32		D3
Trivalent Chromium Calculation								
Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	118	mg/kg	1.0	1		04/09/18 12:27		
9012 Cyanide, Total								
Analytical Method: EPA 9012 Preparation Method: EPA 9012A								
Cyanide	ND	mg/kg	0.41	1	04/05/18 10:35	04/05/18 14:47	57-12-5	
9056 IC Anions								
Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Fluoride	3.9	mg/kg	0.99	1	04/05/18 12:00	04/05/18 18:54	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 140178 Analysis Method: EPA 1630 (1998)
 QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
 Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 555070 Matrix: Solid
 Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.18	04/06/18 13:51	N3

METHOD BLANK: 555071 Matrix: Solid
 Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.20	04/06/18 13:58	N3

METHOD BLANK: 555072 Matrix: Solid
 Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.03	04/06/18 14:05	N3

LABORATORY CONTROL SAMPLE: 555073

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	105	90.2	86	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 555074 555075

Parameter	Units	10425111001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	446	407	290	293	65	72	65-135	1	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 529815 Analysis Method: WI MOD GRO
QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2875655 Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	03/30/18 17:39	
a,a,a-Trifluorotoluene (S)	%	100	80-150	03/30/18 17:39	

LABORATORY CONTROL SAMPLE & LCSD: 2875656 2875657

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	46.3	44.7	93	89	80-120	4	20	
a,a,a-Trifluorotoluene (S)	%				99	99	80-150			

MATRIX SPIKE SAMPLE: 2876408

Parameter	Units	10424443005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	ND	60.8	115	187	80-120	C0,M1
a,a,a-Trifluorotoluene (S)	%				98	80-150	

SAMPLE DUPLICATE: 2876409

Parameter	Units	10424609003 Result	Dup Result	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	104	107	3	20	
a,a,a-Trifluorotoluene (S)	%	99	99	0		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 529342 Analysis Method: EPA 7471
 QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
 Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2873298 Matrix: Solid
 Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.020	03/30/18 12:37	

LABORATORY CONTROL SAMPLE: 2873299

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.45	0.51	112	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873300 2873301

Parameter	Units	2873300		2873301		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10424793001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Mercury	mg/kg	0.12	2.2	2.4	2.6	109	105	80-120	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 529339 Analysis Method: EPA 6010C
 QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
 Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2873286 Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	10.0	04/02/18 12:22	
Barium	mg/kg	ND	0.50	04/02/18 12:22	
Boron	mg/kg	ND	7.5	04/02/18 12:22	
Copper	mg/kg	ND	0.50	04/02/18 12:22	
Iron	mg/kg	24.4	2.5	04/02/18 12:22	
Manganese	mg/kg	ND	0.25	04/02/18 12:22	
Nickel	mg/kg	ND	1.0	04/02/18 12:22	
Silver	mg/kg	ND	0.50	04/02/18 12:22	
Tin	mg/kg	ND	3.8	04/02/18 12:22	
Titanium	mg/kg	ND	1.2	04/02/18 12:22	
Zinc	mg/kg	ND	1.0	04/02/18 12:22	

LABORATORY CONTROL SAMPLE: 2873287

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	962	978	102	80-120	
Barium	mg/kg	48.1	50.1	104	80-120	
Boron	mg/kg	48.1	45.5	95	80-120	
Copper	mg/kg	48.1	47.2	98	80-120	
Iron	mg/kg	962	1000	104	80-120	
Manganese	mg/kg	48.1	50.6	105	80-120	
Nickel	mg/kg	48.1	49.2	102	80-120	
Silver	mg/kg	24	22.4	93	80-120	
Tin	mg/kg	48.1	49.1	102	80-120	
Titanium	mg/kg	48.1	48.7	101	80-120	
Zinc	mg/kg	48.1	48.2	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873288 2873289

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424793001 Result	Spike Conc.	Spike Conc.	Result							Result
Aluminum	mg/kg	5600	4830	4830	12100	12700	134	147	75-125	5	20	M1
Barium	mg/kg	252	241	241	474	480	92	95	75-125	1	20	
Boron	mg/kg	524	241	241	778	802	105	115	75-125	3	20	
Copper	mg/kg	24.2	241	241	275	298	104	113	75-125	8	20	
Iron	mg/kg	15500	4830	4830	18100	23200	55	161	75-125	25	20	M1, R1
Manganese	mg/kg	423	241	241	614	675	79	104	75-125	9	20	
Nickel	mg/kg	11.3	241	241	256	262	101	104	75-125	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Parameter	Units	2873288		2873289		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10424793001 Result	MS Spike Conc.	MSD Spike Conc.									
Silver	mg/kg	ND	121	121	113	110	93	91	75-125	2	20		
Tin	mg/kg	44.1	241	241	272	273	95	95	75-125	0	20		
Titanium	mg/kg	158	241	241	391	406	96	103	75-125	4	20		
Zinc	mg/kg	232	241	241	411	487	74	106	75-125	17	20	M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids
Pace Project No.: 10424793

QC Batch: 435596 Analysis Method: EPA 6020
QC Batch Method: EPA 3050B Analysis Description: 6020 MET
Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2011670 Matrix: Solid
Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.18	04/08/18 14:34	N2

LABORATORY CONTROL SAMPLE: 2011671

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.7	3.8	102	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2011672 2011673

Parameter	Units	2011672		2011673		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10425111003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Chromium	mg/kg	51.1	4.81	4.81	48.6	136	-52	1770	75-125	95	20	1M, E, M0, N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids
Pace Project No.: 10424793

QC Batch: 529341 Analysis Method: EPA 6020A
QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2873294 Matrix: Solid
Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.50	03/30/18 17:03	
Arsenic	mg/kg	ND	0.50	03/30/18 17:03	
Beryllium	mg/kg	ND	0.20	03/30/18 17:03	
Cadmium	mg/kg	ND	0.080	03/30/18 17:03	
Cobalt	mg/kg	ND	0.50	03/30/18 17:03	
Lead	mg/kg	ND	0.10	03/30/18 17:03	
Lithium	mg/kg	ND	0.50	03/30/18 17:03	
Selenium	mg/kg	ND	0.50	03/30/18 17:03	
Strontium	mg/kg	ND	0.50	03/30/18 17:03	
Vanadium	mg/kg	ND	1.0	03/30/18 17:03	

LABORATORY CONTROL SAMPLE: 2873295

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	49.5	49.3	100	80-120	
Arsenic	mg/kg	49.5	49.1	99	80-120	
Beryllium	mg/kg	49.5	46.9	95	80-120	
Cadmium	mg/kg	49.5	48.8	99	80-120	
Cobalt	mg/kg	49.5	49.6	100	80-120	
Lead	mg/kg	49.5	50.3	102	80-120	
Lithium	mg/kg	49.5	45.7	92	80-120	
Selenium	mg/kg	49.5	48.0	97	80-120	
Strontium	mg/kg	49.5	48.3	98	80-120	
Vanadium	mg/kg	49.5	51.0	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873296 2873297

Parameter	Units	10424793001		2873296		2873297		% Rec	% Rec	% Rec	Max	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MS Result	MSD Result	MS % Rec					
Antimony	mg/kg	ND	239	239	192	203	80	85	75-125	5	20	
Arsenic	mg/kg	3.8	239	239	223	236	92	97	75-125	5	20	
Beryllium	mg/kg	ND	239	239	219	234	91	98	75-125	7	20	
Cadmium	mg/kg	0.72	239	239	221	234	92	98	75-125	6	20	
Cobalt	mg/kg	3.4	239	239	228	242	94	100	75-125	6	20	
Lead	mg/kg	308	239	239	641	734	139	178	75-125	14	20 M6	
Lithium	mg/kg	4.6	239	239	216	232	88	95	75-125	7	20	
Selenium	mg/kg	ND	239	239	215	223	90	93	75-125	4	20	
Strontium	mg/kg	47.6	239	239	265	304	91	107	75-125	14	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873296												2873297	
Parameter	Units	10424793001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	RPD	RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits				
Vanadium	mg/kg	15.0	239	239	247	275	97	109	75-125	11	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch:	529398	Analysis Method:	ASTM D2974
QC Batch Method:	ASTM D2974	Analysis Description:	Dry Weight / %M by ASTM D2974
Associated Lab Samples:	10424793001, 10424793002, 10424793003		

SAMPLE DUPLICATE: 2873484

Parameter	Units	10424937006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	31.8	32.4	2	30	

SAMPLE DUPLICATE: 2873740

Parameter	Units	10424803007 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	5.4	4.9	10	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 529276 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2872633 Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,1,1-Trichloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	03/27/18 16:35	N2
1,1,2-Trichloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	03/27/18 16:35	
1,1-Dichloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,1-Dichloroethene	ug/kg	ND	50.0	03/27/18 16:35	
1,1-Dichloropropene	ug/kg	ND	50.0	03/27/18 16:35	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,2,3-Trichloropropane	ug/kg	ND	200	03/27/18 16:35	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	03/27/18 16:35	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	03/27/18 16:35	
1,2-Dichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,2-Dichloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,2-Dichloropropane	ug/kg	ND	50.0	03/27/18 16:35	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,3-Dichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,3-Dichloropropane	ug/kg	ND	50.0	03/27/18 16:35	
1,4-Dichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
2,2-Dichloropropane	ug/kg	ND	200	03/27/18 16:35	
2-Butanone (MEK)	ug/kg	ND	250	03/27/18 16:35	
2-Chlorotoluene	ug/kg	ND	50.0	03/27/18 16:35	
4-Chlorotoluene	ug/kg	ND	50.0	03/27/18 16:35	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	03/27/18 16:35	
Acetone	ug/kg	ND	1000	03/27/18 16:35	
Allyl chloride	ug/kg	ND	200	03/27/18 16:35	
Benzene	ug/kg	ND	20.0	03/27/18 16:35	
Bromobenzene	ug/kg	ND	50.0	03/27/18 16:35	
Bromochloromethane	ug/kg	ND	50.0	03/27/18 16:35	
Bromodichloromethane	ug/kg	ND	50.0	03/27/18 16:35	
Bromoform	ug/kg	ND	200	03/27/18 16:35	
Bromomethane	ug/kg	ND	500	03/27/18 16:35	
Carbon tetrachloride	ug/kg	ND	50.0	03/27/18 16:35	
Chlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
Chloroethane	ug/kg	ND	500	03/27/18 16:35	
Chloroform	ug/kg	ND	50.0	03/27/18 16:35	
Chloromethane	ug/kg	ND	200	03/27/18 16:35	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	03/27/18 16:35	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	03/27/18 16:35	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids
Pace Project No.: 10424793

METHOD BLANK: 2872633 Matrix: Solid
Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	03/27/18 16:35	
Dibromomethane	ug/kg	ND	50.0	03/27/18 16:35	
Dichlorodifluoromethane	ug/kg	ND	200	03/27/18 16:35	
Dichlorofluoromethane	ug/kg	ND	500	03/27/18 16:35	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	03/27/18 16:35	
Ethylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
Hexachloro-1,3-butadiene	ug/kg	ND	250	03/27/18 16:35	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	03/27/18 16:35	
Methyl-tert-butyl ether	ug/kg	ND	50.0	03/27/18 16:35	
Methylene Chloride	ug/kg	ND	200	03/27/18 16:35	
n-Butylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
n-Propylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
Naphthalene	ug/kg	ND	200	03/27/18 16:35	
p-Isopropyltoluene	ug/kg	ND	50.0	03/27/18 16:35	
sec-Butylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
Styrene	ug/kg	ND	50.0	03/27/18 16:35	
tert-Butylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
Tetrachloroethene	ug/kg	ND	50.0	03/27/18 16:35	
Tetrahydrofuran	ug/kg	ND	2000	03/27/18 16:35	
Toluene	ug/kg	ND	50.0	03/27/18 16:35	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	03/27/18 16:35	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	03/27/18 16:35	
Trichloroethene	ug/kg	ND	50.0	03/27/18 16:35	N2
Trichlorofluoromethane	ug/kg	ND	200	03/27/18 16:35	
Vinyl chloride	ug/kg	ND	20.0	03/27/18 16:35	
Xylene (Total)	ug/kg	ND	150	03/27/18 16:35	
1,2-Dichloroethane-d4 (S)	%	91	75-125	03/27/18 16:35	
4-Bromofluorobenzene (S)	%	101	75-125	03/27/18 16:35	
Toluene-d8 (S)	%	98	75-125	03/27/18 16:35	

Parameter	Units	2872634							2872635		
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/kg	1000	936	912	94	91	59-125	3	20		
1,1,1-Trichloroethane	ug/kg	1000	910	885	91	89	59-125	3	20		
1,1,2,2-Tetrachloroethane	ug/kg	1000	923	898	92	90	58-125	3	20	N2	
1,1,2-Trichloroethane	ug/kg	1000	913	861	91	86	64-125	6	20		
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	876	853	88	85	65-125	3	20		
1,1-Dichloroethane	ug/kg	1000	853	825	85	82	63-125	3	20		
1,1-Dichloroethene	ug/kg	1000	918	900	92	90	59-125	2	20		
1,1-Dichloropropene	ug/kg	1000	918	913	92	91	64-125	1	20		
1,2,3-Trichlorobenzene	ug/kg	1000	898	866	90	87	55-126	4	20		
1,2,3-Trichloropropane	ug/kg	1000	847	792	85	79	62-125	7	20		
1,2,4-Trichlorobenzene	ug/kg	1000	907	899	91	90	62-125	1	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

LABORATORY CONTROL SAMPLE & LCSD: 2872634		2872635									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,2,4-Trimethylbenzene	ug/kg	1000	895	876	90	88	59-125	2	20		
1,2-Dibromo-3-chloropropane	ug/kg	2500	2070	2030	83	81	54-125	2	20		
1,2-Dibromoethane (EDB)	ug/kg	1000	865	861	87	86	64-125	1	20		
1,2-Dichlorobenzene	ug/kg	1000	858	840	86	84	63-125	2	20		
1,2-Dichloroethane	ug/kg	1000	784	767	78	77	57-125	2	20		
1,2-Dichloropropane	ug/kg	1000	889	873	89	87	67-125	2	20		
1,3,5-Trimethylbenzene	ug/kg	1000	899	870	90	87	59-125	3	20		
1,3-Dichlorobenzene	ug/kg	1000	864	833	86	83	64-125	4	20		
1,3-Dichloropropane	ug/kg	1000	875	859	87	86	64-125	2	20		
1,4-Dichlorobenzene	ug/kg	1000	840	843	84	84	63-125	0	20		
2,2-Dichloropropane	ug/kg	1000	975	934	98	93	37-126	4	20		
2-Butanone (MEK)	ug/kg	5000	4040	4150	81	83	48-125	3	20		
2-Chlorotoluene	ug/kg	1000	870	844	87	84	62-125	3	20		
4-Chlorotoluene	ug/kg	1000	893	868	89	87	63-125	3	20		
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4230	4170	85	83	52-135	1	20		
Acetone	ug/kg	5000	5930	5540	119	111	65-125	7	20		
Allyl chloride	ug/kg	1000	861	838	86	84	52-125	3	20		
Benzene	ug/kg	1000	870	836	87	84	61-125	4	20		
Bromobenzene	ug/kg	1000	896	858	90	86	64-125	4	20		
Bromochloromethane	ug/kg	1000	902	848	90	85	65-125	6	20		
Bromodichloromethane	ug/kg	1000	956	912	96	91	57-125	5	20		
Bromoform	ug/kg	1000	857	861	86	86	57-125	0	20		
Bromomethane	ug/kg	1000	761	842	76	84	60-125	10	20		
Carbon tetrachloride	ug/kg	1000	936	894	94	89	58-125	5	20		
Chlorobenzene	ug/kg	1000	891	868	89	87	66-125	3	20		
Chloroethane	ug/kg	1000	808	861	81	86	62-125	6	20		
Chloroform	ug/kg	1000	780	773	78	77	59-125	1	20		
Chloromethane	ug/kg	1000	777	793	78	79	50-125	2	20		
cis-1,2-Dichloroethene	ug/kg	1000	871	844	87	84	61-125	3	20		
cis-1,3-Dichloropropene	ug/kg	1000	920	884	92	88	61-125	4	20		
Dibromochloromethane	ug/kg	1000	873	836	87	84	60-125	4	20		
Dibromomethane	ug/kg	1000	919	879	92	88	69-125	4	20		
Dichlorodifluoromethane	ug/kg	1000	692	727	69	73	38-125	5	20		
Dichlorofluoromethane	ug/kg	1000	781	830	78	83	67-125	6	20		
Diethyl ether (Ethyl ether)	ug/kg	1000	1440	1560	144	156	60-125	8	20 L3		
Ethylbenzene	ug/kg	1000	885	876	89	88	62-125	1	20		
Hexachloro-1,3-butadiene	ug/kg	1000	929	952	93	95	56-125	2	20		
Isopropylbenzene (Cumene)	ug/kg	1000	945	925	94	92	65-125	2	20		
Methyl-tert-butyl ether	ug/kg	1000	834	815	83	82	59-125	2	20		
Methylene Chloride	ug/kg	1000	905	859	91	86	64-125	5	20		
n-Butylbenzene	ug/kg	1000	931	914	93	91	59-125	2	20		
n-Propylbenzene	ug/kg	1000	920	887	92	89	61-125	4	20		
Naphthalene	ug/kg	1000	909	917	91	92	53-125	1	20		
p-Isopropyltoluene	ug/kg	1000	911	904	91	90	63-125	1	20		
sec-Butylbenzene	ug/kg	1000	937	918	94	92	62-125	2	20		
Styrene	ug/kg	1000	939	902	94	90	66-125	4	20		
tert-Butylbenzene	ug/kg	1000	914	898	91	90	64-125	2	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Parameter	Units	2872634		2872635			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Tetrachloroethene	ug/kg	1000	916	895	92	89	67-125	2	20	
Tetrahydrofuran	ug/kg	10000	12300	11600	123	116	62-125	6	20	
Toluene	ug/kg	1000	886	876	89	88	61-125	1	20	
trans-1,2-Dichloroethene	ug/kg	1000	901	885	90	89	64-125	2	20	
trans-1,3-Dichloropropene	ug/kg	1000	931	929	93	93	56-125	0	20	
Trichloroethene	ug/kg	1000	892	866	89	87	67-125	3	20	N2
Trichlorofluoromethane	ug/kg	1000	753	816	75	82	65-125	8	20	
Vinyl chloride	ug/kg	1000	851	883	85	88	57-125	4	20	
Xylene (Total)	ug/kg	3000	2710	2690	90	90	62-125	1	20	
1,2-Dichloroethane-d4 (S)	%				92	91	75-125			
4-Bromofluorobenzene (S)	%				100	102	75-125			
Toluene-d8 (S)	%				99	101	75-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 529466 Analysis Method: EPA 8081B
 QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
 Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2873686 Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/05/18 18:14	
4,4'-DDE	ug/kg	ND	3.3	04/05/18 18:14	
4,4'-DDT	ug/kg	ND	3.3	04/05/18 18:14	
Aldrin	ug/kg	ND	1.7	04/05/18 18:14	
alpha-BHC	ug/kg	ND	1.7	04/05/18 18:14	
alpha-Chlordane	ug/kg	ND	1.7	04/05/18 18:14	
beta-BHC	ug/kg	ND	1.7	04/05/18 18:14	
Chlordane (Technical)	ug/kg	ND	16.7	04/05/18 18:14	
delta-BHC	ug/kg	ND	1.7	04/05/18 18:14	
Dieldrin	ug/kg	ND	3.3	04/05/18 18:14	
Endosulfan I	ug/kg	ND	1.7	04/05/18 18:14	
Endosulfan II	ug/kg	ND	3.3	04/05/18 18:14	
Endosulfan sulfate	ug/kg	ND	3.3	04/05/18 18:14	
Endrin	ug/kg	ND	3.3	04/05/18 18:14	
Endrin aldehyde	ug/kg	ND	3.3	04/05/18 18:14	
Endrin ketone	ug/kg	ND	3.3	04/05/18 18:14	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/05/18 18:14	
gamma-Chlordane	ug/kg	ND	1.7	04/05/18 18:14	
Heptachlor	ug/kg	ND	1.7	04/05/18 18:14	
Heptachlor epoxide	ug/kg	ND	1.7	04/05/18 18:14	
Methoxychlor	ug/kg	ND	16.7	04/05/18 18:14	
Toxaphene	ug/kg	ND	50.0	04/05/18 18:14	
Decachlorobiphenyl (S)	%	95	30-150	04/05/18 18:14	
Tetrachloro-m-xylene (S)	%	91	30-150	04/05/18 18:14	

LABORATORY CONTROL SAMPLE: 2873687

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	33.1	99	62-127	
4,4'-DDE	ug/kg	33.3	32.4	97	66-125	
4,4'-DDT	ug/kg	33.3	33.2	99	67-128	CH
Aldrin	ug/kg	16.7	14.5	87	66-125	
alpha-BHC	ug/kg	16.7	14.8	89	64-125	
alpha-Chlordane	ug/kg	16.7	15.2	91	68-125	
beta-BHC	ug/kg	16.7	15.3	92	69-125	
delta-BHC	ug/kg	16.7	9.8	59	42-133	
Dieldrin	ug/kg	33.3	33.7	101	69-126	
Endosulfan I	ug/kg	16.7	14.1	85	63-125	
Endosulfan II	ug/kg	33.3	33.0	99	69-125	
Endosulfan sulfate	ug/kg	33.3	27.6	83	56-137	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

LABORATORY CONTROL SAMPLE: 2873687

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	31.1	93	69-125	
Endrin aldehyde	ug/kg	33.3	31.3	94	65-125	
Endrin ketone	ug/kg	33.3	34.0	102	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	15.3	92	67-125	
gamma-Chlordane	ug/kg	16.7	13.8	83	63-125	
Heptachlor	ug/kg	16.7	15.3	92	69-125	
Heptachlor epoxide	ug/kg	16.7	15.3	92	68-125	
Methoxychlor	ug/kg	167	165	99	65-134	CH
Decachlorobiphenyl (S)	%			90	30-150	
Tetrachloro-m-xylene (S)	%			86	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873688 2873689

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424793001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
4,4'-DDD	ug/kg	ND	166	166	147	154	89	93	56-125	5	20	
4,4'-DDE	ug/kg	ND	166	166	154	164	93	99	32-150	6	20	
4,4'-DDT	ug/kg	ND	166	166	154	158	93	95	60-132	2	20	CH
Aldrin	ug/kg	ND	82.5	83	61.8	64.2	75	78	56-125	4	20	
alpha-BHC	ug/kg	ND	82.5	83	74.1	80.9	90	98	54-136	9	20	
alpha-Chlordane	ug/kg	147	82.5	83	169	140	26	-9	54-133	19	20	M1
beta-BHC	ug/kg	64.3	82.5	83	79.8	87.9	19	28	30-150	10	20	M1
delta-BHC	ug/kg	ND	82.5	83	49.8	54.9	60	66	45-145	10	20	
Dieldrin	ug/kg	ND	166	166	142	143	86	86	47-150	0	20	
Endosulfan I	ug/kg	ND	82.5	83	66.2	70.2	80	85	35-145	6	20	
Endosulfan II	ug/kg	ND	166	166	139	142	84	86	50-147	2	20	
Endosulfan sulfate	ug/kg	ND	166	166	118	120	71	73	54-132	2	20	
Endrin	ug/kg	ND	166	166	126	128	76	78	62-125	2	20	
Endrin aldehyde	ug/kg	ND	166	166	132	132	80	80	33-150	1	20	
Endrin ketone	ug/kg	ND	166	166	144	146	87	88	56-144	1	20	
gamma-BHC (Lindane)	ug/kg	ND	82.5	83	66.3	68.3	80	82	63-125	3	20	
gamma-Chlordane	ug/kg	129	82.5	83	141	118	14	-14	45-132	18	20	M1
Heptachlor	ug/kg	ND	82.5	83	77.5	95.3	94	115	51-142	21	20	R1
Heptachlor epoxide	ug/kg	ND	82.5	83	65.2	69.5	79	84	50-142	6	20	
Methoxychlor	ug/kg	ND	825	830	810	820	98	99	58-139	1	20	CH
Decachlorobiphenyl (S)	%						60	64	30-150			
Tetrachloro-m-xylene (S)	%						57	64	30-150			4M,D4

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids
Pace Project No.: 10424793

QC Batch: 529467 Analysis Method: EPA 8082A
QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2873690 Matrix: Solid
Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/02/18 10:11	
Decachlorobiphenyl (S)	%	88	30-134	04/02/18 10:11	
Tetrachloro-m-xylene (S)	%	88	48-125	04/02/18 10:11	

LABORATORY CONTROL SAMPLE: 2873691

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	569	85	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	575	86	62-125	
Decachlorobiphenyl (S)	%			90	30-134	
Tetrachloro-m-xylene (S)	%			90	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873692 2873693

Parameter	Units	10424793002		2873692		2873693		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
PCB-1016 (Aroclor 1016)	ug/kg	ND	930	930	789	769	85	83	30-150	3	30		
PCB-1260 (Aroclor 1260)	ug/kg	ND	930	930	906	896	97	96	30-138	1	30		
Decachlorobiphenyl (S)	%						77	74	30-134				
Tetrachloro-m-xylene (S)	%						76	69	48-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids
Pace Project No.: 10424793

QC Batch: 529268 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2872570 Matrix: Solid
Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1,2-Dichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1,2-Diphenylhydrazine	ug/kg	ND	330	03/30/18 11:47	
1,3-Dichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1,4-Dichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1-Methylnaphthalene	ug/kg	ND	330	03/30/18 11:47	
2,4,5-Trichlorophenol	ug/kg	ND	330	03/30/18 11:47	
2,4,6-Trichlorophenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dichlorophenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dimethylphenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dinitrophenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dinitrotoluene	ug/kg	ND	330	03/30/18 11:47	
2,6-Dinitrotoluene	ug/kg	ND	330	03/30/18 11:47	
2-Chloronaphthalene	ug/kg	ND	330	03/30/18 11:47	
2-Chlorophenol	ug/kg	ND	330	03/30/18 11:47	
2-Methylnaphthalene	ug/kg	ND	330	03/30/18 11:47	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	03/30/18 11:47	
2-Nitroaniline	ug/kg	ND	330	03/30/18 11:47	
2-Nitrophenol	ug/kg	ND	330	03/30/18 11:47	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	03/30/18 11:47	
3,3'-Dichlorobenzidine	ug/kg	ND	330	03/30/18 11:47	
3-Nitroaniline	ug/kg	ND	330	03/30/18 11:47	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	03/30/18 11:47	
4-Bromophenylphenyl ether	ug/kg	ND	330	03/30/18 11:47	
4-Chloro-3-methylphenol	ug/kg	ND	330	03/30/18 11:47	
4-Chloroaniline	ug/kg	ND	330	03/30/18 11:47	
4-Chlorophenylphenyl ether	ug/kg	ND	330	03/30/18 11:47	
4-Nitroaniline	ug/kg	ND	330	03/30/18 11:47	
4-Nitrophenol	ug/kg	ND	330	03/30/18 11:47	
Acenaphthene	ug/kg	ND	330	03/30/18 11:47	
Acenaphthylene	ug/kg	ND	330	03/30/18 11:47	
Anthracene	ug/kg	ND	330	03/30/18 11:47	
Benzo(a)anthracene	ug/kg	ND	330	03/30/18 11:47	
Benzo(a)pyrene	ug/kg	ND	330	03/30/18 11:47	
Benzo(b)fluoranthene	ug/kg	ND	330	03/30/18 11:47	
Benzo(g,h,i)perylene	ug/kg	ND	330	03/30/18 11:47	
Benzo(k)fluoranthene	ug/kg	ND	330	03/30/18 11:47	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	03/30/18 11:47	
bis(2-Chloroethyl) ether	ug/kg	ND	330	03/30/18 11:47	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	03/30/18 11:47	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	03/30/18 11:47	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

METHOD BLANK: 2872570

Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	03/30/18 11:47	
Carbazole	ug/kg	ND	330	03/30/18 11:47	
Chrysene	ug/kg	ND	330	03/30/18 11:47	
Di-n-butylphthalate	ug/kg	ND	330	03/30/18 11:47	
Di-n-octylphthalate	ug/kg	ND	330	03/30/18 11:47	
Dibenz(a,h)anthracene	ug/kg	ND	330	03/30/18 11:47	
Dibenzofuran	ug/kg	ND	330	03/30/18 11:47	
Diethylphthalate	ug/kg	ND	330	03/30/18 11:47	
Dimethylphthalate	ug/kg	ND	330	03/30/18 11:47	
Fluoranthene	ug/kg	ND	330	03/30/18 11:47	
Fluorene	ug/kg	ND	330	03/30/18 11:47	
Hexachloro-1,3-butadiene	ug/kg	ND	330	03/30/18 11:47	
Hexachlorobenzene	ug/kg	ND	330	03/30/18 11:47	
Hexachloroethane	ug/kg	ND	330	03/30/18 11:47	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	03/30/18 11:47	
Isophorone	ug/kg	ND	330	03/30/18 11:47	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	03/30/18 11:47	
N-Nitrosodimethylamine	ug/kg	ND	330	03/30/18 11:47	
N-Nitrosodiphenylamine	ug/kg	ND	330	03/30/18 11:47	
Naphthalene	ug/kg	ND	330	03/30/18 11:47	
Nitrobenzene	ug/kg	ND	330	03/30/18 11:47	
Pentachlorophenol	ug/kg	ND	670	03/30/18 11:47	
Phenanthrene	ug/kg	ND	330	03/30/18 11:47	
Phenol	ug/kg	ND	330	03/30/18 11:47	
Pyrene	ug/kg	ND	330	03/30/18 11:47	
2,4,6-Tribromophenol (S)	%	73	60-125	03/30/18 11:47	
2-Fluorobiphenyl (S)	%	58	30-132	03/30/18 11:47	
2-Fluorophenol (S)	%	55	40-125	03/30/18 11:47	
Nitrobenzene-d5 (S)	%	54	43-125	03/30/18 11:47	
p-Terphenyl-d14 (S)	%	90	62-125	03/30/18 11:47	
Phenol-d6 (S)	%	56	48-125	03/30/18 11:47	

LABORATORY CONTROL SAMPLE: 2872571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1020	61	46-125	
1,2-Dichlorobenzene	ug/kg	1670	999	60	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1310	78	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1010	61	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1010	61	39-125	
1-Methylnaphthalene	ug/kg	1670	1080	65	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1220	73	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1200	72	61-125	
2,4-Dichlorophenol	ug/kg	1670	1060	64	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

LABORATORY CONTROL SAMPLE: 2872571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1030	62	51-125	
2,4-Dinitrophenol	ug/kg	1670	1200	72	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1250	75	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1240	74	63-125	
2-Chloronaphthalene	ug/kg	1670	1130	68	61-125	
2-Chlorophenol	ug/kg	1670	1020	61	46-125	
2-Methylnaphthalene	ug/kg	1670	1080	65	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1080	65	50-125	
2-Nitroaniline	ug/kg	1670	1380	83	61-125	
2-Nitrophenol	ug/kg	1670	1030	62	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1080	65	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1290	78	47-125	
3-Nitroaniline	ug/kg	1670	1220	73	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1380J	83	30-141	
4-Bromophenylphenyl ether	ug/kg	1670	1350	81	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1180	71	64-125	
4-Chloroaniline	ug/kg	1670	944	57	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1210	73	64-125	
4-Nitroaniline	ug/kg	1670	1180	71	59-125	
4-Nitrophenol	ug/kg	1670	1320	79	54-125	
Acenaphthene	ug/kg	1670	1190	72	62-125	
Acenaphthylene	ug/kg	1670	1140	69	61-125	
Anthracene	ug/kg	1670	1280	77	66-125	
Benzo(a)anthracene	ug/kg	1670	1300	78	69-125	
Benzo(a)pyrene	ug/kg	1670	1310	79	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1380	83	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1320	79	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1300	78	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1120	67	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1090	65	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1180	71	37-125	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1330	80	69-131	
Butylbenzylphthalate	ug/kg	1670	1340	81	69-129	
Carbazole	ug/kg	1670	1290	77	66-125	
Chrysene	ug/kg	1670	1300	78	68-125	
Di-n-butylphthalate	ug/kg	1670	1360	81	69-125	
Di-n-octylphthalate	ug/kg	1670	1310	79	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1340	81	64-125	
Dibenzofuran	ug/kg	1670	1200	72	65-125	
Diethylphthalate	ug/kg	1670	1280	77	67-125	
Dimethylphthalate	ug/kg	1670	1240	75	67-125	
Fluoranthene	ug/kg	1670	1280	77	66-125	
Fluorene	ug/kg	1670	1190	71	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1040	62	40-125	
Hexachlorobenzene	ug/kg	1670	1320	79	62-125	
Hexachloroethane	ug/kg	1670	1010	61	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1320	79	64-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

LABORATORY CONTROL SAMPLE: 2872571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1130	68	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1150	69	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1090	65	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1320	79	65-125	
Naphthalene	ug/kg	1670	1050	63	48-125	
Nitrobenzene	ug/kg	1670	1130	68	48-125	
Pentachlorophenol	ug/kg	1670	1220	73	41-125	
Phenanthrene	ug/kg	1670	1300	78	66-125	
Phenol	ug/kg	1670	1110	67	46-125	
Pyrene	ug/kg	1670	1360	82	69-125	
2,4,6-Tribromophenol (S)	%			85	60-125	
2-Fluorobiphenyl (S)	%			76	30-132	
2-Fluorophenol (S)	%			69	40-125	
Nitrobenzene-d5 (S)	%			71	43-125	
p-Terphenyl-d14 (S)	%			89	62-125	
Phenol-d6 (S)	%			72	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2872788 2872789

Parameter	Units	10424792001		MSD		MSD		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
1,2,4-Trichlorobenzene	ug/kg	ND	1720	1710	1460J	1420J	85	83	30-127		30		
1,2-Dichlorobenzene	ug/kg	ND	1720	1710	1360J	1370J	79	80	30-125		30		
1,2-Diphenylhydrazine	ug/kg	ND	1720	1710	1710	1620J	100	95	30-150		30		
1,3-Dichlorobenzene	ug/kg	ND	1720	1710	1400J	1320J	82	77	30-125		30		
1,4-Dichlorobenzene	ug/kg	ND	1720	1710	1400J	1350J	82	79	30-125		30		
1-Methylnaphthalene	ug/kg	ND	1720	1710	1540J	1510J	90	88	42-125		30		
2,4,5-Trichlorophenol	ug/kg	ND	1720	1710	1470J	1350J	86	79	30-150		30		
2,4,6-Trichlorophenol	ug/kg	ND	1720	1710	1330J	1320J	78	77	30-150		30		
2,4-Dichlorophenol	ug/kg	ND	1720	1710	1550J	1480J	91	87	30-135		30		
2,4-Dimethylphenol	ug/kg	ND	1720	1710	1440J	1430J	84	84	30-148		30		
2,4-Dinitrophenol	ug/kg	ND	1720	1710	ND	ND	5	4	30-125		30	M1	
2,4-Dinitrotoluene	ug/kg	ND	1720	1710	1560J	1560J	91	92	30-150		30		
2,6-Dinitrotoluene	ug/kg	ND	1720	1710	1650J	1720	96	100	30-150		30		
2-Chloronaphthalene	ug/kg	ND	1720	1710	1580J	1500J	92	88	30-138		30		
2-Chlorophenol	ug/kg	ND	1720	1710	1500J	1450J	88	85	30-130		30		
2-Methylnaphthalene	ug/kg	ND	1720	1710	1530J	1640J	89	96	46-125		30		
2-Methylphenol(o-Cresol)	ug/kg	ND	1720	1710	1590J	1490J	93	87	30-133		30		
2-Nitroaniline	ug/kg	ND	1720	1710	1650J	1750	97	103	30-150		30		
2-Nitrophenol	ug/kg	ND	1720	1710	1360J	1410J	79	83	30-134		30		
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	1720	1710	1600J	1590J	94	93	30-138		30		
3,3'-Dichlorobenzidine	ug/kg	ND	1720	1710	1340J	1500J	78	88	30-149		30	5M	
3-Nitroaniline	ug/kg	ND	1720	1710	1300J	1180J	76	69	30-150		30		
4,6-Dinitro-2-methylphenol	ug/kg	ND	1720	1710	ND	ND	19	20	30-133		30	M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2872788												2872789			
Parameter	Units	10424792001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual				
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD		RPD			
4-Bromophenylphenyl ether	ug/kg	ND	1720	1710	1670J	1600J	97	94	44-125		30				
4-Chloro-3-methylphenol	ug/kg	ND	1720	1710	1580J	ND	92	99	30-150		30				
4-Chloroaniline	ug/kg	ND	1720	1710	1010J	930J	59	54	30-125		30				
4-Chlorophenylphenyl ether	ug/kg	ND	1720	1710	1630J	1540J	95	90	44-125		30				
4-Nitroaniline	ug/kg	ND	1720	1710	1500J	1440J	87	84	30-150		30				
4-Nitrophenol	ug/kg	ND	1720	1710	1450J	1370J	85	80	30-150		30				
Acenaphthene	ug/kg	ND	1720	1710	1490J	1430J	87	84	40-125		30				
Acenaphthylene	ug/kg	ND	1720	1710	1560J	1470J	91	86	30-150		30				
Anthracene	ug/kg	ND	1720	1710	1770	1800	103	106	30-150	2	30				
Benzo(a)anthracene	ug/kg	ND	1720	1710	1970	1970	115	115	30-150	0	30				
Benzo(a)pyrene	ug/kg	ND	1720	1710	1860	1850	109	108	30-150	1	30				
Benzo(b)fluoranthene	ug/kg	ND	1720	1710	1560J	1770	91	104	30-150		30				
Benzo(g,h,i)perylene	ug/kg	ND	1720	1710	1600J	1710	93	100	30-150		30				
Benzo(k)fluoranthene	ug/kg	ND	1720	1710	1660J	1550J	97	91	30-150		30				
bis(2-Chloroethoxy)methane	ug/kg	ND	1720	1710	1520J	1460J	89	85	30-134		30				
bis(2-Chloroethyl) ether	ug/kg	ND	1720	1710	1570J	1550J	91	91	30-125		30 5M				
bis(2-Chloroisopropyl) ether	ug/kg	ND	1720	1710	1780	1600J	104	94	30-125		30 5M				
bis(2-Ethylhexyl)phthalate	ug/kg	ND	1720	1710	1780	1880	104	110	30-150	5	30				
Butylbenzylphthalate	ug/kg	ND	1720	1710	1740	1790	102	105	30-150	3	30				
Carbazole	ug/kg	ND	1720	1710	1660J	1710	97	100	41-125		30				
Chrysene	ug/kg	ND	1720	1710	2070	2030	121	119	30-150	2	30				
Di-n-butylphthalate	ug/kg	ND	1720	1710	1730	1740	101	102	30-150	0	30				
Di-n-octylphthalate	ug/kg	ND	1720	1710	1840	1870	108	110	30-150	2	30				
Dibenz(a,h)anthracene	ug/kg	ND	1720	1710	1540J	1680J	90	98	30-150		30				
Dibenzofuran	ug/kg	ND	1720	1710	1620J	1590J	95	93	45-125		30				
Diethylphthalate	ug/kg	ND	1720	1710	1680J	1660J	98	97	30-150		30				
Dimethylphthalate	ug/kg	ND	1720	1710	1650J	1630J	97	96	30-150		30				
Fluoranthene	ug/kg	ND	1720	1710	1750	1740	102	102	30-150	0	30				
Fluorene	ug/kg	ND	1720	1710	1620J	1660J	95	97	30-150		30				
Hexachloro-1,3-butadiene	ug/kg	ND	1720	1710	1380J	1460J	80	86	30-128		30				
Hexachlorobenzene	ug/kg	ND	1720	1710	1500J	1500J	87	88	30-150		30				
Hexachloroethane	ug/kg	ND	1720	1710	1440J	1350J	84	79	30-125		30				
Indeno(1,2,3-cd)pyrene	ug/kg	ND	1720	1710	1500J	1650J	88	97	30-150		30				
Isophorone	ug/kg	ND	1720	1710	1570J	1550J	92	91	30-140		30				
N-Nitroso-di-n-propylamine	ug/kg	ND	1720	1710	1680J	1570J	98	92	30-147		30 5M				
N-Nitrosodimethylamine	ug/kg	ND	1720	1710	1420J	1330J	83	78	30-125		30				
N-Nitrosodiphenylamine	ug/kg	ND	1720	1710	1610J	1720	94	101	30-150		30				
Naphthalene	ug/kg	ND	1720	1710	1520J	1480J	89	86	44-125		30				
Nitrobenzene	ug/kg	ND	1720	1710	1580J	1550J	92	91	30-136		30				
Pentachlorophenol	ug/kg	ND	1720	1710	ND	ND	23	22	30-150		30 M1				
Phenanthrene	ug/kg	ND	1720	1710	1890	1950	110	114	30-150	3	30				
Phenol	ug/kg	ND	1720	1710	1530J	1490J	89	87	30-129		30				
Pyrene	ug/kg	ND	1720	1710	2160	2260	126	132	30-150	4	30				
2,4,6-Tribromophenol (S)	%						86	83	60-125						
2-Fluorobiphenyl (S)	%						98	95	30-132						
2-Fluorophenol (S)	%						95	88	40-125						

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Parameter	Units	2872788		2872789		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Nitrobenzene-d5 (S)	%.					93	93	43-125			
p-Terphenyl-d14 (S)	%.					97	103	62-125			
Phenol-d6 (S)	%.					95	93	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids
Pace Project No.: 10424793

QC Batch: 529263 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2872540 Matrix: Solid
Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/02/18 12:14	
Acenaphthylene	ug/kg	ND	10.0	04/02/18 12:14	
Anthracene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(a)anthracene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(a)pyrene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/02/18 12:14	
Chrysene	ug/kg	ND	10.0	04/02/18 12:14	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/02/18 12:14	
Fluoranthene	ug/kg	ND	10.0	04/02/18 12:14	
Fluorene	ug/kg	ND	10.0	04/02/18 12:14	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/02/18 12:14	
Naphthalene	ug/kg	ND	10.0	04/02/18 12:14	
Phenanthrene	ug/kg	ND	10.0	04/02/18 12:14	
Pyrene	ug/kg	ND	10.0	04/02/18 12:14	
2-Fluorobiphenyl (S)	%	84	42-125	04/02/18 12:14	
p-Terphenyl-d14 (S)	%	100	57-125	04/02/18 12:14	

LABORATORY CONTROL SAMPLE: 2872541

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	24.2	73	52-125	
Acenaphthylene	ug/kg	33.3	26.1	78	50-125	
Anthracene	ug/kg	33.3	30.0	90	65-125	
Benzo(a)anthracene	ug/kg	33.3	31.8	95	60-125	
Benzo(a)pyrene	ug/kg	33.3	30.2	90	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	31.1	93	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	26.3	79	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	29.3	88	67-125	
Chrysene	ug/kg	33.3	28.6	86	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	25.8	77	63-125	
Fluoranthene	ug/kg	33.3	30.2	91	75-125	
Fluorene	ug/kg	33.3	25.3	76	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	26.4	79	63-125	
Naphthalene	ug/kg	33.3	26.1	78	49-125	
Phenanthrene	ug/kg	33.3	25.1	75	65-125	
Pyrene	ug/kg	33.3	31.2	94	64-125	
2-Fluorobiphenyl (S)	%			78	42-125	
p-Terphenyl-d14 (S)	%			97	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Parameter	Units	2872542		2872543		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10424778001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Acenaphthene	ug/kg	ND	36.5	36.6	27.7J	25.3J	76	69	30-125		30		
Acenaphthylene	ug/kg	ND	36.5	36.6	74.3J	57.6J	203	157	30-133		30	M1	
Anthracene	ug/kg	ND	36.5	36.6	76.5J	62.4J	209	170	30-150		30	M1	
Benzo(a)anthracene	ug/kg	ND	36.5	36.6	117	64.1J	319	175	30-150		30	M1	
Benzo(a)pyrene	ug/kg	ND	36.5	36.6	205	148	559	404	30-150	32	30	M1, R1	
Benzo(b)fluoranthene	ug/kg	ND	36.5	36.6	201	135	551	370	30-150	39	30	M1, R1	
Benzo(g,h,i)perylene	ug/kg	0.16 mg/kg	36.5	36.6	275	218	317	158	30-150	23	30	M1	
Benzo(k)fluoranthene	ug/kg	ND	36.5	36.6	94.9J	67.8J	260	185	30-150		30	M1	
Chrysene	ug/kg	ND	36.5	36.6	148	83.8J	406	229	30-150		30	M1	
Dibenz(a,h)anthracene	ug/kg	ND	36.5	36.6	80.8J	61.4J	221	168	30-131		30	M1	
Fluoranthene	ug/kg	ND	36.5	36.6	139	80.6J	380	220	30-150		30	M1	
Fluorene	ug/kg	ND	36.5	36.6	32J	26.3J	88	72	30-147		30		
Indeno(1,2,3-cd)pyrene	ug/kg	ND	36.5	36.6	169	125	463	342	30-150	30	30	M1	
Naphthalene	ug/kg	ND	36.5	36.6	25.2J	22.3J	69	61	30-131		30		
Phenanthrene	ug/kg	ND	36.5	36.6	41.7J	34.5J	114	94	30-150		30		
Pyrene	ug/kg	ND	36.5	36.6	139	74.2J	381	202	30-150		30	M1	
2-Fluorobiphenyl (S)	%.						82	71	42-125				P3
p-Terphenyl-d14 (S)	%.						74	66	57-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 529569 Analysis Method: EPA 8270D
 QC Batch Method: EPA 3546 Analysis Description: MDA2 Solid MSSV
 Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2874519 Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,5-T	mg/kg	ND	0.033	04/04/18 13:35	
2,4,5-TP (Silvex)	mg/kg	ND	0.033	04/04/18 13:35	
2,4-D	mg/kg	ND	0.033	04/04/18 13:35	
2,4-DB	mg/kg	ND	0.033	04/04/18 13:35	
Bentazon	mg/kg	ND	0.033	04/04/18 13:35	
Dicamba	mg/kg	ND	0.033	04/04/18 13:35	
Dinoseb	mg/kg	ND	0.033	04/04/18 13:35	
MCPA	mg/kg	ND	0.033	04/04/18 13:35	
Pentachlorophenol	mg/kg	ND	0.033	04/04/18 13:35	
Picloram	mg/kg	ND	0.033	04/04/18 13:35	
Triclopyr	mg/kg	ND	0.033	04/04/18 13:35	
2,4-DCAA (S)	%	78	46-125	04/04/18 13:35	

LABORATORY CONTROL SAMPLE: 2874520

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,5-T	mg/kg	.33	0.28	83	60-125	
2,4,5-TP (Silvex)	mg/kg	.33	0.26	79	61-125	
2,4-D	mg/kg	.33	0.29	86	63-125	
2,4-DB	mg/kg	.33	0.28	83	59-125	
Bentazon	mg/kg	.33	0.25	76	58-125	
Dicamba	mg/kg	.33	0.27	80	52-125	
Dinoseb	mg/kg	.33	0.18	53	35-126	
MCPA	mg/kg	.33	0.27	82	57-125	
Pentachlorophenol	mg/kg	.33	0.21	63	48-125	
Picloram	mg/kg	.33	0.24	72	47-125	
Triclopyr	mg/kg	.33	0.28	83	68-125	
2,4-DCAA (S)	%			77	46-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874521 2874522

Parameter	Units	10425111006		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
2,4,5-T	mg/kg	ND	.45	.45	0.19	0.21	42	45	30-145	8	20		
2,4,5-TP (Silvex)	mg/kg	ND	.45	.45	0.28	0.26	63	58	30-130	7	20		
2,4-D	mg/kg	ND	.45	.45	0.18	0.20	40	44	30-150	9	20		
2,4-DB	mg/kg	ND	.45	.45	0.35	0.33	77	72	45-126	7	20		
Bentazon	mg/kg	ND	.45	.45	0.33	0.32	73	71	30-133	3	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Parameter	Units	10425111006		2874521		2874522		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
Dicamba	mg/kg	ND	.45	.45	0.13	0.17	29	38	30-140	28	20	M1, R1		
Dinoseb	mg/kg	ND	.45	.45	0.39	0.31	86	69	30-136	23	20	R1		
MCPA	mg/kg	ND	.45	.45	0.24	0.22	53	49	30-136	9	20			
Pentachlorophenol	mg/kg	ND	.45	.45	0.28	0.25	63	55	44-125	13	20			
Picloram	mg/kg	ND	.45	.45	.016J	0.098	3	22	30-125		20	M1		
Triclopyr	mg/kg	ND	.45	.45	0.23	0.22	51	50	30-149	3	20			
2,4-DCAA (S)	%.						65	60	46-125					

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 529271 Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS

Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2872598 Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	03/30/18 13:11	
n-Triacontane (S)	%.	83	50-150	03/30/18 13:11	

LABORATORY CONTROL SAMPLE & LCSD: 2872599

2872600

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	68.2	73.5	85	92	70-120	8	20	
n-Triacontane (S)	%.				85	78	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids
Pace Project No.: 10424793

QC Batch: 435589 Analysis Method: EPA 7196A
QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
Associated Lab Samples: 10424793003

METHOD BLANK: 2011612 Matrix: Solid
Associated Lab Samples: 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/06/18 13:03	

LABORATORY CONTROL SAMPLE: 2011613

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1010	916	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2011628 2011629

Parameter	Units	50192674008 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Chromium, Hexavalent	mg/kg	ND	1130	1120	1050	1050	93	94	75-125	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2011630 2011631

Parameter	Units	50192674008 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Chromium, Hexavalent	mg/kg	ND	45.7	45.5	45.3	45.5	99	100	75-125	0	20	

SAMPLE DUPLICATE: 2011632

Parameter	Units	40166807001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	<71.3	ND		20	D3

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids
Pace Project No.: 10424793

QC Batch: 285232 Analysis Method: EPA 9012
QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 1669245 Matrix: Solid
Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/05/18 14:27	

LABORATORY CONTROL SAMPLE: 1669246

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1669247 1669248

Parameter	Units	40166647001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.10J	2.5	2.5	2.3	2.5	88	96	80-120	7	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1669249 1669250

Parameter	Units	40166870001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.16J	2.37	2.49	2.4	2.3	94	89	80-120	3	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 139994

Analysis Method: EPA 9056A

QC Batch Method: EPA 300.0

Analysis Description: 9056 IC Anions, Soil

Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 554472

Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	0.99	04/05/18 17:16	

LABORATORY CONTROL SAMPLE: 554471

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	49.8	51.6	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 554473

554474

Parameter	Units	10424793002		554473		554474		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result				
Fluoride	mg/kg	1.7	50	49	23.2	28.0	43	54	80-120	19	20 M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

BATCH QUALIFIERS

Batch: 435998

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1M RPD value is outside control limits due to sample non-homogeneity.

2M Sample was black in color. Sample needed to be centrifuged and decanted prior to analysis.

3M Sample was brown in color. Sample was centrifuged and decanted prior to analysis.

4M Sample was yellow in color.

5M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

C0 Result confirmed by second analysis.

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

D4 Sample was diluted due to the presence of high levels of target analytes.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

ANALYTE QUALIFIERS

- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- N2 The lab does not hold NELAC/TNI accreditation for this parameter.
- N3 Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
- P3 Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
- R1 RPD value was outside control limits.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.
- S5 Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
- T6 High boiling point hydrocarbons are present in the sample.
- T7 Low boiling point hydrocarbons are present in the sample.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424793001	FD-SB-A3-S (30-35)	EPA 1630 (1998)	140178	EPA 1630 (1998)	140181
10424793002	FD-SB-B3-WM (5-26)	EPA 1630 (1998)	140178	EPA 1630 (1998)	140181
10424793003	FD-SB-C3-WM (5-20)	EPA 1630 (1998)	140178	EPA 1630 (1998)	140181
10424793001	FD-SB-A3-S (30-35)	EPA 3550	529466	EPA 8081B	530402
10424793002	FD-SB-B3-WM (5-26)	EPA 3550	529466	EPA 8081B	530402
10424793003	FD-SB-C3-WM (5-20)	EPA 3550	529466	EPA 8081B	530402
10424793001	FD-SB-A3-S (30-35)	EPA 3550	529467	EPA 8082A	530082
10424793002	FD-SB-B3-WM (5-26)	EPA 3550	529467	EPA 8082A	530082
10424793003	FD-SB-C3-WM (5-20)	EPA 3550	529467	EPA 8082A	530082
10424793001	FD-SB-A3-S (30-35)	WI MOD DRO	529271	WI MOD DRO	529930
10424793002	FD-SB-B3-WM (5-26)	WI MOD DRO	529271	WI MOD DRO	529930
10424793003	FD-SB-C3-WM (5-20)	WI MOD DRO	529271	WI MOD DRO	529930
10424793001	FD-SB-A3-S (30-35)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424793002	FD-SB-B3-WM (5-26)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424793003	FD-SB-C3-WM (5-20)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424793001	FD-SB-A3-S (30-35)	EPA 3050	529339	EPA 6010C	529383
10424793002	FD-SB-B3-WM (5-26)	EPA 3050	529339	EPA 6010C	529383
10424793003	FD-SB-C3-WM (5-20)	EPA 3050	529339	EPA 6010C	529383
10424793001	FD-SB-A3-S (30-35)	EPA 3050B	435596	EPA 6020	435837
10424793002	FD-SB-B3-WM (5-26)	EPA 3050B	435596	EPA 6020	435837
10424793003	FD-SB-C3-WM (5-20)	EPA 3050B	435596	EPA 6020	435837
10424793001	FD-SB-A3-S (30-35)	EPA 3050	529341	EPA 6020A	529455
10424793002	FD-SB-B3-WM (5-26)	EPA 3050	529341	EPA 6020A	529455
10424793003	FD-SB-C3-WM (5-20)	EPA 3050	529341	EPA 6020A	529455
10424793001	FD-SB-A3-S (30-35)	EPA 7471	529342	EPA 7471	529917
10424793002	FD-SB-B3-WM (5-26)	EPA 7471	529342	EPA 7471	529917
10424793003	FD-SB-C3-WM (5-20)	EPA 7471	529342	EPA 7471	529917
10424793001	FD-SB-A3-S (30-35)	ASTM D2974	529398		
10424793002	FD-SB-B3-WM (5-26)	ASTM D2974	529398		
10424793003	FD-SB-C3-WM (5-20)	ASTM D2974	529398		
10424793001	FD-SB-A3-S (30-35)	EPA 3550	529268	EPA 8270D	529887
10424793002	FD-SB-B3-WM (5-26)	EPA 3550	529268	EPA 8270D	529887
10424793003	FD-SB-C3-WM (5-20)	EPA 3550	529268	EPA 8270D	529887
10424793001	FD-SB-A3-S (30-35)	EPA 3550	529263	EPA 8270D by SIM	530180
10424793002	FD-SB-B3-WM (5-26)	EPA 3550	529263	EPA 8270D by SIM	530180
10424793003	FD-SB-C3-WM (5-20)	EPA 3550	529263	EPA 8270D by SIM	530180
10424793001	FD-SB-A3-S (30-35)	EPA 3546	529569	EPA 8270D	530638
10424793002	FD-SB-B3-WM (5-26)	EPA 3546	529569	EPA 8270D	530638
10424793003	FD-SB-C3-WM (5-20)	EPA 3546	529569	EPA 8270D	530638
10424793001	FD-SB-A3-S (30-35)	EPA 5035/5030B	529276	EPA 8260B	529485
10424793002	FD-SB-B3-WM (5-26)	EPA 5035/5030B	529276	EPA 8260B	529485
10424793003	FD-SB-C3-WM (5-20)	EPA 5035/5030B	529276	EPA 8260B	529485

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424793003	FD-SB-C3-WM (5-20)	EPA 3060A	435589	EPA 7196A	435998
10424793003	FD-SB-C3-WM (5-20)	Trivalent Chromium Calculation	436173		
10424793001	FD-SB-A3-S (30-35)	EPA 9012A	285232	EPA 9012	285274
10424793002	FD-SB-B3-WM (5-26)	EPA 9012A	285232	EPA 9012	285274
10424793003	FD-SB-C3-WM (5-20)	EPA 9012A	285232	EPA 9012	285274
10424793001	FD-SB-A3-S (30-35)	EPA 300.0	139994	EPA 9056A	140024
10424793002	FD-SB-B3-WM (5-26)	EPA 300.0	139994	EPA 9056A	140024
10424793003	FD-SB-C3-WM (5-20)	EPA 300.0	139994	EPA 9056A	140024

REPORT OF LABORATORY ANALYSIS

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Minnesota Pollution Control Agency

Chain-of-Custody Form

Work Order Number:

COC Type: 10424793

Turnaround Time:

COC ID:

PROJECT/CLIENT INFO

LABORATORY

FOR LAB USE ONLY

Facility Code: *MPCA - Freeway LF Solids* Program Code (MDH Lab Only):

Lab Name:

Project Name: *MPCA - Freeway LF Solids* Project Task Code:

Address: *18-00383
Epic Profile #38716*

Project Manager:

Phone No:

Potential Hazard? If yes, add information to Sampler Comments Section

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample-Routine Sample
S-IVP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
NW=Non-potable Water
SD=Soil/Solid
WP=Wipe
AR=Air
BL=Biological Material
OT=Other
TS=Tissue

FIELD MATRIX CODES

Wt-Ground=Groundwater
Wt-Surf=Surface Water
QC-BLANK=Artificial Blank Water
Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, feet	End Depth, feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Coats	ANALYSIS	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	Lab Sample No.	#	
<i>FD-SB-A3 S (31-33)</i>	<i>S</i>	<i>3/23/18</i>	<i>12:30</i>	<i>30</i>	<i>35</i>	<i>C</i>	<i>SD</i>					<i>see attached for soils/waste (-Dioxins)</i>									<i>001</i>	<i>1</i>
<i>FD-SB-B3 -WM (5-30)</i>	<i>S</i>	<i>3/23/18</i>	<i>13:30</i>	<i>5</i>	<i>26</i>	<i>C</i>	<i>SD</i>					<i>X</i>									<i>002</i>	<i>2</i>
<i>FD-SB-C3 -WM (5-30)</i>	<i>S</i>	<i>3/23/18</i>	<i>14:30</i>	<i>5</i>	<i>20</i>	<i>C</i>	<i>SD</i>					<i>X</i>									<i>003</i>	<i>3</i>
																						<i>4</i>
																						<i>5</i>
																						<i>6</i>
																						<i>7</i>
																						<i>8</i>
																						<i>9</i>
																						<i>10</i>

Sampled By: *David Anderson* Sampler's Signature: *David Anderson* Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
<i>David Anderson / Pace</i>	<i>3/23/18 / 1600</i>	<i>Matt Pace</i>	<i>3/23/18 / 1600</i>

T=5.4

Sample Condition Upon Receipt	Client Name: <u>MPCA - FSD</u>	Project #: WO# : 10424793
Courier:	<input type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input checked="" type="checkbox"/> Client <input type="checkbox"/> Commercial <input type="checkbox"/> Pace <input type="checkbox"/> Speedee <input type="checkbox"/> Other: _____	PM: BM2 Due Date: 04/06/18 CLIENT: PASI-MNFLD
Tracking Number: _____		

Custody Seal on Cooler/Box Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Seals Intact? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Optional: Proj. Due Date: _____ Proj. Name: _____
Packing Material: <input type="checkbox"/> Bubble Wrap <input type="checkbox"/> Bubble Bags <input checked="" type="checkbox"/> None <input type="checkbox"/> Other: _____	Temp Blank? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Thermometer <input type="checkbox"/> 151401163 Used: <input checked="" type="checkbox"/> G87A9155100842	Type of Ice: <input checked="" type="checkbox"/> Wet <input type="checkbox"/> Blue <input type="checkbox"/> None <input type="checkbox"/> Dry <input type="checkbox"/> Melted	
Cooler Temp Read (°C): <u>5.2</u> Cooler Temp Corrected (°C): <u>5.4</u>	Biological Tissue Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Temp should be above freezing to 6°C Correction Factor: <u>+0.2</u>	Date and Initials of Person Examining Contents: <u>3-23-18 JDD</u>	
USDA Regulated Soil (<input type="checkbox"/> N/A, water sample)		
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.		

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	12.
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): _____	15.

CLIENT NOTIFICATION/RESOLUTION		Field Data Required? <input type="checkbox"/> Yes <input type="checkbox"/> No
Person Contacted: _____	Date/Time: _____	
Comments/Resolution: _____		

Project Manager Review: BLN **Date:** 3/27/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Chain of Custody

WO#: 12106658



12106658

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424793 Workorder Name: 18-00383 MPCA FreewayLF Solids Owner Received Date: 3/23/2018 Results Requested By: 4/6/2018

Report To		Subcontract To					Requested Analysis																							
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					<div style="display: flex; justify-content: space-between;"> Fluoride by 9056 LAB USE ONLY </div>																							
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers																								
						Unpreserved																								
1	FD-SB-A3-S (30-35)	PS	3/23/2018 12:30	10424793001	Solid	1																								
2	FD-SB-B3-WM (5-26)	PS	3/23/2018 13:30	10424793002	Solid	1																								
3	FD-SB-C3-WM (5-20)	PS	3/23/2018 14:30	10424793003	Solid	1																								
4																														
5																														
Transfers		Released By	Date/Time	Received By	Date/Time	Comments																								
1		<i>Mary Veld Pace</i>	<i>4/03/18 1545</i>	<i>B. Mathews</i>	<i>4/4/18 0935</i>																									
2																														
3																														
Cooler Temperature on Receipt		<i>2.1</i> °C	Custody Seal		<i>Y</i> or N	Received on Ice		<i>Y</i> or N	Samples Intact			<i>Y</i> or N																		

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace Mpls Project #: _____

WO# : 12106658
 PM: HRZ Due Date: 04/06/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: SD

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.8 Cooler Temp Corrected °C: 1.1 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: 10.3 Date and Initials of Person Examining Contents: Bm 4/4/18

Comments: _____

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N
 Project Manager Review: [Signature] Date: 4/4/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Sample Condition Upon Receipt

Client Name: PACE MPLS Project #: _____

WO#: 12106658
 PM: HRZ Due Date: 04/06/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: SD

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 01339252/1710 IR-1 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 3.7 Cooler Temp Corrected °C: 3.7 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6°C Correction Factor: 0.0 Date and Initials of Person Examining Contents: 4/4/18 *[Signature]*

If temperature is ≤0°C, is there evidence of ice formation? Yes No NA

			Comments:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>			
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
Pace Trip Blank Lot # (if purchased):			

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: *[Signature]* Date: 4/4/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



Document Name: Sample Condition Upon Receipt (SCUR)
Document No.: F-GB-C-031-rev.06

Document Revised: 31Jan2018
Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace, MN

Project #: _____

WO#: **40166966**



Courier: CS Logistics Fed Ex Speedee UPS Waitco
 Client Pace Other: _____

Tracking #: 1682502

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Custody Seal on Samples Present: yes no Seals intact: yes no

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR - 4 Type of Ice: Blue Dry None

Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 4.5 / Corr: 4

Temp Blank Present: yes no

Biological Tissue is Frozen: yes no

Person examining contents:

Date: 4-5-18
Initials: SW

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time: _____
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7. <u>4-6-18 TAT</u>
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		8. <u>4-5-18 SW</u>
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>S</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____

If checked, see attached form for additional comments

Comments/ Resolution: No collect times on original labels.

4-5-18 SW

Project Manager Review: [Signature]

Date: 4/5/18



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50193607

Date/Time and Initials of person examining contents: TR 4/4/16 0920

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 9567

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 3.0/3.3 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia?		<input checked="" type="checkbox"/>	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			<input checked="" type="checkbox"/>
Document any containers out of temp.		<input checked="" type="checkbox"/>	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			<input checked="" type="checkbox"/>
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		<input checked="" type="checkbox"/>	Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			<input checked="" type="checkbox"/>
Chain of Custody Present:	<input checked="" type="checkbox"/>		Dissolved Metals field filtered?:			<input checked="" type="checkbox"/>
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>		Headspace Wisconsin Sulfide			<input checked="" type="checkbox"/>
Short Hold Time Analysis (<72hr)?:		<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>
Analysis:		<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	<u>Present</u>	<u>Absent</u>	<u>N/A</u>
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			<input checked="" type="checkbox"/>
Rush TAT Requested: <u>4/6/16</u>	<input checked="" type="checkbox"/>		Headspace in VOA Vials (>6mm):			<input checked="" type="checkbox"/>
Containers Intact?:	<input checked="" type="checkbox"/>		Trip Blank Present?:		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Sample Labels Match COC?:	<input checked="" type="checkbox"/>		Trip Blank Custody Seals?:		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Except TCs, which only require sample ID						

Comments: _____

Sample Container Count

WO#: 50193607



CLIENT: Page MW

COC PAGE 1 of 1

COC ID# _____

Project # 50193607

Sample Line Item	DG9H VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	Bulk Kit R	Matrix Si (Soil/Wa Aqueous	pH <2	pH >9	pH >12
1								1											5		
2								1											1		
3								1													
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
WG9U	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				

Page 70 of 70

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

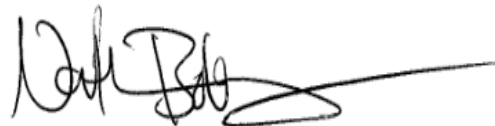
Pace Project #: 10424795
Sample Receipt Date: 03/23/2018
Client Project #: MPCA-Freeway LF Soli
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 05, 2018

Nathan Boberg, Project Manager

(612) 607-6444 (fax)
nathan.boberg@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

April 5, 2018

DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of Pace Analytical Services, Inc. The sample was analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The isotopically-labeled TCDD internal standard in the sample extract was recovered at 66%. All of the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 102%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

WO#: 10424795



Minnesota Pollution Control Agency

Chain-of-Custody Form

Work Order Number: COCT 10424795
Turnaround Time: COC ID:

PROJECT/CLIENT INFO		LABORATORY	
Facility Code: <i>MPCA - Freeway LF Solids</i>	Program Code (MDH Lab Only):	Lab Name:	
Project Name: <i>MPCA - Freeway LF Solids</i>	Project Task Code:	Address: <i>18-00383</i>	
Project Manager:		<i>EPIC Profile #38716</i>	
Potential Hazard?	If yes, add information to Sampler Comments Section		Phone No:

ONLY
Lab Work Order Sticker

SAMPLE DETAILS										ANALYSIS REQUESTED																			
SAMPLE TYPE CODES					LAB MATRIX CODES					FIELD MATRIX CODES					PRESERV.														
Sample=Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample					QC-FB=Field Blank Sample QC-FR=Field Replicate Sample QC-TB= Trip Blank Sample					DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe AR=Air BL=Biological Material OT=Other TS=Tissue					Wu-Ground=Groundwater Wu-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample														
Location Identifier	Sample Type	Date	Time	Start Depth (feet)	End Depth (feet)	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS REQUESTED										Lab Sample No.	#						
<i>FD-SB-A3 (S-31-33)</i>	<i>S</i>	<i>3/23/18</i>	<i>13:30</i>	<i>30</i>	<i>35</i>	<i>C</i>	<i>SD</i>					<i>See attached for soils/waste (-Dioxins)</i>											<i>1</i>						
<i>FD-SB-B3 (WM (S-30))</i>	<i>S</i>	<i>3/23/18</i>	<i>13:30</i>	<i>5</i>	<i>26</i>	<i>C</i>	<i>SD</i>					<i>+Dioxins</i>										<i>001</i>	<i>2</i>						
<i>FD-SB-C3 (WM (S-30))</i>	<i>S</i>	<i>3/23/18</i>	<i>14:30</i>	<i>5</i>	<i>20</i>	<i>C</i>	<i>SD</i>																<i>3</i>						
																							<i>4</i>						
																							<i>5</i>						
																							<i>6</i>						
																							<i>7</i>						
																							<i>8</i>						
																							<i>9</i>						
																							<i>10</i>						

Sampled By: *David Anderson* Sampler's Signature: *David Anderson* Phone #:

Receiving Comments:		Relinquished By/Affiliation		Date/Time		Accepted By/ Affiliation		Date/Time	
		<i>David Anderson / Pace</i>		<i>3/23/18 / 1600</i>		<i>Matt Pace</i>		<i>3/23/18 / 1600</i>	

T=5.4

Sample Condition Upon Receipt **Client Name:** MPCA - FSD **Project #:** _____

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

WO# : 10424795

PM: SCU Due Date: 04/06/18

CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer 151401163 **Type of Ice:** Wet Blue None Dry Melted
Used: G87A9155100842

Cooler Temp Read (°C): 5.2 **Cooler Temp Corrected (°C):** 5.4 **Biological Tissue Frozen?** Yes No N/A
Temp should be above freezing to 6°C **Correction Factor:** +0.2 **Date and Initials of Person Examining Contents:** 3-23-18 JDD

USDA Regulated Soil (N/A, water sample)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. initial when completed: _____ Lot # of added preservative: _____
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Nathan Boberg **Date:** 3/26/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-B3-WM (5-26)		
Lab Sample ID	10424795001		
Filename	F180402B_15		
Injected By	SMT		
Total Amount Extracted	15.9 g	Matrix	Solid
% Moisture	36.8	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	03/23/2018 13:30
ICAL ID	F180329	Received	03/23/2018 16:00
CCal Filename(s)	F180402B_04 & F180402B_21	Extracted	03/27/2018 15:00
Method Blank ID	BLANK-61362	Analyzed	04/03/2018 00:37

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	1.1	----	1.0	2,3,7,8-TCDD-13C	2.00	66
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	78

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61362	Matrix	Solid
Filename	F180401B_07	Dilution	NA
Total Amount Extracted	75.0 g	Extracted	03/27/2018 15:00
ICAL ID	F180329	Analyzed	04/01/2018 16:13
CCal Filename(s)	F180401B_01 & F180401B_17	Injected By	BAL

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	65
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	77

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61363	Matrix	Solid
Filename	F180401B_02	Dilution	NA
Total Amount Extracted	75.3 g	Extracted	03/27/2018 15:00
ICAL ID	F180329	Analyzed	04/01/2018 12:29
CCal Filename(s)	F180401B_01 & F180401B_17	Injected By	BAL
Method Blank ID	BLANK-61362		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.20	102	2,3,7,8-TCDD-13C	2.0	64
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	68

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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April 13, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 27, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Unionized Ammonia was not calculated for sample FD-SB-A3 due to insufficient volume to conduct the field pH & Temperature..

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Bob Michels
bob.michels@pacelabs.com
(612)607-6452
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Montana Certificate #CERT0103

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842018-1

Oklahoma Department of Environmental Quality

California Certification #2973

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512

Minnesota Department of Health, Certificate #1385941

Arkansas Department of Environmental Quality, Certificate #17-046-0

Georgia Environmental Protection Division, Stipulation

Illinois Environmental Protection Agency, Certificate

#004325

Michigan Department of Environmental Quality, Laboratory

#0034

New York State Department of Health, Serial #56192 and 56193

North Carolina Division of Water Resources, Certificate #659

Virginia Department of General Services, Certificate #9028

Wisconsin Department of Natural Resources, Laboratory #999472650

U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10424924001	FD-SB-B4	Water	03/26/18 15:00	03/27/18 08:15
10424924002	FD-SB-A3	Water	03/26/18 14:00	03/27/18 08:15

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10424924001	FD-SB-B4	EPA 8270D	JLR	38	PASI-M
		EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
10424924002	FD-SB-A3	EPA 200.7	IP	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-H+B	JFP	1	PASI-M
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 350.1	DCL	1	PASI-M
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		EPA 353.2	JFP	3	PASI-M
		EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
SM 4500-P E	DCL	1	PASI-M		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

Sample: FD-SB-B4	Lab ID: 10424924001	Collected: 03/26/18 15:00	Received: 03/27/18 08:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	83-32-9	
Anthracene	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	120-12-7	
Benzo(a)pyrene	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	50-32-8	
Benzoic acid	ND	ug/L	529	10	03/29/18 14:54	04/03/18 21:22	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	101-55-3	
Butylbenzylphthalate	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	111-44-4	
2-Chlorophenol	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	529	10	03/29/18 14:54	04/03/18 21:22	91-94-1	
2,4-Dichlorophenol	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	120-83-2	
Diethylphthalate	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	84-66-2	
2,4-Dimethylphenol	ND	ug/L	529	10	03/29/18 14:54	04/03/18 21:22	105-67-9	
Dimethylphthalate	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	131-11-3	
Di-n-butylphthalate	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	84-74-2	
2,4-Dinitrophenol	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	51-28-5	
Di-n-octylphthalate	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	117-81-7	
Fluoranthene	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	206-44-0	
Fluorene	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	86-73-7	
Hexachlorobenzene	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	529	10	03/29/18 14:54	04/03/18 21:22	77-47-4	
Hexachloroethane	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	67-72-1	
Isophorone	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	78-59-1	
2-Methylnaphthalene	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	212	10	03/29/18 14:54	04/03/18 21:22		
N-Nitrosodiphenylamine	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	86-30-6	
Pentachlorophenol	ND	ug/L	212	10	03/29/18 14:54	04/03/18 21:22	87-86-5	
Phenanthrene	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	85-01-8	
Phenol	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	108-95-2	
Pyrene	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%	60-125	10	03/29/18 14:54	04/03/18 21:22	4165-60-0	D3,S4
2-Fluorobiphenyl (S)	0	%	56-125	10	03/29/18 14:54	04/03/18 21:22	321-60-8	S4
p-Terphenyl-d14 (S)	0	%	58-125	10	03/29/18 14:54	04/03/18 21:22	1718-51-0	S4
Phenol-d6 (S)	0	%	58-125	10	03/29/18 14:54	04/03/18 21:22	13127-88-3	S4
2-Fluorophenol (S)	0	%	55-125	10	03/29/18 14:54	04/03/18 21:22	367-12-4	S4
2,4,6-Tribromophenol (S)	0	%	65-125	10	03/29/18 14:54	04/03/18 21:22	118-79-6	S4
9016 Cyanide, Free								
Analytical Method: EPA 9016 Preparation Method: EPA 9016								
Cyanide, Free	ND	ug/L	5.0	1	04/05/18 16:15	04/05/18 17:16		
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	11.0	ug/L	10.0	1	04/03/18 09:46	04/03/18 12:52	57-12-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

Sample: FD-SB-A3		Lab ID: 10424924002	Collected: 03/26/18 14:00	Received: 03/27/18 08:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	03/30/18 11:48	04/02/18 13:39	7429-90-5	
Barium, Dissolved	1110	ug/L	10.0	1	03/30/18 11:48	04/02/18 13:39	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/30/18 11:48	04/02/18 13:39	7440-50-8	
Manganese, Dissolved	623	ug/L	5.0	1	03/30/18 11:48	04/02/18 13:39	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/30/18 11:48	04/02/18 13:39	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/30/18 11:48	04/02/18 13:39	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/30/18 11:48	04/02/18 13:39	7440-31-5	
Zinc, Dissolved	ND	ug/L	20.0	1	03/30/18 11:48	04/02/18 13:39	7440-66-6	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Chromium	7.3	ug/L	2.5	5	03/30/18 13:50	03/30/18 18:10	7440-47-3	
Total Hardness by 2340B	1030000	ug/L	14100	100	03/30/18 13:50	03/30/18 18:13		
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:10	7440-36-0	
Arsenic, Dissolved	0.75	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:10	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/30/18 11:48	03/30/18 13:10	7440-41-7	
Boron, Dissolved	33000	ug/L	1000	200	03/30/18 11:48	03/30/18 16:19	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/30/18 11:48	03/30/18 13:10	7440-43-9	
Chromium, Dissolved	3.7	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:10	7440-47-3	
Cobalt, Dissolved	1.1	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:10	7440-48-4	
Lead, Dissolved	1.2	ug/L	0.10	1	03/30/18 11:48	03/30/18 13:10	7439-92-1	
Selenium, Dissolved	0.72	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:10	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/30/18 11:48	03/30/18 13:10	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:10	7440-61-1	
Vanadium, Dissolved	2.3	ug/L	1.0	1	03/30/18 11:48	03/30/18 13:10	7440-62-2	
245.1 Mercury, Dissolved		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND	ug/L	0.20	1	03/30/18 10:00	04/03/18 17:04	7439-97-6	
Hach 10360 Rev 1.1 BOD		Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360						
BOD, 5 day	4.7	mg/L	2.0	1	03/28/18 10:38	04/02/18 10:18		B3,B6
180.1 Turbidity		Analytical Method: EPA 180.1						
Turbidity	520	NTU	15.0	50		03/27/18 12:32		
2540D Total Suspended Solids		Analytical Method: SM 2540D						
Total Suspended Solids	379	mg/L	10.0	1		03/30/18 10:31		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.4	Std. Units	0.10	1		03/30/18 16:35		H6
300.0 IC Anions		Analytical Method: EPA 300.0						
Fluoride	0.065	mg/L	0.050	1		03/31/18 03:23	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

Sample: FD-SB-A3	Lab ID: 10424924002	Collected: 03/26/18 14:00	Received: 03/27/18 08:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Chromium, Hexavalent	Analytical Method: SM 3500-Cr D Modified							
Chromium, Hexavalent	ND	mg/L	0.010	1		03/27/18 10:04		FS,M3
350.1 Ammonia	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	46.9	mg/L	1.6	40		03/30/18 13:59	7664-41-7	
350.1 Ammonia, Distilled	Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)							
Nitrogen, Ammonia	44.2	mg/L	0.50	5	04/09/18 09:30	04/10/18 08:26	7664-41-7	P6
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrate as N	ND	mg/L	0.020	1		03/28/18 12:02	14797-55-8	FS
Nitrite as N	ND	mg/L	0.020	1		03/28/18 12:02	14797-65-0	FS
Nitrogen, NO ₂ plus NO ₃	ND	mg/L	0.020	1		03/28/18 12:02		FS
9016 Cyanide, Free	Analytical Method: EPA 9016 Preparation Method: EPA 9016							
Cyanide, Free	ND	ug/L	5.0	1	04/05/18 16:15	04/05/18 17:16		
SM4500CN-E Cyanide	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E							
Cyanide	17.3	ug/L	10.0	1	04/03/18 09:46	04/03/18 12:53	57-12-5	
SM4500P-E, Total Phosphorus	Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B							
Phosphorus	0.15	mg/L	0.050	1	04/03/18 10:29	04/04/18 10:04	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

QC Batch:	529772	Analysis Method:	EPA 245.1
QC Batch Method:	EPA 245.1	Analysis Description:	245.1 Mercury - Dissolved
Associated Lab Samples:	10424924002		

METHOD BLANK: 2875568 Matrix: Water
Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	04/03/18 16:57	

LABORATORY CONTROL SAMPLE & LCSD: 2875569

2875570

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury, Dissolved	ug/L	5	5.3	5.3	105	106	85-115	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

QC Batch: 529771 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10424924002

METHOD BLANK: 2875565 Matrix: Water
Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/02/18 13:27	
Barium, Dissolved	ug/L	ND	10.0	04/02/18 13:27	
Copper, Dissolved	ug/L	ND	10.0	04/02/18 13:27	
Manganese, Dissolved	ug/L	ND	5.0	04/02/18 13:27	
Nickel, Dissolved	ug/L	ND	20.0	04/02/18 13:27	
Silver, Dissolved	ug/L	ND	10.0	04/02/18 13:27	
Tin, Dissolved	ug/L	ND	75.0	04/02/18 13:27	
Zinc, Dissolved	ug/L	ND	20.0	04/02/18 13:27	

LABORATORY CONTROL SAMPLE & LCSD: 2875566

Parameter	Units	2875567								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Aluminum, Dissolved	ug/L	20000	20500	20900	103	104	85-115	2	20	
Barium, Dissolved	ug/L	1000	1020	1040	102	104	85-115	2	20	
Copper, Dissolved	ug/L	1000	985	1000	98	100	85-115	2	20	
Manganese, Dissolved	ug/L	1000	1010	1020	101	102	85-115	2	20	
Nickel, Dissolved	ug/L	1000	1010	1030	101	103	85-115	2	20	
Silver, Dissolved	ug/L	500	493	501	99	100	85-115	1	20	
Tin, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	
Zinc, Dissolved	ug/L	1000	1020	1040	102	104	85-115	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

QC Batch: 529767 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10424924002

METHOD BLANK: 2875545 Matrix: Water
Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	0.50	03/30/18 17:44	

LABORATORY CONTROL SAMPLE: 2875546

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	100	107	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875547 2875548

Parameter	Units	10425362001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Chromium	ug/L	4.8	100	100	111	107	106	102	70-130	4	20				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

QC Batch: 529770 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10424924002

METHOD BLANK: 2875559 Matrix: Water
Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Arsenic, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Beryllium, Dissolved	ug/L	ND	0.20	04/02/18 09:36	
Boron, Dissolved	ug/L	ND	5.0	04/02/18 09:36	
Cadmium, Dissolved	ug/L	ND	0.080	04/02/18 09:36	
Chromium, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Cobalt, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Lead, Dissolved	ug/L	ND	0.10	04/02/18 09:36	
Selenium, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Thallium, Dissolved	ug/L	ND	0.10	04/02/18 09:36	
Uranium-238, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Vanadium, Dissolved	ug/L	ND	1.0	04/02/18 09:36	

LABORATORY CONTROL SAMPLE & LCSD: 2875560

Parameter	Units	2875564								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Antimony, Dissolved	ug/L	100	104	104	104	104	85-115	0	20	
Arsenic, Dissolved	ug/L	100	105	104	105	104	85-115	1	20	
Beryllium, Dissolved	ug/L	100	110	109	110	109	85-115	1	20	
Boron, Dissolved	ug/L	100	106	110	106	110	85-115	4	20	
Cadmium, Dissolved	ug/L	100	106	105	106	105	85-115	1	20	
Chromium, Dissolved	ug/L	100	106	105	106	105	85-115	1	20	
Cobalt, Dissolved	ug/L	100	107	106	107	106	85-115	0	20	
Lead, Dissolved	ug/L	100	109	107	109	107	85-115	1	20	
Selenium, Dissolved	ug/L	100	107	106	107	106	85-115	1	20	
Thallium, Dissolved	ug/L	100	107	105	107	105	85-115	2	20	
Uranium-238, Dissolved	ug/L	100	111	111	111	111	85-115	0	20	
Vanadium, Dissolved	ug/L	100	103	104	103	104	85-115	0	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

QC Batch: 529677

Analysis Method: EPA 8270D

QC Batch Method: EPA 3520

Analysis Description: 8270D Water MSSV

Associated Lab Samples: 10424924001

METHOD BLANK: 2874915

Matrix: Water

Associated Lab Samples: 10424924001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/03/18 17:31	
2,4-Dichlorophenol	ug/L	ND	10.0	04/03/18 17:31	
2,4-Dimethylphenol	ug/L	ND	50.0	04/03/18 17:31	
2,4-Dinitrophenol	ug/L	ND	10.0	04/03/18 17:31	
2-Chlorophenol	ug/L	ND	10.0	04/03/18 17:31	
2-Methylnaphthalene	ug/L	ND	10.0	04/03/18 17:31	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/03/18 17:31	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/03/18 17:31	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/03/18 17:31	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/03/18 17:31	
Acenaphthene	ug/L	ND	10.0	04/03/18 17:31	
Anthracene	ug/L	ND	10.0	04/03/18 17:31	
Benzo(a)pyrene	ug/L	ND	10.0	04/03/18 17:31	
Benzoic acid	ug/L	ND	50.0	04/03/18 17:31	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/03/18 17:31	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/03/18 17:31	
Butylbenzylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Di-n-butylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Di-n-octylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Diethylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Dimethylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Fluoranthene	ug/L	ND	10.0	04/03/18 17:31	
Fluorene	ug/L	ND	10.0	04/03/18 17:31	
Hexachlorobenzene	ug/L	ND	10.0	04/03/18 17:31	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/03/18 17:31	
Hexachloroethane	ug/L	ND	10.0	04/03/18 17:31	
Isophorone	ug/L	ND	10.0	04/03/18 17:31	
N-Nitrosodiphenylamine	ug/L	ND	10.0	04/03/18 17:31	
Pentachlorophenol	ug/L	ND	20.0	04/03/18 17:31	
Phenanthrene	ug/L	ND	10.0	04/03/18 17:31	
Phenol	ug/L	ND	10.0	04/03/18 17:31	
Pyrene	ug/L	ND	10.0	04/03/18 17:31	
2,4,6-Tribromophenol (S)	%	81	65-125	04/03/18 17:31	
2-Fluorobiphenyl (S)	%	74	56-125	04/03/18 17:31	
2-Fluorophenol (S)	%	83	55-125	04/03/18 17:31	
Nitrobenzene-d5 (S)	%	81	60-125	04/03/18 17:31	
p-Terphenyl-d14 (S)	%	107	58-125	04/03/18 17:31	
Phenol-d6 (S)	%	87	58-125	04/03/18 17:31	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

LABORATORY CONTROL SAMPLE & LCSD: 2874916			2874917							
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	41.4	42.1	83	84	74-125	2	20	
2,4-Dichlorophenol	ug/L	50	39.2	39.7	78	79	68-125	1	20	
2,4-Dimethylphenol	ug/L	50	28.9J	31J	58	62	33-125		20	
2,4-Dinitrophenol	ug/L	50	34.2	36.8	68	74	30-127	7	20	
2-Chlorophenol	ug/L	50	38.3	37.2	77	74	61-125	3	20	
2-Methylnaphthalene	ug/L	50	38.0	38.8	76	78	67-125	2	20	
2-Methylphenol(o-Cresol)	ug/L	50	36.4	35.0	73	70	63-125	4	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	37.3	36.8	75	74	67-125	1	20	
3,3'-Dichlorobenzidine	ug/L	50	45.7J	48.1J	91	96	60-125		20	
4-Bromophenylphenyl ether	ug/L	50	43.2	43.6	86	87	75-125	1	20	
Acenaphthene	ug/L	50	40.1	40.9	80	82	74-125	2	20	
Anthracene	ug/L	50	43.5	43.9	87	88	75-125	1	20	
Benzo(a)pyrene	ug/L	50	42.7	42.4	85	85	75-125	1	20	
Benzoic acid	ug/L	50	21.9J	22.1J	44	44	30-125		20	1M
bis(2-Chloroethyl) ether	ug/L	50	35.4	34.0	71	68	55-125	4	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	41.0	41.6	82	83	72-129	1	20	
Butylbenzylphthalate	ug/L	50	41.2	41.2	82	82	69-127	0	20	
Di-n-butylphthalate	ug/L	50	41.5	42.0	83	84	75-125	1	20	
Di-n-octylphthalate	ug/L	50	41.6	41.4	83	83	69-131	1	20	
Diethylphthalate	ug/L	50	42.5	43.0	85	86	75-125	1	20	
Dimethylphthalate	ug/L	50	42.6	43.0	85	86	75-125	1	20	
Fluoranthene	ug/L	50	42.6	44.2	85	88	75-125	4	20	
Fluorene	ug/L	50	41.7	42.4	83	85	75-125	2	20	
Hexachlorobenzene	ug/L	50	42.0	42.3	84	85	74-125	1	20	
Hexachlorocyclopentadiene	ug/L	50	ND	ND	30	31	30-125		20	
Hexachloroethane	ug/L	50	28.9	26.6	58	53	30-125	9	20	
Isophorone	ug/L	50	37.8	38.4	76	77	72-125	2	20	
N-Nitrosodiphenylamine	ug/L	50	41.5	41.7	83	83	75-125	0	20	
Pentachlorophenol	ug/L	50	35.5	36.9	71	74	52-125	4	20	
Phenanthrene	ug/L	50	43.3	43.5	87	87	75-125	1	20	
Phenol	ug/L	50	38.0	36.7	76	73	59-125	3	20	
Pyrene	ug/L	50	44.1	44.3	88	89	75-125	0	20	
2,4,6-Tribromophenol (S)	%				90	92	65-125			
2-Fluorobiphenyl (S)	%				80	82	56-125			
2-Fluorophenol (S)	%				80	77	55-125			
Nitrobenzene-d5 (S)	%				76	77	60-125			
p-Terphenyl-d14 (S)	%				99	101	58-125			
Phenol-d6 (S)	%				82	81	58-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

QC Batch: 529389

Analysis Method: Hach 10360 Rev 1.1

QC Batch Method: Hach 10360

Analysis Description: Hach 10360 Rev 1.1, BOD

Associated Lab Samples: 10424924002

METHOD BLANK: 2873451

Matrix: Water

Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	04/02/18 10:05	B3,B6

LABORATORY CONTROL SAMPLE: 2873453

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	206	104	85-115	B3,B6

SAMPLE DUPLICATE: 2873454

Parameter	Units	10424970001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	ND	1.7J		20	B3,B6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

QC Batch: 529253 Analysis Method: EPA 180.1
QC Batch Method: EPA 180.1 Analysis Description: 180.1 Turbidity
Associated Lab Samples: 10424924002

METHOD BLANK: 2872494 Matrix: Water
Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	03/27/18 12:18	

LABORATORY CONTROL SAMPLE: 2872495

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.3	100	90-110	

SAMPLE DUPLICATE: 2872496

Parameter	Units	10424931002 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	1.4	1.5	4	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

QC Batch: 529627 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10424924002

METHOD BLANK: 2874679 Matrix: Water
Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	ND	0.050	03/30/18 20:53	

LABORATORY CONTROL SAMPLE: 2874680

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	1	0.96	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874681 2874682

Parameter	Units	10424547001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Fluoride	mg/L	0.29	1	1	1.3	1.3	98	99	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874683 2874684

Parameter	Units	10424924002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Fluoride	mg/L	0.065	1	1	1.1	1.1	103	104	90-110	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

QC Batch: 529176	Analysis Method: SM 3500-Cr D Modified
QC Batch Method: SM 3500-Cr D Modified	Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10424924002	

METHOD BLANK: 2872178 Matrix: Water
Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	03/27/18 10:04	FS

LABORATORY CONTROL SAMPLE: 2872179

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.20	102	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2872180 2872181

Parameter	Units	10424924002		2872180		2872181		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Chromium, Hexavalent	mg/L	ND	.2	.2	ND	ND	0	0	85-115	20	FS,M3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

QC Batch: 529786

Analysis Method: EPA 350.1

QC Batch Method: EPA 350.1

Analysis Description: 350.1 Ammonia

Associated Lab Samples: 10424924002

METHOD BLANK: 2875606

Matrix: Water

Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.040	03/30/18 09:06	

LABORATORY CONTROL SAMPLE: 2875607

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	0.96	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875608 2875609

Parameter	Units	10424864002		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Nitrogen, Ammonia	mg/L	<0.019	1	1	0.98	1.0	98	103	90-110	5	20				

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875610 2875611

Parameter	Units	10425125004		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Nitrogen, Ammonia	mg/L	18.4	10	10	30.1	33.4	117	150	90-110	10	20	M6			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

QC Batch:	140179	Analysis Method:	EPA 350.1 rev. 2 (1993)
QC Batch Method:	EPA 350.1 rev. 2 (1993)	Analysis Description:	350.1 Ammonia Distilled
Associated Lab Samples:	10424924002		

METHOD BLANK: 555078 Matrix: Water
Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	04/10/18 08:10	

LABORATORY CONTROL SAMPLE: 555079

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	10	10.3	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 555080 555081

Parameter	Units	10424924002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	44.2	10	10	55.0	60.0	108	158	90-110	9	10	P6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

QC Batch: 529431	Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2	Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 10424924002	

METHOD BLANK: 2873588 Matrix: Water

Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	03/28/18 12:03	FS
Nitrite as N	mg/L	ND	0.020	03/28/18 12:03	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	03/28/18 12:03	FS

LABORATORY CONTROL SAMPLE: 2873589

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	0.97	97	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	0.99	99	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873590 2873591

Parameter	Units	10424968001		2873590		2873591		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Nitrite as N	mg/L	0.051	1	1	0.99	1.0	94	98	90-110	4	20		
Nitrogen, NO2 plus NO3	mg/L	9.7	20	20	28.4	28.2	93	92	90-110	1	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

QC Batch: 19623 Analysis Method: EPA 9016
QC Batch Method: EPA 9016 Analysis Description: 9016 Free Cyanide
Associated Lab Samples: 10424924001, 10424924002

METHOD BLANK: 77969 Matrix: Water
Associated Lab Samples: 10424924001, 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/05/18 17:03	

LABORATORY CONTROL SAMPLE: 77970

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	151	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 77971 77972

Parameter	Units	10424606001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Cyanide, Free	ug/L	ND	150	150	160	160	106	106	80-120	0	11	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

QC Batch: 530296 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10424924001, 10424924002

METHOD BLANK: 2878424 Matrix: Water
Associated Lab Samples: 10424924001, 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/03/18 12:40	

LABORATORY CONTROL SAMPLE: 2878425

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	241	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878426 2878427

Parameter	Units	10423797004 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Cyanide	ug/L	1.5 mg/L	250	250	1950	1840	172	128	80-120	6	30	H3,M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878428 2878429

Parameter	Units	10425152001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Cyanide	ug/L	38.4	250	250	269	268	92	92	80-120	0	30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

QC Batch: 530338 Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10424924002

METHOD BLANK: 2878509 Matrix: Water
Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	04/03/18 16:23	

LABORATORY CONTROL SAMPLE: 2878510

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	1.1	108	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878511 2878512

Parameter	Units	10424908001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Phosphorus	mg/L	ND	1	1.1	1	1.2	108	115	80-120	7	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878513 2878514

Parameter	Units	10425827001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Phosphorus	mg/L	ND	1	1.1	1	1.0	107	103	80-120	4	30	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan
PASI-M Pace Analytical Services - Minneapolis
PASI-V Pace Analytical Services - Virginia

BATCH QUALIFIERS

Batch: 529937
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
Batch: 529951
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
Batch: 530440
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
B3 The dissolved oxygen depletion of the dilution water blank exceeded 0.2 mg/L.
B6 The calculated seed correction exceeded the range of 0.6 to 1.0 mg/L.
D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
D6 The precision between the sample and sample duplicate exceeded laboratory control limits.
D8 The sample and duplicate results for this parameter are less than 5 times the reporting limit, the RPD may not be statistically valid.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

ANALYTE QUALIFIERS

- FS The sample was filtered in the laboratory prior to analysis.
- H3 Sample was received or analysis requested beyond the recognized method holding time.
- H6 Analysis initiated outside of the 15 minute EPA required holding time.
- M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424924002	FD-SB-A3	EPA 200.7	529771	EPA 200.7	529951
10424924002	FD-SB-A3	EPA 200.8	529767	EPA 200.8	529968
10424924002	FD-SB-A3	EPA 200.8	529770	EPA 200.8	529937
10424924002	FD-SB-A3	EPA 245.1	529772	EPA 245.1	530149
10424924001	FD-SB-B4	EPA 3520	529677	EPA 8270D	530440
10424924002	FD-SB-A3	Hach 10360	529389	Hach 10360 Rev 1.1	529615
10424924002	FD-SB-A3	EPA 180.1	529253		
10424924002	FD-SB-A3	SM 2540D	529843		
10424924002	FD-SB-A3	SM 4500-H+B	529922		
10424924002	FD-SB-A3	EPA 300.0	529627		
10424924002	FD-SB-A3	SM 3500-Cr D Modified	529176		
10424924002	FD-SB-A3	EPA 350.1	529786		
10424924002	FD-SB-A3	EPA 350.1 rev. 2 (1993)	140179	EPA 350.1 rev. 2 (1993)	140246
10424924002	FD-SB-A3	EPA 353.2	529431		
10424924001	FD-SB-B4	EPA 9016	19623	EPA 9016	19643
10424924002	FD-SB-A3	EPA 9016	19623	EPA 9016	19643
10424924001	FD-SB-B4	SM 4500-CN-E	530296	SM 4500-CN-E	530376
10424924002	FD-SB-A3	SM 4500-CN-E	530296	SM 4500-CN-E	530376
10424924002	FD-SB-A3	SM 4500-P B	530338	SM 4500-P E	530391

REPORT OF LABORATORY ANALYSIS

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March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent <i>(unfiltered)</i>	calculated
Chromium, hexavalent	SM3500CRB
Mercury Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans EPA 1613B	
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs EPA 8270C	
PCBs EPA 8082	
PFCs EPA 537	
VOCs EPA 8260 LL/SIM	
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

**** ADD to Parameter List A:**

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Harness detrmination)

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270-SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids EPA 552.2	

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace



SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: <u>Pace Minnesota</u>	Work Order #: <u>4610068</u>
Receipt Record Page/Line #: <u>19-11</u>	Project Chemist: _____ Sample #: _____

Recorded by (initials/date): <u>TS 3/29/18</u>	<input checked="" type="checkbox"/> Cooler <input type="checkbox"/> Box <input type="checkbox"/> Other	Qty Received: <u>1</u>	<input checked="" type="checkbox"/> IR Gun (#202) Thermometer Used: <input type="checkbox"/> Digital Thermometer (#54) <input type="checkbox"/> Other (# _____) <input type="checkbox"/> See Additional Cooler Information Form
---	--	---------------------------	---

Cooler # <u>Blue</u>	Time <u>1150</u>	
Custody Seals: <input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		
Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		
Coolant Location: <input checked="" type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		
Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		
Observed °C	Correction Factor °C	Actual °C
Temp Blank:		
Sample 1: <u>1.1</u>		<u>1.1</u>
Sample 2: <u>2.7</u>		<u>2.7</u>
Sample 3: <u>2.6</u>		<u>2.6</u>
3 Sample Average °C: _____		
<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?		

Cooler #	Time	
Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		
Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		
Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		
Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		
If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		
Observed °C	Correction Factor °C	Actual °C
Temp Blank:		
Sample 1:		
Sample 2:		
Sample 3:		
3 Sample Average °C: _____		
<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?		

Cooler #	Time	
Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		
Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		
Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		
Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		
If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		
Observed °C	Correction Factor °C	Actual °C
Temp Blank:		
Sample 1:		
Sample 2:		
Sample 3:		
3 Sample Average °C: _____		
<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?		

Cooler #	Time	
Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		
Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		
Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		
Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		
If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		
Observed °C	Correction Factor °C	Actual °C
Temp Blank:		
Sample 1:		
Sample 2:		
Sample 3:		
3 Sample Average °C: _____		
<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?		

If any shaded areas checked, complete Sample Receiving Non-Conformance and/or Inventory Form

Paperwork Received

Yes No Chain of Custody record(s)? If No, Initiated By _____
 Received for Lab Signed/Date/Time? _____

Shipping document?
 Other _____

COC Information

Pace COC Other _____

COC ID Numbers: _____

Check COC for Accuracy

Yes No Analysis Requested?

Sample ID matches COC?
 Sample Date and Time matches COC?
 Container type completed on COC?
 All container types indicated are received?

Sample Condition Summary

N/A Yes No

Broken containers/lids?
 Missing or incomplete labels?
 Illegible information on labels?
 Low volume received?
 Inappropriate or non-Pace containers received?
 VOC vials / TOX containers have headspace?
 Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A Yes No

Temperature Blank OR average sample temperature, ≥6° C?
 If either is ≥6° C, was thermal preservation required?
 If "Yes", Project Chemist Approval Initials: _____
 If "Yes" Completed Non Con Cooler - Cont Inventory Form?
 Completed Sample Preservation Verification Form?
 Samples chemically preserved correctly?
 If "No", added orange tag?
 Received pre-preserved VOC soils?
 MeOH Na₂SO₄

Check for Short Hold-Time Prep/Analyses

Bacteriological
 Air Bags
 EnCores / Methanol Pre-Preserved
 Formaldehyde/Aldehyde
 Green-tagged containers
 Yellow/White-tagged 1 L ambers (SV Prep-Lab)

AFTER HOURS ONLY:

COPIES OF COC TO LAB AREA(S)

NONE RECEIVED

RECEIVED, COCs TO LAB(S)

Notes

Trip Blank received Trip Blank not listed on COC

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
<u>TS 3/29/18</u>	<u>TS 3/29/18</u>	Yes / No

AQUEOUS SAMPLE PRESERVATION VERIFICATION

Client: <u>Pace Minnesota</u>	Work Order #: <u>4610068</u>
Receipt Log #: <u>19-11</u>	Completed By (initials/date): <u>TS 8/29/18</u>
Project Manager: _____	

COC ID # _____												Adjusted by: _____	
												Date: _____	
Container Type	5 / 23		4		13		6		15				
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1	✓	10											
COC Line #2	✓	10											
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

pH Strip Reagent or Lot #
<input checked="" type="checkbox"/> HC727135
<input type="checkbox"/> Other

Place a check mark in the Received box if pH is acceptable. If pH is not acceptable, document the Received and Adjusted pH values in the appropriate columns (all adjustments must be reviewed by the project manager). Never add more than 2x the default preservation volume (see table below for default volumes). Complete and attach an orange preservation tag to all adjusted samples. A Sample Receiving Non-Conformance Report must be completed if a pH adjustment was required.

Comments: _____

COC ID # _____												Adjusted by: _____	
												Date: _____	
Container Type	5 / 23		4		13		6		15				
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1													
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

Container Size (mL)	Default Preservative Volume (mL)
Container Types 5 / 23	NaOH
250	1.3
Container Type 4	H ₂ SO ₄
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H ₂ SO ₄
500	2.5
Container Types 6 / 15	HNO ₃
125	0.7
250	1.25
500	2.5
1000	5.0

Comments: _____

Sample Condition Upon Receipt

Client Name: MPCA FSD PAST-MNF/D

Project #: **WO#: 12106457**
 PM: HRZ Due Date: 04/10/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 3.5 Cooler Temp Corrected °C: 3.5 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: 3-28-18 P.C.

Comments: Bm 3/29/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11 Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N
 Project Manager Review: [Signature] Date: 3/29/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

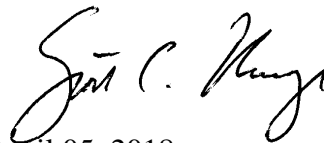
PaceProject#: 10424934
Sample Receipt Date: 03/27/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 05, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

April 5, 2018

DISCUSSION

This report presents the results from the analyses performed on three samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 45-68%. All of the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 91%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New Hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10424934

Appendix A

Sample Management

WO#: 10424934



10424934

Report No.....10424934_8290TCDD_DFR

Minnesota Pollution Control Agency		Chain-of-Custody Form		Work Order Number:		Turnaround Time:		COC ID:		LABORATORY		FOR LAB USE ONLY			
PROJECT/CLIENT INFO				LABORATORY				FOR LAB USE ONLY							
Facility Code:		MPCA - Freeway LF Solids		Program Code (MDH Lab Only):		Lab Name:		Address: 18-00383				Lab Work Order Sticker			
Project Name:		MPCA - Freeway LF Solids		Project Task Code:		Address: 18-00383		EPIC Profile #38716				Lab Work Order Sticker			
Project Manager:						Phone No:						Lab Work Order Sticker			
Potential Hazard?		If yes, add information to Sampler Comments Section										Lab Work Order Sticker			
SAMPLE DETAILS										ANALYSIS REQUESTED					
SAMPLE TYPE CODES			LAB MATRIX CODES			FIELD MATRIX CODES				ANALYSIS REQUESTED					
Sample=Routine Sample			DW=Drinking Water			Wt-Ground=Groundwater									
S-IVP=Integrated Vertical Profile Sample			NW=Non-potable Water			Wt-Surf=Surface Water									
S-CWOP=Composite Sample			SD=Soil/Solid			QC-BLANK=Artificial Blank Water									
QC-FB=Field Blank Sample			WP=Wipe			Leachate=Leachate Sample									
QC-FR=Field Replicate Sample			AR=Air												
QC-TB=Trip Blank Sample			BL=Biological Material												
			OT=Other												
			TS=Tissue												
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	PRESERV.	Lab Sample No.	#
FD-SB-64 (3.5-17.3)	S	3/26/18	1150	15.5	17.0	C	SD				13	X	X		1
FD-SB-63 (4-16.0)	S	3/26/18	1400	4	16	C	SD				13	X	X	001	2
FD-SB-E3 (11-15.5)	S	3/26/18	1440	11	15	C	SD				13	X	X		3
FD-SB-F3 (3-11.0)	S	3/26/18	1530	3	11	C	SD				12	X	X		4
FD-SB-63 (7-16.0)	S	3/26/18	1635	7	16	C	SD				13	X	X	002	5
FD-SB-62 (10-16.0)	S	3/26/18	1720	10	12	C	SD				13	X	X	003	6
															7
															8
															9
															10
Sampled By: David Anderson				Sampler's Signature: David Anderson				Phone #:							
Receiving Comments:															
Relinquished By/Affiliation				Date/Time				Accepted By/ Affiliation				Date/Time			
(Sampler) David Anderson / PACE Analytical				3/27/18/0700				Wm PACE				3-27-18 815 4.7°C			

Page 5 of 13

Sample Condition Upon Receipt

Client Name: MPCA

Project #: **WO# : 10424934**

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____
 Tracking Number: _____

PM: SCU Due Date: 04/10/18
 CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 Type of Ice: Wet Blue None Dry Melted
 Used: G87A9155100842

Cooler Temp Read (°C): 4.5 Cooler Temp Corrected (°C): 4.2 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: ME 3/27/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	12. <u>No time on samples</u>
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: [Signature] Date: 3/27/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10424934

Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-D3 (4-16wm)		
Lab Sample ID	10424934001		
Filename	F180403B_07		
Injected By	SMT		
Total Amount Extracted	14.1 g	Matrix	Solid
% Moisture	28.4	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	03/26/2018 14:00
ICAL ID	F180329	Received	03/27/2018 08:15
CCal Filename(s)	F180403B_01 & F180403B_18	Extracted	03/29/2018 15:05
Method Blank ID	BLANK-61419	Analyzed	04/03/2018 18:48

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	2.0	----	1.0	2,3,7,8-TCDD-13C	2.00	58
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	64

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-G3 (7-16wm)		
Lab Sample ID	10424934002		
Filename	F180403B_08		
Injected By	SMT		
Total Amount Extracted	14.6 g	Matrix	Solid
% Moisture	30.8	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	03/26/2018 16:35
ICAL ID	F180329	Received	03/27/2018 08:15
CCal Filename(s)	F180403B_01 & F180403B_18	Extracted	03/29/2018 15:05
Method Blank ID	BLANK-61419	Analyzed	04/03/2018 19:33

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	2.5	----	1.0	2,3,7,8-TCDD-13C	2.00	45
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	46

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-G2 (10-12wm)		
Lab Sample ID	10424934003		
Filename	F180403B_09		
Injected By	SMT		
Total Amount Extracted	14.4 g	Matrix	Solid
% Moisture	30.3	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	03/26/2018 17:20
ICAL ID	F180329	Received	03/27/2018 08:15
CCal Filename(s)	F180403B_01 & F180403B_18	Extracted	03/29/2018 15:05
Method Blank ID	BLANK-61419	Analyzed	04/03/2018 20:18

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	68
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	77

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61419	Matrix	Solid
Filename	U180403A_03	Dilution	NA
Total Amount Extracted	10.6 g	Extracted	03/29/2018 15:05
ICAL ID	U171222	Analyzed	04/03/2018 05:23
CCal Filename(s)	U180402B_14 & U180403A_18	Injected By	BAL

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	63
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	82

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61420	Matrix	Solid
Filename	U180403A_01	Dilution	NA
Total Amount Extracted	10.8 g	Extracted	03/29/2018 15:05
ICAL ID	U171222	Analyzed	04/03/2018 03:58
CCal Filename(s)	U180402B_14 & U180403A_18	Injected By	BAL
Method Blank ID	BLANK-61419		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.18	91	2,3,7,8-TCDD-13C	2.0	70
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	78

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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June 20, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 27, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This project was revised on June 20, 2018 to add manganese results for all samples.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Ryan Thibault for
Bob Michels
bob.michels@pacelabs.com
(612)709-5046
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
California Certification #2973
Montana Certificate #CERT0103
California Certification #2973
Alaska Certification UST-107
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
Minnesota Dept of Health Certification #: 1420586
Montana DHHS Certification #: CERT0102

Nevada DCNR Certification #: MN000372018-1
Wisconsin DNR Certification #: 999446800
North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10424937001	FD-SB-G4 (15.5-17.5)	Solid	03/26/18 11:30	03/27/18 08:15
10424937002	FD-SB-D3 (4-16wm)	Solid	03/26/18 14:00	03/27/18 08:15
10424937003	FD-SB-E3 (11-15.5)	Solid	03/26/18 14:40	03/27/18 08:15
10424937004	FD-SB-F3 (3-11wm)	Solid	03/26/18 15:30	03/27/18 08:15
10424937005	FD-SB-G3 (7-16wm)	Solid	03/26/18 16:35	03/27/18 08:15
10424937006	FD-SB-G2 (10-12wm)	Solid	03/26/18 17:20	03/27/18 08:15

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10424937001	FD-SB-G4 (15.5-17.5)	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	EC2	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010C	DM	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	RJS	10	PASI-M		
		EPA 7471	PW1	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	JLR, JRH	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8270D	STB	12	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10424937002	FD-SB-D3 (4-16wm)	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
EPA 8082A	RAG			12	PASI-M		
WI MOD DRO	EC2			2	PASI-M		
WI MOD GRO	AJR			2	PASI-M		
EPA 6010C	DM			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	RJS			10	PASI-M		
EPA 7471	PW1			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	JLR			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8270D	STB			12	PASI-M		
EPA 8260B	CD2			70	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
10424937003	FD-SB-E3 (11-15.5)			EPA 1630 (1998)	CPK	1	PASI-DUL

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	PW1	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	JRH	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10424937004	FD-SB-F3 (3-11wm)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	PW1	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	JLR	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10424937005	FD-SB-G3 (7-16wm)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	PW1	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	JLR	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10424937006	FD-SB-G2 (10-12wm)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	PW1	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	JRH	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G4 (15.5-17.5) **Lab ID: 10424937001** Collected: 03/26/18 11:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	12.2	1	03/30/18 11:35	04/02/18 17:26	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	309-00-2	
alpha-BHC	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	319-84-6	
beta-BHC	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	319-85-7	
delta-BHC	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	58-89-9	
Chlordane (Technical)	ND	ug/kg	45.7	2	03/28/18 12:51	04/05/18 20:59	57-74-9	
alpha-Chlordane	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	5103-71-9	
gamma-Chlordane	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	5103-74-2	
4,4'-DDD	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 20:59	72-54-8	
4,4'-DDE	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 20:59	72-55-9	
4,4'-DDT	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 20:59	50-29-3	
Dieldrin	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 20:59	60-57-1	
Endosulfan I	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	959-98-8	
Endosulfan II	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 20:59	33213-65-9	
Endosulfan sulfate	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 20:59	1031-07-8	
Endrin	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 20:59	72-20-8	
Endrin aldehyde	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 20:59	7421-93-4	
Endrin ketone	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 20:59	53494-70-5	
Heptachlor	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	76-44-8	
Heptachlor epoxide	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	1024-57-3	
Methoxychlor	ND	ug/kg	45.7	2	03/28/18 12:51	04/05/18 20:59	72-43-5	
Toxaphene	ND	ug/kg	137	2	03/28/18 12:51	04/05/18 20:59	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	77	%	30-150	2	03/28/18 12:51	04/05/18 20:59	877-09-8	5M, D3
Decachlorobiphenyl (S)	70	%	30-150	2	03/28/18 12:51	04/05/18 20:59	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	11141-16-5	
PCB-1242 (Aroclor 1242)	124	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	11097-69-1	
PCB-1260 (Aroclor 1260)	558	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	37324-23-5	
PCB-1268 (Aroclor 1268)	343	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	11100-14-4	
PCB, Total	1020	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	88	%	48-125	1	03/28/18 12:51	04/02/18 12:33	877-09-8	
Decachlorobiphenyl (S)	84	%	30-134	1	03/28/18 12:51	04/02/18 12:33	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	409	mg/kg	88.2	5	03/27/18 16:31	03/30/18 13:39		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G4 (15.5-17.5) Lab ID: 10424937001 Collected: 03/26/18 11:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	87	%	50-150	5	03/27/18 16:31	03/30/18 13:39	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	31.0	mg/kg	24.2	1	04/03/18 09:56	04/04/18 12:19		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	04/03/18 09:56	04/04/18 12:19	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	4370	mg/kg	13.0	1	03/28/18 04:51	04/02/18 12:51	7429-90-5	
Barium	104	mg/kg	0.65	1	03/28/18 04:51	04/02/18 12:51	7440-39-3	
Boron	124	mg/kg	9.8	1	03/28/18 04:51	04/02/18 12:51	7440-42-8	
Copper	38.1	mg/kg	0.65	1	03/28/18 04:51	04/02/18 12:51	7440-50-8	
Iron	10600	mg/kg	3.3	1	03/28/18 04:51	04/02/18 12:51	7439-89-6	
Manganese	834	mg/kg	1.6	5	03/28/18 04:51	06/19/18 08:54	7439-96-5	
Nickel	9.6	mg/kg	1.3	1	03/28/18 04:51	04/02/18 12:51	7440-02-0	
Silver	ND	mg/kg	0.65	1	03/28/18 04:51	04/02/18 12:51	7440-22-4	
Tin	ND	mg/kg	4.9	1	03/28/18 04:51	04/02/18 12:51	7440-31-5	
Titanium	206	mg/kg	1.6	1	03/28/18 04:51	04/02/18 12:51	7440-32-6	
Zinc	35.7	mg/kg	1.3	1	03/28/18 04:51	04/02/18 12:51	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	19.0	mg/kg	1.2	5	03/30/18 09:43	03/31/18 06:05	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.68	20	03/28/18 04:52	03/30/18 17:17	7440-36-0	
Arsenic	1.4	mg/kg	0.68	20	03/28/18 04:52	03/30/18 17:17	7440-38-2	
Beryllium	ND	mg/kg	0.27	20	03/28/18 04:52	03/30/18 17:17	7440-41-7	
Cadmium	0.14	mg/kg	0.11	20	03/28/18 04:52	03/30/18 17:17	7440-43-9	
Cobalt	3.2	mg/kg	0.68	20	03/28/18 04:52	03/30/18 17:17	7440-48-4	
Lead	5.7	mg/kg	0.14	20	03/28/18 04:52	03/30/18 17:17	7439-92-1	
Lithium	1.9	mg/kg	0.68	20	03/28/18 04:52	03/30/18 17:17	7439-93-2	
Selenium	ND	mg/kg	0.68	20	03/28/18 04:52	03/30/18 17:17	7782-49-2	
Strontium	36.9	mg/kg	0.68	20	03/28/18 04:52	03/30/18 17:17	7440-24-6	
Vanadium	12.0	mg/kg	1.4	20	03/28/18 04:52	03/30/18 17:17	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	ND	mg/kg	0.023	1	03/28/18 04:53	03/30/18 12:55	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	26.9	%	0.10	1		03/28/18 12:45		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	83-32-9	
Acenaphthylene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G4 (15.5-17.5) **Lab ID: 10424937001** Collected: 03/26/18 11:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Anthracene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	120-12-7	
Benzo(a)anthracene	2900	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	56-55-3	
Benzo(a)pyrene	3550	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	50-32-8	
Benzo(b)fluoranthene	4160	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	205-99-2	
Benzo(g,h,i)perylene	2190	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	191-24-2	
Benzo(k)fluoranthene	2010	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	101-55-3	
Butylbenzylphthalate	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	85-68-7	
Carbazole	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	59-50-7	
4-Chloroaniline	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	108-60-1	
2-Chloronaphthalene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	91-58-7	
2-Chlorophenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	7005-72-3	
Chrysene	3360	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	53-70-3	
Dibenzofuran	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	120-83-2	
Diethylphthalate	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	105-67-9	
Dimethylphthalate	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	131-11-3	
Di-n-butylphthalate	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2320	1	03/27/18 12:47	03/30/18 14:49	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	606-20-2	
Di-n-octylphthalate	576	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	122-66-7	
bis(2-Ethylhexyl)phthalate	45300	ug/kg	9010	20	03/27/18 12:47	03/30/18 19:53	117-81-7	
Fluoranthene	3560	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	206-44-0	
Fluorene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	87-68-3	
Hexachlorobenzene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	118-74-1	
Hexachloroethane	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	67-72-1	
Indeno(1,2,3-cd)pyrene	1970	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	193-39-5	
Isophorone	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	78-59-1	
1-Methylnaphthalene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	90-12-0	
2-Methylnaphthalene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G4 (15.5-17.5) **Lab ID: 10424937001** Collected: 03/26/18 11:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	901	1	03/27/18 12:47	03/30/18 14:49		
Naphthalene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	91-20-3	
2-Nitroaniline	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	88-74-4	
3-Nitroaniline	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	99-09-2	
4-Nitroaniline	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	100-01-6	
Nitrobenzene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	98-95-3	
2-Nitrophenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	88-75-5	
4-Nitrophenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	86-30-6	
Pentachlorophenol	ND	ug/kg	915	1	03/27/18 12:47	03/30/18 14:49	87-86-5	
Phenanthrene	1020	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	85-01-8	
Phenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	108-95-2	
Pyrene	3880	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	81	%.	43-125	1	03/27/18 12:47	03/30/18 14:49	4165-60-0	
2-Fluorobiphenyl (S)	90	%.	30-132	1	03/27/18 12:47	03/30/18 14:49	321-60-8	
p-Terphenyl-d14 (S)	91	%.	62-125	1	03/27/18 12:47	03/30/18 14:49	1718-51-0	
Phenol-d6 (S)	82	%.	48-125	1	03/27/18 12:47	03/30/18 14:49	13127-88-3	
2-Fluorophenol (S)	75	%.	40-125	1	03/27/18 12:47	03/30/18 14:49	367-12-4	
2,4,6-Tribromophenol (S)	86	%.	60-125	1	03/27/18 12:47	03/30/18 14:49	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	18.9	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	83-32-9	
Acenaphthylene	ND	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	208-96-8	
Anthracene	19.4	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	120-12-7	
Benzo(a)anthracene	197	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	56-55-3	
Benzo(a)pyrene	283	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	50-32-8	
Benzo(b)fluoranthene	335	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	205-99-2	
Benzo(g,h,i)perylene	197	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	191-24-2	
Benzo(k)fluoranthene	124	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	207-08-9	
Chrysene	241	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	218-01-9	
Dibenz(a,h)anthracene	41.3	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	53-70-3	
Fluoranthene	272	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	206-44-0	
Fluorene	ND	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	86-73-7	
Indeno(1,2,3-cd)pyrene	150	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	193-39-5	
Naphthalene	36.0	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	91-20-3	
Phenanthrene	72.3	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	85-01-8	
Pyrene	285	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	77	%.	42-125	1	03/27/18 15:20	04/02/18 21:22	321-60-8	
p-Terphenyl-d14 (S)	101	%.	57-125	1	03/27/18 15:20	04/02/18 21:22	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G4 (15.5-17.5) **Lab ID: 10424937001** Collected: 03/26/18 11:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	25057-89-0	
2,4-D	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	94-75-7	
2,4-DB	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	94-82-6	
Dicamba	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	1918-00-9	
Dinoseb	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	88-85-7	
MCPA	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	94-74-6	
Pentachlorophenol	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	87-86-5	
Picloram	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	1918-02-1	
2,4,5-T	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	93-72-1	
Triclopyr	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	55335-06-3	
Surrogates								
2,4-DCAA (S)	56	%.	46-125	1	03/29/18 07:30	04/04/18 16:46	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	2400	1	03/27/18 14:03	03/27/18 17:42	67-64-1	
Allyl chloride	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	107-05-1	
Benzene	ND	ug/kg	47.9	1	03/27/18 14:03	03/27/18 17:42	71-43-2	
Bromobenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	108-86-1	
Bromochloromethane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	74-97-5	
Bromodichloromethane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	75-27-4	
Bromoform	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	75-25-2	
Bromomethane	ND	ug/kg	1200	1	03/27/18 14:03	03/27/18 17:42	74-83-9	
2-Butanone (MEK)	ND	ug/kg	599	1	03/27/18 14:03	03/27/18 17:42	78-93-3	
n-Butylbenzene	137	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	104-51-8	
sec-Butylbenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	135-98-8	
tert-Butylbenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	98-06-6	
Carbon tetrachloride	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	56-23-5	
Chlorobenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	108-90-7	
Chloroethane	ND	ug/kg	1200	1	03/27/18 14:03	03/27/18 17:42	75-00-3	
Chloroform	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	67-66-3	
Chloromethane	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	74-87-3	
2-Chlorotoluene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	95-49-8	
4-Chlorotoluene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1200	1	03/27/18 14:03	03/27/18 17:42	96-12-8	
Dibromochloromethane	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	106-93-4	
Dibromomethane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	75-71-8	
1,1-Dichloroethane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	75-34-3	
1,2-Dichloroethane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	107-06-2	
1,1-Dichloroethene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	156-59-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G4 (15.5-17.5) **Lab ID: 10424937001** Collected: 03/26/18 11:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
trans-1,2-Dichloroethene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1200	1	03/27/18 14:03	03/27/18 17:42	75-43-4	
1,2-Dichloropropane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	78-87-5	
1,3-Dichloropropane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	142-28-9	
2,2-Dichloropropane	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	594-20-7	
1,1-Dichloropropene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	60-29-7	
Ethylbenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	599	1	03/27/18 14:03	03/27/18 17:42	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	98-82-8	
p-Isopropyltoluene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	99-87-6	
Methylene Chloride	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	599	1	03/27/18 14:03	03/27/18 17:42	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	1634-04-4	
Naphthalene	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	91-20-3	
n-Propylbenzene	190	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	103-65-1	
Styrene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	79-34-5	N2
Tetrachloroethene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	127-18-4	
Tetrahydrofuran	ND	ug/kg	4790	1	03/27/18 14:03	03/27/18 17:42	109-99-9	
Toluene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	79-00-5	
Trichloroethene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	76-13-1	
1,2,4-Trimethylbenzene	302	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	108-67-8	
Vinyl chloride	ND	ug/kg	47.9	1	03/27/18 14:03	03/27/18 17:42	75-01-4	
Xylene (Total)	525	ug/kg	360	1	03/27/18 14:03	03/27/18 17:42	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	93	%	75-125	1	03/27/18 14:03	03/27/18 17:42	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	03/27/18 14:03	03/27/18 17:42	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125	1	03/27/18 14:03	03/27/18 17:42	460-00-4	

7196 Chromium, Hexavalent

Analytical Method: EPA 7196A Preparation Method: EPA 3060A

Chromium, Hexavalent	ND	mg/kg	273	100	04/02/18 15:00	04/04/18 12:50	18540-29-9	D3
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Trivalent Chromium Calculation

Analytical Method: Trivalent Chromium Calculation

Chromium, Trivalent	19.0	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	
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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G4 (15.5-17.5) **Lab ID: 10424937001** Collected: 03/26/18 11:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
9012 Cyanide, Total Analytical Method: EPA 9012 Preparation Method: EPA 9012A								
Cyanide	0.90	mg/kg	0.49	1	03/29/18 10:55	03/29/18 13:16	57-12-5	
9056 IC Anions Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Fluoride	ND	mg/kg	0.98	1	03/30/18 14:00	04/02/18 21:55	16984-48-8	

Sample: FD-SB-D3 (4-16wm) **Lab ID: 10424937002** Collected: 03/26/18 14:00 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.8	1	03/30/18 11:35	04/02/18 17:32	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	309-00-2	
alpha-BHC	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	319-84-6	
beta-BHC	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	319-85-7	
delta-BHC	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	58-89-9	
Chlordane (Technical)	ND	ug/kg	502	20	03/28/18 12:51	04/06/18 00:38	57-74-9	
alpha-Chlordane	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	5103-71-9	
gamma-Chlordane	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	5103-74-2	
4,4'-DDD	ND	ug/kg	100	20	03/28/18 12:51	04/06/18 00:38	72-54-8	
4,4'-DDE	ND	ug/kg	100	20	03/28/18 12:51	04/06/18 00:38	72-55-9	
4,4'-DDT	ND	ug/kg	100	20	03/28/18 12:51	04/06/18 00:38	50-29-3	
Dieldrin	ND	ug/kg	100	20	03/28/18 12:51	04/06/18 00:38	60-57-1	
Endosulfan I	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	959-98-8	
Endosulfan II	ND	ug/kg	100	20	03/28/18 12:51	04/06/18 00:38	33213-65-9	
Endosulfan sulfate	ND	ug/kg	100	20	03/28/18 12:51	04/06/18 00:38	1031-07-8	
Endrin	ND	ug/kg	100	20	03/28/18 12:51	04/06/18 00:38	72-20-8	
Endrin aldehyde	ND	ug/kg	100	20	03/28/18 12:51	04/06/18 00:38	7421-93-4	
Endrin ketone	ND	ug/kg	100	20	03/28/18 12:51	04/06/18 00:38	53494-70-5	
Heptachlor	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	76-44-8	
Heptachlor epoxide	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	1024-57-3	
Methoxychlor	ND	ug/kg	502	20	03/28/18 12:51	04/06/18 00:38	72-43-5	
Toxaphene	ND	ug/kg	1500	20	03/28/18 12:51	04/06/18 00:38	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	03/28/18 12:51	04/06/18 00:38	877-09-8	4M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	20	03/28/18 12:51	04/06/18 00:38	2051-24-3	S4
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	11141-16-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-D3 (4-16wm) **Lab ID: 10424937002** Collected: 03/26/18 14:00 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1242 (Aroclor 1242)	1870	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	12672-29-6	
PCB-1254 (Aroclor 1254)	322	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	11100-14-4	
PCB, Total	2190	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	89	%.	48-125	1	03/28/18 12:51	04/02/18 12:18	877-09-8	
Decachlorobiphenyl (S)	82	%.	30-134	1	03/28/18 12:51	04/02/18 12:18	2051-24-3	
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	3830	mg/kg	1430	1	03/27/18 16:31	03/30/18 14:07		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	1	03/27/18 16:31	03/30/18 14:07	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	512	mg/kg	26.5	1	04/03/18 09:56	04/04/18 12:43		
Surrogates								
a,a,a-Trifluorotoluene (S)	94	%.	80-150	1	04/03/18 09:56	04/04/18 12:43	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	12800	mg/kg	14.9	1	03/28/18 04:51	04/02/18 12:59	7429-90-5	
Barium	167	mg/kg	0.75	1	03/28/18 04:51	04/02/18 12:59	7440-39-3	
Boron	12.7	mg/kg	11.2	1	03/28/18 04:51	04/02/18 12:59	7440-42-8	
Copper	36.4	mg/kg	0.75	1	03/28/18 04:51	04/02/18 12:59	7440-50-8	
Iron	23000	mg/kg	37.3	10	03/28/18 04:51	04/02/18 13:37	7439-89-6	
Manganese	353	mg/kg	0.37	1	03/28/18 04:51	04/02/18 12:59	7439-96-5	
Nickel	19.2	mg/kg	1.5	1	03/28/18 04:51	04/02/18 12:59	7440-02-0	
Silver	ND	mg/kg	0.75	1	03/28/18 04:51	04/02/18 12:59	7440-22-4	
Tin	9.9	mg/kg	5.6	1	03/28/18 04:51	04/02/18 12:59	7440-31-5	
Titanium	165	mg/kg	1.9	1	03/28/18 04:51	04/02/18 12:59	7440-32-6	
Zinc	63.6	mg/kg	1.5	1	03/28/18 04:51	04/02/18 12:59	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	26.8	mg/kg	1.3	5	03/30/18 09:43	03/31/18 06:18	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.75	20	03/28/18 04:52	03/30/18 18:02	7440-36-0	
Arsenic	3.3	mg/kg	0.75	20	03/28/18 04:52	03/30/18 18:02	7440-38-2	
Beryllium	0.61	mg/kg	0.30	20	03/28/18 04:52	03/30/18 18:02	7440-41-7	
Cadmium	0.62	mg/kg	0.12	20	03/28/18 04:52	03/30/18 18:02	7440-43-9	
Cobalt	6.2	mg/kg	0.75	20	03/28/18 04:52	03/30/18 18:02	7440-48-4	
Lead	49.8	mg/kg	0.15	20	03/28/18 04:52	03/30/18 18:02	7439-92-1	
Lithium	7.2	mg/kg	0.75	20	03/28/18 04:52	03/30/18 18:02	7439-93-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-D3 (4-16wm) **Lab ID: 10424937002** Collected: 03/26/18 14:00 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Selenium	1.1	mg/kg	0.75	20	03/28/18 04:52	03/30/18 18:02	7782-49-2	
Strontium	42.5	mg/kg	0.75	20	03/28/18 04:52	03/30/18 18:02	7440-24-6	
Vanadium	28.5	mg/kg	1.5	20	03/28/18 04:52	03/30/18 18:02	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.089	mg/kg	0.030	1	03/28/18 04:53	03/30/18 12:58	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	33.6	%	0.10	1		03/28/18 12:45		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	83-32-9	
Acenaphthylene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	208-96-8	
Anthracene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	120-12-7	
Benzo(a)anthracene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	56-55-3	
Benzo(a)pyrene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	101-55-3	
Butylbenzylphthalate	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	85-68-7	
Carbazole	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	59-50-7	
4-Chloroaniline	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	108-60-1	
2-Chloronaphthalene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	91-58-7	
2-Chlorophenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	7005-72-3	
Chrysene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	53-70-3	
Dibenzofuran	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	120-83-2	
Diethylphthalate	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	105-67-9	
Dimethylphthalate	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	131-11-3	
Di-n-butylphthalate	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2560	1	03/27/18 12:47	03/31/18 19:35	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	121-14-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-D3 (4-16wm) **Lab ID: 10424937002** Collected: 03/26/18 14:00 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

2,6-Dinitrotoluene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	606-20-2	
Di-n-octylphthalate	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	122-66-7	
bis(2-Ethylhexyl)phthalate	40000	ug/kg	4960	10	03/27/18 12:47	03/31/18 20:04	117-81-7	
Fluoranthene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	206-44-0	
Fluorene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	87-68-3	
Hexachlorobenzene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	118-74-1	
Hexachloroethane	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	193-39-5	
Isophorone	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	78-59-1	
1-Methylnaphthalene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	90-12-0	
2-Methylnaphthalene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	992	1	03/27/18 12:47	03/31/18 19:35		
Naphthalene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	91-20-3	
2-Nitroaniline	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	88-74-4	
3-Nitroaniline	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	99-09-2	
4-Nitroaniline	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	100-01-6	
Nitrobenzene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	98-95-3	
2-Nitrophenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	88-75-5	
4-Nitrophenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	86-30-6	
Pentachlorophenol	ND	ug/kg	1010	1	03/27/18 12:47	03/31/18 19:35	87-86-5	
Phenanthrene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	85-01-8	
Phenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	108-95-2	
Pyrene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	59	%	43-125	1	03/27/18 12:47	03/31/18 19:35	4165-60-0	
2-Fluorobiphenyl (S)	76	%	30-132	1	03/27/18 12:47	03/31/18 19:35	321-60-8	
p-Terphenyl-d14 (S)	75	%	62-125	1	03/27/18 12:47	03/31/18 19:35	1718-51-0	
Phenol-d6 (S)	68	%	48-125	1	03/27/18 12:47	03/31/18 19:35	13127-88-3	
2-Fluorophenol (S)	60	%	40-125	1	03/27/18 12:47	03/31/18 19:35	367-12-4	
2,4,6-Tribromophenol (S)	68	%	60-125	1	03/27/18 12:47	03/31/18 19:35	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	83-32-9	
Acenaphthylene	ND	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	208-96-8	
Anthracene	177	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	120-12-7	
Benzo(a)anthracene	204	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	56-55-3	
Benzo(a)pyrene	229	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	50-32-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: **FD-SB-D3 (4-16wm)** Lab ID: **10424937002** Collected: 03/26/18 14:00 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Benzo(b)fluoranthene	262	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	207-08-9	
Chrysene	331	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	53-70-3	
Fluoranthene	418	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	206-44-0	
Fluorene	ND	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	193-39-5	
Naphthalene	167	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	91-20-3	
Phenanthrene	380	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	85-01-8	
Pyrene	325	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%.	42-125	1	03/27/18 15:20	04/03/18 22:56	321-60-8	P3,S4
p-Terphenyl-d14 (S)	0	%.	57-125	1	03/27/18 15:20	04/03/18 22:56	1718-51-0	S4
8270D MSSV MDA LIST 2 Analytical Method: EPA 8270D Preparation Method: EPA 3546								
Bentazon	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	25057-89-0	
2,4-D	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	94-75-7	
2,4-DB	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	94-82-6	
Dicamba	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	1918-00-9	
Dinoseb	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	88-85-7	
MCPA	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	94-74-6	
Pentachlorophenol	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	87-86-5	
Picloram	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	1918-02-1	
2,4,5-T	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	93-72-1	
Triclopyr	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	55335-06-3	
Surrogates								
2,4-DCAA (S)	75	%.	46-125	5	03/29/18 07:30	04/04/18 18:44	19719-28-9	D3
8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Acetone	ND	ug/kg	2290	1	03/27/18 14:03	03/27/18 17:59	67-64-1	
Allyl chloride	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	107-05-1	
Benzene	199	ug/kg	45.8	1	03/27/18 14:03	03/27/18 17:59	71-43-2	
Bromobenzene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	108-86-1	
Bromochloromethane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	74-97-5	
Bromodichloromethane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	75-27-4	
Bromoform	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	75-25-2	
Bromomethane	ND	ug/kg	1150	1	03/27/18 14:03	03/27/18 17:59	74-83-9	
2-Butanone (MEK)	ND	ug/kg	573	1	03/27/18 14:03	03/27/18 17:59	78-93-3	
n-Butylbenzene	1360	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	104-51-8	
sec-Butylbenzene	1060	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	135-98-8	
tert-Butylbenzene	164	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	98-06-6	
Carbon tetrachloride	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	56-23-5	
Chlorobenzene	26400	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	108-90-7	
Chloroethane	ND	ug/kg	1150	1	03/27/18 14:03	03/27/18 17:59	75-00-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-D3 (4-16wm) Lab ID: 10424937002 Collected: 03/26/18 14:00 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Chloroform	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	67-66-3	
Chloromethane	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	74-87-3	
2-Chlorotoluene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	95-49-8	
4-Chlorotoluene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1150	1	03/27/18 14:03	03/27/18 17:59	96-12-8	
Dibromochloromethane	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	106-93-4	
Dibromomethane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	74-95-3	
1,2-Dichlorobenzene	935	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	95-50-1	
1,3-Dichlorobenzene	2660	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	541-73-1	
1,4-Dichlorobenzene	17100	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	75-71-8	
1,1-Dichloroethane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	75-34-3	
1,2-Dichloroethane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	107-06-2	
1,1-Dichloroethene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1150	1	03/27/18 14:03	03/27/18 17:59	75-43-4	
1,2-Dichloropropane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	78-87-5	
1,3-Dichloropropane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	142-28-9	
2,2-Dichloropropane	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	594-20-7	
1,1-Dichloropropene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	60-29-7	
Ethylbenzene	1210	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	573	1	03/27/18 14:03	03/27/18 17:59	87-68-3	
Isopropylbenzene (Cumene)	684	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	98-82-8	
p-Isopropyltoluene	408	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	99-87-6	
Methylene Chloride	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	573	1	03/27/18 14:03	03/27/18 17:59	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	1634-04-4	
Naphthalene	1850	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	91-20-3	
n-Propylbenzene	1280	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	103-65-1	
Styrene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	79-34-5	N2
Tetrachloroethene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	127-18-4	
Tetrahydrofuran	ND	ug/kg	4580	1	03/27/18 14:03	03/27/18 17:59	109-99-9	
Toluene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	87-61-6	
1,2,4-Trichlorobenzene	298	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	79-00-5	
Trichloroethene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	75-69-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-D3 (4-16wm) **Lab ID: 10424937002** Collected: 03/26/18 14:00 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,2,3-Trichloropropane	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	76-13-1	
1,2,4-Trimethylbenzene	5000	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	95-63-6	
1,3,5-Trimethylbenzene	1570	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	108-67-8	
Vinyl chloride	ND	ug/kg	45.8	1	03/27/18 14:03	03/27/18 17:59	75-01-4	
Xylene (Total)	5190	ug/kg	344	1	03/27/18 14:03	03/27/18 17:59	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	90	%.	75-125	1	03/27/18 14:03	03/27/18 17:59	17060-07-0	
Toluene-d8 (S)	102	%.	75-125	1	03/27/18 14:03	03/27/18 17:59	2037-26-5	
4-Bromofluorobenzene (S)	112	%.	75-125	1	03/27/18 14:03	03/27/18 17:59	460-00-4	

7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	30.2	10	04/02/18 15:00	04/04/18 13:17	18540-29-9	D3

Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	26.8	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	

9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.56	mg/kg	0.48	1	03/29/18 10:55	03/29/18 13:16	57-12-5	

9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	03/30/18 14:00	03/31/18 03:07	16984-48-8	

Sample: FD-SB-E3 (11-15.5) **Lab ID: 10424937003** Collected: 03/26/18 14:40 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury		Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)						
Methyl Mercury	ND	ng/g	10.4	1	03/30/18 11:35	04/02/18 17:39	7439-97-6	N3
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA 3550						
Aldrin	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	309-00-2	
alpha-BHC	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	319-84-6	
beta-BHC	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	319-85-7	
delta-BHC	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	58-89-9	
Chlordane (Technical)	ND	ug/kg	24.4	1	03/28/18 12:51	04/05/18 20:22	57-74-9	
alpha-Chlordane	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	5103-71-9	
gamma-Chlordane	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	5103-74-2	
4,4'-DDD	ND	ug/kg	4.9	1	03/28/18 12:51	04/05/18 20:22	72-54-8	
4,4'-DDE	ND	ug/kg	4.9	1	03/28/18 12:51	04/05/18 20:22	72-55-9	
4,4'-DDT	ND	ug/kg	4.9	1	03/28/18 12:51	04/05/18 20:22	50-29-3	
Dieldrin	ND	ug/kg	4.9	1	03/28/18 12:51	04/05/18 20:22	60-57-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-E3 (11-15.5) **Lab ID: 10424937003** Collected: 03/26/18 14:40 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Endosulfan I	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	959-98-8	
Endosulfan II	ND	ug/kg	4.9	1	03/28/18 12:51	04/05/18 20:22	33213-65-9	
Endosulfan sulfate	ND	ug/kg	4.9	1	03/28/18 12:51	04/05/18 20:22	1031-07-8	
Endrin	ND	ug/kg	4.9	1	03/28/18 12:51	04/05/18 20:22	72-20-8	
Endrin aldehyde	ND	ug/kg	4.9	1	03/28/18 12:51	04/05/18 20:22	7421-93-4	
Endrin ketone	ND	ug/kg	4.9	1	03/28/18 12:51	04/05/18 20:22	53494-70-5	
Heptachlor	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	76-44-8	
Heptachlor epoxide	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	1024-57-3	
Methoxychlor	ND	ug/kg	24.4	1	03/28/18 12:51	04/05/18 20:22	72-43-5	
Toxaphene	ND	ug/kg	72.9	1	03/28/18 12:51	04/05/18 20:22	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	53	%	30-150	1	03/28/18 12:51	04/05/18 20:22	877-09-8	
Decachlorobiphenyl (S)	79	%	30-150	1	03/28/18 12:51	04/05/18 20:22	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	11100-14-4	
PCB, Total	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	82	%	48-125	1	03/28/18 12:51	04/02/18 14:56	877-09-8	
Decachlorobiphenyl (S)	83	%	30-134	1	03/28/18 12:51	04/02/18 14:56	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	ND	mg/kg	11.6	1	03/27/18 16:31	03/30/18 14:57		
Surrogates								
n-Triacontane (S)	63	%	50-150	1	03/27/18 16:31	03/30/18 14:57	638-68-6	
WIGRO GCV								
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	14.2	1	04/03/18 09:56	04/04/18 11:54		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/03/18 09:56	04/04/18 11:54	98-08-8	
6010C MET ICP								
Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	12900	mg/kg	14.3	1	03/28/18 04:51	04/02/18 13:02	7429-90-5	
Barium	104	mg/kg	0.71	1	03/28/18 04:51	04/02/18 13:02	7440-39-3	
Boron	188	mg/kg	10.7	1	03/28/18 04:51	04/02/18 13:02	7440-42-8	
Copper	25.2	mg/kg	0.71	1	03/28/18 04:51	04/02/18 13:02	7440-50-8	
Iron	36000	mg/kg	35.6	10	03/28/18 04:51	04/02/18 13:40	7439-89-6	
Manganese	146	mg/kg	0.36	1	03/28/18 04:51	04/02/18 13:02	7439-96-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-E3 (11-15.5) **Lab ID: 10424937003** Collected: 03/26/18 14:40 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Nickel	26.8	mg/kg	1.4	1	03/28/18 04:51	04/02/18 13:02	7440-02-0	
Silver	ND	mg/kg	0.71	1	03/28/18 04:51	04/02/18 13:02	7440-22-4	
Tin	ND	mg/kg	5.3	1	03/28/18 04:51	04/02/18 13:02	7440-31-5	
Titanium	589	mg/kg	1.8	1	03/28/18 04:51	04/02/18 13:02	7440-32-6	
Zinc	149	mg/kg	1.4	1	03/28/18 04:51	04/02/18 13:02	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	45.1	mg/kg	1.4	5	03/30/18 09:43	03/31/18 06:23	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.1	mg/kg	0.73	20	03/28/18 04:52	03/30/18 18:06	7440-36-0	
Arsenic	16.9	mg/kg	0.73	20	03/28/18 04:52	03/30/18 18:06	7440-38-2	
Beryllium	2.9	mg/kg	0.29	20	03/28/18 04:52	03/30/18 18:06	7440-41-7	
Cadmium	1.8	mg/kg	0.12	20	03/28/18 04:52	03/30/18 18:06	7440-43-9	
Cobalt	7.9	mg/kg	0.73	20	03/28/18 04:52	03/30/18 18:06	7440-48-4	
Lead	20.5	mg/kg	0.15	20	03/28/18 04:52	03/30/18 18:06	7439-92-1	
Lithium	10.4	mg/kg	0.73	20	03/28/18 04:52	03/30/18 18:06	7439-93-2	
Selenium	5.6	mg/kg	0.73	20	03/28/18 04:52	03/30/18 18:06	7782-49-2	
Strontium	69.7	mg/kg	0.73	20	03/28/18 04:52	03/30/18 18:06	7440-24-6	
Vanadium	86.8	mg/kg	1.5	20	03/28/18 04:52	03/30/18 18:06	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.075	mg/kg	0.027	1	03/28/18 04:53	03/30/18 13:00	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	31.9	%	0.10	1		03/28/18 12:46		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	83-32-9	
Acenaphthylene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	208-96-8	
Anthracene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	120-12-7	
Benzo(a)anthracene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	56-55-3	
Benzo(a)pyrene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	101-55-3	
Butylbenzylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	85-68-7	
Carbazole	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	59-50-7	
4-Chloroaniline	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	108-60-1	
2-Chloronaphthalene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	91-58-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: **FD-SB-E3 (11-15.5)** Lab ID: **10424937003** Collected: 03/26/18 14:40 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Chlorophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	7005-72-3	
Chrysene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	53-70-3	
Dibenzofuran	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	120-83-2	
Diethylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	105-67-9	
Dimethylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	131-11-3	
Di-n-butylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2490	1	03/27/18 12:47	03/30/18 12:48	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	606-20-2	
Di-n-octylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	117-81-7	
Fluoranthene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	206-44-0	
Fluorene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	87-68-3	
Hexachlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	118-74-1	
Hexachloroethane	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	193-39-5	
Isophorone	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	78-59-1	
1-Methylnaphthalene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	90-12-0	
2-Methylnaphthalene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	968	1	03/27/18 12:47	03/30/18 12:48		
Naphthalene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	91-20-3	
2-Nitroaniline	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	88-74-4	
3-Nitroaniline	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	99-09-2	
4-Nitroaniline	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	100-01-6	
Nitrobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	98-95-3	
2-Nitrophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	88-75-5	
4-Nitrophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	86-30-6	
Pentachlorophenol	ND	ug/kg	983	1	03/27/18 12:47	03/30/18 12:48	87-86-5	
Phenanthrene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	85-01-8	
Phenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	108-95-2	
Pyrene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	129-00-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: **FD-SB-E3 (11-15.5)** Lab ID: **10424937003** Collected: 03/26/18 14:40 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
1,2,4-Trichlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	78	%	43-125	1	03/27/18 12:47	03/30/18 12:48	4165-60-0	
2-Fluorobiphenyl (S)	79	%	30-132	1	03/27/18 12:47	03/30/18 12:48	321-60-8	
p-Terphenyl-d14 (S)	94	%	62-125	1	03/27/18 12:47	03/30/18 12:48	1718-51-0	
Phenol-d6 (S)	79	%	48-125	1	03/27/18 12:47	03/30/18 12:48	13127-88-3	
2-Fluorophenol (S)	79	%	40-125	1	03/27/18 12:47	03/30/18 12:48	367-12-4	
2,4,6-Tribromophenol (S)	86	%	60-125	1	03/27/18 12:47	03/30/18 12:48	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	83-32-9	
Acenaphthylene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	208-96-8	
Anthracene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	120-12-7	
Benzo(a)anthracene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	56-55-3	
Benzo(a)pyrene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	207-08-9	
Chrysene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	53-70-3	
Fluoranthene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	206-44-0	
Fluorene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	193-39-5	
Naphthalene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	91-20-3	
Phenanthrene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	85-01-8	
Pyrene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	73	%	42-125	1	03/27/18 15:20	04/02/18 21:43	321-60-8	
p-Terphenyl-d14 (S)	90	%	57-125	1	03/27/18 15:20	04/02/18 21:43	1718-51-0	
8270D MSSV MDA LIST 2 Analytical Method: EPA 8270D Preparation Method: EPA 3546								
Bentazon	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	25057-89-0	
2,4-D	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	94-75-7	
2,4-DB	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	94-82-6	
Dicamba	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	1918-00-9	
Dinoseb	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	88-85-7	
MCPA	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	94-74-6	
Pentachlorophenol	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	87-86-5	
Picloram	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	1918-02-1	
2,4,5-T	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	93-72-1	
Triclopyr	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	55335-06-3	
Surrogates								
2,4-DCAA (S)	67	%	46-125	1	03/29/18 07:30	04/04/18 17:01	19719-28-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-E3 (11-15.5) **Lab ID: 10424937003** Collected: 03/26/18 14:40 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1580	1	03/27/18 14:03	03/27/18 18:15	67-64-1	
Allyl chloride	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	107-05-1	
Benzene	ND	ug/kg	31.6	1	03/27/18 14:03	03/27/18 18:15	71-43-2	
Bromobenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	108-86-1	
Bromochloromethane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	74-97-5	
Bromodichloromethane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	75-27-4	
Bromoform	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	75-25-2	
Bromomethane	ND	ug/kg	790	1	03/27/18 14:03	03/27/18 18:15	74-83-9	
2-Butanone (MEK)	ND	ug/kg	395	1	03/27/18 14:03	03/27/18 18:15	78-93-3	
n-Butylbenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	104-51-8	
sec-Butylbenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	135-98-8	
tert-Butylbenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	98-06-6	
Carbon tetrachloride	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	56-23-5	
Chlorobenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	108-90-7	
Chloroethane	ND	ug/kg	790	1	03/27/18 14:03	03/27/18 18:15	75-00-3	
Chloroform	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	67-66-3	
Chloromethane	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	74-87-3	
2-Chlorotoluene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	95-49-8	
4-Chlorotoluene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	790	1	03/27/18 14:03	03/27/18 18:15	96-12-8	
Dibromochloromethane	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	106-93-4	
Dibromomethane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	75-71-8	
1,1-Dichloroethane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	75-34-3	
1,2-Dichloroethane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	107-06-2	
1,1-Dichloroethene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	156-60-5	
Dichlorofluoromethane	ND	ug/kg	790	1	03/27/18 14:03	03/27/18 18:15	75-43-4	
1,2-Dichloropropane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	78-87-5	
1,3-Dichloropropane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	142-28-9	
2,2-Dichloropropane	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	594-20-7	
1,1-Dichloropropene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	60-29-7	
Ethylbenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	395	1	03/27/18 14:03	03/27/18 18:15	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	98-82-8	
p-Isopropyltoluene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	99-87-6	
Methylene Chloride	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	395	1	03/27/18 14:03	03/27/18 18:15	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-E3 (11-15.5) **Lab ID: 10424937003** Collected: 03/26/18 14:40 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	1634-04-4	
Naphthalene	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	91-20-3	
n-Propylbenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	103-65-1	
Styrene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	79-34-5	N2
Tetrachloroethene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	127-18-4	
Tetrahydrofuran	ND	ug/kg	3160	1	03/27/18 14:03	03/27/18 18:15	109-99-9	
Toluene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	79-00-5	
Trichloroethene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	108-67-8	
Vinyl chloride	ND	ug/kg	31.6	1	03/27/18 14:03	03/27/18 18:15	75-01-4	
Xylene (Total)	ND	ug/kg	237	1	03/27/18 14:03	03/27/18 18:15	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	91	%.	75-125	1	03/27/18 14:03	03/27/18 18:15	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1	03/27/18 14:03	03/27/18 18:15	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	75-125	1	03/27/18 14:03	03/27/18 18:15	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	14.7	5	04/02/18 15:00	04/04/18 13:18	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	45.1	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.59	1	03/29/18 10:55	03/29/18 13:17	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	3.5	mg/kg	0.99	1	03/30/18 14:00	03/31/18 05:04	16984-48-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: **FD-SB-F3 (3-11wm)** Lab ID: **10424937004** Collected: 03/26/18 15:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	9.70	1	03/30/18 11:35	04/02/18 17:46	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	309-00-2	
alpha-BHC	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	319-84-6	
beta-BHC	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	319-85-7	
delta-BHC	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	58-89-9	
Chlordane (Technical)	ND	ug/kg	438	20	03/28/18 12:51	04/06/18 00:56	57-74-9	
alpha-Chlordane	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	5103-71-9	
gamma-Chlordane	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	5103-74-2	
4,4'-DDD	ND	ug/kg	87.4	20	03/28/18 12:51	04/06/18 00:56	72-54-8	
4,4'-DDE	ND	ug/kg	87.4	20	03/28/18 12:51	04/06/18 00:56	72-55-9	
4,4'-DDT	ND	ug/kg	87.4	20	03/28/18 12:51	04/06/18 00:56	50-29-3	
Dieldrin	ND	ug/kg	87.4	20	03/28/18 12:51	04/06/18 00:56	60-57-1	
Endosulfan I	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	959-98-8	
Endosulfan II	ND	ug/kg	87.4	20	03/28/18 12:51	04/06/18 00:56	33213-65-9	
Endosulfan sulfate	ND	ug/kg	87.4	20	03/28/18 12:51	04/06/18 00:56	1031-07-8	
Endrin	ND	ug/kg	87.4	20	03/28/18 12:51	04/06/18 00:56	72-20-8	
Endrin aldehyde	ND	ug/kg	87.4	20	03/28/18 12:51	04/06/18 00:56	7421-93-4	
Endrin ketone	ND	ug/kg	87.4	20	03/28/18 12:51	04/06/18 00:56	53494-70-5	
Heptachlor	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	76-44-8	
Heptachlor epoxide	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	1024-57-3	
Methoxychlor	ND	ug/kg	438	20	03/28/18 12:51	04/06/18 00:56	72-43-5	
Toxaphene	ND	ug/kg	1310	20	03/28/18 12:51	04/06/18 00:56	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	03/28/18 12:51	04/06/18 00:56	877-09-8	4M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	20	03/28/18 12:51	04/06/18 00:56	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	53469-21-9	
PCB-1248 (Aroclor 1248)	928	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	12672-29-6	
PCB-1254 (Aroclor 1254)	1280	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	11100-14-4	
PCB, Total	2200	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	82	%	48-125	1	03/28/18 12:51	04/02/18 14:40	877-09-8	
Decachlorobiphenyl (S)	77	%	30-134	1	03/28/18 12:51	04/02/18 14:40	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-F3 (3-11wm) Lab ID: 10424937004 Collected: 03/26/18 15:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	229	mg/kg	55.1	5	03/27/18 16:31	03/30/18 13:46		T6
Surrogates								
n-Triacontane (S)	43	%.	50-150	5	03/27/18 16:31	03/30/18 13:46	638-68-6	S5
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	734	mg/kg	43.9	1	04/03/18 09:56	04/04/18 13:07		
Surrogates								
a,a,a-Trifluorotoluene (S)	96	%.	80-150	1	04/03/18 09:56	04/04/18 13:07	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	8730	mg/kg	12.4	1	03/28/18 04:51	04/02/18 13:05	7429-90-5	
Barium	489	mg/kg	0.62	1	03/28/18 04:51	04/02/18 13:05	7440-39-3	
Boron	163	mg/kg	9.3	1	03/28/18 04:51	04/02/18 13:05	7440-42-8	
Copper	47.2	mg/kg	0.62	1	03/28/18 04:51	04/02/18 13:05	7440-50-8	
Iron	43500	mg/kg	31.1	10	03/28/18 04:51	04/02/18 13:43	7439-89-6	
Manganese	230	mg/kg	0.31	1	03/28/18 04:51	04/02/18 13:05	7439-96-5	
Nickel	33.7	mg/kg	1.2	1	03/28/18 04:51	04/02/18 13:05	7440-02-0	
Silver	ND	mg/kg	0.62	1	03/28/18 04:51	04/02/18 13:05	7440-22-4	
Tin	102	mg/kg	4.7	1	03/28/18 04:51	04/02/18 13:05	7440-31-5	
Titanium	340	mg/kg	1.6	1	03/28/18 04:51	04/02/18 13:05	7440-32-6	
Zinc	312	mg/kg	1.2	1	03/28/18 04:51	04/02/18 13:05	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	45.0	mg/kg	1.3	5	03/30/18 09:43	03/31/18 06:28	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	2.5	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:11	7440-36-0	
Arsenic	20.6	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:11	7440-38-2	
Beryllium	1.9	mg/kg	0.26	20	03/28/18 04:52	03/30/18 18:11	7440-41-7	
Cadmium	3.4	mg/kg	0.10	20	03/28/18 04:52	03/30/18 18:11	7440-43-9	
Cobalt	8.3	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:11	7440-48-4	
Lead	352	mg/kg	0.13	20	03/28/18 04:52	03/30/18 18:11	7439-92-1	
Lithium	7.6	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:11	7439-93-2	
Selenium	4.2	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:11	7782-49-2	
Strontium	72.9	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:11	7440-24-6	
Vanadium	76.5	mg/kg	1.3	20	03/28/18 04:52	03/30/18 18:11	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.40	mg/kg	0.023	1	03/28/18 04:53	03/30/18 13:02	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	24.1	%	0.10	1		03/28/18 12:46		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-F3 (3-11wm) Lab ID: 10424937004 Collected: 03/26/18 15:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	208-96-8	
Anthracene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	120-12-7	
Benzo(a)anthracene	3470	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	56-55-3	
Benzo(a)pyrene	2690	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	50-32-8	
Benzo(b)fluoranthene	3300	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	101-55-3	
Butylbenzylphthalate	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	85-68-7	
Carbazole	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	59-50-7	
4-Chloroaniline	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	108-60-1	
2-Chloronaphthalene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	91-58-7	
2-Chlorophenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	7005-72-3	
Chrysene	3150	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	53-70-3	
Dibenzofuran	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	120-83-2	
Diethylphthalate	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	105-67-9	
Dimethylphthalate	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	131-11-3	
Di-n-butylphthalate	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	11200	5	03/27/18 12:47	03/30/18 21:24	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	606-20-2	
Di-n-octylphthalate	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	117-81-7	
Fluoranthene	7320	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	206-44-0	
Fluorene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	87-68-3	
Hexachlorobenzene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	118-74-1	
Hexachloroethane	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	193-39-5	
Isophorone	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	78-59-1	
1-Methylnaphthalene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	90-12-0	
2-Methylnaphthalene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: **FD-SB-F3 (3-11wm)** Lab ID: **10424937004** Collected: 03/26/18 15:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	4340	5	03/27/18 12:47	03/30/18 21:24		
Naphthalene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	91-20-3	
2-Nitroaniline	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	88-74-4	
3-Nitroaniline	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	99-09-2	
4-Nitroaniline	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	100-01-6	
Nitrobenzene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	98-95-3	
2-Nitrophenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	88-75-5	
4-Nitrophenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	86-30-6	
Pentachlorophenol	ND	ug/kg	4400	5	03/27/18 12:47	03/30/18 21:24	87-86-5	
Phenanthrene	8430	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	85-01-8	
Phenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	108-95-2	
Pyrene	6380	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	67	%	43-125	5	03/27/18 12:47	03/30/18 21:24	4165-60-0	D4
2-Fluorobiphenyl (S)	80	%	30-132	5	03/27/18 12:47	03/30/18 21:24	321-60-8	
p-Terphenyl-d14 (S)	81	%	62-125	5	03/27/18 12:47	03/30/18 21:24	1718-51-0	
Phenol-d6 (S)	75	%	48-125	5	03/27/18 12:47	03/30/18 21:24	13127-88-3	
2-Fluorophenol (S)	66	%	40-125	5	03/27/18 12:47	03/30/18 21:24	367-12-4	
2,4,6-Tribromophenol (S)	74	%	60-125	5	03/27/18 12:47	03/30/18 21:24	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	243	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	83-32-9	
Acenaphthylene	ND	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	208-96-8	
Anthracene	541	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	120-12-7	
Benzo(a)anthracene	936	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	56-55-3	
Benzo(a)pyrene	937	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	50-32-8	
Benzo(b)fluoranthene	1120	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	205-99-2	
Benzo(g,h,i)perylene	434	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	191-24-2	
Benzo(k)fluoranthene	1040	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	207-08-9	
Chrysene	1040	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	218-01-9	
Dibenz(a,h)anthracene	145	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	53-70-3	
Fluoranthene	1770	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	206-44-0	
Fluorene	328	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	86-73-7	
Indeno(1,2,3-cd)pyrene	389	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	193-39-5	
Naphthalene	232	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	91-20-3	
Phenanthrene	1540	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	85-01-8	
Pyrene	1310	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	82	%	42-125	5	03/27/18 15:20	04/03/18 23:20	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-F3 (3-11wm) Lab ID: 10424937004 Collected: 03/26/18 15:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Surrogates								
p-Terphenyl-d14 (S)	84	%	57-125	5	03/27/18 15:20	04/03/18 23:20	1718-51-0	
8270D MSSV MDA LIST 2 Analytical Method: EPA 8270D Preparation Method: EPA 3546								
Bentazon	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	25057-89-0	
2,4-D	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	94-75-7	
2,4-DB	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	94-82-6	
Dicamba	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	1918-00-9	
Dinoseb	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	88-85-7	
MCPA	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	94-74-6	
Pentachlorophenol	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	87-86-5	
Picloram	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	1918-02-1	
2,4,5-T	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	93-72-1	
Triclopyr	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	55335-06-3	
Surrogates								
2,4-DCAA (S)	61	%	46-125	5	03/29/18 07:30	04/04/18 19:58	19719-28-9	D3
8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Acetone	ND	ug/kg	4330	1	03/27/18 14:03	03/27/18 19:06	67-64-1	
Allyl chloride	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	107-05-1	
Benzene	142	ug/kg	86.6	1	03/27/18 14:03	03/27/18 19:06	71-43-2	
Bromobenzene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	108-86-1	
Bromochloromethane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	74-97-5	
Bromodichloromethane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	75-27-4	
Bromoform	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	75-25-2	
Bromomethane	ND	ug/kg	2170	1	03/27/18 14:03	03/27/18 19:06	74-83-9	
2-Butanone (MEK)	ND	ug/kg	1080	1	03/27/18 14:03	03/27/18 19:06	78-93-3	
n-Butylbenzene	3350	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	104-51-8	
sec-Butylbenzene	4440	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	135-98-8	
tert-Butylbenzene	412	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	98-06-6	
Carbon tetrachloride	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	56-23-5	
Chlorobenzene	487	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	108-90-7	
Chloroethane	ND	ug/kg	2170	1	03/27/18 14:03	03/27/18 19:06	75-00-3	
Chloroform	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	67-66-3	
Chloromethane	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	74-87-3	
2-Chlorotoluene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	95-49-8	
4-Chlorotoluene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	2170	1	03/27/18 14:03	03/27/18 19:06	96-12-8	
Dibromochloromethane	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	106-93-4	
Dibromomethane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	74-95-3	
1,2-Dichlorobenzene	79700	ug/kg	433	2	03/27/18 14:03	03/28/18 19:41	95-50-1	
1,3-Dichlorobenzene	974	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	541-73-1	
1,4-Dichlorobenzene	32700	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	75-71-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: **FD-SB-F3 (3-11wm)** Lab ID: **10424937004** Collected: 03/26/18 15:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,1-Dichloroethane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	75-34-3	
1,2-Dichloroethane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	107-06-2	
1,1-Dichloroethene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	156-60-5	
Dichlorofluoromethane	ND	ug/kg	2170	1	03/27/18 14:03	03/27/18 19:06	75-43-4	
1,2-Dichloropropane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	78-87-5	
1,3-Dichloropropane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	142-28-9	
2,2-Dichloropropane	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	594-20-7	
1,1-Dichloropropene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	60-29-7	
Ethylbenzene	12200	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	1080	1	03/27/18 14:03	03/27/18 19:06	87-68-3	
Isopropylbenzene (Cumene)	2390	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	98-82-8	
p-Isopropyltoluene	13000	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	99-87-6	
Methylene Chloride	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	1080	1	03/27/18 14:03	03/27/18 19:06	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	1634-04-4	
Naphthalene	41000	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	91-20-3	
n-Propylbenzene	3550	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	103-65-1	
Styrene	903	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	79-34-5	N2
Tetrachloroethene	5880	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	127-18-4	
Tetrahydrofuran	ND	ug/kg	8660	1	03/27/18 14:03	03/27/18 19:06	109-99-9	
Toluene	744	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	108-88-3	
1,2,3-Trichlorobenzene	725	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	87-61-6	
1,2,4-Trichlorobenzene	4380	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	79-00-5	
Trichloroethene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	76-13-1	
1,2,4-Trimethylbenzene	17000	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	95-63-6	
1,3,5-Trimethylbenzene	5920	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	108-67-8	
Vinyl chloride	ND	ug/kg	86.6	1	03/27/18 14:03	03/27/18 19:06	75-01-4	
Xylene (Total)	13700	ug/kg	650	1	03/27/18 14:03	03/27/18 19:06	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	90	%.	75-125	1	03/27/18 14:03	03/27/18 19:06	17060-07-0	
Toluene-d8 (S)	100	%.	75-125	1	03/27/18 14:03	03/27/18 19:06	2037-26-5	
4-Bromofluorobenzene (S)	115	%.	75-125	1	03/27/18 14:03	03/27/18 19:06	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-F3 (3-11wm) **Lab ID: 10424937004** Collected: 03/26/18 15:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
7196 Chromium, Hexavalent Analytical Method: EPA 7196A Preparation Method: EPA 3060A								
Chromium, Hexavalent	ND	mg/kg	13.0	5	04/02/18 15:00	04/04/18 13:18	18540-29-9	D3
Trivalent Chromium Calculation Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	45.0	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	
9012 Cyanide, Total Analytical Method: EPA 9012 Preparation Method: EPA 9012A								
Cyanide	0.58	mg/kg	0.36	1	03/29/18 10:55	03/29/18 13:18	57-12-5	
9056 IC Anions Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Fluoride	ND	mg/kg	1.0	1	03/30/18 14:00	03/31/18 02:08	16984-48-8	

Sample: FD-SB-G3 (7-16wm) **Lab ID: 10424937005** Collected: 03/26/18 16:35 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	8.04	1	03/30/18 11:35	04/02/18 17:52	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	309-00-2	
alpha-BHC	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	319-84-6	
beta-BHC	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	319-85-7	
delta-BHC	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	58-89-9	
Chlordane (Technical)	ND	ug/kg	2170	100	03/28/18 12:51	04/05/18 23:07	57-74-9	
alpha-Chlordane	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	5103-71-9	
gamma-Chlordane	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	5103-74-2	
4,4'-DDD	511	ug/kg	432	100	03/28/18 12:51	04/05/18 23:07	72-54-8	
4,4'-DDE	ND	ug/kg	432	100	03/28/18 12:51	04/05/18 23:07	72-55-9	
4,4'-DDT	ND	ug/kg	432	100	03/28/18 12:51	04/05/18 23:07	50-29-3	
Dieldrin	ND	ug/kg	432	100	03/28/18 12:51	04/05/18 23:07	60-57-1	
Endosulfan I	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	959-98-8	
Endosulfan II	ND	ug/kg	432	100	03/28/18 12:51	04/05/18 23:07	33213-65-9	
Endosulfan sulfate	ND	ug/kg	432	100	03/28/18 12:51	04/05/18 23:07	1031-07-8	
Endrin	ND	ug/kg	432	100	03/28/18 12:51	04/05/18 23:07	72-20-8	
Endrin aldehyde	ND	ug/kg	432	100	03/28/18 12:51	04/05/18 23:07	7421-93-4	
Endrin ketone	701	ug/kg	432	100	03/28/18 12:51	04/05/18 23:07	53494-70-5	
Heptachlor	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	76-44-8	
Heptachlor epoxide	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	1024-57-3	
Methoxychlor	ND	ug/kg	2170	100	03/28/18 12:51	04/05/18 23:07	72-43-5	
Toxaphene	ND	ug/kg	6490	100	03/28/18 12:51	04/05/18 23:07	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	100	03/28/18 12:51	04/05/18 23:07	877-09-8	3M, D4, S4

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G3 (7-16wm) **Lab ID: 10424937005** Collected: 03/26/18 16:35 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Surrogates								
Decachlorobiphenyl (S)	0	%.	30-150	100	03/28/18 12:51	04/05/18 23:07	2051-24-3	S4
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	11141-16-5	
PCB-1242 (Aroclor 1242)	1110	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	11097-69-1	
PCB-1260 (Aroclor 1260)	639	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	11100-14-4	
PCB, Total	1750	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	73	%.	48-125	1	03/28/18 12:51	04/02/18 14:08	877-09-8	
Decachlorobiphenyl (S)	72	%.	30-134	1	03/28/18 12:51	04/02/18 14:08	2051-24-3	
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	83.8	mg/kg	57.6	5	03/27/18 16:31	03/30/18 13:53		T6
Surrogates								
n-Triacontane (S)	71	%.	50-150	5	03/27/18 16:31	03/30/18 13:53	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	24.0	1	04/03/18 09:56	04/05/18 17:32		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%.	80-150	1	04/03/18 09:56	04/05/18 17:32	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	10600	mg/kg	12.9	1	03/28/18 04:51	04/02/18 13:08	7429-90-5	
Barium	179	mg/kg	0.64	1	03/28/18 04:51	04/02/18 13:08	7440-39-3	
Boron	163	mg/kg	9.7	1	03/28/18 04:51	04/02/18 13:08	7440-42-8	
Copper	66.2	mg/kg	0.64	1	03/28/18 04:51	04/02/18 13:08	7440-50-8	
Iron	42300	mg/kg	32.2	10	03/28/18 04:51	04/02/18 13:53	7439-89-6	
Manganese	225	mg/kg	0.32	1	03/28/18 04:51	04/02/18 13:08	7439-96-5	
Nickel	24.4	mg/kg	1.3	1	03/28/18 04:51	04/02/18 13:08	7440-02-0	
Silver	0.66	mg/kg	0.64	1	03/28/18 04:51	04/02/18 13:08	7440-22-4	
Tin	89.2	mg/kg	4.8	1	03/28/18 04:51	04/02/18 13:08	7440-31-5	
Titanium	408	mg/kg	1.6	1	03/28/18 04:51	04/02/18 13:08	7440-32-6	
Zinc	1540	mg/kg	1.3	1	03/28/18 04:51	04/02/18 13:08	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	40.2	mg/kg	1.2	5	03/30/18 09:43	03/31/18 06:32	7440-47-3	N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G3 (7-16wm) Lab ID: 10424937005 Collected: 03/26/18 16:35 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	2.1	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:16	7440-36-0	
Arsenic	13.8	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:16	7440-38-2	
Beryllium	1.2	mg/kg	0.26	20	03/28/18 04:52	03/30/18 18:16	7440-41-7	
Cadmium	4.8	mg/kg	0.10	20	03/28/18 04:52	03/30/18 18:16	7440-43-9	
Cobalt	6.7	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:16	7440-48-4	
Lead	311	mg/kg	0.13	20	03/28/18 04:52	03/30/18 18:16	7439-92-1	
Lithium	7.0	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:16	7439-93-2	
Selenium	3.5	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:16	7782-49-2	
Strontium	73.5	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:16	7440-24-6	
Vanadium	54.0	mg/kg	1.3	20	03/28/18 04:52	03/30/18 18:16	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.27	mg/kg	0.024	1	03/28/18 04:53	03/30/18 13:04	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	23.1	%	0.10	1		03/28/18 12:46		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	72100	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	83-32-9	
Acenaphthylene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	208-96-8	
Anthracene	173000	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	120-12-7	
Benzo(a)anthracene	162000	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	56-55-3	
Benzo(a)pyrene	117000	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	50-32-8	
Benzo(b)fluoranthene	145000	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	205-99-2	
Benzo(g,h,i)perylene	61700	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	191-24-2	
Benzo(k)fluoranthene	64300	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	101-55-3	
Butylbenzylphthalate	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	85-68-7	
Carbazole	74600	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	59-50-7	
4-Chloroaniline	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	108-60-1	
2-Chloronaphthalene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	91-58-7	
2-Chlorophenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	7005-72-3	
Chrysene	154000	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	53-70-3	
Dibenzofuran	65300	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	120-83-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: **FD-SB-G3 (7-16wm)** Lab ID: **10424937005** Collected: 03/26/18 16:35 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Diethylphthalate	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	105-67-9	
Dimethylphthalate	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	131-11-3	
Di-n-butylphthalate	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	110000	10	03/27/18 12:47	03/31/18 20:34	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	606-20-2	
Di-n-octylphthalate	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	117-81-7	
Fluoranthene	394000	ug/kg	107000	50	03/27/18 12:47	03/31/18 21:03	206-44-0	
Fluorene	104000	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	87-68-3	
Hexachlorobenzene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	118-74-1	
Hexachloroethane	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	67-72-1	
Indeno(1,2,3-cd)pyrene	56300	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	193-39-5	
Isophorone	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	78-59-1	
1-Methylnaphthalene	30000	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	90-12-0	
2-Methylnaphthalene	47600	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	42700	10	03/27/18 12:47	03/31/18 20:34		
Naphthalene	66500	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	91-20-3	
2-Nitroaniline	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	88-74-4	
3-Nitroaniline	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	99-09-2	
4-Nitroaniline	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	100-01-6	
Nitrobenzene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	98-95-3	
2-Nitrophenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	88-75-5	
4-Nitrophenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	86-30-6	
Pentachlorophenol	ND	ug/kg	43400	10	03/27/18 12:47	03/31/18 20:34	87-86-5	
Phenanthrene	545000	ug/kg	107000	50	03/27/18 12:47	03/31/18 21:03	85-01-8	
Phenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	108-95-2	
Pyrene	327000	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%	43-125	10	03/27/18 12:47	03/31/18 20:34	4165-60-0	D3,P3, S4
2-Fluorobiphenyl (S)	0	%	30-132	10	03/27/18 12:47	03/31/18 20:34	321-60-8	S4
p-Terphenyl-d14 (S)	0	%	62-125	10	03/27/18 12:47	03/31/18 20:34	1718-51-0	S4
Phenol-d6 (S)	0	%	48-125	10	03/27/18 12:47	03/31/18 20:34	13127-88-3	S4
2-Fluorophenol (S)	0	%	40-125	10	03/27/18 12:47	03/31/18 20:34	367-12-4	S4

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G3 (7-16wm) **Lab ID: 10424937005** Collected: 03/26/18 16:35 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Surrogates								
2,4,6-Tribromophenol (S)	0	%.	60-125	10	03/27/18 12:47	03/31/18 20:34	118-79-6	S4
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	45000	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	83-32-9	
Acenaphthylene	ND	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	208-96-8	
Anthracene	105000	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	120-12-7	
Benzo(a)anthracene	99600	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	56-55-3	
Benzo(a)pyrene	73000	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	50-32-8	
Benzo(b)fluoranthene	85300	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	205-99-2	
Benzo(g,h,i)perylene	38500	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	191-24-2	
Benzo(k)fluoranthene	37900	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	207-08-9	
Chrysene	83700	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	218-01-9	
Dibenz(a,h)anthracene	11700	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	53-70-3	
Fluoranthene	243000	ug/kg	16200	250	03/27/18 15:20	04/04/18 12:05	206-44-0	
Fluorene	61800	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	86-73-7	
Indeno(1,2,3-cd)pyrene	38800	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	193-39-5	
Naphthalene	42700	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	91-20-3	
Phenanthrene	325000	ug/kg	16200	250	03/27/18 15:20	04/04/18 12:05	85-01-8	
Pyrene	195000	ug/kg	16200	250	03/27/18 15:20	04/04/18 12:05	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%.	42-125	50	03/27/18 15:20	04/04/18 11:45	321-60-8	D4,P3, S4
p-Terphenyl-d14 (S)	0	%.	57-125	50	03/27/18 15:20	04/04/18 11:45	1718-51-0	S4
8270D MSSV MDA LIST 2 Analytical Method: EPA 8270D Preparation Method: EPA 3546								
Bentazon	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	25057-89-0	
2,4-D	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	94-75-7	
2,4-DB	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	94-82-6	
Dicamba	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	1918-00-9	
Dinoseb	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	88-85-7	
MCPA	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	94-74-6	
Pentachlorophenol	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	87-86-5	
Picloram	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	1918-02-1	
2,4,5-T	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	93-72-1	
Triclopyr	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	55335-06-3	
Surrogates								
2,4-DCAA (S)	69	%.	46-125	5	04/02/18 05:42	04/04/18 14:49	19719-28-9	D3
8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Acetone	ND	ug/kg	1890	1	03/27/18 14:03	03/27/18 18:32	67-64-1	
Allyl chloride	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	107-05-1	
Benzene	ND	ug/kg	37.7	1	03/27/18 14:03	03/27/18 18:32	71-43-2	
Bromobenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	108-86-1	
Bromochloromethane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	74-97-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: **FD-SB-G3 (7-16wm)** Lab ID: **10424937005** Collected: 03/26/18 16:35 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Bromodichloromethane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	75-27-4	
Bromoform	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	75-25-2	
Bromomethane	ND	ug/kg	943	1	03/27/18 14:03	03/27/18 18:32	74-83-9	
2-Butanone (MEK)	ND	ug/kg	472	1	03/27/18 14:03	03/27/18 18:32	78-93-3	
n-Butylbenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	104-51-8	
sec-Butylbenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	135-98-8	
tert-Butylbenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	98-06-6	
Carbon tetrachloride	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	56-23-5	
Chlorobenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	108-90-7	
Chloroethane	ND	ug/kg	943	1	03/27/18 14:03	03/27/18 18:32	75-00-3	
Chloroform	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	67-66-3	
Chloromethane	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	74-87-3	
2-Chlorotoluene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	95-49-8	
4-Chlorotoluene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	943	1	03/27/18 14:03	03/27/18 18:32	96-12-8	
Dibromochloromethane	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	106-93-4	
Dibromomethane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	541-73-1	
1,4-Dichlorobenzene	132	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	75-71-8	
1,1-Dichloroethane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	75-34-3	
1,2-Dichloroethane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	107-06-2	
1,1-Dichloroethene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	156-60-5	
Dichlorofluoromethane	ND	ug/kg	943	1	03/27/18 14:03	03/27/18 18:32	75-43-4	
1,2-Dichloropropane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	78-87-5	
1,3-Dichloropropane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	142-28-9	
2,2-Dichloropropane	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	594-20-7	
1,1-Dichloropropene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	60-29-7	
Ethylbenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	472	1	03/27/18 14:03	03/27/18 18:32	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	98-82-8	
p-Isopropyltoluene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	99-87-6	
Methylene Chloride	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	472	1	03/27/18 14:03	03/27/18 18:32	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	1634-04-4	
Naphthalene	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	91-20-3	
n-Propylbenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	103-65-1	
Styrene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	630-20-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G3 (7-16wm) Lab ID: 10424937005 Collected: 03/26/18 16:35 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,1,2,2-Tetrachloroethane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	79-34-5	N2
Tetrachloroethene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	127-18-4	
Tetrahydrofuran	ND	ug/kg	3770	1	03/27/18 14:03	03/27/18 18:32	109-99-9	
Toluene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	79-00-5	
Trichloroethene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	108-67-8	
Vinyl chloride	ND	ug/kg	37.7	1	03/27/18 14:03	03/27/18 18:32	75-01-4	
Xylene (Total)	ND	ug/kg	283	1	03/27/18 14:03	03/27/18 18:32	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	91	%.	75-125	1	03/27/18 14:03	03/27/18 18:32	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1	03/27/18 14:03	03/27/18 18:32	2037-26-5	
4-Bromofluorobenzene (S)	103	%.	75-125	1	03/27/18 14:03	03/27/18 18:32	460-00-4	

7196 Chromium, Hexavalent

Analytical Method: EPA 7196A Preparation Method: EPA 3060A

Chromium, Hexavalent	ND	mg/kg	12.8	5	04/02/18 15:00	04/04/18 13:18	18540-29-9	D3
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Trivalent Chromium Calculation

Analytical Method: Trivalent Chromium Calculation

Chromium, Trivalent	40.2	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	
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9012 Cyanide, Total

Analytical Method: EPA 9012 Preparation Method: EPA 9012A

Cyanide	0.62	mg/kg	0.52	1	03/29/18 10:55	03/29/18 13:22	57-12-5	
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9056 IC Anions

Analytical Method: EPA 9056A Preparation Method: EPA 300.0

Fluoride	2.0	mg/kg	0.99	1	03/30/18 14:00	04/02/18 20:37	16984-48-8	
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Sample: FD-SB-G2 (10-12wm) Lab ID: 10424937006 Collected: 03/26/18 17:20 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury		Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)						
Methyl Mercury	ND	ng/g	9.03	1	03/30/18 11:35	04/02/18 17:59	7439-97-6	N3
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA 3550						
Aldrin	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	309-00-2	
alpha-BHC	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	319-84-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G2 (10-12wm) **Lab ID: 10424937006** Collected: 03/26/18 17:20 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA 3550						
beta-BHC	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	319-85-7	
delta-BHC	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	58-89-9	
Chlordane (Technical)	ND	ug/kg	48.9	2	03/28/18 12:51	04/05/18 20:41	57-74-9	
alpha-Chlordane	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	5103-71-9	
gamma-Chlordane	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	5103-74-2	
4,4'-DDD	19.8	ug/kg	9.8	2	03/28/18 12:51	04/05/18 20:41	72-54-8	
4,4'-DDE	ND	ug/kg	9.8	2	03/28/18 12:51	04/05/18 20:41	72-55-9	
4,4'-DDT	ND	ug/kg	9.8	2	03/28/18 12:51	04/05/18 20:41	50-29-3	
Dieldrin	ND	ug/kg	9.8	2	03/28/18 12:51	04/05/18 20:41	60-57-1	
Endosulfan I	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	959-98-8	
Endosulfan II	ND	ug/kg	9.8	2	03/28/18 12:51	04/05/18 20:41	33213-65-9	
Endosulfan sulfate	ND	ug/kg	9.8	2	03/28/18 12:51	04/05/18 20:41	1031-07-8	
Endrin	ND	ug/kg	9.8	2	03/28/18 12:51	04/05/18 20:41	72-20-8	
Endrin aldehyde	ND	ug/kg	9.8	2	03/28/18 12:51	04/05/18 20:41	7421-93-4	
Endrin ketone	ND	ug/kg	9.8	2	03/28/18 12:51	04/05/18 20:41	53494-70-5	
Heptachlor	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	76-44-8	
Heptachlor epoxide	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	1024-57-3	
Methoxychlor	ND	ug/kg	48.9	2	03/28/18 12:51	04/05/18 20:41	72-43-5	
Toxaphene	ND	ug/kg	146	2	03/28/18 12:51	04/05/18 20:41	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	72	%	30-150	2	03/28/18 12:51	04/05/18 20:41	877-09-8	5M, D4
Decachlorobiphenyl (S)	82	%	30-150	2	03/28/18 12:51	04/05/18 20:41	2051-24-3	
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA 3550						
PCB-1016 (Aroclor 1016)	ND	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	11141-16-5	
PCB-1242 (Aroclor 1242)	134	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	11100-14-4	
PCB, Total	134	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	89	%	48-125	1	03/28/18 12:51	04/02/18 11:15	877-09-8	
Decachlorobiphenyl (S)	83	%	30-134	1	03/28/18 12:51	04/02/18 11:15	2051-24-3	
WIDRO GCS		Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO						
WDRO C10-C28	287	mg/kg	63.9	5	03/27/18 16:31	03/30/18 14:00		T6
Surrogates								
n-Triacontane (S)	94	%	50-150	5	03/27/18 16:31	03/30/18 14:00	638-68-6	
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil						
Gasoline Range Organics	69.0	mg/kg	19.9	1	04/03/18 09:56	04/04/18 13:55		

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G2 (10-12wm) Lab ID: 10424937006 Collected: 03/26/18 17:20 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Surrogates								
a,a,a-Trifluorotoluene (S)	97	%	80-150	1	04/03/18 09:56	04/04/18 13:55	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	13200	mg/kg	13.8	1	03/28/18 04:51	04/02/18 13:10	7429-90-5	
Barium	130	mg/kg	0.69	1	03/28/18 04:51	04/02/18 13:10	7440-39-3	
Boron	1930	mg/kg	10.4	1	03/28/18 04:51	04/02/18 13:10	7440-42-8	
Copper	29.1	mg/kg	0.69	1	03/28/18 04:51	04/02/18 13:10	7440-50-8	
Iron	39400	mg/kg	34.6	10	03/28/18 04:51	04/02/18 13:55	7439-89-6	
Manganese	188	mg/kg	0.35	1	03/28/18 04:51	04/02/18 13:10	7439-96-5	
Nickel	27.8	mg/kg	1.4	1	03/28/18 04:51	04/02/18 13:10	7440-02-0	
Silver	ND	mg/kg	0.69	1	03/28/18 04:51	04/02/18 13:10	7440-22-4	
Tin	5.3	mg/kg	5.2	1	03/28/18 04:51	04/02/18 13:10	7440-31-5	
Titanium	597	mg/kg	1.7	1	03/28/18 04:51	04/02/18 13:10	7440-32-6	
Zinc	209	mg/kg	1.4	1	03/28/18 04:51	04/02/18 13:10	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	57.6	mg/kg	1.4	5	03/30/18 09:43	03/31/18 06:37	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	2.0	mg/kg	0.71	20	03/28/18 04:52	03/30/18 18:21	7440-36-0	
Arsenic	28.4	mg/kg	0.71	20	03/28/18 04:52	03/30/18 18:21	7440-38-2	
Beryllium	3.0	mg/kg	0.28	20	03/28/18 04:52	03/30/18 18:21	7440-41-7	
Cadmium	3.1	mg/kg	0.11	20	03/28/18 04:52	03/30/18 18:21	7440-43-9	
Cobalt	7.4	mg/kg	0.71	20	03/28/18 04:52	03/30/18 18:21	7440-48-4	
Lead	40.8	mg/kg	0.14	20	03/28/18 04:52	03/30/18 18:21	7439-92-1	
Lithium	13.0	mg/kg	0.71	20	03/28/18 04:52	03/30/18 18:21	7439-93-2	
Selenium	7.4	mg/kg	0.71	20	03/28/18 04:52	03/30/18 18:21	7782-49-2	
Strontium	83.5	mg/kg	0.71	20	03/28/18 04:52	03/30/18 18:21	7440-24-6	
Vanadium	120	mg/kg	1.4	20	03/28/18 04:52	03/30/18 18:21	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.094	mg/kg	0.028	1	03/28/18 04:53	03/30/18 13:06	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	31.8	%	0.10	1		03/28/18 12:46		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	83-32-9	
Acenaphthylene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	208-96-8	
Anthracene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	120-12-7	
Benzo(a)anthracene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	56-55-3	
Benzo(a)pyrene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	191-24-2	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: **FD-SB-G2 (10-12wm)** Lab ID: **10424937006** Collected: 03/26/18 17:20 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Benzo(k)fluoranthene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	101-55-3	
Butylbenzylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	85-68-7	
Carbazole	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	59-50-7	
4-Chloroaniline	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	108-60-1	
2-Chloronaphthalene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	91-58-7	
2-Chlorophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	7005-72-3	
Chrysene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	53-70-3	
Dibenzofuran	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	120-83-2	
Diethylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	105-67-9	
Dimethylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	131-11-3	
Di-n-butylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2490	1	03/27/18 12:47	03/30/18 13:48	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	606-20-2	
Di-n-octylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	117-81-7	
Fluoranthene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	206-44-0	
Fluorene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	87-68-3	
Hexachlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	118-74-1	
Hexachloroethane	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	193-39-5	
Isophorone	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	78-59-1	
1-Methylnaphthalene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	90-12-0	
2-Methylnaphthalene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	967	1	03/27/18 12:47	03/30/18 13:48		
Naphthalene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	91-20-3	
2-Nitroaniline	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	88-74-4	
3-Nitroaniline	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	99-09-2	
4-Nitroaniline	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	100-01-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G2 (10-12wm) Lab ID: 10424937006 Collected: 03/26/18 17:20 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

Nitrobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	98-95-3	
2-Nitrophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	88-75-5	
4-Nitrophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	86-30-6	
Pentachlorophenol	ND	ug/kg	982	1	03/27/18 12:47	03/30/18 13:48	87-86-5	
Phenanthrene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	85-01-8	
Phenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	108-95-2	
Pyrene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	72	%.	43-125	1	03/27/18 12:47	03/30/18 13:48	4165-60-0	
2-Fluorobiphenyl (S)	79	%.	30-132	1	03/27/18 12:47	03/30/18 13:48	321-60-8	
p-Terphenyl-d14 (S)	98	%.	62-125	1	03/27/18 12:47	03/30/18 13:48	1718-51-0	
Phenol-d6 (S)	70	%.	48-125	1	03/27/18 12:47	03/30/18 13:48	13127-88-3	
2-Fluorophenol (S)	69	%.	40-125	1	03/27/18 12:47	03/30/18 13:48	367-12-4	
2,4,6-Tribromophenol (S)	83	%.	60-125	1	03/27/18 12:47	03/30/18 13:48	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	83-32-9	
Acenaphthylene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	208-96-8	
Anthracene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	120-12-7	
Benzo(a)anthracene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	56-55-3	
Benzo(a)pyrene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	207-08-9	
Chrysene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	53-70-3	
Fluoranthene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	206-44-0	
Fluorene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	193-39-5	
Naphthalene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	91-20-3	
Phenanthrene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	85-01-8	
Pyrene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	74	%.	42-125	1	03/27/18 15:20	04/02/18 22:05	321-60-8	
p-Terphenyl-d14 (S)	89	%.	57-125	1	03/27/18 15:20	04/02/18 22:05	1718-51-0	

8270D MSSV MDA LIST 2

Analytical Method: EPA 8270D Preparation Method: EPA 3546

Bentazon	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	25057-89-0	
2,4-D	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	94-75-7	
2,4-DB	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	94-82-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G2 (10-12wm) Lab ID: 10424937006 Collected: 03/26/18 17:20 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Dicamba	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	1918-00-9	
Dinoseb	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	88-85-7	
MCPA	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	94-74-6	
Pentachlorophenol	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	87-86-5	
Picloram	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	1918-02-1	
2,4,5-T	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	93-72-1	
Triclopyr	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	55335-06-3	
Surrogates								
2,4-DCAA (S)	65	%.	46-125	1	03/29/18 07:30	04/04/18 17:16	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 18:49	67-64-1	
Allyl chloride	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	107-05-1	
Benzene	ND	ug/kg	33.1	1	03/27/18 14:03	03/27/18 18:49	71-43-2	
Bromobenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	108-86-1	
Bromochloromethane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	74-97-5	
Bromodichloromethane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	75-27-4	
Bromoform	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	75-25-2	
Bromomethane	ND	ug/kg	827	1	03/27/18 14:03	03/27/18 18:49	74-83-9	
2-Butanone (MEK)	ND	ug/kg	414	1	03/27/18 14:03	03/27/18 18:49	78-93-3	
n-Butylbenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	104-51-8	
sec-Butylbenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	135-98-8	
tert-Butylbenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	98-06-6	
Carbon tetrachloride	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	56-23-5	
Chlorobenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	108-90-7	
Chloroethane	ND	ug/kg	827	1	03/27/18 14:03	03/27/18 18:49	75-00-3	
Chloroform	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	67-66-3	
Chloromethane	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	74-87-3	
2-Chlorotoluene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	95-49-8	
4-Chlorotoluene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	827	1	03/27/18 14:03	03/27/18 18:49	96-12-8	
Dibromochloromethane	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	106-93-4	
Dibromomethane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	75-71-8	
1,1-Dichloroethane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	75-34-3	
1,2-Dichloroethane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	107-06-2	
1,1-Dichloroethene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	75-35-4	
cis-1,2-Dichloroethene	263	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	156-60-5	
Dichlorofluoromethane	ND	ug/kg	827	1	03/27/18 14:03	03/27/18 18:49	75-43-4	
1,2-Dichloropropane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	78-87-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G2 (10-12wm) **Lab ID: 10424937006** Collected: 03/26/18 17:20 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,3-Dichloropropane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	142-28-9	
2,2-Dichloropropane	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	594-20-7	
1,1-Dichloropropene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	60-29-7	
Ethylbenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	414	1	03/27/18 14:03	03/27/18 18:49	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	98-82-8	
p-Isopropyltoluene	131	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	99-87-6	
Methylene Chloride	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	414	1	03/27/18 14:03	03/27/18 18:49	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	1634-04-4	
Naphthalene	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	91-20-3	
n-Propylbenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	103-65-1	
Styrene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	79-34-5	N2
Tetrachloroethene	363	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	127-18-4	
Tetrahydrofuran	ND	ug/kg	3310	1	03/27/18 14:03	03/27/18 18:49	109-99-9	
Toluene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	79-00-5	
Trichloroethene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	76-13-1	
1,2,4-Trimethylbenzene	341	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	95-63-6	
1,3,5-Trimethylbenzene	172	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	108-67-8	
Vinyl chloride	ND	ug/kg	33.1	1	03/27/18 14:03	03/27/18 18:49	75-01-4	
Xylene (Total)	ND	ug/kg	248	1	03/27/18 14:03	03/27/18 18:49	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	92	%	75-125	1	03/27/18 14:03	03/27/18 18:49	17060-07-0	
Toluene-d8 (S)	100	%	75-125	1	03/27/18 14:03	03/27/18 18:49	2037-26-5	
4-Bromofluorobenzene (S)	105	%	75-125	1	03/27/18 14:03	03/27/18 18:49	460-00-4	

7196 Chromium, Hexavalent

Analytical Method: EPA 7196A Preparation Method: EPA 3060A

Chromium, Hexavalent	ND	mg/kg	14.6	5	04/02/18 15:00	04/04/18 13:18	18540-29-9	D3
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Trivalent Chromium Calculation

Analytical Method: Trivalent Chromium Calculation

Chromium, Trivalent	57.6	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	
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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

Sample: FD-SB-G2 (10-12wm) Lab ID: 10424937006 Collected: 03/26/18 17:20 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
9012 Cyanide, Total	Analytical Method: EPA 9012 Preparation Method: EPA 9012A							
Cyanide	0.56	mg/kg	0.56	1	03/29/18 10:55	03/29/18 13:22	57-12-5	
9056 IC Anions	Analytical Method: EPA 9056A Preparation Method: EPA 300.0							
Fluoride	7.4	mg/kg	1.0	1	03/30/18 14:00	04/02/18 21:35	16984-48-8	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 139779 Analysis Method: EPA 1630 (1998)
 QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 553598 Matrix: Solid
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.16	04/02/18 14:39	N3

METHOD BLANK: 553599 Matrix: Solid
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.14	04/02/18 14:46	N3

METHOD BLANK: 553600 Matrix: Solid
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.19	04/02/18 14:52	N3

LABORATORY CONTROL SAMPLE: 553601

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	104	109	105	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553602 553603

Parameter	Units	10424249001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	22.5	480	482	389	390	76	76	65-135	0	35	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553604 553605

Parameter	Units	10424609001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	1000	932	788	743	79	80	65-135	6	35	N3

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 530309 Analysis Method: WI MOD GRO
 QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2878459 Matrix: Solid
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	04/03/18 12:36	
a,a,a-Trifluorotoluene (S)	%	98	80-150	04/03/18 12:36	

LABORATORY CONTROL SAMPLE & LCSD: 2878460

2878461

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	43.7	49.5	87	99	80-120	12	20	
a,a,a-Trifluorotoluene (S)	%				99	99	80-150			

MATRIX SPIKE SAMPLE: 2878564

Parameter	Units	10424937003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	ND	70.3	70.9	100	80-120	
a,a,a-Trifluorotoluene (S)	%				99	80-150	

SAMPLE DUPLICATE: 2878565

Parameter	Units	10425027002 Result	Dup Result	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	ND		20	
a,a,a-Trifluorotoluene (S)	%	99	100	8		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 529342 Analysis Method: EPA 7471
 QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2873298 Matrix: Solid
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.020	03/30/18 12:37	

LABORATORY CONTROL SAMPLE: 2873299

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.45	0.51	112	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873300 2873301

Parameter	Units	10424793001		2873301		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.						
Mercury	mg/kg	0.12	2.2	2.4	2.6	109	105	80-120	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

QC Batch: 529339 Analysis Method: EPA 6010C
QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2873286 Matrix: Solid
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	10.0	04/02/18 12:22	
Barium	mg/kg	ND	0.50	04/02/18 12:22	
Boron	mg/kg	ND	7.5	04/02/18 12:22	
Copper	mg/kg	ND	0.50	04/02/18 12:22	
Iron	mg/kg	24.4	2.5	04/02/18 12:22	
Manganese	mg/kg	ND	0.25	04/02/18 12:22	
Nickel	mg/kg	ND	1.0	04/02/18 12:22	
Silver	mg/kg	ND	0.50	04/02/18 12:22	
Tin	mg/kg	ND	3.8	04/02/18 12:22	
Titanium	mg/kg	ND	1.2	04/02/18 12:22	
Zinc	mg/kg	ND	1.0	04/02/18 12:22	

LABORATORY CONTROL SAMPLE: 2873287

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	962	978	102	80-120	
Barium	mg/kg	48.1	50.1	104	80-120	
Boron	mg/kg	48.1	45.5	95	80-120	
Copper	mg/kg	48.1	47.2	98	80-120	
Iron	mg/kg	962	1000	104	80-120	
Manganese	mg/kg	48.1	50.6	105	80-120	
Nickel	mg/kg	48.1	49.2	102	80-120	
Silver	mg/kg	24	22.4	93	80-120	
Tin	mg/kg	48.1	49.1	102	80-120	
Titanium	mg/kg	48.1	48.7	101	80-120	
Zinc	mg/kg	48.1	48.2	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873288 2873289

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424793001 Result	Spike Conc.	Spike Conc.	Result							Result
Aluminum	mg/kg	5600	4830	4830	12100	12700	134	147	75-125	5	20	M1
Barium	mg/kg	252	241	241	474	480	92	95	75-125	1	20	
Boron	mg/kg	524	241	241	778	802	105	115	75-125	3	20	
Copper	mg/kg	24.2	241	241	275	298	104	113	75-125	8	20	
Iron	mg/kg	15500	4830	4830	18100	23200	55	161	75-125	25	20	M1,R1
Manganese	mg/kg	423	241	241	614	675	79	104	75-125	9	20	
Nickel	mg/kg	11.3	241	241	256	262	101	104	75-125	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Parameter	Units	2873288		2873289		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
		10424793001 Result	MS Spike Conc.	MSD Spike Conc.	RPD						RPD		
Silver	mg/kg	ND	121	121	113	110	93	91	75-125	2	20		
Tin	mg/kg	44.1	241	241	272	273	95	95	75-125	0	20		
Titanium	mg/kg	158	241	241	391	406	96	103	75-125	4	20		
Zinc	mg/kg	232	241	241	411	487	74	106	75-125	17	20	M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

QC Batch: 434613 Analysis Method: EPA 6020
QC Batch Method: EPA 3050B Analysis Description: 6020 MET
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2007430 Matrix: Solid
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.18	03/31/18 04:29	N2

LABORATORY CONTROL SAMPLE: 2007431

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.7	3.6	97	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2007432 2007433

Parameter	Units	2007432		2007433		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10424609003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chromium	mg/kg	31.2	4.74	4.74	36.1	22.7	103	-179	75-125	46	20 1M, M0, N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 529341 Analysis Method: EPA 6020A
 QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2873294 Matrix: Solid
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.50	03/30/18 17:03	
Arsenic	mg/kg	ND	0.50	03/30/18 17:03	
Beryllium	mg/kg	ND	0.20	03/30/18 17:03	
Cadmium	mg/kg	ND	0.080	03/30/18 17:03	
Cobalt	mg/kg	ND	0.50	03/30/18 17:03	
Lead	mg/kg	ND	0.10	03/30/18 17:03	
Lithium	mg/kg	ND	0.50	03/30/18 17:03	
Selenium	mg/kg	ND	0.50	03/30/18 17:03	
Strontium	mg/kg	ND	0.50	03/30/18 17:03	
Vanadium	mg/kg	ND	1.0	03/30/18 17:03	

LABORATORY CONTROL SAMPLE: 2873295

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	49.5	49.3	100	80-120	
Arsenic	mg/kg	49.5	49.1	99	80-120	
Beryllium	mg/kg	49.5	46.9	95	80-120	
Cadmium	mg/kg	49.5	48.8	99	80-120	
Cobalt	mg/kg	49.5	49.6	100	80-120	
Lead	mg/kg	49.5	50.3	102	80-120	
Lithium	mg/kg	49.5	45.7	92	80-120	
Selenium	mg/kg	49.5	48.0	97	80-120	
Strontium	mg/kg	49.5	48.3	98	80-120	
Vanadium	mg/kg	49.5	51.0	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873296 2873297

Parameter	Units	10424793001 Result	MS Spike Conc.	MSD Spike Conc.	2873296		2873297		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Antimony	mg/kg	ND	239	239	192	203	80	85	75-125	5	20	
Arsenic	mg/kg	3.8	239	239	223	236	92	97	75-125	5	20	
Beryllium	mg/kg	ND	239	239	219	234	91	98	75-125	7	20	
Cadmium	mg/kg	0.72	239	239	221	234	92	98	75-125	6	20	
Cobalt	mg/kg	3.4	239	239	228	242	94	100	75-125	6	20	
Lead	mg/kg	308	239	239	641	734	139	178	75-125	14	20 M6	
Lithium	mg/kg	4.6	239	239	216	232	88	95	75-125	7	20	
Selenium	mg/kg	ND	239	239	215	223	90	93	75-125	4	20	
Strontium	mg/kg	47.6	239	239	265	304	91	107	75-125	14	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873296												2873297	
Parameter	Units	10424793001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	RPD	RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits				
Vanadium	mg/kg	15.0	239	239	247	275	97	109	75-125	11	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

QC Batch: 529276 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2872633 Matrix: Solid
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,1,1-Trichloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	03/27/18 16:35	N2
1,1,2-Trichloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	03/27/18 16:35	
1,1-Dichloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,1-Dichloroethene	ug/kg	ND	50.0	03/27/18 16:35	
1,1-Dichloropropene	ug/kg	ND	50.0	03/27/18 16:35	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,2,3-Trichloropropane	ug/kg	ND	200	03/27/18 16:35	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	03/27/18 16:35	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	03/27/18 16:35	
1,2-Dichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,2-Dichloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,2-Dichloropropane	ug/kg	ND	50.0	03/27/18 16:35	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,3-Dichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,3-Dichloropropane	ug/kg	ND	50.0	03/27/18 16:35	
1,4-Dichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
2,2-Dichloropropane	ug/kg	ND	200	03/27/18 16:35	
2-Butanone (MEK)	ug/kg	ND	250	03/27/18 16:35	
2-Chlorotoluene	ug/kg	ND	50.0	03/27/18 16:35	
4-Chlorotoluene	ug/kg	ND	50.0	03/27/18 16:35	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	03/27/18 16:35	
Acetone	ug/kg	ND	1000	03/27/18 16:35	
Allyl chloride	ug/kg	ND	200	03/27/18 16:35	
Benzene	ug/kg	ND	20.0	03/27/18 16:35	
Bromobenzene	ug/kg	ND	50.0	03/27/18 16:35	
Bromochloromethane	ug/kg	ND	50.0	03/27/18 16:35	
Bromodichloromethane	ug/kg	ND	50.0	03/27/18 16:35	
Bromoform	ug/kg	ND	200	03/27/18 16:35	
Bromomethane	ug/kg	ND	500	03/27/18 16:35	
Carbon tetrachloride	ug/kg	ND	50.0	03/27/18 16:35	
Chlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
Chloroethane	ug/kg	ND	500	03/27/18 16:35	
Chloroform	ug/kg	ND	50.0	03/27/18 16:35	
Chloromethane	ug/kg	ND	200	03/27/18 16:35	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	03/27/18 16:35	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	03/27/18 16:35	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

METHOD BLANK: 2872633 Matrix: Solid
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	03/27/18 16:35	
Dibromomethane	ug/kg	ND	50.0	03/27/18 16:35	
Dichlorodifluoromethane	ug/kg	ND	200	03/27/18 16:35	
Dichlorofluoromethane	ug/kg	ND	500	03/27/18 16:35	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	03/27/18 16:35	
Ethylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
Hexachloro-1,3-butadiene	ug/kg	ND	250	03/27/18 16:35	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	03/27/18 16:35	
Methyl-tert-butyl ether	ug/kg	ND	50.0	03/27/18 16:35	
Methylene Chloride	ug/kg	ND	200	03/27/18 16:35	
n-Butylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
n-Propylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
Naphthalene	ug/kg	ND	200	03/27/18 16:35	
p-Isopropyltoluene	ug/kg	ND	50.0	03/27/18 16:35	
sec-Butylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
Styrene	ug/kg	ND	50.0	03/27/18 16:35	
tert-Butylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
Tetrachloroethene	ug/kg	ND	50.0	03/27/18 16:35	
Tetrahydrofuran	ug/kg	ND	2000	03/27/18 16:35	
Toluene	ug/kg	ND	50.0	03/27/18 16:35	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	03/27/18 16:35	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	03/27/18 16:35	
Trichloroethene	ug/kg	ND	50.0	03/27/18 16:35	N2
Trichlorofluoromethane	ug/kg	ND	200	03/27/18 16:35	
Vinyl chloride	ug/kg	ND	20.0	03/27/18 16:35	
Xylene (Total)	ug/kg	ND	150	03/27/18 16:35	
1,2-Dichloroethane-d4 (S)	%	91	75-125	03/27/18 16:35	
4-Bromofluorobenzene (S)	%	101	75-125	03/27/18 16:35	
Toluene-d8 (S)	%	98	75-125	03/27/18 16:35	

Parameter	Units	2872634							2872635		
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/kg	1000	936	912	94	91	59-125	3	20		
1,1,1-Trichloroethane	ug/kg	1000	910	885	91	89	59-125	3	20		
1,1,2,2-Tetrachloroethane	ug/kg	1000	923	898	92	90	58-125	3	20	N2	
1,1,2-Trichloroethane	ug/kg	1000	913	861	91	86	64-125	6	20		
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	876	853	88	85	65-125	3	20		
1,1-Dichloroethane	ug/kg	1000	853	825	85	82	63-125	3	20		
1,1-Dichloroethene	ug/kg	1000	918	900	92	90	59-125	2	20		
1,1-Dichloropropene	ug/kg	1000	918	913	92	91	64-125	1	20		
1,2,3-Trichlorobenzene	ug/kg	1000	898	866	90	87	55-126	4	20		
1,2,3-Trichloropropane	ug/kg	1000	847	792	85	79	62-125	7	20		
1,2,4-Trichlorobenzene	ug/kg	1000	907	899	91	90	62-125	1	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

LABORATORY CONTROL SAMPLE & LCSD:		2872634	2872635		LCS	LCSD	% Rec		Max	
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	% Rec	% Rec	Limits	RPD	RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	1000	895	876	90	88	59-125	2	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	2070	2030	83	81	54-125	2	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	865	861	87	86	64-125	1	20	
1,2-Dichlorobenzene	ug/kg	1000	858	840	86	84	63-125	2	20	
1,2-Dichloroethane	ug/kg	1000	784	767	78	77	57-125	2	20	
1,2-Dichloropropane	ug/kg	1000	889	873	89	87	67-125	2	20	
1,3,5-Trimethylbenzene	ug/kg	1000	899	870	90	87	59-125	3	20	
1,3-Dichlorobenzene	ug/kg	1000	864	833	86	83	64-125	4	20	
1,3-Dichloropropane	ug/kg	1000	875	859	87	86	64-125	2	20	
1,4-Dichlorobenzene	ug/kg	1000	840	843	84	84	63-125	0	20	
2,2-Dichloropropane	ug/kg	1000	975	934	98	93	37-126	4	20	
2-Butanone (MEK)	ug/kg	5000	4040	4150	81	83	48-125	3	20	
2-Chlorotoluene	ug/kg	1000	870	844	87	84	62-125	3	20	
4-Chlorotoluene	ug/kg	1000	893	868	89	87	63-125	3	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4230	4170	85	83	52-135	1	20	
Acetone	ug/kg	5000	5930	5540	119	111	65-125	7	20	
Allyl chloride	ug/kg	1000	861	838	86	84	52-125	3	20	
Benzene	ug/kg	1000	870	836	87	84	61-125	4	20	
Bromobenzene	ug/kg	1000	896	858	90	86	64-125	4	20	
Bromochloromethane	ug/kg	1000	902	848	90	85	65-125	6	20	
Bromodichloromethane	ug/kg	1000	956	912	96	91	57-125	5	20	
Bromoform	ug/kg	1000	857	861	86	86	57-125	0	20	
Bromomethane	ug/kg	1000	761	842	76	84	60-125	10	20	
Carbon tetrachloride	ug/kg	1000	936	894	94	89	58-125	5	20	
Chlorobenzene	ug/kg	1000	891	868	89	87	66-125	3	20	
Chloroethane	ug/kg	1000	808	861	81	86	62-125	6	20	
Chloroform	ug/kg	1000	780	773	78	77	59-125	1	20	
Chloromethane	ug/kg	1000	777	793	78	79	50-125	2	20	
cis-1,2-Dichloroethene	ug/kg	1000	871	844	87	84	61-125	3	20	
cis-1,3-Dichloropropene	ug/kg	1000	920	884	92	88	61-125	4	20	
Dibromochloromethane	ug/kg	1000	873	836	87	84	60-125	4	20	
Dibromomethane	ug/kg	1000	919	879	92	88	69-125	4	20	
Dichlorodifluoromethane	ug/kg	1000	692	727	69	73	38-125	5	20	
Dichlorofluoromethane	ug/kg	1000	781	830	78	83	67-125	6	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	1440	1560	144	156	60-125	8	20 L3	
Ethylbenzene	ug/kg	1000	885	876	89	88	62-125	1	20	
Hexachloro-1,3-butadiene	ug/kg	1000	929	952	93	95	56-125	2	20	
Isopropylbenzene (Cumene)	ug/kg	1000	945	925	94	92	65-125	2	20	
Methyl-tert-butyl ether	ug/kg	1000	834	815	83	82	59-125	2	20	
Methylene Chloride	ug/kg	1000	905	859	91	86	64-125	5	20	
n-Butylbenzene	ug/kg	1000	931	914	93	91	59-125	2	20	
n-Propylbenzene	ug/kg	1000	920	887	92	89	61-125	4	20	
Naphthalene	ug/kg	1000	909	917	91	92	53-125	1	20	
p-Isopropyltoluene	ug/kg	1000	911	904	91	90	63-125	1	20	
sec-Butylbenzene	ug/kg	1000	937	918	94	92	62-125	2	20	
Styrene	ug/kg	1000	939	902	94	90	66-125	4	20	
tert-Butylbenzene	ug/kg	1000	914	898	91	90	64-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Parameter	Units	2872634		2872635			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Tetrachloroethene	ug/kg	1000	916	895	92	89	67-125	2	20	
Tetrahydrofuran	ug/kg	10000	12300	11600	123	116	62-125	6	20	
Toluene	ug/kg	1000	886	876	89	88	61-125	1	20	
trans-1,2-Dichloroethene	ug/kg	1000	901	885	90	89	64-125	2	20	
trans-1,3-Dichloropropene	ug/kg	1000	931	929	93	93	56-125	0	20	
Trichloroethene	ug/kg	1000	892	866	89	87	67-125	3	20	N2
Trichlorofluoromethane	ug/kg	1000	753	816	75	82	65-125	8	20	
Vinyl chloride	ug/kg	1000	851	883	85	88	57-125	4	20	
Xylene (Total)	ug/kg	3000	2710	2690	90	90	62-125	1	20	
1,2-Dichloroethane-d4 (S)	%				92	91	75-125			
4-Bromofluorobenzene (S)	%				100	102	75-125			
Toluene-d8 (S)	%				99	101	75-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 529466 Analysis Method: EPA 8081B
QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2873686 Matrix: Solid
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/05/18 18:14	
4,4'-DDE	ug/kg	ND	3.3	04/05/18 18:14	
4,4'-DDT	ug/kg	ND	3.3	04/05/18 18:14	
Aldrin	ug/kg	ND	1.7	04/05/18 18:14	
alpha-BHC	ug/kg	ND	1.7	04/05/18 18:14	
alpha-Chlordane	ug/kg	ND	1.7	04/05/18 18:14	
beta-BHC	ug/kg	ND	1.7	04/05/18 18:14	
Chlordane (Technical)	ug/kg	ND	16.7	04/05/18 18:14	
delta-BHC	ug/kg	ND	1.7	04/05/18 18:14	
Dieldrin	ug/kg	ND	3.3	04/05/18 18:14	
Endosulfan I	ug/kg	ND	1.7	04/05/18 18:14	
Endosulfan II	ug/kg	ND	3.3	04/05/18 18:14	
Endosulfan sulfate	ug/kg	ND	3.3	04/05/18 18:14	
Endrin	ug/kg	ND	3.3	04/05/18 18:14	
Endrin aldehyde	ug/kg	ND	3.3	04/05/18 18:14	
Endrin ketone	ug/kg	ND	3.3	04/05/18 18:14	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/05/18 18:14	
gamma-Chlordane	ug/kg	ND	1.7	04/05/18 18:14	
Heptachlor	ug/kg	ND	1.7	04/05/18 18:14	
Heptachlor epoxide	ug/kg	ND	1.7	04/05/18 18:14	
Methoxychlor	ug/kg	ND	16.7	04/05/18 18:14	
Toxaphene	ug/kg	ND	50.0	04/05/18 18:14	
Decachlorobiphenyl (S)	%	95	30-150	04/05/18 18:14	
Tetrachloro-m-xylene (S)	%	91	30-150	04/05/18 18:14	

LABORATORY CONTROL SAMPLE: 2873687

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	33.1	99	62-127	
4,4'-DDE	ug/kg	33.3	32.4	97	66-125	
4,4'-DDT	ug/kg	33.3	33.2	99	67-128 CH	
Aldrin	ug/kg	16.7	14.5	87	66-125	
alpha-BHC	ug/kg	16.7	14.8	89	64-125	
alpha-Chlordane	ug/kg	16.7	15.2	91	68-125	
beta-BHC	ug/kg	16.7	15.3	92	69-125	
delta-BHC	ug/kg	16.7	9.8	59	42-133	
Dieldrin	ug/kg	33.3	33.7	101	69-126	
Endosulfan I	ug/kg	16.7	14.1	85	63-125	
Endosulfan II	ug/kg	33.3	33.0	99	69-125	
Endosulfan sulfate	ug/kg	33.3	27.6	83	56-137	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

LABORATORY CONTROL SAMPLE: 2873687

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	31.1	93	69-125	
Endrin aldehyde	ug/kg	33.3	31.3	94	65-125	
Endrin ketone	ug/kg	33.3	34.0	102	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	15.3	92	67-125	
gamma-Chlordane	ug/kg	16.7	13.8	83	63-125	
Heptachlor	ug/kg	16.7	15.3	92	69-125	
Heptachlor epoxide	ug/kg	16.7	15.3	92	68-125	
Methoxychlor	ug/kg	167	165	99	65-134	CH
Decachlorobiphenyl (S)	%			90	30-150	
Tetrachloro-m-xylene (S)	%			86	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873688 2873689

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424793001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
4,4'-DDD	ug/kg	ND	166	166	147	154	89	93	56-125	5	20	
4,4'-DDE	ug/kg	ND	166	166	154	164	93	99	32-150	6	20	
4,4'-DDT	ug/kg	ND	166	166	154	158	93	95	60-132	2	20	CH
Aldrin	ug/kg	ND	82.5	83	61.8	64.2	75	78	56-125	4	20	
alpha-BHC	ug/kg	ND	82.5	83	74.1	80.9	90	98	54-136	9	20	
alpha-Chlordane	ug/kg	147	82.5	83	169	140	26	-9	54-133	19	20	M1
beta-BHC	ug/kg	64.3	82.5	83	79.8	87.9	19	28	30-150	10	20	M1
delta-BHC	ug/kg	ND	82.5	83	49.8	54.9	60	66	45-145	10	20	
Dieldrin	ug/kg	ND	166	166	142	143	86	86	47-150	0	20	
Endosulfan I	ug/kg	ND	82.5	83	66.2	70.2	80	85	35-145	6	20	
Endosulfan II	ug/kg	ND	166	166	139	142	84	86	50-147	2	20	
Endosulfan sulfate	ug/kg	ND	166	166	118	120	71	73	54-132	2	20	
Endrin	ug/kg	ND	166	166	126	128	76	78	62-125	2	20	
Endrin aldehyde	ug/kg	ND	166	166	132	132	80	80	33-150	1	20	
Endrin ketone	ug/kg	ND	166	166	144	146	87	88	56-144	1	20	
gamma-BHC (Lindane)	ug/kg	ND	82.5	83	66.3	68.3	80	82	63-125	3	20	
gamma-Chlordane	ug/kg	129	82.5	83	141	118	14	-14	45-132	18	20	M1
Heptachlor	ug/kg	ND	82.5	83	77.5	95.3	94	115	51-142	21	20	R1
Heptachlor epoxide	ug/kg	ND	82.5	83	65.2	69.5	79	84	50-142	6	20	
Methoxychlor	ug/kg	ND	825	830	810	820	98	99	58-139	1	20	CH
Decachlorobiphenyl (S)	%						60	64	30-150			
Tetrachloro-m-xylene (S)	%						57	64	30-150			5M,D4

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

QC Batch: 529467 Analysis Method: EPA 8082A
QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2873690 Matrix: Solid
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/02/18 10:11	
Decachlorobiphenyl (S)	%	88	30-134	04/02/18 10:11	
Tetrachloro-m-xylene (S)	%	88	48-125	04/02/18 10:11	

LABORATORY CONTROL SAMPLE: 2873691

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	569	85	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	575	86	62-125	
Decachlorobiphenyl (S)	%			90	30-134	
Tetrachloro-m-xylene (S)	%			90	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873692 2873693

Parameter	Units	10424793002		2873692		2873693		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
PCB-1016 (Aroclor 1016)	ug/kg	ND	930	930	789	769	85	83	30-150	3	30		
PCB-1260 (Aroclor 1260)	ug/kg	ND	930	930	906	896	97	96	30-138	1	30		
Decachlorobiphenyl (S)	%						77	74	30-134				
Tetrachloro-m-xylene (S)	%						76	69	48-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 529268 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2872570 Matrix: Solid
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1,2-Dichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1,2-Diphenylhydrazine	ug/kg	ND	330	03/30/18 11:47	
1,3-Dichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1,4-Dichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1-Methylnaphthalene	ug/kg	ND	330	03/30/18 11:47	
2,4,5-Trichlorophenol	ug/kg	ND	330	03/30/18 11:47	
2,4,6-Trichlorophenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dichlorophenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dimethylphenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dinitrophenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dinitrotoluene	ug/kg	ND	330	03/30/18 11:47	
2,6-Dinitrotoluene	ug/kg	ND	330	03/30/18 11:47	
2-Chloronaphthalene	ug/kg	ND	330	03/30/18 11:47	
2-Chlorophenol	ug/kg	ND	330	03/30/18 11:47	
2-Methylnaphthalene	ug/kg	ND	330	03/30/18 11:47	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	03/30/18 11:47	
2-Nitroaniline	ug/kg	ND	330	03/30/18 11:47	
2-Nitrophenol	ug/kg	ND	330	03/30/18 11:47	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	03/30/18 11:47	
3,3'-Dichlorobenzidine	ug/kg	ND	330	03/30/18 11:47	
3-Nitroaniline	ug/kg	ND	330	03/30/18 11:47	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	03/30/18 11:47	
4-Bromophenylphenyl ether	ug/kg	ND	330	03/30/18 11:47	
4-Chloro-3-methylphenol	ug/kg	ND	330	03/30/18 11:47	
4-Chloroaniline	ug/kg	ND	330	03/30/18 11:47	
4-Chlorophenylphenyl ether	ug/kg	ND	330	03/30/18 11:47	
4-Nitroaniline	ug/kg	ND	330	03/30/18 11:47	
4-Nitrophenol	ug/kg	ND	330	03/30/18 11:47	
Acenaphthene	ug/kg	ND	330	03/30/18 11:47	
Acenaphthylene	ug/kg	ND	330	03/30/18 11:47	
Anthracene	ug/kg	ND	330	03/30/18 11:47	
Benzo(a)anthracene	ug/kg	ND	330	03/30/18 11:47	
Benzo(a)pyrene	ug/kg	ND	330	03/30/18 11:47	
Benzo(b)fluoranthene	ug/kg	ND	330	03/30/18 11:47	
Benzo(g,h,i)perylene	ug/kg	ND	330	03/30/18 11:47	
Benzo(k)fluoranthene	ug/kg	ND	330	03/30/18 11:47	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	03/30/18 11:47	
bis(2-Chloroethyl) ether	ug/kg	ND	330	03/30/18 11:47	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	03/30/18 11:47	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	03/30/18 11:47	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

METHOD BLANK: 2872570

Matrix: Solid

Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	03/30/18 11:47	
Carbazole	ug/kg	ND	330	03/30/18 11:47	
Chrysene	ug/kg	ND	330	03/30/18 11:47	
Di-n-butylphthalate	ug/kg	ND	330	03/30/18 11:47	
Di-n-octylphthalate	ug/kg	ND	330	03/30/18 11:47	
Dibenz(a,h)anthracene	ug/kg	ND	330	03/30/18 11:47	
Dibenzofuran	ug/kg	ND	330	03/30/18 11:47	
Diethylphthalate	ug/kg	ND	330	03/30/18 11:47	
Dimethylphthalate	ug/kg	ND	330	03/30/18 11:47	
Fluoranthene	ug/kg	ND	330	03/30/18 11:47	
Fluorene	ug/kg	ND	330	03/30/18 11:47	
Hexachloro-1,3-butadiene	ug/kg	ND	330	03/30/18 11:47	
Hexachlorobenzene	ug/kg	ND	330	03/30/18 11:47	
Hexachloroethane	ug/kg	ND	330	03/30/18 11:47	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	03/30/18 11:47	
Isophorone	ug/kg	ND	330	03/30/18 11:47	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	03/30/18 11:47	
N-Nitrosodimethylamine	ug/kg	ND	330	03/30/18 11:47	
N-Nitrosodiphenylamine	ug/kg	ND	330	03/30/18 11:47	
Naphthalene	ug/kg	ND	330	03/30/18 11:47	
Nitrobenzene	ug/kg	ND	330	03/30/18 11:47	
Pentachlorophenol	ug/kg	ND	670	03/30/18 11:47	
Phenanthrene	ug/kg	ND	330	03/30/18 11:47	
Phenol	ug/kg	ND	330	03/30/18 11:47	
Pyrene	ug/kg	ND	330	03/30/18 11:47	
2,4,6-Tribromophenol (S)	%	73	60-125	03/30/18 11:47	
2-Fluorobiphenyl (S)	%	58	30-132	03/30/18 11:47	
2-Fluorophenol (S)	%	55	40-125	03/30/18 11:47	
Nitrobenzene-d5 (S)	%	54	43-125	03/30/18 11:47	
p-Terphenyl-d14 (S)	%	90	62-125	03/30/18 11:47	
Phenol-d6 (S)	%	56	48-125	03/30/18 11:47	

LABORATORY CONTROL SAMPLE: 2872571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1020	61	46-125	
1,2-Dichlorobenzene	ug/kg	1670	999	60	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1310	78	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1010	61	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1010	61	39-125	
1-Methylnaphthalene	ug/kg	1670	1080	65	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1220	73	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1200	72	61-125	
2,4-Dichlorophenol	ug/kg	1670	1060	64	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

LABORATORY CONTROL SAMPLE: 2872571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1030	62	51-125	
2,4-Dinitrophenol	ug/kg	1670	1200	72	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1250	75	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1240	74	63-125	
2-Chloronaphthalene	ug/kg	1670	1130	68	61-125	
2-Chlorophenol	ug/kg	1670	1020	61	46-125	
2-Methylnaphthalene	ug/kg	1670	1080	65	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1080	65	50-125	
2-Nitroaniline	ug/kg	1670	1380	83	61-125	
2-Nitrophenol	ug/kg	1670	1030	62	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1080	65	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1290	78	47-125	
3-Nitroaniline	ug/kg	1670	1220	73	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1380J	83	30-141	
4-Bromophenylphenyl ether	ug/kg	1670	1350	81	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1180	71	64-125	
4-Chloroaniline	ug/kg	1670	944	57	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1210	73	64-125	
4-Nitroaniline	ug/kg	1670	1180	71	59-125	
4-Nitrophenol	ug/kg	1670	1320	79	54-125	
Acenaphthene	ug/kg	1670	1190	72	62-125	
Acenaphthylene	ug/kg	1670	1140	69	61-125	
Anthracene	ug/kg	1670	1280	77	66-125	
Benzo(a)anthracene	ug/kg	1670	1300	78	69-125	
Benzo(a)pyrene	ug/kg	1670	1310	79	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1380	83	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1320	79	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1300	78	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1120	67	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1090	65	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1180	71	37-125	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1330	80	69-131	
Butylbenzylphthalate	ug/kg	1670	1340	81	69-129	
Carbazole	ug/kg	1670	1290	77	66-125	
Chrysene	ug/kg	1670	1300	78	68-125	
Di-n-butylphthalate	ug/kg	1670	1360	81	69-125	
Di-n-octylphthalate	ug/kg	1670	1310	79	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1340	81	64-125	
Dibenzofuran	ug/kg	1670	1200	72	65-125	
Diethylphthalate	ug/kg	1670	1280	77	67-125	
Dimethylphthalate	ug/kg	1670	1240	75	67-125	
Fluoranthene	ug/kg	1670	1280	77	66-125	
Fluorene	ug/kg	1670	1190	71	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1040	62	40-125	
Hexachlorobenzene	ug/kg	1670	1320	79	62-125	
Hexachloroethane	ug/kg	1670	1010	61	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1320	79	64-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

LABORATORY CONTROL SAMPLE: 2872571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1130	68	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1150	69	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1090	65	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1320	79	65-125	
Naphthalene	ug/kg	1670	1050	63	48-125	
Nitrobenzene	ug/kg	1670	1130	68	48-125	
Pentachlorophenol	ug/kg	1670	1220	73	41-125	
Phenanthrene	ug/kg	1670	1300	78	66-125	
Phenol	ug/kg	1670	1110	67	46-125	
Pyrene	ug/kg	1670	1360	82	69-125	
2,4,6-Tribromophenol (S)	%			85	60-125	
2-Fluorobiphenyl (S)	%			76	30-132	
2-Fluorophenol (S)	%			69	40-125	
Nitrobenzene-d5 (S)	%			71	43-125	
p-Terphenyl-d14 (S)	%			89	62-125	
Phenol-d6 (S)	%			72	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2872788 2872789

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424792001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,2,4-Trichlorobenzene	ug/kg	ND	1720	1710	1460J	1420J	85	83	30-127		30	
1,2-Dichlorobenzene	ug/kg	ND	1720	1710	1360J	1370J	79	80	30-125		30	
1,2-Diphenylhydrazine	ug/kg	ND	1720	1710	1710	1620J	100	95	30-150		30	
1,3-Dichlorobenzene	ug/kg	ND	1720	1710	1400J	1320J	82	77	30-125		30	
1,4-Dichlorobenzene	ug/kg	ND	1720	1710	1400J	1350J	82	79	30-125		30	
1-Methylnaphthalene	ug/kg	ND	1720	1710	1540J	1510J	90	88	42-125		30	
2,4,5-Trichlorophenol	ug/kg	ND	1720	1710	1470J	1350J	86	79	30-150		30	
2,4,6-Trichlorophenol	ug/kg	ND	1720	1710	1330J	1320J	78	77	30-150		30	
2,4-Dichlorophenol	ug/kg	ND	1720	1710	1550J	1480J	91	87	30-135		30	
2,4-Dimethylphenol	ug/kg	ND	1720	1710	1440J	1430J	84	84	30-148		30	
2,4-Dinitrophenol	ug/kg	ND	1720	1710	ND	ND	5	4	30-125		30	M1
2,4-Dinitrotoluene	ug/kg	ND	1720	1710	1560J	1560J	91	92	30-150		30	
2,6-Dinitrotoluene	ug/kg	ND	1720	1710	1650J	1720	96	100	30-150		30	
2-Chloronaphthalene	ug/kg	ND	1720	1710	1580J	1500J	92	88	30-138		30	
2-Chlorophenol	ug/kg	ND	1720	1710	1500J	1450J	88	85	30-130		30	
2-Methylnaphthalene	ug/kg	ND	1720	1710	1530J	1640J	89	96	46-125		30	
2-Methylphenol(o-Cresol)	ug/kg	ND	1720	1710	1590J	1490J	93	87	30-133		30	
2-Nitroaniline	ug/kg	ND	1720	1710	1650J	1750	97	103	30-150		30	
2-Nitrophenol	ug/kg	ND	1720	1710	1360J	1410J	79	83	30-134		30	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	1720	1710	1600J	1590J	94	93	30-138		30	
3,3'-Dichlorobenzidine	ug/kg	ND	1720	1710	1340J	1500J	78	88	30-149		30	6M
3-Nitroaniline	ug/kg	ND	1720	1710	1300J	1180J	76	69	30-150		30	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1720	1710	ND	ND	19	20	30-133		30	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2872788		2872789									
Parameter	Units	10424792001	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	RPD	RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits				
4-Bromophenylphenyl ether	ug/kg	ND	1720	1710	1670J	1600J	97	94	44-125			30	
4-Chloro-3-methylphenol	ug/kg	ND	1720	1710	1580J	ND	92	99	30-150			30	
4-Chloroaniline	ug/kg	ND	1720	1710	1010J	930J	59	54	30-125			30	
4-Chlorophenylphenyl ether	ug/kg	ND	1720	1710	1630J	1540J	95	90	44-125			30	
4-Nitroaniline	ug/kg	ND	1720	1710	1500J	1440J	87	84	30-150			30	
4-Nitrophenol	ug/kg	ND	1720	1710	1450J	1370J	85	80	30-150			30	
Acenaphthene	ug/kg	ND	1720	1710	1490J	1430J	87	84	40-125			30	
Acenaphthylene	ug/kg	ND	1720	1710	1560J	1470J	91	86	30-150			30	
Anthracene	ug/kg	ND	1720	1710	1770	1800	103	106	30-150	2		30	
Benzo(a)anthracene	ug/kg	ND	1720	1710	1970	1970	115	115	30-150	0		30	
Benzo(a)pyrene	ug/kg	ND	1720	1710	1860	1850	109	108	30-150	1		30	
Benzo(b)fluoranthene	ug/kg	ND	1720	1710	1560J	1770	91	104	30-150			30	
Benzo(g,h,i)perylene	ug/kg	ND	1720	1710	1600J	1710	93	100	30-150			30	
Benzo(k)fluoranthene	ug/kg	ND	1720	1710	1660J	1550J	97	91	30-150			30	
bis(2-Chloroethoxy)methane	ug/kg	ND	1720	1710	1520J	1460J	89	85	30-134			30	
bis(2-Chloroethyl) ether	ug/kg	ND	1720	1710	1570J	1550J	91	91	30-125			30	6M
bis(2-Chloroisopropyl) ether	ug/kg	ND	1720	1710	1780	1600J	104	94	30-125			30	6M
bis(2-Ethylhexyl)phthalate	ug/kg	ND	1720	1710	1780	1880	104	110	30-150	5		30	
Butylbenzylphthalate	ug/kg	ND	1720	1710	1740	1790	102	105	30-150	3		30	
Carbazole	ug/kg	ND	1720	1710	1660J	1710	97	100	41-125			30	
Chrysene	ug/kg	ND	1720	1710	2070	2030	121	119	30-150	2		30	
Di-n-butylphthalate	ug/kg	ND	1720	1710	1730	1740	101	102	30-150	0		30	
Di-n-octylphthalate	ug/kg	ND	1720	1710	1840	1870	108	110	30-150	2		30	
Dibenz(a,h)anthracene	ug/kg	ND	1720	1710	1540J	1680J	90	98	30-150			30	
Dibenzofuran	ug/kg	ND	1720	1710	1620J	1590J	95	93	45-125			30	
Diethylphthalate	ug/kg	ND	1720	1710	1680J	1660J	98	97	30-150			30	
Dimethylphthalate	ug/kg	ND	1720	1710	1650J	1630J	97	96	30-150			30	
Fluoranthene	ug/kg	ND	1720	1710	1750	1740	102	102	30-150	0		30	
Fluorene	ug/kg	ND	1720	1710	1620J	1660J	95	97	30-150			30	
Hexachloro-1,3-butadiene	ug/kg	ND	1720	1710	1380J	1460J	80	86	30-128			30	
Hexachlorobenzene	ug/kg	ND	1720	1710	1500J	1500J	87	88	30-150			30	
Hexachloroethane	ug/kg	ND	1720	1710	1440J	1350J	84	79	30-125			30	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	1720	1710	1500J	1650J	88	97	30-150			30	
Isophorone	ug/kg	ND	1720	1710	1570J	1550J	92	91	30-140			30	
N-Nitroso-di-n-propylamine	ug/kg	ND	1720	1710	1680J	1570J	98	92	30-147			30	6M
N-Nitrosodimethylamine	ug/kg	ND	1720	1710	1420J	1330J	83	78	30-125			30	
N-Nitrosodiphenylamine	ug/kg	ND	1720	1710	1610J	1720	94	101	30-150			30	
Naphthalene	ug/kg	ND	1720	1710	1520J	1480J	89	86	44-125			30	
Nitrobenzene	ug/kg	ND	1720	1710	1580J	1550J	92	91	30-136			30	
Pentachlorophenol	ug/kg	ND	1720	1710	ND	ND	23	22	30-150			30	M1
Phenanthrene	ug/kg	ND	1720	1710	1890	1950	110	114	30-150	3		30	
Phenol	ug/kg	ND	1720	1710	1530J	1490J	89	87	30-129			30	
Pyrene	ug/kg	ND	1720	1710	2160	2260	126	132	30-150	4		30	
2,4,6-Tribromophenol (S)	%						86	83	60-125				
2-Fluorobiphenyl (S)	%						98	95	30-132				
2-Fluorophenol (S)	%						95	88	40-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Parameter	Units	2872788		2872789		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Nitrobenzene-d5 (S)	%.					93	93	43-125			
p-Terphenyl-d14 (S)	%.					97	103	62-125			
Phenol-d6 (S)	%.					95	93	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 529263 Analysis Method: EPA 8270D by SIM
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2872540 Matrix: Solid
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/02/18 12:14	
Acenaphthylene	ug/kg	ND	10.0	04/02/18 12:14	
Anthracene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(a)anthracene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(a)pyrene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/02/18 12:14	
Chrysene	ug/kg	ND	10.0	04/02/18 12:14	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/02/18 12:14	
Fluoranthene	ug/kg	ND	10.0	04/02/18 12:14	
Fluorene	ug/kg	ND	10.0	04/02/18 12:14	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/02/18 12:14	
Naphthalene	ug/kg	ND	10.0	04/02/18 12:14	
Phenanthrene	ug/kg	ND	10.0	04/02/18 12:14	
Pyrene	ug/kg	ND	10.0	04/02/18 12:14	
2-Fluorobiphenyl (S)	%	84	42-125	04/02/18 12:14	
p-Terphenyl-d14 (S)	%	100	57-125	04/02/18 12:14	

LABORATORY CONTROL SAMPLE: 2872541

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	24.2	73	52-125	
Acenaphthylene	ug/kg	33.3	26.1	78	50-125	
Anthracene	ug/kg	33.3	30.0	90	65-125	
Benzo(a)anthracene	ug/kg	33.3	31.8	95	60-125	
Benzo(a)pyrene	ug/kg	33.3	30.2	90	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	31.1	93	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	26.3	79	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	29.3	88	67-125	
Chrysene	ug/kg	33.3	28.6	86	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	25.8	77	63-125	
Fluoranthene	ug/kg	33.3	30.2	91	75-125	
Fluorene	ug/kg	33.3	25.3	76	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	26.4	79	63-125	
Naphthalene	ug/kg	33.3	26.1	78	49-125	
Phenanthrene	ug/kg	33.3	25.1	75	65-125	
Pyrene	ug/kg	33.3	31.2	94	64-125	
2-Fluorobiphenyl (S)	%			78	42-125	
p-Terphenyl-d14 (S)	%			97	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Parameter	Units	2872542		2872543		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10424778001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Acenaphthene	ug/kg	ND	36.5	36.6	27.7J	25.3J	76	69	30-125		30		
Acenaphthylene	ug/kg	ND	36.5	36.6	74.3J	57.6J	203	157	30-133		30	M1	
Anthracene	ug/kg	ND	36.5	36.6	76.5J	62.4J	209	170	30-150		30	M1	
Benzo(a)anthracene	ug/kg	ND	36.5	36.6	117	64.1J	319	175	30-150		30	M1	
Benzo(a)pyrene	ug/kg	ND	36.5	36.6	205	148	559	404	30-150	32	30	M1, R1	
Benzo(b)fluoranthene	ug/kg	ND	36.5	36.6	201	135	551	370	30-150	39	30	M1, R1	
Benzo(g,h,i)perylene	ug/kg	0.16 mg/kg	36.5	36.6	275	218	317	158	30-150	23	30	M1	
Benzo(k)fluoranthene	ug/kg	ND	36.5	36.6	94.9J	67.8J	260	185	30-150		30	M1	
Chrysene	ug/kg	ND	36.5	36.6	148	83.8J	406	229	30-150		30	M1	
Dibenz(a,h)anthracene	ug/kg	ND	36.5	36.6	80.8J	61.4J	221	168	30-131		30	M1	
Fluoranthene	ug/kg	ND	36.5	36.6	139	80.6J	380	220	30-150		30	M1	
Fluorene	ug/kg	ND	36.5	36.6	32J	26.3J	88	72	30-147		30		
Indeno(1,2,3-cd)pyrene	ug/kg	ND	36.5	36.6	169	125	463	342	30-150	30	30	M1	
Naphthalene	ug/kg	ND	36.5	36.6	25.2J	22.3J	69	61	30-131		30		
Phenanthrene	ug/kg	ND	36.5	36.6	41.7J	34.5J	114	94	30-150		30		
Pyrene	ug/kg	ND	36.5	36.6	139	74.2J	381	202	30-150		30	M1	
2-Fluorobiphenyl (S)	%.						82	71	42-125				P3
p-Terphenyl-d14 (S)	%.						74	66	57-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 529569 Analysis Method: EPA 8270D
QC Batch Method: EPA 3546 Analysis Description: MDA2 Solid MSSV
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937006

METHOD BLANK: 2874519 Matrix: Solid
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,5-T	mg/kg	ND	0.033	04/04/18 13:35	
2,4,5-TP (Silvex)	mg/kg	ND	0.033	04/04/18 13:35	
2,4-D	mg/kg	ND	0.033	04/04/18 13:35	
2,4-DB	mg/kg	ND	0.033	04/04/18 13:35	
Bentazon	mg/kg	ND	0.033	04/04/18 13:35	
Dicamba	mg/kg	ND	0.033	04/04/18 13:35	
Dinoseb	mg/kg	ND	0.033	04/04/18 13:35	
MCPA	mg/kg	ND	0.033	04/04/18 13:35	
Pentachlorophenol	mg/kg	ND	0.033	04/04/18 13:35	
Picloram	mg/kg	ND	0.033	04/04/18 13:35	
Triclopyr	mg/kg	ND	0.033	04/04/18 13:35	
2,4-DCAA (S)	%	78	46-125	04/04/18 13:35	

LABORATORY CONTROL SAMPLE: 2874520

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,5-T	mg/kg	.33	0.28	83	60-125	
2,4,5-TP (Silvex)	mg/kg	.33	0.26	79	61-125	
2,4-D	mg/kg	.33	0.29	86	63-125	
2,4-DB	mg/kg	.33	0.28	83	59-125	
Bentazon	mg/kg	.33	0.25	76	58-125	
Dicamba	mg/kg	.33	0.27	80	52-125	
Dinoseb	mg/kg	.33	0.18	53	35-126	
MCPA	mg/kg	.33	0.27	82	57-125	
Pentachlorophenol	mg/kg	.33	0.21	63	48-125	
Picloram	mg/kg	.33	0.24	72	47-125	
Triclopyr	mg/kg	.33	0.28	83	68-125	
2,4-DCAA (S)	%			77	46-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874521 2874522

Parameter	Units	10425111006		2874522		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
2,4,5-T	mg/kg	ND	.45	.45	0.19	0.21	42	45	30-145	8	20	
2,4,5-TP (Silvex)	mg/kg	ND	.45	.45	0.28	0.26	63	58	30-130	7	20	
2,4-D	mg/kg	ND	.45	.45	0.18	0.20	40	44	30-150	9	20	
2,4-DB	mg/kg	ND	.45	.45	0.35	0.33	77	72	45-126	7	20	
Bentazon	mg/kg	ND	.45	.45	0.33	0.32	73	71	30-133	3	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Parameter	Units	2874521		2874522		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10425111006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Dicamba	mg/kg	ND	.45	.45	0.13	0.17	29	38	30-140	28	20	M1, R1	
Dinoseb	mg/kg	ND	.45	.45	0.39	0.31	86	69	30-136	23	20	R1	
MCPA	mg/kg	ND	.45	.45	0.24	0.22	53	49	30-136	9	20		
Pentachlorophenol	mg/kg	ND	.45	.45	0.28	0.25	63	55	44-125	13	20		
Picloram	mg/kg	ND	.45	.45	.016J	0.098	3	22	30-125		20	M1	
Triclopyr	mg/kg	ND	.45	.45	0.23	0.22	51	50	30-149	3	20		
2,4-DCAA (S)	%.						65	60	46-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 530039	Analysis Method: EPA 8270D
QC Batch Method: EPA 3546	Analysis Description: MDA2 Solid MSSV
Associated Lab Samples: 10424937005	

METHOD BLANK: 2877307 Matrix: Solid

Associated Lab Samples: 10424937005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,5-T	mg/kg	ND	0.033	04/04/18 14:05	
2,4,5-TP (Silvex)	mg/kg	ND	0.033	04/04/18 14:05	
2,4-D	mg/kg	ND	0.033	04/04/18 14:05	
2,4-DB	mg/kg	ND	0.033	04/04/18 14:05	
Bentazon	mg/kg	ND	0.033	04/04/18 14:05	
Dicamba	mg/kg	ND	0.033	04/04/18 14:05	
Dinoseb	mg/kg	ND	0.033	04/04/18 14:05	
MCPA	mg/kg	ND	0.033	04/04/18 14:05	
Pentachlorophenol	mg/kg	ND	0.033	04/04/18 14:05	
Picloram	mg/kg	ND	0.033	04/04/18 14:05	
Triclopyr	mg/kg	ND	0.033	04/04/18 14:05	
2,4-DCAA (S)	%	82	46-125	04/04/18 14:05	

LABORATORY CONTROL SAMPLE & LCSD: 2877308 2877550

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,5-T	mg/kg	.33	0.31	0.30	92	91	60-125	1	20	
2,4,5-TP (Silvex)	mg/kg	.33	0.30	0.29	89	87	61-125	2	20	
2,4-D	mg/kg	.33	0.31	0.31	92	93	63-125	2	20	
2,4-DB	mg/kg	.33	0.30	0.30	91	90	59-125	1	20	
Bentazon	mg/kg	.33	0.27	0.26	82	79	58-125	4	20	
Dicamba	mg/kg	.33	0.29	0.30	86	89	52-125	4	20	
Dinoseb	mg/kg	.33	0.21	0.22	64	66	35-126	4	20	
MCPA	mg/kg	.33	0.29	0.29	88	87	57-125	2	20	
Pentachlorophenol	mg/kg	.33	0.22	0.22	65	66	48-125	1	20	
Picloram	mg/kg	.33	0.26	0.25	77	76	47-125	2	20	
Triclopyr	mg/kg	.33	0.30	0.30	89	90	68-125	2	20	
2,4-DCAA (S)	%				84	79	46-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 529271 Analysis Method: WI MOD DRO
 QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2872598 Matrix: Solid
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	03/30/18 13:11	
n-Triacontane (S)	%.	83	50-150	03/30/18 13:11	

LABORATORY CONTROL SAMPLE & LCSD: 2872599 2872600

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	68.2	73.5	85	92	70-120	8	20	
n-Triacontane (S)	%.				85	78	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 435086 Analysis Method: EPA 7196A
 QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2009757 Matrix: Solid
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/04/18 12:49	

LABORATORY CONTROL SAMPLE: 2009758

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	981	901	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009842 2009843

Parameter	Units	10424937001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	1420	1360	ND	ND	0	0	75-125		20	2M, M3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009844 2009845

Parameter	Units	10424937001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	54.8	54.3	ND	ND	12	18	75-125		20	M3

SAMPLE DUPLICATE: 2009846

Parameter	Units	50193299003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

QC Batch: 284583 Analysis Method: EPA 9012
QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 1665486 Matrix: Solid
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	03/29/18 12:56	

LABORATORY CONTROL SAMPLE: 1665487

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665488 1665489

Parameter	Units	10424609003 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Cyanide	mg/kg	ND	3.62	2.8	3.62	3.2	66	77	80-120	13	20	M0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665490 1665491

Parameter	Units	10424937006 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Cyanide	mg/kg	0.56	4.11	4.2	4.26	4.0	89	81	80-120	5	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

QC Batch: 139650 Analysis Method: EPA 9056A
QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
Associated Lab Samples: 10424937001, 10424937005, 10424937006

METHOD BLANK: 553027 Matrix: Solid
Associated Lab Samples: 10424937001, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	1.0	04/02/18 14:06	

LABORATORY CONTROL SAMPLE: 553026

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	50	51.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553028 553029

Parameter	Units	12106345001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Fluoride	mg/kg	2.6	50.2	49.5	39.2	45.6	73	87	80-120	15	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553030 553031

Parameter	Units	12106346001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Fluoride	mg/kg	2.9	50.2	49.3	50.6	47.0	95	90	80-120	7	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 139654 Analysis Method: EPA 9056A
 QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
 Associated Lab Samples: 10424937002, 10424937003, 10424937004

METHOD BLANK: 553043 Matrix: Solid
 Associated Lab Samples: 10424937002, 10424937003, 10424937004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	0.98	03/31/18 00:49	

LABORATORY CONTROL SAMPLE: 553042

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	48.9	50.2	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553044 553045

Parameter	Units	10424443004		553045		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Fluoride	mg/kg	2.9	50.3	28.2	28.6	50	51	80-120	1	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553046 553047

Parameter	Units	10424937003		553047		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Fluoride	mg/kg	3.5	49.3	14.1	15.9	21	25	80-120	12	20	M1

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth

PASI-G Pace Analytical Services - Green Bay

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

ANALYTE QUALIFIERS

1M RPD value is outside control limits due to sample non-homogeneity.

2M Redox (174 mv) and pH (8.13) values indicate a naturally reducing matrix. This accounts for poor recovery values on the sample per method Eh/pH phase diagram.

3M Sample was black in color with a tint of red and viscous. After 100X dilution sample was dark orange and was centrifuged and decanted.

4M Sample was black in color. Sample was centrifuged and decanted.

5M Sample was yellow in color.

6M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

D4 Sample was diluted due to the presence of high levels of target analytes.

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

ANALYTE QUALIFIERS

M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M3	Matrix spike recovery was outside laboratory control limits due to matrix interferences.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
N2	The lab does not hold NELAC/TNI accreditation for this parameter.
N3	Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
P3	Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
R1	RPD value was outside control limits.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
T6	High boiling point hydrocarbons are present in the sample.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424937001	FD-SB-G4 (15.5-17.5)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424937002	FD-SB-D3 (4-16wm)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424937003	FD-SB-E3 (11-15.5)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424937004	FD-SB-F3 (3-11wm)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424937005	FD-SB-G3 (7-16wm)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424937006	FD-SB-G2 (10-12wm)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424937001	FD-SB-G4 (15.5-17.5)	EPA 3550	529466	EPA 8081B	530402
10424937002	FD-SB-D3 (4-16wm)	EPA 3550	529466	EPA 8081B	530402
10424937003	FD-SB-E3 (11-15.5)	EPA 3550	529466	EPA 8081B	530402
10424937004	FD-SB-F3 (3-11wm)	EPA 3550	529466	EPA 8081B	530402
10424937005	FD-SB-G3 (7-16wm)	EPA 3550	529466	EPA 8081B	530402
10424937006	FD-SB-G2 (10-12wm)	EPA 3550	529466	EPA 8081B	530402
10424937001	FD-SB-G4 (15.5-17.5)	EPA 3550	529467	EPA 8082A	530082
10424937002	FD-SB-D3 (4-16wm)	EPA 3550	529467	EPA 8082A	530082
10424937003	FD-SB-E3 (11-15.5)	EPA 3550	529467	EPA 8082A	530082
10424937004	FD-SB-F3 (3-11wm)	EPA 3550	529467	EPA 8082A	530082
10424937005	FD-SB-G3 (7-16wm)	EPA 3550	529467	EPA 8082A	530082
10424937006	FD-SB-G2 (10-12wm)	EPA 3550	529467	EPA 8082A	530082
10424937001	FD-SB-G4 (15.5-17.5)	WI MOD DRO	529271	WI MOD DRO	529930
10424937002	FD-SB-D3 (4-16wm)	WI MOD DRO	529271	WI MOD DRO	529930
10424937003	FD-SB-E3 (11-15.5)	WI MOD DRO	529271	WI MOD DRO	529930
10424937004	FD-SB-F3 (3-11wm)	WI MOD DRO	529271	WI MOD DRO	529930
10424937005	FD-SB-G3 (7-16wm)	WI MOD DRO	529271	WI MOD DRO	529930
10424937006	FD-SB-G2 (10-12wm)	WI MOD DRO	529271	WI MOD DRO	529930
10424937001	FD-SB-G4 (15.5-17.5)	EPA 5030 Medium Soil	530309	WI MOD GRO	530384
10424937002	FD-SB-D3 (4-16wm)	EPA 5030 Medium Soil	530309	WI MOD GRO	530384
10424937003	FD-SB-E3 (11-15.5)	EPA 5030 Medium Soil	530309	WI MOD GRO	530384
10424937004	FD-SB-F3 (3-11wm)	EPA 5030 Medium Soil	530309	WI MOD GRO	530384
10424937005	FD-SB-G3 (7-16wm)	EPA 5030 Medium Soil	530309	WI MOD GRO	530384
10424937006	FD-SB-G2 (10-12wm)	EPA 5030 Medium Soil	530309	WI MOD GRO	530384
10424937001	FD-SB-G4 (15.5-17.5)	EPA 3050	529339	EPA 6010C	529383
10424937002	FD-SB-D3 (4-16wm)	EPA 3050	529339	EPA 6010C	529383
10424937003	FD-SB-E3 (11-15.5)	EPA 3050	529339	EPA 6010C	529383
10424937004	FD-SB-F3 (3-11wm)	EPA 3050	529339	EPA 6010C	529383
10424937005	FD-SB-G3 (7-16wm)	EPA 3050	529339	EPA 6010C	529383
10424937006	FD-SB-G2 (10-12wm)	EPA 3050	529339	EPA 6010C	529383
10424937001	FD-SB-G4 (15.5-17.5)	EPA 3050B	434613	EPA 6020	434971
10424937002	FD-SB-D3 (4-16wm)	EPA 3050B	434613	EPA 6020	434971
10424937003	FD-SB-E3 (11-15.5)	EPA 3050B	434613	EPA 6020	434971
10424937004	FD-SB-F3 (3-11wm)	EPA 3050B	434613	EPA 6020	434971
10424937005	FD-SB-G3 (7-16wm)	EPA 3050B	434613	EPA 6020	434971
10424937006	FD-SB-G2 (10-12wm)	EPA 3050B	434613	EPA 6020	434971
10424937001	FD-SB-G4 (15.5-17.5)	EPA 3050	529341	EPA 6020A	529455
10424937002	FD-SB-D3 (4-16wm)	EPA 3050	529341	EPA 6020A	529455
10424937003	FD-SB-E3 (11-15.5)	EPA 3050	529341	EPA 6020A	529455

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424937004	FD-SB-F3 (3-11wm)	EPA 3050	529341	EPA 6020A	529455
10424937005	FD-SB-G3 (7-16wm)	EPA 3050	529341	EPA 6020A	529455
10424937006	FD-SB-G2 (10-12wm)	EPA 3050	529341	EPA 6020A	529455
10424937001	FD-SB-G4 (15.5-17.5)	EPA 7471	529342	EPA 7471	529917
10424937002	FD-SB-D3 (4-16wm)	EPA 7471	529342	EPA 7471	529917
10424937003	FD-SB-E3 (11-15.5)	EPA 7471	529342	EPA 7471	529917
10424937004	FD-SB-F3 (3-11wm)	EPA 7471	529342	EPA 7471	529917
10424937005	FD-SB-G3 (7-16wm)	EPA 7471	529342	EPA 7471	529917
10424937006	FD-SB-G2 (10-12wm)	EPA 7471	529342	EPA 7471	529917
10424937001	FD-SB-G4 (15.5-17.5)	ASTM D2974	529398		
10424937002	FD-SB-D3 (4-16wm)	ASTM D2974	529398		
10424937003	FD-SB-E3 (11-15.5)	ASTM D2974	529398		
10424937004	FD-SB-F3 (3-11wm)	ASTM D2974	529398		
10424937005	FD-SB-G3 (7-16wm)	ASTM D2974	529398		
10424937006	FD-SB-G2 (10-12wm)	ASTM D2974	529398		
10424937001	FD-SB-G4 (15.5-17.5)	EPA 3550	529268	EPA 8270D	529887
10424937002	FD-SB-D3 (4-16wm)	EPA 3550	529268	EPA 8270D	529887
10424937003	FD-SB-E3 (11-15.5)	EPA 3550	529268	EPA 8270D	529887
10424937004	FD-SB-F3 (3-11wm)	EPA 3550	529268	EPA 8270D	529887
10424937005	FD-SB-G3 (7-16wm)	EPA 3550	529268	EPA 8270D	529887
10424937006	FD-SB-G2 (10-12wm)	EPA 3550	529268	EPA 8270D	529887
10424937001	FD-SB-G4 (15.5-17.5)	EPA 3550	529263	EPA 8270D by SIM	530180
10424937002	FD-SB-D3 (4-16wm)	EPA 3550	529263	EPA 8270D by SIM	530180
10424937003	FD-SB-E3 (11-15.5)	EPA 3550	529263	EPA 8270D by SIM	530180
10424937004	FD-SB-F3 (3-11wm)	EPA 3550	529263	EPA 8270D by SIM	530180
10424937005	FD-SB-G3 (7-16wm)	EPA 3550	529263	EPA 8270D by SIM	530180
10424937006	FD-SB-G2 (10-12wm)	EPA 3550	529263	EPA 8270D by SIM	530180
10424937001	FD-SB-G4 (15.5-17.5)	EPA 3546	529569	EPA 8270D	530638
10424937002	FD-SB-D3 (4-16wm)	EPA 3546	529569	EPA 8270D	530638
10424937003	FD-SB-E3 (11-15.5)	EPA 3546	529569	EPA 8270D	530638
10424937004	FD-SB-F3 (3-11wm)	EPA 3546	529569	EPA 8270D	530638
10424937005	FD-SB-G3 (7-16wm)	EPA 3546	530039	EPA 8270D	530639
10424937006	FD-SB-G2 (10-12wm)	EPA 3546	529569	EPA 8270D	530638
10424937001	FD-SB-G4 (15.5-17.5)	EPA 5035/5030B	529276	EPA 8260B	529485
10424937002	FD-SB-D3 (4-16wm)	EPA 5035/5030B	529276	EPA 8260B	529485
10424937003	FD-SB-E3 (11-15.5)	EPA 5035/5030B	529276	EPA 8260B	529485
10424937004	FD-SB-F3 (3-11wm)	EPA 5035/5030B	529276	EPA 8260B	529485
10424937005	FD-SB-G3 (7-16wm)	EPA 5035/5030B	529276	EPA 8260B	529485
10424937006	FD-SB-G2 (10-12wm)	EPA 5035/5030B	529276	EPA 8260B	529485
10424937001	FD-SB-G4 (15.5-17.5)	EPA 3060A	435086	EPA 7196A	435521
10424937002	FD-SB-D3 (4-16wm)	EPA 3060A	435086	EPA 7196A	435521
10424937003	FD-SB-E3 (11-15.5)	EPA 3060A	435086	EPA 7196A	435521
10424937004	FD-SB-F3 (3-11wm)	EPA 3060A	435086	EPA 7196A	435521
10424937005	FD-SB-G3 (7-16wm)	EPA 3060A	435086	EPA 7196A	435521

REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424937006	FD-SB-G2 (10-12wm)	EPA 3060A	435086	EPA 7196A	435521
10424937001	FD-SB-G4 (15.5-17.5)	Trivalent Chromium Calculation	436360		
10424937002	FD-SB-D3 (4-16wm)	Trivalent Chromium Calculation	436360		
10424937003	FD-SB-E3 (11-15.5)	Trivalent Chromium Calculation	436360		
10424937004	FD-SB-F3 (3-11wm)	Trivalent Chromium Calculation	436360		
10424937005	FD-SB-G3 (7-16wm)	Trivalent Chromium Calculation	436360		
10424937006	FD-SB-G2 (10-12wm)	Trivalent Chromium Calculation	436360		
10424937001	FD-SB-G4 (15.5-17.5)	EPA 9012A	284583	EPA 9012	284661
10424937002	FD-SB-D3 (4-16wm)	EPA 9012A	284583	EPA 9012	284661
10424937003	FD-SB-E3 (11-15.5)	EPA 9012A	284583	EPA 9012	284661
10424937004	FD-SB-F3 (3-11wm)	EPA 9012A	284583	EPA 9012	284661
10424937005	FD-SB-G3 (7-16wm)	EPA 9012A	284583	EPA 9012	284661
10424937006	FD-SB-G2 (10-12wm)	EPA 9012A	284583	EPA 9012	284661
10424937001	FD-SB-G4 (15.5-17.5)	EPA 300.0	139650	EPA 9056A	139673
10424937002	FD-SB-D3 (4-16wm)	EPA 300.0	139654	EPA 9056A	139672
10424937003	FD-SB-E3 (11-15.5)	EPA 300.0	139654	EPA 9056A	139672
10424937004	FD-SB-F3 (3-11wm)	EPA 300.0	139654	EPA 9056A	139672
10424937005	FD-SB-G3 (7-16wm)	EPA 300.0	139650	EPA 9056A	139673
10424937006	FD-SB-G2 (10-12wm)	EPA 300.0	139650	EPA 9056A	139673

REPORT OF LABORATORY ANALYSIS

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WO#: 10424937



Minnesota Pollution Control Agency

Chain-of-Custody Form revised 201 1/2009

Work Order Number: COC

Turnaround Time: COC

PROJECT/CLIENT INFO

LABORATORY

FOR LAB USE ONLY

Facility Code: *MPCA - Freeway LF Solids* Program Code (MDH Lab Only):

Lab Name:

Project Name: *MPCA - Freeway LF Solids* Project Task Code:

Address: *18-00383*

Project Manager:

EPIC Profile #38716

Potential Hazard? If yes, add information to Sampler Comments Section

Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample-Routine Sample
S-IVP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water AR=Air
NW=Non-potable Water BL=Biological Material
SD=Soil/Solid OT=Other
WP=Wipe TS=Tissue

FIELD MATRIX CODES

Wt-Ground=Groundwater
Wt-Surf=Surface Water
QC-BLANK=Artificial Blank Water
Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in feet	End Depth, in feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	PRESERV.	Lab Sample No.	#
<i>FD-SB-64 (15.5-17.0)</i>	<i>S</i>	<i>3/26/18</i>	<i>1150</i>	<i>15.5</i>	<i>17.0</i>	<i>C</i>	<i>SD</i>				<i>13</i>			<i>001</i>	<i>1</i>
<i>FD-SB-D3 (4-16WM)</i>	<i>S</i>	<i>3/26/18</i>	<i>1400</i>	<i>4</i>	<i>16</i>	<i>C</i>	<i>SD</i>				<i>13</i>			<i>002</i>	<i>2</i>
<i>FD-SB-E3 (11-15)</i>	<i>S</i>	<i>3/26/18</i>	<i>1440</i>	<i>11</i>	<i>15</i>	<i>C</i>	<i>SD</i>				<i>13</i>			<i>003</i>	<i>3</i>
<i>FD-SB-F3 (3-11WM)</i>	<i>S</i>	<i>3/26/18</i>	<i>1530</i>	<i>3</i>	<i>11</i>	<i>C</i>	<i>SD</i>				<i>12</i>			<i>004</i>	<i>4</i>
<i>FD-SB-G3 (7-16WM)</i>	<i>S</i>	<i>3/26/18</i>	<i>1635</i>	<i>7</i>	<i>16</i>	<i>C</i>	<i>SD</i>				<i>13</i>			<i>005</i>	<i>5</i>
<i>FD-SB-G2 (10-12WM)</i>	<i>S</i>	<i>3/26/18</i>	<i>1720</i>	<i>10</i>	<i>12</i>	<i>C</i>	<i>SD</i>				<i>13</i>			<i>006</i>	<i>6</i>
															<i>7</i>
															<i>8</i>
															<i>9</i>
															<i>10</i>

Sampled By: *David Anderson*

Sampler's Signature: *David Anderson*

Phone #:

Receiving Comments:


Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
<i>David Anderson / Pace Analytical</i>	<i>3/27/18/0700</i>	<i>WJ Pace</i>	<i>3-27-18 815 4.7°C</i>

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

	Document Name: Sample Condition Upon Receipt Form	Document Revised: 14Dec2017 Page 1 of 2
	Document No.: F-MN-L-213-rev.22	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: MPCA

Project #: **WO# : 10424937**

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____

PM: **BM2** Due Date: **04/10/18**
CLIENT: PASI-MNFLD

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 4.5 Cooler Temp Corrected (°C): 4.7 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: ME 3/27/18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	12. <u>No fine on samples</u>
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N Sample # _____ Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: BA M Date: 3/27/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

WO#: 12106363

Chain of Custody

PM: HRZ Due Date: 04/10/18
CLIENT: PACE MPLS

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424937 Workorder Name: 18-00383 MPCA Freeway LF Soil Owner Received Date: 3/27/2018 Results Requested By: 4/10/2018

Report To		Subcontract To				Requested Analysis																						
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Duluth 4730 Oneota St. Duluth, MN 55807 Phone (218)727-6380																										
						Preserved Containers					Methyl Mercury by EPA 1630					LAB USE ONLY												
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved																						
1	FD-SB-G4 (15.5-17.5)	PS	3/26/2018 11:30	10424937001	Solid	1																						
2	FD-SB-D3 (4-16wm)	PS	3/26/2018 14:00	10424937002	Solid	1																						
3	FD-SB-E3 (11-15.5)	PS	3/26/2018 14:40	10424937003	Solid	1																						
4	FD-SB-F3 (3-11wm)	PS	3/26/2018 15:30	10424937004	Solid	1																						
5	FD-SB-G3 (7-16wm)	PS	3/26/2018 16:35	10424937005	Solid	1																						
6	FD-SB-G2 (10-12wm)	PS	3/26/2018 17:20	10424937006	Solid	1																						

					Comments										
Transfers	Released By	Date/Time	Received By	Date/Time											
1	<i>[Signature]</i>	3/27/18 1730	<i>[Signature]</i>	3/27/18 1845											
2	<i>[Signature]</i>	3/27/18 2100	<i>[Signature]</i>	3/28/18 0800											
3															
Cooler Temperature on Receipt 2.9 °C		Custody Seal <input checked="" type="radio"/> Y or N		Received on Ice <input checked="" type="radio"/> Y or N		Samples Intact <input checked="" type="radio"/> Y or N									

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace-Mpls Project #: _____

WO#: 12106363

PM: HRZ Due Date: 04/10/18

CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 01339252/1710 IR-1 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.7 Cooler Temp Corrected °C: 2.7 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6°C Correction Factor: 0.09 Date and Initials of Person Examining Contents: 3/27/18 CCS

If temperature is ≤0°C, is there evidence of ice formation? Yes No NA

			Comments:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		8.
Correct Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>			
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Pace Trip Blank Lot # (if purchased):			

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____

Heather Z...

Date: 3/28/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Sample Condition Upon Receipt

Client Name: Pace - Mpls. Project #: _____

WO#: 12106363
 PM: HRZ Due Date: 04/10/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 3.7 Cooler Temp Corrected °C: 4.0 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: 10.3 Date and Initials of Person Examining Contents: 3/27/18 CRB

Comments: all 5/28/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SC</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____

Date: 3/28/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

70166516

Samples were sent directly to the Subcontracting Laboratory.

[Handwritten Signature]

State Of Origin: MN



Page 1 of 95

Workorder: 10424937 Workorder Name: 18-00383 MPCA Freeway LF Soil Owner Received Date: 3/27/2018 Results Requested By: 4/10/2018


Report To		Subcontract To				Requested Analysis																			
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Green Bay 1241 Bellevue Street Suite 9 Green Bay, WI 54302 Phone (920)469-2436																							
							Preserved Containers					Cyanide by EPA 9012		LAB USE ONLY											
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved																			
1	FD-SB-G4 (15.5-17.5)	PS	3/26/2018 11:30	10424937001	Solid	1																			
2	FD-SB-D3 (4-16wm)	PS	3/26/2018 14:00	10424937002	Solid	1																			
3	FD-SB-E3 (11-15.5)	PS	3/26/2018 14:40	10424937003	Solid	1																			
4	FD-SB-F3 (3-11wm)	PS	3/26/2018 15:30	10424937004	Solid	1																			
5	FD-SB-G3 (7-16wm)	PS	3/26/2018 16:35	10424937005	Solid	1																			
6	FD-SB-G2 (10-12wm)	PS	3/26/2018 17:20	10424937006	Solid	1																			

[Handwritten: OK 3-28-18]

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	3/27/18 1730			
2	<i>[Signature]</i>	3/28/18 0830	<i>[Signature]</i>	3/28/18 0830	
3					

Cooler Temperature on Receipt 5 °C Custody Seal (Y) or N Received on Ice (Y) or N Samples Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.


 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 31Jan2018
	Document No.: F-GB-C-031-rev.06	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace, MN Project #: _____

Courier: CS Logistics Fed Ex Speedee UPS Walco
 Client Pace Other: _____

Tracking #: 1676708

WO#: **40166516**

 40166516

Custody Seal on Cooler/Box Present: yes no **Seals intact:** yes no
Custody Seal on Samples Present: yes no **Seals intact:** yes no

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used: SR - 4 **Type of Ice:** Wet Blue Dry None

Cooler Temperature: Uncorr: 5.5 / Corr: 5 Samples on ice, cooling process has begun

Temp Blank Present: yes no **Biological Tissue is Frozen:** yes no

Temp should be above freezing to 6°C.
 Biota Samples may be received at ≤ 0°C.

Person examining contents:
 Date: 3-28-18
 Initials: SW

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>FRWD</u> 3-28-18 SW
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>Original client labels no collect times.</u> 3-28-18 SW
-Includes date/time/ID/Analysis Matrix: <u>S</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: _____ If checked, see attached form for additional comments

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: CEV Date: 3/28/18



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50193167

Date/Time and Initials of person examining contents: 3/28/18 1415 AX

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 7405

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 023456ABCDEF Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 0.8/1.0 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

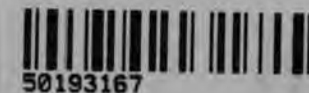
All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.			All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)			All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
Chain of Custody Present:			Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:			Dissolved Metals field filtered?:			
Short Hold Time Analysis (<72hr)?: Analysis:			Headspace Wisconsin Sulfide			
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			
Rush TAT Requested:			Headspace in VOA Vials (>6mm):			
Containers Intact?:			Trip Blank Present?:			
Sample Labels Match COC?: Except TCs, which only require sample ID			Trip Blank Custody Seals?:			

Comments:

Sample Container Count

WO#: 50193167



CLIENT: Pace MN

COC PAGE 1 of 1

COC ID# _____

Project # 50193167

SBS
DI
Bulk
Kit

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	Matrix (Soil/Water/Aqueous)	pH <2	pH >9	pH >12
1																			Soil			
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VS	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
VGGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
VGGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
SGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				

May 03, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Solid-Revised Report
Pace Project No.: 10425111

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 27, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This report was revised on May 3, 2018 to exclude results for magnesium and include results for manganese by method 6010.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Bob Michels
bob.michels@pacelabs.com
(612)709-5046
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report
Pace Project No.: 10425111

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Montana Certificate #CERT0103
California Certification #2973
California Certification #2973
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
Montana DHHS Certification #: CERT0102
Minnesota Dept of Health Certification #: 1382680

Nevada DCNR Certification #: MN000372018-1
Wisconsin DNR Certification #: 999446800
North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10425111001	FD-SB-A2 (10-20 S)	Solid	03/27/18 10:40	03/27/18 16:50
10425111002	FD-SB-B2 (12-21 WM)	Solid	03/27/18 11:15	03/27/18 16:50
10425111003	FD-SB-C2 (5-17 WM)	Solid	03/27/18 13:30	03/27/18 16:50
10425111004	FD-SB-D2 (3-12 WM)	Solid	03/27/18 14:10	03/27/18 16:50
10425111005	FD-SB-E2 (11-21 S)	Solid	03/27/18 15:15	03/27/18 16:50
10425111006	FD-SB-F2 (7-13 WM)	Solid	03/27/18 16:20	03/27/18 16:50

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10425111001	FD-SB-A2 (10-20 S)	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	EC2	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010C	IP	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	TT3	10	PASI-M		
		EPA 7471	LMW	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	AT1	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8270D	STB	12	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10425111002	FD-SB-B2 (12-21 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
EPA 8082A	RAG			12	PASI-M		
WI MOD DRO	EC2			2	PASI-M		
WI MOD GRO	AJR			2	PASI-M		
EPA 6010C	IP			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	TT3			10	PASI-M		
EPA 7471	LMW			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	AT1			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8270D	STB			12	PASI-M		
EPA 8260B	CD2			70	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
10425111003	FD-SB-C2 (5-17 WM)			EPA 1630 (1998)	CPK	1	PASI-DUL

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10425111004	FD-SB-D2 (3-12 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10425111005	FD-SB-E2 (11-21 S)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Solid-Revised Report
Pace Project No.: 10425111

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10425111006	FD-SB-F2 (7-13 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: **FD-SB-A2 (10-20 S)** Lab ID: **10425111001** Collected: 03/27/18 10:40 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.0	1	04/04/18 10:58	04/06/18 14:18	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	309-00-2	
alpha-BHC	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	319-84-6	
beta-BHC	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	319-85-7	
delta-BHC	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	58-89-9	
Chlordane (Technical)	ND	ug/kg	2300	100	03/28/18 12:51	04/05/18 23:25	57-74-9	
alpha-Chlordane	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	5103-71-9	
gamma-Chlordane	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	5103-74-2	
4,4'-DDD	ND	ug/kg	458	100	03/28/18 12:51	04/05/18 23:25	72-54-8	
4,4'-DDE	ND	ug/kg	458	100	03/28/18 12:51	04/05/18 23:25	72-55-9	
4,4'-DDT	ND	ug/kg	458	100	03/28/18 12:51	04/05/18 23:25	50-29-3	
Dieldrin	ND	ug/kg	458	100	03/28/18 12:51	04/05/18 23:25	60-57-1	
Endosulfan I	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	959-98-8	
Endosulfan II	ND	ug/kg	458	100	03/28/18 12:51	04/05/18 23:25	33213-65-9	
Endosulfan sulfate	ND	ug/kg	458	100	03/28/18 12:51	04/05/18 23:25	1031-07-8	
Endrin	ND	ug/kg	458	100	03/28/18 12:51	04/05/18 23:25	72-20-8	
Endrin aldehyde	ND	ug/kg	458	100	03/28/18 12:51	04/05/18 23:25	7421-93-4	
Endrin ketone	ND	ug/kg	458	100	03/28/18 12:51	04/05/18 23:25	53494-70-5	
Heptachlor	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	76-44-8	
Heptachlor epoxide	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	1024-57-3	
Methoxychlor	ND	ug/kg	2300	100	03/28/18 12:51	04/05/18 23:25	72-43-5	
Toxaphene	ND	ug/kg	6870	100	03/28/18 12:51	04/05/18 23:25	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	100	03/28/18 12:51	04/05/18 23:25	877-09-8	4M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	100	03/28/18 12:51	04/05/18 23:25	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	11141-16-5	
PCB-1242 (Aroclor 1242)	122	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	11100-14-4	
PCB, Total	122	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	74	%	48-125	1	03/28/18 12:51	04/02/18 11:30	877-09-8	
Decachlorobiphenyl (S)	83	%	30-134	1	03/28/18 12:51	04/02/18 11:30	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-A2 (10-20 S) **Lab ID: 10425111001** Collected: 03/27/18 10:40 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	ND	mg/kg	11.5	1	03/28/18 12:37	03/29/18 12:07		
Surrogates								
n-Triacontane (S)	57	%	50-150	1	03/28/18 12:37	03/29/18 12:07	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	14.0	1	04/03/18 15:49	04/03/18 21:58		
Surrogates								
a,a,a-Trifluorotoluene (S)	100	%	80-150	1	04/03/18 15:49	04/03/18 21:58	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	11500	mg/kg	13.2	1	03/30/18 05:23	04/02/18 11:41	7429-90-5	
Barium	130	mg/kg	0.66	1	03/30/18 05:23	04/02/18 11:41	7440-39-3	
Boron	238	mg/kg	9.9	1	03/30/18 05:23	04/02/18 11:41	7440-42-8	
Copper	26.1	mg/kg	0.66	1	03/30/18 05:23	04/02/18 11:41	7440-50-8	
Iron	35100	mg/kg	16.5	5	03/30/18 05:23	04/02/18 12:48	7439-89-6	
Manganese	161	mg/kg	0.33	1	03/30/18 05:23	04/02/18 11:41	7439-96-5	
Nickel	26.9	mg/kg	1.3	1	03/30/18 05:23	04/02/18 11:41	7440-02-0	
Silver	ND	mg/kg	0.66	1	03/30/18 05:23	04/02/18 11:41	7440-22-4	
Tin	ND	mg/kg	5.0	1	03/30/18 05:23	04/02/18 11:41	7440-31-5	
Titanium	568	mg/kg	1.7	1	03/30/18 05:23	04/02/18 11:41	7440-32-6	
Zinc	173	mg/kg	1.3	1	03/30/18 05:23	04/02/18 11:41	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	49.9	mg/kg	1.3	5	04/04/18 17:21	04/08/18 14:43	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	2.0	mg/kg	0.66	20	03/30/18 05:24	03/30/18 11:01	7440-36-0	M6
Arsenic	23.3	mg/kg	0.66	20	03/30/18 05:24	03/30/18 11:01	7440-38-2	
Beryllium	3.1	mg/kg	0.26	20	03/30/18 05:24	03/30/18 11:01	7440-41-7	
Cadmium	2.3	mg/kg	0.11	20	03/30/18 05:24	03/30/18 11:01	7440-43-9	
Cobalt	8.3	mg/kg	0.66	20	03/30/18 05:24	03/30/18 11:01	7440-48-4	
Lead	37.7	mg/kg	0.13	20	03/30/18 05:24	03/30/18 11:01	7439-92-1	
Lithium	14.9	mg/kg	0.66	20	03/30/18 05:24	03/30/18 11:01	7439-93-2	
Selenium	5.4	mg/kg	0.66	20	03/30/18 05:24	03/30/18 11:01	7782-49-2	
Strontium	77.3	mg/kg	0.66	20	03/30/18 05:24	03/30/18 11:01	7440-24-6	
Vanadium	124	mg/kg	1.3	20	03/30/18 05:24	03/30/18 11:01	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.070	mg/kg	0.028	1	03/30/18 05:24	04/04/18 17:39	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	27.3	%	0.10	1		03/29/18 13:23		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	2320	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: **FD-SB-A2 (10-20 S)** Lab ID: **10425111001** Collected: 03/27/18 10:40 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	208-96-8	
Anthracene	8100	ug/kg	2260	5	03/29/18 13:52	04/08/18 18:08	120-12-7	
Benzo(a)anthracene	10800	ug/kg	2260	5	03/29/18 13:52	04/08/18 18:08	56-55-3	
Benzo(a)pyrene	8910	ug/kg	2260	5	03/29/18 13:52	04/08/18 18:08	50-32-8	
Benzo(b)fluoranthene	11200	ug/kg	2260	5	03/29/18 13:52	04/08/18 18:08	205-99-2	
Benzo(g,h,i)perylene	3930	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	191-24-2	
Benzo(k)fluoranthene	4830	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	101-55-3	
Butylbenzylphthalate	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	85-68-7	
Carbazole	2950	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	59-50-7	
4-Chloroaniline	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	108-60-1	
2-Chloronaphthalene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	91-58-7	
2-Chlorophenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	7005-72-3	
Chrysene	11200	ug/kg	2260	5	03/29/18 13:52	04/08/18 18:08	218-01-9	
Dibenz(a,h)anthracene	990	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	53-70-3	
Dibenzofuran	1590	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	120-83-2	
Diethylphthalate	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	105-67-9	
Dimethylphthalate	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	131-11-3	
Di-n-butylphthalate	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2330	1	03/29/18 13:52	04/05/18 15:37	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	606-20-2	
Di-n-octylphthalate	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	117-81-7	
Fluoranthene	27300	ug/kg	2260	5	03/29/18 13:52	04/08/18 18:08	206-44-0	
Fluorene	3150	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	87-68-3	
Hexachlorobenzene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	118-74-1	
Hexachloroethane	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	67-72-1	
Indeno(1,2,3-cd)pyrene	3610	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	193-39-5	
Isophorone	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	78-59-1	
1-Methylnaphthalene	539	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	90-12-0	
2-Methylnaphthalene	523	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: **FD-SB-A2 (10-20 S)** Lab ID: **10425111001** Collected: 03/27/18 10:40 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	904	1	03/29/18 13:52	04/05/18 15:37		
Naphthalene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	91-20-3	
2-Nitroaniline	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	88-74-4	
3-Nitroaniline	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	99-09-2	
4-Nitroaniline	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	100-01-6	
Nitrobenzene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	98-95-3	
2-Nitrophenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	88-75-5	
4-Nitrophenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	86-30-6	
Pentachlorophenol	ND	ug/kg	918	1	03/29/18 13:52	04/05/18 15:37	87-86-5	
Phenanthrene	23700	ug/kg	2260	5	03/29/18 13:52	04/08/18 18:08	85-01-8	
Phenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	108-95-2	
Pyrene	23000	ug/kg	2260	5	03/29/18 13:52	04/08/18 18:08	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	54	%	43-125	1	03/29/18 13:52	04/05/18 15:37	4165-60-0	D4
2-Fluorobiphenyl (S)	66	%	30-132	1	03/29/18 13:52	04/05/18 15:37	321-60-8	
p-Terphenyl-d14 (S)	77	%	62-125	1	03/29/18 13:52	04/05/18 15:37	1718-51-0	
Phenol-d6 (S)	63	%	48-125	1	03/29/18 13:52	04/05/18 15:37	13127-88-3	
2-Fluorophenol (S)	60	%	40-125	1	03/29/18 13:52	04/05/18 15:37	367-12-4	
2,4,6-Tribromophenol (S)	69	%	60-125	1	03/29/18 13:52	04/05/18 15:37	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	3930	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	83-32-9	
Acenaphthylene	204	ug/kg	68.7	5	03/28/18 19:00	03/30/18 20:56	208-96-8	
Anthracene	11300	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	120-12-7	
Benzo(a)anthracene	14400	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	56-55-3	
Benzo(a)pyrene	11700	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	50-32-8	
Benzo(b)fluoranthene	13300	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	205-99-2	
Benzo(g,h,i)perylene	5310	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	191-24-2	
Benzo(k)fluoranthene	6960	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	207-08-9	
Chrysene	13900	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	218-01-9	
Dibenz(a,h)anthracene	1700	ug/kg	68.7	5	03/28/18 19:00	03/30/18 20:56	53-70-3	
Fluoranthene	40000	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	206-44-0	
Fluorene	4970	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	86-73-7	
Indeno(1,2,3-cd)pyrene	4480	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	193-39-5	
Naphthalene	644	ug/kg	68.7	5	03/28/18 19:00	03/30/18 20:56	91-20-3	
Phenanthrene	30900	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	85-01-8	
Pyrene	32500	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	52	%	42-125	5	03/28/18 19:00	03/30/18 20:56	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-A2 (10-20 S) **Lab ID: 10425111001** Collected: 03/27/18 10:40 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Surrogates								
p-Terphenyl-d14 (S)	64	%.	57-125	5	03/28/18 19:00	03/30/18 20:56	1718-51-0	
8270D MSSV MDA LIST 2 Analytical Method: EPA 8270D Preparation Method: EPA 3546								
Bentazon	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	25057-89-0	
2,4-D	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	94-75-7	
2,4-DB	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	94-82-6	
Dicamba	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	1918-00-9	
Dinoseb	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	88-85-7	
MCPA	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	94-74-6	
Pentachlorophenol	0.30	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	87-86-5	
Picloram	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	1918-02-1	
2,4,5-T	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	93-72-1	
Triclopyr	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	55335-06-3	
Surrogates								
2,4-DCAA (S)	69	%.	46-125	5	03/29/18 07:30	04/04/18 18:58	19719-28-9	D3
8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Acetone	ND	ug/kg	1350	1	03/28/18 15:25	03/29/18 11:41	67-64-1	
Allyl chloride	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	107-05-1	
Benzene	ND	ug/kg	27.1	1	03/28/18 15:25	03/29/18 11:41	71-43-2	
Bromobenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	108-86-1	
Bromochloromethane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	74-97-5	
Bromodichloromethane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	75-27-4	
Bromoform	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	75-25-2	
Bromomethane	ND	ug/kg	677	1	03/28/18 15:25	03/29/18 11:41	74-83-9	
2-Butanone (MEK)	ND	ug/kg	339	1	03/28/18 15:25	03/29/18 11:41	78-93-3	
n-Butylbenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	104-51-8	
sec-Butylbenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	135-98-8	
tert-Butylbenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	98-06-6	
Carbon tetrachloride	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	56-23-5	
Chlorobenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	108-90-7	
Chloroethane	ND	ug/kg	677	1	03/28/18 15:25	03/29/18 11:41	75-00-3	
Chloroform	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	67-66-3	
Chloromethane	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	74-87-3	
2-Chlorotoluene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	95-49-8	
4-Chlorotoluene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	677	1	03/28/18 15:25	03/29/18 11:41	96-12-8	
Dibromochloromethane	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	106-93-4	
Dibromomethane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	75-71-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-A2 (10-20 S) **Lab ID: 10425111001** Collected: 03/27/18 10:40 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,1-Dichloroethane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	75-34-3	
1,2-Dichloroethane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	107-06-2	
1,1-Dichloroethene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	156-60-5	
Dichlorofluoromethane	ND	ug/kg	677	1	03/28/18 15:25	03/29/18 11:41	75-43-4	
1,2-Dichloropropane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	78-87-5	
1,3-Dichloropropane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	142-28-9	
2,2-Dichloropropane	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	594-20-7	
1,1-Dichloropropene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	60-29-7	
Ethylbenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	339	1	03/28/18 15:25	03/29/18 11:41	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	98-82-8	
p-Isopropyltoluene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	99-87-6	
Methylene Chloride	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	339	1	03/28/18 15:25	03/29/18 11:41	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	1634-04-4	
Naphthalene	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	91-20-3	
n-Propylbenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	103-65-1	
Styrene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	79-34-5	N2
Tetrachloroethene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	127-18-4	
Tetrahydrofuran	ND	ug/kg	2710	1	03/28/18 15:25	03/29/18 11:41	109-99-9	
Toluene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	79-00-5	
Trichloroethene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	108-67-8	
Vinyl chloride	ND	ug/kg	27.1	1	03/28/18 15:25	03/29/18 11:41	75-01-4	
Xylene (Total)	ND	ug/kg	203	1	03/28/18 15:25	03/29/18 11:41	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	91	%	75-125	1	03/28/18 15:25	03/29/18 11:41	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	03/28/18 15:25	03/29/18 11:41	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125	1	03/28/18 15:25	03/29/18 11:41	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-A2 (10-20 S) **Lab ID: 10425111001** Collected: 03/27/18 10:40 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
7196 Chromium, Hexavalent Analytical Method: EPA 7196A Preparation Method: EPA 3060A								
Chromium, Hexavalent	ND	mg/kg	13.5	5	04/02/18 15:00	04/04/18 13:19	18540-29-9	D3
Trivalent Chromium Calculation Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	49.9	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	
9012 Cyanide, Total Analytical Method: EPA 9012 Preparation Method: EPA 9012A								
Cyanide	ND	mg/kg	0.41	1	04/05/18 10:35	04/05/18 14:31	57-12-5	
9056 IC Anions Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Fluoride	2.3	mg/kg	1.0	1	04/02/18 15:30	04/03/18 16:03	16984-48-8	M1,R1

Sample: FD-SB-B2 (12-21 WM) **Lab ID: 10425111002** Collected: 03/27/18 11:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.9	1	04/04/18 10:58	04/06/18 14:38	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	309-00-2	
alpha-BHC	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	319-84-6	
beta-BHC	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	319-85-7	
delta-BHC	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	58-89-9	
Chlordane (Technical)	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	57-74-9	
alpha-Chlordane	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	5103-71-9	
gamma-Chlordane	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	5103-74-2	
4,4'-DDD	ND	ug/kg	24.1	5	03/28/18 12:51	04/05/18 21:54	72-54-8	
4,4'-DDE	ND	ug/kg	24.1	5	03/28/18 12:51	04/05/18 21:54	72-55-9	
4,4'-DDT	ND	ug/kg	24.1	5	03/28/18 12:51	04/05/18 21:54	50-29-3	
Dieldrin	ND	ug/kg	24.1	5	03/28/18 12:51	04/05/18 21:54	60-57-1	
Endosulfan I	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	959-98-8	
Endosulfan II	ND	ug/kg	24.1	5	03/28/18 12:51	04/05/18 21:54	33213-65-9	
Endosulfan sulfate	ND	ug/kg	24.1	5	03/28/18 12:51	04/05/18 21:54	1031-07-8	
Endrin	ND	ug/kg	24.1	5	03/28/18 12:51	04/05/18 21:54	72-20-8	
Endrin aldehyde	ND	ug/kg	24.1	5	03/28/18 12:51	04/05/18 21:54	7421-93-4	
Endrin ketone	ND	ug/kg	24.1	5	03/28/18 12:51	04/05/18 21:54	53494-70-5	
Heptachlor	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	76-44-8	
Heptachlor epoxide	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	1024-57-3	
Methoxychlor	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	72-43-5	
Toxaphene	ND	ug/kg	362	5	03/28/18 12:51	04/05/18 21:54	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	78	%	30-150	5	03/28/18 12:51	04/05/18 21:54	877-09-8	5M,D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-B2 (12-21 WM) Lab ID: 10425111002 Collected: 03/27/18 11:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Surrogates								
Decachlorobiphenyl (S)	117	%.	30-150	5	03/28/18 12:51	04/05/18 21:54	2051-24-3	
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	11100-14-4	
PCB, Total	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	86	%.	48-125	1	03/28/18 12:51	04/02/18 11:46	877-09-8	
Decachlorobiphenyl (S)	77	%.	30-134	1	03/28/18 12:51	04/02/18 11:46	2051-24-3	
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	139	mg/kg	60.0	5	03/28/18 18:58	03/29/18 16:50		T6
Surrogates								
n-Triacontane (S)	76	%.	50-150	5	03/28/18 18:58	03/29/18 16:50	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	16.7	1	04/03/18 15:49	04/03/18 22:21		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	04/03/18 15:49	04/03/18 22:21	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	8890	mg/kg	13.9	1	03/30/18 05:23	04/02/18 11:45	7429-90-5	
Barium	129	mg/kg	0.70	1	03/30/18 05:23	04/02/18 11:45	7440-39-3	
Boron	196	mg/kg	10.5	1	03/30/18 05:23	04/02/18 11:45	7440-42-8	
Copper	20.7	mg/kg	0.70	1	03/30/18 05:23	04/02/18 11:45	7440-50-8	
Iron	27900	mg/kg	17.4	5	03/30/18 05:23	04/02/18 12:52	7439-89-6	
Manganese	250	mg/kg	0.35	1	03/30/18 05:23	04/02/18 11:45	7439-96-5	
Nickel	30.9	mg/kg	1.4	1	03/30/18 05:23	04/02/18 11:45	7440-02-0	
Silver	ND	mg/kg	0.70	1	03/30/18 05:23	04/02/18 11:45	7440-22-4	
Tin	ND	mg/kg	5.2	1	03/30/18 05:23	04/02/18 11:45	7440-31-5	
Titanium	426	mg/kg	1.7	1	03/30/18 05:23	04/02/18 11:45	7440-32-6	
Zinc	1050	mg/kg	1.4	1	03/30/18 05:23	04/02/18 11:45	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	46.8	mg/kg	1.3	5	04/04/18 17:21	04/08/18 14:47	7440-47-3	N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-B2 (12-21 WM) **Lab ID: 10425111002** Collected: 03/27/18 11:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	1.9	mg/kg	0.68	20	03/30/18 05:24	03/30/18 10:47	7440-36-0	
Arsenic	14.8	mg/kg	0.68	20	03/30/18 05:24	03/30/18 10:47	7440-38-2	
Beryllium	2.3	mg/kg	0.27	20	03/30/18 05:24	03/30/18 10:47	7440-41-7	
Cadmium	3.8	mg/kg	0.11	20	03/30/18 05:24	03/30/18 10:47	7440-43-9	
Cobalt	6.8	mg/kg	0.68	20	03/30/18 05:24	03/30/18 10:47	7440-48-4	
Lead	56.8	mg/kg	0.14	20	03/30/18 05:24	03/30/18 10:47	7439-92-1	
Lithium	12.1	mg/kg	0.68	20	03/30/18 05:24	03/30/18 10:47	7439-93-2	
Selenium	3.9	mg/kg	0.68	20	03/30/18 05:24	03/30/18 10:47	7782-49-2	
Strontium	63.2	mg/kg	0.68	20	03/30/18 05:24	03/30/18 10:47	7440-24-6	
Vanadium	135	mg/kg	1.4	20	03/30/18 05:24	03/30/18 10:47	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.056	mg/kg	0.026	1	03/30/18 05:24	04/04/18 17:45	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	31.0	%	0.10	1		03/29/18 13:23		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	83-32-9	
Acenaphthylene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	208-96-8	
Anthracene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	120-12-7	
Benzo(a)anthracene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	56-55-3	
Benzo(a)pyrene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	101-55-3	
Butylbenzylphthalate	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	85-68-7	
Carbazole	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	59-50-7	
4-Chloroaniline	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	108-60-1	
2-Chloronaphthalene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	91-58-7	
2-Chlorophenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	7005-72-3	
Chrysene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	53-70-3	
Dibenzofuran	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	120-83-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: **FD-SB-B2 (12-21 WM)** Lab ID: **10425111002** Collected: 03/27/18 11:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Diethylphthalate	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	105-67-9	
Dimethylphthalate	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	131-11-3	
Di-n-butylphthalate	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2450	1	03/29/18 13:52	04/05/18 16:06	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	606-20-2	
Di-n-octylphthalate	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	117-81-7	
Fluoranthene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	206-44-0	
Fluorene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	87-68-3	
Hexachlorobenzene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	118-74-1	
Hexachloroethane	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	193-39-5	
Isophorone	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	78-59-1	
1-Methylnaphthalene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	90-12-0	
2-Methylnaphthalene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	951	1	03/29/18 13:52	04/05/18 16:06		
Naphthalene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	91-20-3	
2-Nitroaniline	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	88-74-4	
3-Nitroaniline	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	99-09-2	
4-Nitroaniline	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	100-01-6	
Nitrobenzene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	98-95-3	
2-Nitrophenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	88-75-5	
4-Nitrophenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	86-30-6	
Pentachlorophenol	ND	ug/kg	965	1	03/29/18 13:52	04/05/18 16:06	87-86-5	
Phenanthrene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	85-01-8	
Phenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	108-95-2	
Pyrene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	52	%	43-125	1	03/29/18 13:52	04/05/18 16:06	4165-60-0	
2-Fluorobiphenyl (S)	66	%	30-132	1	03/29/18 13:52	04/05/18 16:06	321-60-8	
p-Terphenyl-d14 (S)	87	%	62-125	1	03/29/18 13:52	04/05/18 16:06	1718-51-0	
Phenol-d6 (S)	65	%	48-125	1	03/29/18 13:52	04/05/18 16:06	13127-88-3	
2-Fluorophenol (S)	60	%	40-125	1	03/29/18 13:52	04/05/18 16:06	367-12-4	
2,4,6-Tribromophenol (S)	76	%	60-125	1	03/29/18 13:52	04/05/18 16:06	118-79-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-B2 (12-21 WM) **Lab ID: 10425111002** Collected: 03/27/18 11:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Acenaphthene	339	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	83-32-9	
Acenaphthylene	ND	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	208-96-8	
Anthracene	106	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	120-12-7	
Benzo(a)anthracene	82.8	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	56-55-3	
Benzo(a)pyrene	83.3	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	50-32-8	
Benzo(b)fluoranthene	104	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	207-08-9	
Chrysene	94.4	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	53-70-3	
Fluoranthene	242	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	206-44-0	
Fluorene	331	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	193-39-5	
Naphthalene	ND	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	91-20-3	
Phenanthrene	219	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	85-01-8	
Pyrene	225	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	67	%.	42-125	5	03/28/18 19:00	03/30/18 21:18	321-60-8	D3
p-Terphenyl-d14 (S)	78	%.	57-125	5	03/28/18 19:00	03/30/18 21:18	1718-51-0	
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	25057-89-0	
2,4-D	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	94-75-7	
2,4-DB	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	94-82-6	
Dicamba	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	1918-00-9	
Dinoseb	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	88-85-7	
MCPA	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	94-74-6	
Pentachlorophenol	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	87-86-5	
Picloram	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	1918-02-1	
2,4,5-T	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	93-72-1	
Triclopyr	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	55335-06-3	
Surrogates								
2,4-DCAA (S)	68	%.	46-125	1	03/29/18 07:30	04/04/18 17:30	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1440	1	03/28/18 15:25	03/29/18 12:31	67-64-1	
Allyl chloride	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	107-05-1	
Benzene	ND	ug/kg	28.9	1	03/28/18 15:25	03/29/18 12:31	71-43-2	
Bromobenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	108-86-1	
Bromochloromethane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	74-97-5	
Bromodichloromethane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	75-27-4	
Bromoform	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	75-25-2	
Bromomethane	ND	ug/kg	722	1	03/28/18 15:25	03/29/18 12:31	74-83-9	
2-Butanone (MEK)	ND	ug/kg	361	1	03/28/18 15:25	03/29/18 12:31	78-93-3	
n-Butylbenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	104-51-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-B2 (12-21 WM) Lab ID: 10425111002 Collected: 03/27/18 11:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
sec-Butylbenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	135-98-8	
tert-Butylbenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	98-06-6	
Carbon tetrachloride	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	56-23-5	
Chlorobenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	108-90-7	
Chloroethane	ND	ug/kg	722	1	03/28/18 15:25	03/29/18 12:31	75-00-3	
Chloroform	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	67-66-3	
Chloromethane	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	74-87-3	
2-Chlorotoluene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	95-49-8	
4-Chlorotoluene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	722	1	03/28/18 15:25	03/29/18 12:31	96-12-8	
Dibromochloromethane	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	106-93-4	
Dibromomethane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	75-71-8	
1,1-Dichloroethane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	75-34-3	
1,2-Dichloroethane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	107-06-2	
1,1-Dichloroethene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	156-60-5	
Dichlorofluoromethane	ND	ug/kg	722	1	03/28/18 15:25	03/29/18 12:31	75-43-4	
1,2-Dichloropropane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	78-87-5	
1,3-Dichloropropane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	142-28-9	
2,2-Dichloropropane	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	594-20-7	
1,1-Dichloropropene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	60-29-7	
Ethylbenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	361	1	03/28/18 15:25	03/29/18 12:31	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	98-82-8	
p-Isopropyltoluene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	99-87-6	
Methylene Chloride	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	361	1	03/28/18 15:25	03/29/18 12:31	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	1634-04-4	
Naphthalene	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	91-20-3	
n-Propylbenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	103-65-1	
Styrene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	79-34-5	N2
Tetrachloroethene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	127-18-4	
Tetrahydrofuran	ND	ug/kg	2890	1	03/28/18 15:25	03/29/18 12:31	109-99-9	
Toluene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	87-61-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-B2 (12-21 WM) Lab ID: 10425111002 Collected: 03/27/18 11:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,2,4-Trichlorobenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	79-00-5	
Trichloroethene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	108-67-8	
Vinyl chloride	ND	ug/kg	28.9	1	03/28/18 15:25	03/29/18 12:31	75-01-4	
Xylene (Total)	ND	ug/kg	216	1	03/28/18 15:25	03/29/18 12:31	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	90	%.	75-125	1	03/28/18 15:25	03/29/18 12:31	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1	03/28/18 15:25	03/29/18 12:31	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	75-125	1	03/28/18 15:25	03/29/18 12:31	460-00-4	

7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	14.2	5	04/02/18 15:00	04/04/18 13:19	18540-29-9	D3

Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	46.8	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	

9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.62	1	04/05/18 10:35	04/05/18 14:34	57-12-5	

9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	3.3	mg/kg	0.98	1	04/02/18 15:30	04/03/18 17:02	16984-48-8	

Sample: FD-SB-C2 (5-17 WM) Lab ID: 10425111003 Collected: 03/27/18 13:30 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury		Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)						
Methyl Mercury	ND	ng/g	8.93	1	04/04/18 10:58	04/06/18 14:45	7439-97-6	N3
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA 3550						
Aldrin	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	309-00-2	
alpha-BHC	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	319-84-6	
beta-BHC	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	319-85-7	
delta-BHC	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	58-89-9	
Chlordane (Technical)	ND	ug/kg	1080	50	03/28/18 12:51	04/05/18 23:43	57-74-9	
alpha-Chlordane	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	5103-71-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-C2 (5-17 WM) **Lab ID: 10425111003** Collected: 03/27/18 13:30 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
gamma-Chlordane	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	5103-74-2	
4,4'-DDD	ND	ug/kg	216	50	03/28/18 12:51	04/05/18 23:43	72-54-8	
4,4'-DDE	ND	ug/kg	216	50	03/28/18 12:51	04/05/18 23:43	72-55-9	
4,4'-DDT	ND	ug/kg	216	50	03/28/18 12:51	04/05/18 23:43	50-29-3	
Dieldrin	ND	ug/kg	216	50	03/28/18 12:51	04/05/18 23:43	60-57-1	
Endosulfan I	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	959-98-8	
Endosulfan II	ND	ug/kg	216	50	03/28/18 12:51	04/05/18 23:43	33213-65-9	
Endosulfan sulfate	ND	ug/kg	216	50	03/28/18 12:51	04/05/18 23:43	1031-07-8	
Endrin	ND	ug/kg	216	50	03/28/18 12:51	04/05/18 23:43	72-20-8	
Endrin aldehyde	ND	ug/kg	216	50	03/28/18 12:51	04/05/18 23:43	7421-93-4	
Endrin ketone	ND	ug/kg	216	50	03/28/18 12:51	04/05/18 23:43	53494-70-5	
Heptachlor	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	76-44-8	
Heptachlor epoxide	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	1024-57-3	
Methoxychlor	ND	ug/kg	1080	50	03/28/18 12:51	04/05/18 23:43	72-43-5	
Toxaphene	ND	ug/kg	3240	50	03/28/18 12:51	04/05/18 23:43	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	50	03/28/18 12:51	04/05/18 23:43	877-09-8	3M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	50	03/28/18 12:51	04/05/18 23:43	2051-24-3	S4
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	12672-29-6	
PCB-1254 (Aroclor 1254)	178	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	11100-14-4	
PCB, Total	178	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	76	%	48-125	1	03/28/18 12:51	04/02/18 14:24	877-09-8	
Decachlorobiphenyl (S)	91	%	30-134	1	03/28/18 12:51	04/02/18 14:24	2051-24-3	
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	413	mg/kg	223	20	03/28/18 18:58	03/29/18 13:32		T6
Surrogates								
n-Triacontane (S)	0	%	50-150	20	03/28/18 18:58	03/29/18 13:32	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	75.7	mg/kg	15.6	1	04/03/18 15:49	04/03/18 22:45		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/03/18 15:49	04/03/18 22:45	98-08-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-C2 (5-17 WM) **Lab ID: 10425111003** Collected: 03/27/18 13:30 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP		Analytical Method: EPA 6010C Preparation Method: EPA 3050						
Aluminum	4660	mg/kg	13.0	1	03/30/18 05:23	04/02/18 11:49	7429-90-5	
Barium	198	mg/kg	0.65	1	03/30/18 05:23	04/02/18 11:49	7440-39-3	
Boron	85.7	mg/kg	9.7	1	03/30/18 05:23	04/02/18 11:49	7440-42-8	
Copper	53.4	mg/kg	0.65	1	03/30/18 05:23	04/02/18 11:49	7440-50-8	
Iron	66500	mg/kg	32.5	10	03/30/18 05:23	04/02/18 12:56	7439-89-6	
Manganese	520	mg/kg	0.32	1	03/30/18 05:23	04/02/18 11:49	7439-96-5	
Nickel	23.8	mg/kg	1.3	1	03/30/18 05:23	04/02/18 11:49	7440-02-0	
Silver	ND	mg/kg	0.65	1	03/30/18 05:23	04/02/18 11:49	7440-22-4	
Tin	793	mg/kg	4.9	1	03/30/18 05:23	04/02/18 11:49	7440-31-5	
Titanium	248	mg/kg	1.6	1	03/30/18 05:23	04/02/18 11:49	7440-32-6	
Zinc	237	mg/kg	1.3	1	03/30/18 05:23	04/02/18 11:49	7440-66-6	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3050B						
Chromium	51.1	mg/kg	1.2	5	04/04/18 17:21	04/08/18 14:52	7440-47-3	N2
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	1.7	mg/kg	0.64	20	03/30/18 05:24	03/30/18 10:50	7440-36-0	
Arsenic	15.9	mg/kg	0.64	20	03/30/18 05:24	03/30/18 10:50	7440-38-2	
Beryllium	0.81	mg/kg	0.26	20	03/30/18 05:24	03/30/18 10:50	7440-41-7	
Cadmium	2.2	mg/kg	0.10	20	03/30/18 05:24	03/30/18 10:50	7440-43-9	
Cobalt	7.1	mg/kg	0.64	20	03/30/18 05:24	03/30/18 10:50	7440-48-4	
Lead	557	mg/kg	0.13	20	03/30/18 05:24	03/30/18 10:50	7439-92-1	
Lithium	7.7	mg/kg	0.64	20	03/30/18 05:24	03/30/18 10:50	7439-93-2	
Selenium	1.3	mg/kg	0.64	20	03/30/18 05:24	03/30/18 10:50	7782-49-2	
Strontium	59.1	mg/kg	0.64	20	03/30/18 05:24	03/30/18 10:50	7440-24-6	
Vanadium	54.5	mg/kg	1.3	20	03/30/18 05:24	03/30/18 10:50	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.38	mg/kg	0.026	1	03/30/18 05:24	04/04/18 17:47	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	23.0	%	0.10	1		03/29/18 13:23		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	466	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	83-32-9	
Acenaphthylene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	208-96-8	
Anthracene	1440	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	120-12-7	
Benzo(a)anthracene	3590	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	56-55-3	
Benzo(a)pyrene	2710	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	50-32-8	
Benzo(b)fluoranthene	3760	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	205-99-2	
Benzo(g,h,i)perylene	1380	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	191-24-2	
Benzo(k)fluoranthene	1270	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	101-55-3	
Butylbenzylphthalate	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	85-68-7	
Carbazole	529	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	86-74-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-C2 (5-17 WM) **Lab ID: 10425111003** Collected: 03/27/18 13:30 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
4-Chloro-3-methylphenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	59-50-7	
4-Chloroaniline	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	108-60-1	
2-Chloronaphthalene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	91-58-7	
2-Chlorophenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	7005-72-3	
Chrysene	3290	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	53-70-3	
Dibenzofuran	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	120-83-2	
Diethylphthalate	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	105-67-9	
Dimethylphthalate	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	131-11-3	
Di-n-butylphthalate	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2210	1	03/29/18 13:52	04/05/18 16:36	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	606-20-2	
Di-n-octylphthalate	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	122-66-7	
bis(2-Ethylhexyl)phthalate	1220	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	117-81-7	
Fluoranthene	7680	ug/kg	857	2	03/29/18 13:52	04/08/18 18:37	206-44-0	
Fluorene	723	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	87-68-3	
Hexachlorobenzene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	118-74-1	
Hexachloroethane	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	67-72-1	
Indeno(1,2,3-cd)pyrene	1210	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	193-39-5	
Isophorone	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	78-59-1	
1-Methylnaphthalene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	90-12-0	
2-Methylnaphthalene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	857	1	03/29/18 13:52	04/05/18 16:36		
Naphthalene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	91-20-3	
2-Nitroaniline	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	88-74-4	
3-Nitroaniline	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	99-09-2	
4-Nitroaniline	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	100-01-6	
Nitrobenzene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	98-95-3	
2-Nitrophenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	88-75-5	
4-Nitrophenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	62-75-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-C2 (5-17 WM) **Lab ID: 10425111003** Collected: 03/27/18 13:30 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

N-Nitroso-di-n-propylamine	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	86-30-6	
Pentachlorophenol	ND	ug/kg	870	1	03/29/18 13:52	04/05/18 16:36	87-86-5	
Phenanthrene	6640	ug/kg	857	2	03/29/18 13:52	04/08/18 18:37	85-01-8	
Phenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	108-95-2	
Pyrene	6760	ug/kg	857	2	03/29/18 13:52	04/08/18 18:37	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	50	%	43-125	1	03/29/18 13:52	04/05/18 16:36	4165-60-0	
2-Fluorobiphenyl (S)	61	%	30-132	1	03/29/18 13:52	04/05/18 16:36	321-60-8	
p-Terphenyl-d14 (S)	78	%	62-125	1	03/29/18 13:52	04/05/18 16:36	1718-51-0	
Phenol-d6 (S)	60	%	48-125	1	03/29/18 13:52	04/05/18 16:36	13127-88-3	
2-Fluorophenol (S)	57	%	40-125	1	03/29/18 13:52	04/05/18 16:36	367-12-4	
2,4,6-Tribromophenol (S)	63	%	60-125	1	03/29/18 13:52	04/05/18 16:36	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	2680	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	83-32-9	
Acenaphthylene	635	ug/kg	64.6	5	03/28/18 19:00	03/30/18 21:39	208-96-8	
Anthracene	13100	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	120-12-7	
Benzo(a)anthracene	20500	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	56-55-3	
Benzo(a)pyrene	14400	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	50-32-8	
Benzo(b)fluoranthene	18500	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	205-99-2	
Benzo(g,h,i)perylene	5740	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	191-24-2	
Benzo(k)fluoranthene	6380	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	207-08-9	
Chrysene	17700	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	218-01-9	
Dibenz(a,h)anthracene	2090	ug/kg	64.6	5	03/28/18 19:00	03/30/18 21:39	53-70-3	
Fluoranthene	46400	ug/kg	3230	250	03/28/18 19:00	04/02/18 14:48	206-44-0	
Fluorene	4030	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	86-73-7	
Indeno(1,2,3-cd)pyrene	4930	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	193-39-5	
Naphthalene	882	ug/kg	64.6	5	03/28/18 19:00	03/30/18 21:39	91-20-3	
Phenanthrene	41800	ug/kg	3230	250	03/28/18 19:00	04/02/18 14:48	85-01-8	
Pyrene	37700	ug/kg	3230	250	03/28/18 19:00	04/02/18 14:48	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	63	%	42-125	5	03/28/18 19:00	03/30/18 21:39	321-60-8	D3
p-Terphenyl-d14 (S)	95	%	57-125	5	03/28/18 19:00	03/30/18 21:39	1718-51-0	

8270D MSSV MDA LIST 2

Analytical Method: EPA 8270D Preparation Method: EPA 3546

Bentazon	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	25057-89-0	
2,4-D	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	94-75-7	
2,4-DB	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	94-82-6	
Dicamba	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	1918-00-9	
Dinoseb	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	88-85-7	
MCPA	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	94-74-6	
Pentachlorophenol	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	87-86-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: **FD-SB-C2 (5-17 WM)** Lab ID: **10425111003** Collected: 03/27/18 13:30 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Picloram	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	1918-02-1	
2,4,5-T	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	93-72-1	
Triclopyr	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	55335-06-3	
Surrogates								
2,4-DCAA (S)	65	%.	46-125	5	03/29/18 07:30	04/04/18 19:28	19719-28-9	D3
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1490	1	03/28/18 15:25	03/29/18 12:48	67-64-1	
Allyl chloride	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	107-05-1	
Benzene	ND	ug/kg	29.9	1	03/28/18 15:25	03/29/18 12:48	71-43-2	
Bromobenzene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	108-86-1	
Bromochloromethane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	74-97-5	
Bromodichloromethane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	75-27-4	
Bromoform	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	75-25-2	
Bromomethane	ND	ug/kg	746	1	03/28/18 15:25	03/29/18 12:48	74-83-9	
2-Butanone (MEK)	ND	ug/kg	373	1	03/28/18 15:25	03/29/18 12:48	78-93-3	
n-Butylbenzene	243	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	104-51-8	
sec-Butylbenzene	192	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	135-98-8	
tert-Butylbenzene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	98-06-6	
Carbon tetrachloride	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	56-23-5	
Chlorobenzene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	108-90-7	
Chloroethane	ND	ug/kg	746	1	03/28/18 15:25	03/29/18 12:48	75-00-3	
Chloroform	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	67-66-3	
Chloromethane	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	74-87-3	
2-Chlorotoluene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	95-49-8	
4-Chlorotoluene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	746	1	03/28/18 15:25	03/29/18 12:48	96-12-8	
Dibromochloromethane	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	106-93-4	
Dibromomethane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	75-71-8	
1,1-Dichloroethane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	75-34-3	
1,2-Dichloroethane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	107-06-2	
1,1-Dichloroethene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	156-60-5	
Dichlorofluoromethane	ND	ug/kg	746	1	03/28/18 15:25	03/29/18 12:48	75-43-4	
1,2-Dichloropropane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	78-87-5	
1,3-Dichloropropane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	142-28-9	
2,2-Dichloropropane	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	594-20-7	
1,1-Dichloropropene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	10061-01-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-C2 (5-17 WM) **Lab ID: 10425111003** Collected: 03/27/18 13:30 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
trans-1,3-Dichloropropene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	60-29-7	
Ethylbenzene	232	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	373	1	03/28/18 15:25	03/29/18 12:48	87-68-3	
Isopropylbenzene (Cumene)	252	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	98-82-8	
p-Isopropyltoluene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	99-87-6	
Methylene Chloride	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	373	1	03/28/18 15:25	03/29/18 12:48	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	1634-04-4	
Naphthalene	396	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	91-20-3	
n-Propylbenzene	313	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	103-65-1	
Styrene	324	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	79-34-5	N2
Tetrachloroethene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	127-18-4	
Tetrahydrofuran	ND	ug/kg	2990	1	03/28/18 15:25	03/29/18 12:48	109-99-9	
Toluene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	79-00-5	
Trichloroethene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	76-13-1	
1,2,4-Trimethylbenzene	95.0	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	108-67-8	
Vinyl chloride	ND	ug/kg	29.9	1	03/28/18 15:25	03/29/18 12:48	75-01-4	
Xylene (Total)	326	ug/kg	224	1	03/28/18 15:25	03/29/18 12:48	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	90	%	75-125	1	03/28/18 15:25	03/29/18 12:48	17060-07-0	
Toluene-d8 (S)	101	%	75-125	1	03/28/18 15:25	03/29/18 12:48	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125	1	03/28/18 15:25	03/29/18 12:48	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	0.26	10	04/02/18 15:00	04/04/18 13:19	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	51.1	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.54	mg/kg	0.44	1	04/05/18 10:35	04/05/18 14:34	57-12-5	B
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	04/02/18 15:30	04/03/18 17:22	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-D2 (3-12 WM) **Lab ID: 10425111004** Collected: 03/27/18 14:10 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	8.53	1	04/04/18 10:58	04/06/18 14:51	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	309-00-2	
alpha-BHC	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	319-84-6	
beta-BHC	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	319-85-7	
delta-BHC	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	58-89-9	
Chlordane (Technical)	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	57-74-9	
alpha-Chlordane	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	5103-71-9	
gamma-Chlordane	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	5103-74-2	
4,4'-DDD	ND	ug/kg	190	50	03/28/18 12:51	04/06/18 00:02	72-54-8	
4,4'-DDE	ND	ug/kg	190	50	03/28/18 12:51	04/06/18 00:02	72-55-9	
4,4'-DDT	ND	ug/kg	190	50	03/28/18 12:51	04/06/18 00:02	50-29-3	
Dieldrin	ND	ug/kg	190	50	03/28/18 12:51	04/06/18 00:02	60-57-1	
Endosulfan I	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	959-98-8	
Endosulfan II	ND	ug/kg	190	50	03/28/18 12:51	04/06/18 00:02	33213-65-9	
Endosulfan sulfate	ND	ug/kg	190	50	03/28/18 12:51	04/06/18 00:02	1031-07-8	
Endrin	ND	ug/kg	190	50	03/28/18 12:51	04/06/18 00:02	72-20-8	
Endrin aldehyde	ND	ug/kg	190	50	03/28/18 12:51	04/06/18 00:02	7421-93-4	
Endrin ketone	ND	ug/kg	190	50	03/28/18 12:51	04/06/18 00:02	53494-70-5	
Heptachlor	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	76-44-8	
Heptachlor epoxide	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	1024-57-3	
Methoxychlor	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	72-43-5	
Toxaphene	ND	ug/kg	2860	50	03/28/18 12:51	04/06/18 00:02	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	50	03/28/18 12:51	04/06/18 00:02	877-09-8	3M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	50	03/28/18 12:51	04/06/18 00:02	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	12672-29-6	
PCB-1254 (Aroclor 1254)	45.2	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	11100-14-4	
PCB, Total	45.2	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	80	%	48-125	1	03/28/18 12:51	04/02/18 12:02	877-09-8	
Decachlorobiphenyl (S)	81	%	30-134	1	03/28/18 12:51	04/02/18 12:02	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-D2 (3-12 WM) Lab ID: 10425111004 Collected: 03/27/18 14:10 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	3710	mg/kg	526	50	03/28/18 18:58	03/29/18 16:57		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	50	03/28/18 18:58	03/29/18 16:57	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	16.9	mg/kg	11.7	1	04/03/18 15:49	04/03/18 23:09		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%.	80-150	1	04/03/18 15:49	04/03/18 23:09	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	3640	mg/kg	11.3	1	03/30/18 05:23	04/02/18 11:52	7429-90-5	
Barium	57.0	mg/kg	0.57	1	03/30/18 05:23	04/02/18 11:52	7440-39-3	
Boron	13.1	mg/kg	8.5	1	03/30/18 05:23	04/02/18 11:52	7440-42-8	
Copper	18.5	mg/kg	0.57	1	03/30/18 05:23	04/02/18 11:52	7440-50-8	
Iron	10100	mg/kg	2.8	1	03/30/18 05:23	04/02/18 11:52	7439-89-6	
Manganese	277	mg/kg	0.28	1	03/30/18 05:23	04/02/18 11:52	7439-96-5	
Nickel	11.0	mg/kg	1.1	1	03/30/18 05:23	04/02/18 11:52	7440-02-0	
Silver	ND	mg/kg	0.57	1	03/30/18 05:23	04/02/18 11:52	7440-22-4	
Tin	8.8	mg/kg	4.2	1	03/30/18 05:23	04/02/18 11:52	7440-31-5	
Titanium	198	mg/kg	1.4	1	03/30/18 05:23	04/02/18 11:52	7440-32-6	
Zinc	171	mg/kg	1.1	1	03/30/18 05:23	04/02/18 11:52	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	15.7	mg/kg	1.1	5	04/04/18 17:21	04/08/18 15:24	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.56	20	03/30/18 05:24	03/30/18 10:53	7440-36-0	
Arsenic	3.9	mg/kg	0.56	20	03/30/18 05:24	03/30/18 10:53	7440-38-2	
Beryllium	0.33	mg/kg	0.22	20	03/30/18 05:24	03/30/18 10:53	7440-41-7	
Cadmium	0.41	mg/kg	0.090	20	03/30/18 05:24	03/30/18 10:53	7440-43-9	
Cobalt	4.1	mg/kg	0.56	20	03/30/18 05:24	03/30/18 10:53	7440-48-4	
Lead	65.3	mg/kg	0.11	20	03/30/18 05:24	03/30/18 10:53	7439-92-1	
Lithium	4.8	mg/kg	0.56	20	03/30/18 05:24	03/30/18 10:53	7439-93-2	
Selenium	ND	mg/kg	0.56	20	03/30/18 05:24	03/30/18 10:53	7782-49-2	
Strontium	21.2	mg/kg	0.56	20	03/30/18 05:24	03/30/18 10:53	7440-24-6	
Vanadium	19.2	mg/kg	1.1	20	03/30/18 05:24	03/30/18 10:53	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.063	mg/kg	0.021	1	03/30/18 05:24	04/04/18 17:49	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	12.6	%	0.10	1		03/29/18 13:23		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-D2 (3-12 WM) **Lab ID: 10425111004** Collected: 03/27/18 14:10 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	208-96-8	
Anthracene	813	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	120-12-7	
Benzo(a)anthracene	1640	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	56-55-3	
Benzo(a)pyrene	1450	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	50-32-8	
Benzo(b)fluoranthene	1840	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	205-99-2	
Benzo(g,h,i)perylene	843	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	191-24-2	
Benzo(k)fluoranthene	671	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	101-55-3	
Butylbenzylphthalate	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	85-68-7	
Carbazole	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	59-50-7	
4-Chloroaniline	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	108-60-1	
2-Chloronaphthalene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	91-58-7	
2-Chlorophenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	7005-72-3	
Chrysene	1570	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	53-70-3	
Dibenzofuran	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	120-83-2	
Diethylphthalate	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	105-67-9	
Dimethylphthalate	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	131-11-3	
Di-n-butylphthalate	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	1940	1	03/29/18 13:52	04/05/18 17:06	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	606-20-2	
Di-n-octylphthalate	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	117-81-7	
Fluoranthene	4150	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	206-44-0	
Fluorene	650	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	87-68-3	
Hexachlorobenzene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	118-74-1	
Hexachloroethane	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	67-72-1	
Indeno(1,2,3-cd)pyrene	719	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	193-39-5	
Isophorone	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	78-59-1	
1-Methylnaphthalene	484	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	90-12-0	
2-Methylnaphthalene	562	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-D2 (3-12 WM) **Lab ID: 10425111004** Collected: 03/27/18 14:10 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	754	1	03/29/18 13:52	04/05/18 17:06		
Naphthalene	572	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	91-20-3	
2-Nitroaniline	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	88-74-4	
3-Nitroaniline	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	99-09-2	
4-Nitroaniline	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	100-01-6	
Nitrobenzene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	98-95-3	
2-Nitrophenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	88-75-5	
4-Nitrophenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	86-30-6	
Pentachlorophenol	ND	ug/kg	766	1	03/29/18 13:52	04/05/18 17:06	87-86-5	
Phenanthrene	3680	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	85-01-8	
Phenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	108-95-2	
Pyrene	4440	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	57	%	43-125	1	03/29/18 13:52	04/05/18 17:06	4165-60-0	
2-Fluorobiphenyl (S)	65	%	30-132	1	03/29/18 13:52	04/05/18 17:06	321-60-8	
p-Terphenyl-d14 (S)	77	%	62-125	1	03/29/18 13:52	04/05/18 17:06	1718-51-0	
Phenol-d6 (S)	65	%	48-125	1	03/29/18 13:52	04/05/18 17:06	13127-88-3	
2-Fluorophenol (S)	65	%	40-125	1	03/29/18 13:52	04/05/18 17:06	367-12-4	
2,4,6-Tribromophenol (S)	64	%	60-125	1	03/29/18 13:52	04/05/18 17:06	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	334	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	83-32-9	
Acenaphthylene	287	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	208-96-8	
Anthracene	777	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	120-12-7	
Benzo(a)anthracene	1070	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	56-55-3	
Benzo(a)pyrene	1000	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	50-32-8	
Benzo(b)fluoranthene	1100	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	205-99-2	
Benzo(g,h,i)perylene	648	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	191-24-2	
Benzo(k)fluoranthene	425	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	207-08-9	
Chrysene	982	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	218-01-9	
Dibenz(a,h)anthracene	168	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	53-70-3	
Fluoranthene	2530	ug/kg	114	10	03/28/18 19:00	04/02/18 15:10	206-44-0	
Fluorene	553	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	86-73-7	
Indeno(1,2,3-cd)pyrene	521	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	193-39-5	
Naphthalene	486	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	91-20-3	
Phenanthrene	2390	ug/kg	114	10	03/28/18 19:00	04/02/18 15:10	85-01-8	
Pyrene	2390	ug/kg	114	10	03/28/18 19:00	04/02/18 15:10	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	70	%	42-125	5	03/28/18 19:00	03/30/18 22:01	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: **FD-SB-D2 (3-12 WM)** Lab ID: **10425111004** Collected: 03/27/18 14:10 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Surrogates								
p-Terphenyl-d14 (S)	80	%.	57-125	5	03/28/18 19:00	03/30/18 22:01	1718-51-0	
8270D MSSV MDA LIST 2 Analytical Method: EPA 8270D Preparation Method: EPA 3546								
Bentazon	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	25057-89-0	
2,4-D	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	94-75-7	
2,4-DB	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	94-82-6	
Dicamba	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	1918-00-9	
Dinoseb	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	88-85-7	
MCPA	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	94-74-6	
Pentachlorophenol	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	87-86-5	
Picloram	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	1918-02-1	
2,4,5-T	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	93-72-1	
Triclopyr	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	55335-06-3	
Surrogates								
2,4-DCAA (S)	71	%.	46-125	5	03/29/18 07:30	04/04/18 19:43	19719-28-9	D3
8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Acetone	ND	ug/kg	1180	1	03/28/18 15:25	03/29/18 12:15	67-64-1	
Allyl chloride	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	107-05-1	
Benzene	ND	ug/kg	23.5	1	03/28/18 15:25	03/29/18 12:15	71-43-2	
Bromobenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	108-86-1	
Bromochloromethane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	74-97-5	
Bromodichloromethane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	75-27-4	
Bromoform	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	75-25-2	
Bromomethane	ND	ug/kg	588	1	03/28/18 15:25	03/29/18 12:15	74-83-9	
2-Butanone (MEK)	ND	ug/kg	294	1	03/28/18 15:25	03/29/18 12:15	78-93-3	
n-Butylbenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	104-51-8	
sec-Butylbenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	135-98-8	
tert-Butylbenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	98-06-6	
Carbon tetrachloride	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	56-23-5	
Chlorobenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	108-90-7	
Chloroethane	ND	ug/kg	588	1	03/28/18 15:25	03/29/18 12:15	75-00-3	
Chloroform	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	67-66-3	
Chloromethane	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	74-87-3	
2-Chlorotoluene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	95-49-8	
4-Chlorotoluene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	588	1	03/28/18 15:25	03/29/18 12:15	96-12-8	
Dibromochloromethane	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	106-93-4	
Dibromomethane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	75-71-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-D2 (3-12 WM) **Lab ID: 10425111004** Collected: 03/27/18 14:10 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,1-Dichloroethane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	75-34-3	
1,2-Dichloroethane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	107-06-2	
1,1-Dichloroethene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	156-60-5	
Dichlorofluoromethane	ND	ug/kg	588	1	03/28/18 15:25	03/29/18 12:15	75-43-4	
1,2-Dichloropropane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	78-87-5	
1,3-Dichloropropane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	142-28-9	
2,2-Dichloropropane	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	594-20-7	
1,1-Dichloropropene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	60-29-7	
Ethylbenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	294	1	03/28/18 15:25	03/29/18 12:15	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	98-82-8	
p-Isopropyltoluene	68.5	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	99-87-6	
Methylene Chloride	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	294	1	03/28/18 15:25	03/29/18 12:15	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	1634-04-4	
Naphthalene	8480	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	91-20-3	
n-Propylbenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	103-65-1	
Styrene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	79-34-5	N2
Tetrachloroethene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	127-18-4	
Tetrahydrofuran	ND	ug/kg	2350	1	03/28/18 15:25	03/29/18 12:15	109-99-9	
Toluene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	79-00-5	
Trichloroethene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	76-13-1	
1,2,4-Trimethylbenzene	148	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	108-67-8	
Vinyl chloride	ND	ug/kg	23.5	1	03/28/18 15:25	03/29/18 12:15	75-01-4	
Xylene (Total)	ND	ug/kg	176	1	03/28/18 15:25	03/29/18 12:15	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	91	%	75-125	1	03/28/18 15:25	03/29/18 12:15	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	03/28/18 15:25	03/29/18 12:15	2037-26-5	
4-Bromofluorobenzene (S)	97	%	75-125	1	03/28/18 15:25	03/29/18 12:15	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-D2 (3-12 WM) **Lab ID: 10425111004** Collected: 03/27/18 14:10 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
7196 Chromium, Hexavalent Analytical Method: EPA 7196A Preparation Method: EPA 3060A								
Chromium, Hexavalent	ND	mg/kg	23.0	10	04/02/18 15:00	04/04/18 14:00	18540-29-9	D3
Trivalent Chromium Calculation Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	15.7	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	
9012 Cyanide, Total Analytical Method: EPA 9012 Preparation Method: EPA 9012A								
Cyanide	ND	mg/kg	0.36	1	04/05/18 10:35	04/05/18 14:38	57-12-5	
9056 IC Anions Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Fluoride	ND	mg/kg	0.99	1	04/02/18 15:30	04/03/18 17:41	16984-48-8	

Sample: FD-SB-E2 (11-21 S) **Lab ID: 10425111005** Collected: 03/27/18 15:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.2	1	04/04/18 10:58	04/06/18 15:11	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	309-00-2	
alpha-BHC	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	319-84-6	
beta-BHC	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	319-85-7	
delta-BHC	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	58-89-9	
Chlordane (Technical)	ND	ug/kg	45.9	2	03/28/18 12:51	04/05/18 21:17	57-74-9	
alpha-Chlordane	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	5103-71-9	
gamma-Chlordane	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	5103-74-2	
4,4'-DDD	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 21:17	72-54-8	
4,4'-DDE	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 21:17	72-55-9	
4,4'-DDT	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 21:17	50-29-3	
Dieldrin	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 21:17	60-57-1	
Endosulfan I	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	959-98-8	
Endosulfan II	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 21:17	33213-65-9	
Endosulfan sulfate	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 21:17	1031-07-8	
Endrin	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 21:17	72-20-8	
Endrin aldehyde	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 21:17	7421-93-4	
Endrin ketone	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 21:17	53494-70-5	
Heptachlor	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	76-44-8	
Heptachlor epoxide	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	1024-57-3	
Methoxychlor	ND	ug/kg	45.9	2	03/28/18 12:51	04/05/18 21:17	72-43-5	
Toxaphene	ND	ug/kg	137	2	03/28/18 12:51	04/05/18 21:17	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	54	%	30-150	2	03/28/18 12:51	04/05/18 21:17	877-09-8	6M, D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-E2 (11-21 S) **Lab ID: 10425111005** Collected: 03/27/18 15:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Surrogates								
Decachlorobiphenyl (S)	79	%.	30-150	2	03/28/18 12:51	04/05/18 21:17	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	11100-14-4	
PCB, Total	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	79	%.	48-125	1	03/28/18 12:51	04/02/18 13:36	877-09-8	
Decachlorobiphenyl (S)	85	%.	30-134	1	03/28/18 12:51	04/02/18 13:36	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	ND	mg/kg	12.7	1	03/28/18 18:58	03/29/18 14:36		
Surrogates								
n-Triacontane (S)	86	%.	50-150	1	03/28/18 18:58	03/29/18 14:36	638-68-6	
WIGRO GCV								
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	14.9	1	04/03/18 15:49	04/03/18 20:21		
Surrogates								
a,a,a-Trifluorotoluene (S)	100	%.	80-150	1	04/03/18 15:49	04/03/18 20:21	98-08-8	
6010C MET ICP								
Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	9940	mg/kg	12.8	1	03/30/18 05:23	04/02/18 11:56	7429-90-5	
Barium	144	mg/kg	0.64	1	03/30/18 05:23	04/02/18 11:56	7440-39-3	
Boron	439	mg/kg	9.6	1	03/30/18 05:23	04/02/18 11:56	7440-42-8	
Copper	20.1	mg/kg	0.64	1	03/30/18 05:23	04/02/18 11:56	7440-50-8	
Iron	31500	mg/kg	15.9	5	03/30/18 05:23	04/02/18 13:00	7439-89-6	
Manganese	173	mg/kg	0.32	1	03/30/18 05:23	04/02/18 11:56	7439-96-5	
Nickel	62.7	mg/kg	1.3	1	03/30/18 05:23	04/02/18 11:56	7440-02-0	
Silver	ND	mg/kg	0.64	1	03/30/18 05:23	04/02/18 11:56	7440-22-4	
Tin	ND	mg/kg	4.8	1	03/30/18 05:23	04/02/18 11:56	7440-31-5	
Titanium	558	mg/kg	1.6	1	03/30/18 05:23	04/02/18 11:56	7440-32-6	
Zinc	154	mg/kg	1.3	1	03/30/18 05:23	04/02/18 11:56	7440-66-6	
6020 MET ICPMS								
Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	47.5	mg/kg	1.2	5	04/04/18 17:21	04/08/18 15:28	7440-47-3	N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-E2 (11-21 S) **Lab ID: 10425111005** Collected: 03/27/18 15:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	2.0	mg/kg	0.69	20	03/30/18 05:24	03/30/18 10:55	7440-36-0	
Arsenic	21.1	mg/kg	0.69	20	03/30/18 05:24	03/30/18 10:55	7440-38-2	
Beryllium	2.6	mg/kg	0.28	20	03/30/18 05:24	03/30/18 10:55	7440-41-7	
Cadmium	1.8	mg/kg	0.11	20	03/30/18 05:24	03/30/18 10:55	7440-43-9	
Cobalt	6.7	mg/kg	0.69	20	03/30/18 05:24	03/30/18 10:55	7440-48-4	
Lead	29.0	mg/kg	0.14	20	03/30/18 05:24	03/30/18 10:55	7439-92-1	
Lithium	10.7	mg/kg	0.69	20	03/30/18 05:24	03/30/18 10:55	7439-93-2	
Selenium	5.1	mg/kg	0.69	20	03/30/18 05:24	03/30/18 10:55	7782-49-2	
Strontium	60.9	mg/kg	0.69	20	03/30/18 05:24	03/30/18 10:55	7440-24-6	
Vanadium	301	mg/kg	1.4	20	03/30/18 05:24	03/30/18 10:55	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.033	mg/kg	0.028	1	03/30/18 05:24	04/04/18 17:56	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	27.4	%	0.10	1		03/29/18 13:24		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	83-32-9	
Acenaphthylene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	208-96-8	
Anthracene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	120-12-7	
Benzo(a)anthracene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	56-55-3	
Benzo(a)pyrene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	101-55-3	
Butylbenzylphthalate	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	85-68-7	
Carbazole	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	59-50-7	
4-Chloroaniline	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	108-60-1	
2-Chloronaphthalene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	91-58-7	
2-Chlorophenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	7005-72-3	
Chrysene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	53-70-3	
Dibenzofuran	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	120-83-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: **FD-SB-E2 (11-21 S)** Lab ID: **10425111005** Collected: 03/27/18 15:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Diethylphthalate	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	105-67-9	
Dimethylphthalate	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	131-11-3	
Di-n-butylphthalate	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2340	1	03/29/18 13:52	04/05/18 17:36	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	606-20-2	
Di-n-octylphthalate	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	117-81-7	
Fluoranthene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	206-44-0	
Fluorene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	87-68-3	
Hexachlorobenzene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	118-74-1	
Hexachloroethane	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	193-39-5	
Isophorone	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	78-59-1	
1-Methylnaphthalene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	90-12-0	
2-Methylnaphthalene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	908	1	03/29/18 13:52	04/05/18 17:36		
Naphthalene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	91-20-3	
2-Nitroaniline	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	88-74-4	
3-Nitroaniline	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	99-09-2	
4-Nitroaniline	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	100-01-6	
Nitrobenzene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	98-95-3	
2-Nitrophenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	88-75-5	
4-Nitrophenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	86-30-6	
Pentachlorophenol	ND	ug/kg	922	1	03/29/18 13:52	04/05/18 17:36	87-86-5	
Phenanthrene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	85-01-8	
Phenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	108-95-2	
Pyrene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	60	%	43-125	1	03/29/18 13:52	04/05/18 17:36	4165-60-0	
2-Fluorobiphenyl (S)	59	%	30-132	1	03/29/18 13:52	04/05/18 17:36	321-60-8	
p-Terphenyl-d14 (S)	84	%	62-125	1	03/29/18 13:52	04/05/18 17:36	1718-51-0	
Phenol-d6 (S)	72	%	48-125	1	03/29/18 13:52	04/05/18 17:36	13127-88-3	
2-Fluorophenol (S)	74	%	40-125	1	03/29/18 13:52	04/05/18 17:36	367-12-4	
2,4,6-Tribromophenol (S)	73	%	60-125	1	03/29/18 13:52	04/05/18 17:36	118-79-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-E2 (11-21 S) **Lab ID: 10425111005** Collected: 03/27/18 15:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	83-32-9	
Acenaphthylene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	208-96-8	
Anthracene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	120-12-7	
Benzo(a)anthracene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	56-55-3	
Benzo(a)pyrene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	207-08-9	
Chrysene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	53-70-3	
Fluoranthene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	206-44-0	
Fluorene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	193-39-5	
Naphthalene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	91-20-3	
Phenanthrene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	85-01-8	
Pyrene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	63	%.	42-125	1	04/03/18 17:20	04/04/18 12:46	321-60-8	
p-Terphenyl-d14 (S)	88	%.	57-125	1	04/03/18 17:20	04/04/18 12:46	1718-51-0	
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	25057-89-0	
2,4-D	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	94-75-7	
2,4-DB	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	94-82-6	
Dicamba	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	1918-00-9	
Dinoseb	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	88-85-7	
MCPA	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	94-74-6	
Pentachlorophenol	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	87-86-5	
Picloram	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	1918-02-1	
2,4,5-T	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	93-72-1	
Triclopyr	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	55335-06-3	
Surrogates								
2,4-DCAA (S)	52	%.	46-125	1	03/29/18 07:30	04/04/18 17:45	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1460	1	03/28/18 15:25	03/29/18 11:58	67-64-1	
Allyl chloride	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	107-05-1	
Benzene	ND	ug/kg	29.3	1	03/28/18 15:25	03/29/18 11:58	71-43-2	
Bromobenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	108-86-1	
Bromochloromethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	74-97-5	
Bromodichloromethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	75-27-4	
Bromoform	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	75-25-2	
Bromomethane	ND	ug/kg	731	1	03/28/18 15:25	03/29/18 11:58	74-83-9	
2-Butanone (MEK)	ND	ug/kg	366	1	03/28/18 15:25	03/29/18 11:58	78-93-3	
n-Butylbenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	104-51-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-E2 (11-21 S) **Lab ID: 10425111005** Collected: 03/27/18 15:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
sec-Butylbenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	135-98-8	
tert-Butylbenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	98-06-6	
Carbon tetrachloride	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	56-23-5	
Chlorobenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	108-90-7	
Chloroethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	75-00-3	
Chloroform	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	67-66-3	
Chloromethane	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	74-87-3	
2-Chlorotoluene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	95-49-8	
4-Chlorotoluene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	96-12-8	
Dibromochloromethane	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	106-93-4	
Dibromomethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	75-71-8	
1,1-Dichloroethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	75-34-3	
1,2-Dichloroethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	107-06-2	
1,1-Dichloroethene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	156-60-5	
Dichlorofluoromethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	75-43-4	
1,2-Dichloropropane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	78-87-5	
1,3-Dichloropropane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	142-28-9	
2,2-Dichloropropane	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	594-20-7	
1,1-Dichloropropene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	60-29-7	
Ethylbenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	366	1	03/28/18 15:25	03/29/18 11:58	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	98-82-8	
p-Isopropyltoluene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	99-87-6	
Methylene Chloride	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	366	1	03/28/18 15:25	03/29/18 11:58	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	1634-04-4	
Naphthalene	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	91-20-3	
n-Propylbenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	103-65-1	
Styrene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	79-34-5	N2
Tetrachloroethene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	127-18-4	
Tetrahydrofuran	ND	ug/kg	2930	1	03/28/18 15:25	03/29/18 11:58	109-99-9	
Toluene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	87-61-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-E2 (11-21 S) **Lab ID: 10425111005** Collected: 03/27/18 15:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,2,4-Trichlorobenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	79-00-5	
Trichloroethene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	76-13-1	
1,2,4-Trimethylbenzene	120	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	108-67-8	
Vinyl chloride	ND	ug/kg	29.3	1	03/28/18 15:25	03/29/18 11:58	75-01-4	
Xylene (Total)	ND	ug/kg	219	1	03/28/18 15:25	03/29/18 11:58	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	93	%.	75-125	1	03/28/18 15:25	03/29/18 11:58	17060-07-0	
Toluene-d8 (S)	96	%.	75-125	1	03/28/18 15:25	03/29/18 11:58	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1	03/28/18 15:25	03/29/18 11:58	460-00-4	

7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	13.6	5	04/02/18 15:00	04/04/18 14:01	18540-29-9	D3

Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	47.5	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	

9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.60	1	04/05/18 10:35	04/05/18 14:38	57-12-5	

9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	1.9	mg/kg	0.98	1	04/02/18 15:30	04/03/18 18:01	16984-48-8	

Sample: FD-SB-F2 (7-13 WM) **Lab ID: 10425111006** Collected: 03/27/18 16:20 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury		Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)						
Methyl Mercury	ND	ng/g	11.0	1	04/04/18 10:58	04/06/18 15:18	7439-97-6	N3
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA 3550						
Aldrin	ND	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	309-00-2	
alpha-BHC	ND	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	319-84-6	
beta-BHC	ND	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	319-85-7	
delta-BHC	15.5	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	58-89-9	
Chlordane (Technical)	ND	ug/kg	113	5	03/28/18 12:51	04/05/18 22:12	57-74-9	
alpha-Chlordane	ND	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	5103-71-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: **FD-SB-F2 (7-13 WM)** Lab ID: **10425111006** Collected: 03/27/18 16:20 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
gamma-Chlordane	ND	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	5103-74-2	
4,4'-DDD	ND	ug/kg	22.6	5	03/28/18 12:51	04/05/18 22:12	72-54-8	
4,4'-DDE	ND	ug/kg	22.6	5	03/28/18 12:51	04/05/18 22:12	72-55-9	
4,4'-DDT	ND	ug/kg	22.6	5	03/28/18 12:51	04/05/18 22:12	50-29-3	
Dieldrin	ND	ug/kg	22.6	5	03/28/18 12:51	04/05/18 22:12	60-57-1	
Endosulfan I	ND	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	959-98-8	
Endosulfan II	ND	ug/kg	22.6	5	03/28/18 12:51	04/05/18 22:12	33213-65-9	
Endosulfan sulfate	ND	ug/kg	22.6	5	03/28/18 12:51	04/05/18 22:12	1031-07-8	
Endrin	ND	ug/kg	22.6	5	03/28/18 12:51	04/05/18 22:12	72-20-8	
Endrin aldehyde	ND	ug/kg	22.6	5	03/28/18 12:51	04/05/18 22:12	7421-93-4	
Endrin ketone	52.1	ug/kg	22.6	5	03/28/18 12:51	04/05/18 22:12	53494-70-5	
Heptachlor	ND	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	76-44-8	
Heptachlor epoxide	ND	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	1024-57-3	
Methoxychlor	ND	ug/kg	113	5	03/28/18 12:51	04/05/18 22:12	72-43-5	
Toxaphene	ND	ug/kg	340	5	03/28/18 12:51	04/05/18 22:12	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	85	%	30-150	5	03/28/18 12:51	04/05/18 22:12	877-09-8	5M, D4
Decachlorobiphenyl (S)	93	%	30-150	5	03/28/18 12:51	04/05/18 22:12	2051-24-3	
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	11141-16-5	
PCB-1242 (Aroclor 1242)	1740	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	11100-14-4	
PCB, Total	1740	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	86	%	48-125	1	03/28/18 12:51	04/02/18 13:52	877-09-8	
Decachlorobiphenyl (S)	86	%	30-134	1	03/28/18 12:51	04/02/18 13:52	2051-24-3	
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	61.7	mg/kg	23.8	2	03/28/18 18:58	03/29/18 17:04		T6
Surrogates								
n-Triacontane (S)	75	%	50-150	2	03/28/18 18:58	03/29/18 17:04	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	14.6	mg/kg	13.8	1	04/03/18 15:49	04/03/18 21:09		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	04/03/18 15:49	04/03/18 21:09	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	11500	mg/kg	13.0	1	03/30/18 05:23	04/02/18 12:00	7429-90-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-F2 (7-13 WM) Lab ID: 10425111006 Collected: 03/27/18 16:20 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP								
Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Barium	158	mg/kg	0.65	1	03/30/18 05:23	04/02/18 12:00	7440-39-3	
Boron	157	mg/kg	9.7	1	03/30/18 05:23	04/02/18 12:00	7440-42-8	
Copper	55.8	mg/kg	0.65	1	03/30/18 05:23	04/02/18 12:00	7440-50-8	
Iron	37700	mg/kg	16.2	5	03/30/18 05:23	04/02/18 13:04	7439-89-6	
Manganese	330	mg/kg	0.32	1	03/30/18 05:23	04/02/18 12:00	7439-96-5	
Nickel	27.1	mg/kg	1.3	1	03/30/18 05:23	04/02/18 12:00	7440-02-0	
Silver	2.3	mg/kg	0.65	1	03/30/18 05:23	04/02/18 12:00	7440-22-4	
Tin	11.8	mg/kg	4.9	1	03/30/18 05:23	04/02/18 12:00	7440-31-5	
Titanium	450	mg/kg	1.6	1	03/30/18 05:23	04/02/18 12:00	7440-32-6	
Zinc	176	mg/kg	1.3	1	03/30/18 05:23	04/02/18 12:00	7440-66-6	
6020 MET ICPMS								
Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	52.1	mg/kg	1.3	5	04/04/18 17:21	04/08/18 15:33	7440-47-3	N2
6020A MET ICPMS								
Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	17.1	mg/kg	0.66	20	03/30/18 05:24	03/30/18 10:58	7440-36-0	
Arsenic	20.9	mg/kg	0.66	20	03/30/18 05:24	03/30/18 10:58	7440-38-2	
Beryllium	2.4	mg/kg	0.26	20	03/30/18 05:24	03/30/18 10:58	7440-41-7	
Cadmium	2.9	mg/kg	0.11	20	03/30/18 05:24	03/30/18 10:58	7440-43-9	
Cobalt	8.1	mg/kg	0.66	20	03/30/18 05:24	03/30/18 10:58	7440-48-4	
Lead	88.7	mg/kg	0.13	20	03/30/18 05:24	03/30/18 10:58	7439-92-1	
Lithium	11.5	mg/kg	0.66	20	03/30/18 05:24	03/30/18 10:58	7439-93-2	
Selenium	4.9	mg/kg	0.66	20	03/30/18 05:24	03/30/18 10:58	7782-49-2	
Strontium	73.7	mg/kg	0.66	20	03/30/18 05:24	03/30/18 10:58	7440-24-6	
Vanadium	121	mg/kg	1.3	20	03/30/18 05:24	03/30/18 10:58	7440-62-2	
7471 Mercury								
Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.11	mg/kg	0.024	1	03/30/18 05:24	04/04/18 17:58	7439-97-6	
Dry Weight / %M by ASTM D2974								
Analytical Method: ASTM D2974								
Percent Moisture	26.6	%	0.10	1		03/29/18 13:55		
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	83-32-9	
Acenaphthylene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	208-96-8	
Anthracene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	120-12-7	
Benzo(a)anthracene	1340	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	56-55-3	
Benzo(a)pyrene	1200	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	50-32-8	
Benzo(b)fluoranthene	2060	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	205-99-2	
Benzo(g,h,i)perylene	707	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	191-24-2	
Benzo(k)fluoranthene	575	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	101-55-3	
Butylbenzylphthalate	3600	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	85-68-7	
Carbazole	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	59-50-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: **FD-SB-F2 (7-13 WM)** Lab ID: **10425111006** Collected: 03/27/18 16:20 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
4-Chloroaniline	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	108-60-1	
2-Chloronaphthalene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	91-58-7	
2-Chlorophenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	7005-72-3	
Chrysene	1580	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	53-70-3	
Dibenzofuran	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	120-83-2	
Diethylphthalate	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	105-67-9	
Dimethylphthalate	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	131-11-3	
Di-n-butylphthalate	800	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2320	1	03/29/18 13:52	04/05/18 18:06	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	606-20-2	
Di-n-octylphthalate	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	122-66-7	
bis(2-Ethylhexyl)phthalate	118000	ug/kg	22500	50	03/29/18 13:52	04/08/18 19:06	117-81-7	
Fluoranthene	4360	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	206-44-0	
Fluorene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	87-68-3	
Hexachlorobenzene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	118-74-1	
Hexachloroethane	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	67-72-1	
Indeno(1,2,3-cd)pyrene	631	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	193-39-5	
Isophorone	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	78-59-1	
1-Methylnaphthalene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	90-12-0	
2-Methylnaphthalene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	899	1	03/29/18 13:52	04/05/18 18:06		
Naphthalene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	91-20-3	
2-Nitroaniline	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	88-74-4	
3-Nitroaniline	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	99-09-2	
4-Nitroaniline	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	100-01-6	
Nitrobenzene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	98-95-3	
2-Nitrophenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	88-75-5	
4-Nitrophenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	621-64-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-F2 (7-13 WM) **Lab ID: 10425111006** Collected: 03/27/18 16:20 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

N-Nitrosodiphenylamine	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	86-30-6	
Pentachlorophenol	ND	ug/kg	913	1	03/29/18 13:52	04/05/18 18:06	87-86-5	
Phenanthrene	3120	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	85-01-8	
Phenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	108-95-2	
Pyrene	2920	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	63	%	43-125	1	03/29/18 13:52	04/05/18 18:06	4165-60-0	
2-Fluorobiphenyl (S)	70	%	30-132	1	03/29/18 13:52	04/05/18 18:06	321-60-8	
p-Terphenyl-d14 (S)	75	%	62-125	1	03/29/18 13:52	04/05/18 18:06	1718-51-0	
Phenol-d6 (S)	68	%	48-125	1	03/29/18 13:52	04/05/18 18:06	13127-88-3	
2-Fluorophenol (S)	68	%	40-125	1	03/29/18 13:52	04/05/18 18:06	367-12-4	
2,4,6-Tribromophenol (S)	70	%	60-125	1	03/29/18 13:52	04/05/18 18:06	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	83-32-9	
Acenaphthylene	ND	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	208-96-8	
Anthracene	ND	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	120-12-7	
Benzo(a)anthracene	30.7	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	56-55-3	
Benzo(a)pyrene	34.9	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	50-32-8	
Benzo(b)fluoranthene	48.4	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	205-99-2	
Benzo(g,h,i)perylene	22.1	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	191-24-2	
Benzo(k)fluoranthene	17.2	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	207-08-9	
Chrysene	37.9	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	53-70-3	
Fluoranthene	60.0	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	206-44-0	
Fluorene	ND	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	86-73-7	
Indeno(1,2,3-cd)pyrene	17.0	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	193-39-5	
Naphthalene	ND	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	91-20-3	
Phenanthrene	33.4	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	85-01-8	
Pyrene	59.2	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	76	%	42-125	1	03/28/18 19:00	03/30/18 16:11	321-60-8	
p-Terphenyl-d14 (S)	95	%	57-125	1	03/28/18 19:00	03/30/18 16:11	1718-51-0	

8270D MSSV MDA LIST 2

Analytical Method: EPA 8270D Preparation Method: EPA 3546

Bentazon	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	25057-89-0	
2,4-D	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	94-75-7	
2,4-DB	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	94-82-6	
Dicamba	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	1918-00-9	M1, R1
Dinoseb	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	88-85-7	R1
MCPA	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	94-74-6	
Pentachlorophenol	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	87-86-5	
Picloram	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	1918-02-1	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-F2 (7-13 WM) Lab ID: 10425111006 Collected: 03/27/18 16:20 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
2,4,5-T	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	93-72-1	
Triclopyr	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	55335-06-3	
Surrogates								
2,4-DCAA (S)	69	%	46-125	1	03/29/18 07:30	04/04/18 18:00	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1420	1	03/28/18 15:25	03/29/18 13:05	67-64-1	
Allyl chloride	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	107-05-1	
Benzene	ND	ug/kg	28.4	1	03/28/18 15:25	03/29/18 13:05	71-43-2	
Bromobenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	108-86-1	
Bromochloromethane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	74-97-5	
Bromodichloromethane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	75-27-4	
Bromoform	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	75-25-2	
Bromomethane	ND	ug/kg	710	1	03/28/18 15:25	03/29/18 13:05	74-83-9	
2-Butanone (MEK)	ND	ug/kg	355	1	03/28/18 15:25	03/29/18 13:05	78-93-3	
n-Butylbenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	104-51-8	
sec-Butylbenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	135-98-8	
tert-Butylbenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	98-06-6	
Carbon tetrachloride	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	56-23-5	
Chlorobenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	108-90-7	
Chloroethane	ND	ug/kg	710	1	03/28/18 15:25	03/29/18 13:05	75-00-3	
Chloroform	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	67-66-3	
Chloromethane	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	74-87-3	
2-Chlorotoluene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	95-49-8	
4-Chlorotoluene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	710	1	03/28/18 15:25	03/29/18 13:05	96-12-8	
Dibromochloromethane	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	106-93-4	
Dibromomethane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	75-71-8	
1,1-Dichloroethane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	75-34-3	
1,2-Dichloroethane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	107-06-2	
1,1-Dichloroethene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	156-60-5	
Dichlorofluoromethane	ND	ug/kg	710	1	03/28/18 15:25	03/29/18 13:05	75-43-4	
1,2-Dichloropropane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	78-87-5	
1,3-Dichloropropane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	142-28-9	
2,2-Dichloropropane	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	594-20-7	
1,1-Dichloropropene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	10061-02-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-F2 (7-13 WM) **Lab ID: 10425111006** Collected: 03/27/18 16:20 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Diethyl ether (Ethyl ether)	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	60-29-7	
Ethylbenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	355	1	03/28/18 15:25	03/29/18 13:05	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	98-82-8	
p-Isopropyltoluene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	99-87-6	
Methylene Chloride	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	355	1	03/28/18 15:25	03/29/18 13:05	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	1634-04-4	
Naphthalene	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	91-20-3	
n-Propylbenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	103-65-1	
Styrene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	79-34-5	N2
Tetrachloroethene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	127-18-4	
Tetrahydrofuran	ND	ug/kg	2840	1	03/28/18 15:25	03/29/18 13:05	109-99-9	
Toluene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	79-00-5	
Trichloroethene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	76-13-1	
1,2,4-Trimethylbenzene	94.7	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	108-67-8	
Vinyl chloride	ND	ug/kg	28.4	1	03/28/18 15:25	03/29/18 13:05	75-01-4	
Xylene (Total)	ND	ug/kg	213	1	03/28/18 15:25	03/29/18 13:05	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%	75-125	1	03/28/18 15:25	03/29/18 13:05	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	03/28/18 15:25	03/29/18 13:05	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125	1	03/28/18 15:25	03/29/18 13:05	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	27.0	10	04/02/18 15:00	04/04/18 14:01	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	52.1	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.45	mg/kg	0.40	1	04/05/18 10:35	04/05/18 14:39	57-12-5	B
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.97	1	04/02/18 15:30	04/03/18 18:20	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 140178 Analysis Method: EPA 1630 (1998)
 QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 555070 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.18	04/06/18 13:51	N3

METHOD BLANK: 555071 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.20	04/06/18 13:58	N3

METHOD BLANK: 555072 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.03	04/06/18 14:05	N3

LABORATORY CONTROL SAMPLE: 555073

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	105	90.2	86	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 555074 555075

Parameter	Units	10425111001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	446	407	290	293	65	72	65-135	1	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 530355 Analysis Method: WI MOD GRO
 QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2878567 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	04/03/18 18:43	
a,a,a-Trifluorotoluene (S)	%	100	80-150	04/03/18 18:43	

LABORATORY CONTROL SAMPLE & LCSD: 2878568 2878569

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	44.7	44.7	89	89	80-120	0	20	
a,a,a-Trifluorotoluene (S)	%				99	99	80-150			

MATRIX SPIKE SAMPLE: 2879442

Parameter	Units	10425111005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg		ND	74.7	75.8	98	80-120
a,a,a-Trifluorotoluene (S)	%				99	80-150	

SAMPLE DUPLICATE: 2879443

Parameter	Units	10425111006 Result	Dup Result	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	14.6	11.2J		20	
a,a,a-Trifluorotoluene (S)	%	98	99	8		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529756 Analysis Method: EPA 7471
 QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2875501 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.018	04/04/18 17:35	

LABORATORY CONTROL SAMPLE: 2875502

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.43	0.48	112	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875503 2875504

Parameter	Units	2875503		2875504		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10425111001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Mercury	mg/kg	0.070	.66	.62	0.77	0.74	105	107	80-120	4	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529753 Analysis Method: EPA 6010C
 QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2875489 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.8	04/02/18 11:01	
Barium	mg/kg	ND	0.49	04/02/18 11:01	
Boron	mg/kg	ND	7.4	04/02/18 11:01	
Copper	mg/kg	ND	0.49	04/02/18 11:01	
Iron	mg/kg	ND	2.5	04/02/18 11:01	
Manganese	mg/kg	ND	0.25	04/02/18 11:01	
Nickel	mg/kg	ND	0.98	04/02/18 11:01	
Silver	mg/kg	ND	0.49	04/02/18 11:01	
Tin	mg/kg	ND	3.7	04/02/18 11:01	
Titanium	mg/kg	ND	1.2	04/02/18 11:01	
Zinc	mg/kg	ND	0.98	04/02/18 11:01	

LABORATORY CONTROL SAMPLE: 2875490

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	962	995	104	80-120	
Barium	mg/kg	48.1	50.8	106	80-120	
Boron	mg/kg	48.1	46.1	96	80-120	
Copper	mg/kg	48.1	50.1	104	80-120	
Iron	mg/kg	962	1000	104	80-120	
Manganese	mg/kg	48.1	50.7	105	80-120	
Nickel	mg/kg	48.1	50.0	104	80-120	
Silver	mg/kg	24	24.0	100	80-120	
Tin	mg/kg	48.1	50.5	105	80-120	
Titanium	mg/kg	48.1	50.3	105	80-120	
Zinc	mg/kg	48.1	50.6	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875491 2875492

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10425453001 Result	Spike Conc.	Spike Conc.	Result							
Aluminum	mg/kg	4040	1100	1110	5880	4800	167	68	75-125	20	20	P6
Barium	mg/kg	46.6	54.9	55.5	623	93.7	1050	85	75-125	148	20	M1,R1
Boron	mg/kg	ND	54.9	55.5	62.8	60.0	101	95	75-125	5	20	
Copper	mg/kg	8.5	54.9	55.5	69.6	61.1	111	95	75-125	13	20	
Iron	mg/kg	11200	1100	1110	13600	10000	223	-107	75-125	31	20	P6,R1
Manganese	mg/kg	442	54.9	55.5	9660	528	16800	157	75-125	179	20	P6
Nickel	mg/kg	9.3	54.9	55.5	182	58.9	313	89	75-125	102	20	M1,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Parameter	Units	10425453001		2875491		2875492		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS Result	MSD Result							
Silver	mg/kg	ND	27.5	27.7	26.2	26.6	95	96	75-125	1	20			
Tin	mg/kg	ND	54.9	55.5	53.5	50.4	95	88	75-125	6	20			
Titanium	mg/kg	158	54.9	55.5	256	219	179	111	75-125	16	20	M1		
Zinc	mg/kg	59.3	54.9	55.5	130	90.5	129	56	75-125	36	20	M1, R1		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 435596 Analysis Method: EPA 6020
 QC Batch Method: EPA 3050B Analysis Description: 6020 MET
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2011670 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.18	04/08/18 14:34	N2

LABORATORY CONTROL SAMPLE: 2011671

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.7	3.8	102	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2011672 2011673

Parameter	Units	2011672		2011673		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10425111003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Chromium	mg/kg	51.1	4.81	4.81	48.6	136	-52	1770	75-125	95	20	1M, E, M0, N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529754 Analysis Method: EPA 6020A
 QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2875493 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.48	03/30/18 10:14	
Arsenic	mg/kg	ND	0.48	03/30/18 10:14	
Beryllium	mg/kg	ND	0.19	03/30/18 10:14	
Cadmium	mg/kg	ND	0.077	03/30/18 10:14	
Cobalt	mg/kg	ND	0.48	03/30/18 10:14	
Lead	mg/kg	ND	0.096	03/30/18 10:14	
Lithium	mg/kg	ND	0.48	03/30/18 10:14	
Selenium	mg/kg	ND	0.48	03/30/18 10:14	
Strontium	mg/kg	ND	0.48	03/30/18 10:14	
Vanadium	mg/kg	ND	0.96	03/30/18 10:14	

LABORATORY CONTROL SAMPLE: 2875494

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	48.5	46.2	95	80-120	
Arsenic	mg/kg	48.5	46.3	95	80-120	
Beryllium	mg/kg	48.5	47.1	97	80-120	
Cadmium	mg/kg	48.5	46.4	96	80-120	
Cobalt	mg/kg	48.5	47.7	98	80-120	
Lead	mg/kg	48.5	49.3	102	80-120	
Lithium	mg/kg	48.5	48.0	99	80-120	
Selenium	mg/kg	48.5	49.9	103	80-120	
Strontium	mg/kg	48.5	47.2	97	80-120	
Vanadium	mg/kg	48.5	47.5	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875495 2875496

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10425111001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Antimony	mg/kg	2.0	66.2	66.7	46.1	46.6	67	67	75-125	1	20	M6
Arsenic	mg/kg	23.3	66.2	66.7	83.3	87.7	91	96	75-125	5	20	
Beryllium	mg/kg	3.1	66.2	66.7	63.4	63.2	91	90	75-125	0	20	
Cadmium	mg/kg	2.3	66.2	66.7	65.1	67.0	95	97	75-125	3	20	
Cobalt	mg/kg	8.3	66.2	66.7	71.9	72.9	96	97	75-125	1	20	
Lead	mg/kg	37.7	66.2	66.7	107	119	105	122	75-125	11	20	
Lithium	mg/kg	14.9	66.2	66.7	75.7	75.2	92	90	75-125	1	20	
Selenium	mg/kg	5.4	66.2	66.7	67.5	69.2	94	96	75-125	3	20	
Strontium	mg/kg	77.3	66.2	66.7	135	137	87	90	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2875495		2875496									
Parameter	Units	10425111001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
Vanadium	mg/kg	124	66.2	66.7	199	207	113	124	75-125	4	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529626 Analysis Method: ASTM D2974
 QC Batch Method: ASTM D2974 Analysis Description: Dry Weight / %M by ASTM D2974
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005

SAMPLE DUPLICATE: 2874677

Parameter	Units	10425327002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	28.4	28.5	1	30	

SAMPLE DUPLICATE: 2874678

Parameter	Units	10425111005 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	27.4	30.5	10	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529638

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10425111006

SAMPLE DUPLICATE: 2874717

Parameter	Units	10425324012 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	12.7	11.8	8	30	

SAMPLE DUPLICATE: 2875004

Parameter	Units	12106379001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	52.5	53.3	1	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529503 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2873977 Matrix: Solid
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	03/28/18 21:05	
1,1,1-Trichloroethane	ug/kg	ND	50.0	03/28/18 21:05	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	03/28/18 21:05	N2
1,1,2-Trichloroethane	ug/kg	ND	50.0	03/28/18 21:05	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	03/28/18 21:05	
1,1-Dichloroethane	ug/kg	ND	50.0	03/28/18 21:05	
1,1-Dichloroethene	ug/kg	ND	50.0	03/28/18 21:05	
1,1-Dichloropropene	ug/kg	ND	50.0	03/28/18 21:05	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	03/28/18 21:05	
1,2,3-Trichloropropane	ug/kg	ND	200	03/28/18 21:05	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	03/28/18 21:05	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	03/28/18 21:05	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	03/28/18 21:05	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	03/28/18 21:05	
1,2-Dichlorobenzene	ug/kg	ND	50.0	03/28/18 21:05	
1,2-Dichloroethane	ug/kg	ND	50.0	03/28/18 21:05	
1,2-Dichloropropane	ug/kg	ND	50.0	03/28/18 21:05	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	03/28/18 21:05	
1,3-Dichlorobenzene	ug/kg	ND	50.0	03/28/18 21:05	
1,3-Dichloropropane	ug/kg	ND	50.0	03/28/18 21:05	
1,4-Dichlorobenzene	ug/kg	ND	50.0	03/28/18 21:05	
2,2-Dichloropropane	ug/kg	ND	200	03/28/18 21:05	
2-Butanone (MEK)	ug/kg	ND	250	03/28/18 21:05	
2-Chlorotoluene	ug/kg	ND	50.0	03/28/18 21:05	
4-Chlorotoluene	ug/kg	ND	50.0	03/28/18 21:05	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	03/28/18 21:05	
Acetone	ug/kg	ND	1000	03/28/18 21:05	
Allyl chloride	ug/kg	ND	200	03/28/18 21:05	
Benzene	ug/kg	ND	20.0	03/28/18 21:05	
Bromobenzene	ug/kg	ND	50.0	03/28/18 21:05	
Bromochloromethane	ug/kg	ND	50.0	03/28/18 21:05	
Bromodichloromethane	ug/kg	ND	50.0	03/28/18 21:05	
Bromoform	ug/kg	ND	200	03/28/18 21:05	
Bromomethane	ug/kg	ND	500	03/28/18 21:05	
Carbon tetrachloride	ug/kg	ND	50.0	03/28/18 21:05	
Chlorobenzene	ug/kg	ND	50.0	03/28/18 21:05	
Chloroethane	ug/kg	ND	500	03/28/18 21:05	
Chloroform	ug/kg	ND	50.0	03/28/18 21:05	
Chloromethane	ug/kg	ND	200	03/28/18 21:05	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	03/28/18 21:05	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	03/28/18 21:05	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

METHOD BLANK: 2873977

Matrix: Solid

Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	03/28/18 21:05	
Dibromomethane	ug/kg	ND	50.0	03/28/18 21:05	
Dichlorodifluoromethane	ug/kg	ND	200	03/28/18 21:05	
Dichlorofluoromethane	ug/kg	ND	500	03/28/18 21:05	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	03/28/18 21:05	
Ethylbenzene	ug/kg	ND	50.0	03/28/18 21:05	
Hexachloro-1,3-butadiene	ug/kg	ND	250	03/28/18 21:05	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	03/28/18 21:05	
Methyl-tert-butyl ether	ug/kg	ND	50.0	03/28/18 21:05	
Methylene Chloride	ug/kg	ND	200	03/28/18 21:05	
n-Butylbenzene	ug/kg	ND	50.0	03/28/18 21:05	
n-Propylbenzene	ug/kg	ND	50.0	03/28/18 21:05	
Naphthalene	ug/kg	ND	200	03/28/18 21:05	
p-Isopropyltoluene	ug/kg	ND	50.0	03/28/18 21:05	
sec-Butylbenzene	ug/kg	ND	50.0	03/28/18 21:05	
Styrene	ug/kg	ND	50.0	03/28/18 21:05	
tert-Butylbenzene	ug/kg	ND	50.0	03/28/18 21:05	
Tetrachloroethene	ug/kg	ND	50.0	03/28/18 21:05	
Tetrahydrofuran	ug/kg	ND	2000	03/28/18 21:05	
Toluene	ug/kg	ND	50.0	03/28/18 21:05	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	03/28/18 21:05	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	03/28/18 21:05	
Trichloroethene	ug/kg	ND	50.0	03/28/18 21:05	N2
Trichlorofluoromethane	ug/kg	ND	200	03/28/18 21:05	
Vinyl chloride	ug/kg	ND	20.0	03/28/18 21:05	
Xylene (Total)	ug/kg	ND	150	03/28/18 21:05	
1,2-Dichloroethane-d4 (S)	%	94	75-125	03/28/18 21:05	
4-Bromofluorobenzene (S)	%	102	75-125	03/28/18 21:05	
Toluene-d8 (S)	%	99	75-125	03/28/18 21:05	

LABORATORY CONTROL SAMPLE & LCSD: 2873978

2873979

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	899	871	90	87	59-125	3	20	
1,1,1-Trichloroethane	ug/kg	1000	906	866	91	87	59-125	5	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	933	916	93	92	58-125	2	20	N2
1,1,2-Trichloroethane	ug/kg	1000	905	857	91	86	64-125	5	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	844	836	84	84	65-125	1	20	
1,1-Dichloroethane	ug/kg	1000	873	834	87	83	63-125	5	20	
1,1-Dichloroethene	ug/kg	1000	908	896	91	90	59-125	1	20	
1,1-Dichloropropene	ug/kg	1000	974	944	97	94	64-125	3	20	
1,2,3-Trichlorobenzene	ug/kg	1000	845	863	84	86	55-126	2	20	
1,2,3-Trichloropropane	ug/kg	1000	905	833	91	83	62-125	8	20	
1,2,4-Trichlorobenzene	ug/kg	1000	864	883	86	88	62-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

LABORATORY CONTROL SAMPLE & LCSD: 2873978		2873979									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,2,4-Trimethylbenzene	ug/kg	1000	914	869	91	87	59-125	5	20		
1,2-Dibromo-3-chloropropane	ug/kg	2500	1970	1850	79	74	54-125	7	20		
1,2-Dibromoethane (EDB)	ug/kg	1000	907	836	91	84	64-125	8	20		
1,2-Dichlorobenzene	ug/kg	1000	905	849	91	85	63-125	6	20		
1,2-Dichloroethane	ug/kg	1000	809	768	81	77	57-125	5	20		
1,2-Dichloropropane	ug/kg	1000	881	846	88	85	67-125	4	20		
1,3,5-Trimethylbenzene	ug/kg	1000	903	884	90	88	59-125	2	20		
1,3-Dichlorobenzene	ug/kg	1000	848	839	85	84	64-125	1	20		
1,3-Dichloropropane	ug/kg	1000	901	849	90	85	64-125	6	20		
1,4-Dichlorobenzene	ug/kg	1000	866	823	87	82	63-125	5	20		
2,2-Dichloropropane	ug/kg	1000	915	865	91	87	37-126	6	20		
2-Butanone (MEK)	ug/kg	5000	4500	3950	90	79	48-125	13	20		
2-Chlorotoluene	ug/kg	1000	867	847	87	85	62-125	2	20		
4-Chlorotoluene	ug/kg	1000	916	881	92	88	63-125	4	20		
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4400	4190	88	84	52-135	5	20		
Acetone	ug/kg	5000	5760	5420	115	108	65-125	6	20		
Allyl chloride	ug/kg	1000	850	823	85	82	52-125	3	20		
Benzene	ug/kg	1000	889	852	89	85	61-125	4	20		
Bromobenzene	ug/kg	1000	907	864	91	86	64-125	5	20		
Bromochloromethane	ug/kg	1000	903	854	90	85	65-125	6	20		
Bromodichloromethane	ug/kg	1000	884	863	88	86	57-125	2	20		
Bromoform	ug/kg	1000	761	768	76	77	57-125	1	20		
Bromomethane	ug/kg	1000	882	867	88	87	60-125	2	20		
Carbon tetrachloride	ug/kg	1000	895	859	89	86	58-125	4	20		
Chlorobenzene	ug/kg	1000	886	856	89	86	66-125	3	20		
Chloroethane	ug/kg	1000	890	865	89	86	62-125	3	20		
Chloroform	ug/kg	1000	801	771	80	77	59-125	4	20		
Chloromethane	ug/kg	1000	839	854	84	85	50-125	2	20		
cis-1,2-Dichloroethene	ug/kg	1000	872	819	87	82	61-125	6	20		
cis-1,3-Dichloropropene	ug/kg	1000	891	844	89	84	61-125	5	20		
Dibromochloromethane	ug/kg	1000	812	821	81	82	60-125	1	20		
Dibromomethane	ug/kg	1000	885	842	88	84	69-125	5	20		
Dichlorodifluoromethane	ug/kg	1000	758	771	76	77	38-125	2	20		
Dichlorofluoromethane	ug/kg	1000	812	852	81	85	67-125	5	20		
Diethyl ether (Ethyl ether)	ug/kg	1000	1610	1600	161	160	60-125	1	20 L3		
Ethylbenzene	ug/kg	1000	897	854	90	85	62-125	5	20		
Hexachloro-1,3-butadiene	ug/kg	1000	841	890	84	89	56-125	6	20		
Isopropylbenzene (Cumene)	ug/kg	1000	942	911	94	91	65-125	3	20		
Methyl-tert-butyl ether	ug/kg	1000	863	817	86	82	59-125	5	20		
Methylene Chloride	ug/kg	1000	900	848	90	85	64-125	6	20		
n-Butylbenzene	ug/kg	1000	913	892	91	89	59-125	2	20		
n-Propylbenzene	ug/kg	1000	911	881	91	88	61-125	3	20		
Naphthalene	ug/kg	1000	1050	928	105	93	53-125	12	20		
p-Isopropyltoluene	ug/kg	1000	924	890	92	89	63-125	4	20		
sec-Butylbenzene	ug/kg	1000	923	906	92	91	62-125	2	20		
Styrene	ug/kg	1000	937	918	94	92	66-125	2	20		
tert-Butylbenzene	ug/kg	1000	913	877	91	88	64-125	4	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

LABORATORY CONTROL SAMPLE & LCSD: 2873978		2873979									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Tetrachloroethene	ug/kg	1000	906	889	91	89	67-125	2	20		
Tetrahydrofuran	ug/kg	10000	11500	11200	115	112	62-125	3	20	CH	
Toluene	ug/kg	1000	900	864	90	86	61-125	4	20		
trans-1,2-Dichloroethene	ug/kg	1000	935	880	94	88	64-125	6	20		
trans-1,3-Dichloropropene	ug/kg	1000	907	859	91	86	56-125	5	20		
Trichloroethene	ug/kg	1000	854	818	85	82	67-125	4	20	N2	
Trichlorofluoromethane	ug/kg	1000	815	837	82	84	65-125	3	20		
Vinyl chloride	ug/kg	1000	904	927	90	93	57-125	3	20		
Xylene (Total)	ug/kg	3000	2750	2640	92	88	62-125	4	20		
1,2-Dichloroethane-d4 (S)	%				96	95	75-125				
4-Bromofluorobenzene (S)	%				101	104	75-125				
Toluene-d8 (S)	%				100	102	75-125				

MATRIX SPIKE SAMPLE: 2873980		10425099001	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Parameter	Units	Result					
1,1,1,2-Tetrachloroethane	ug/kg	ND	1120	1090	98	64-146	
1,1,1-Trichloroethane	ug/kg	ND	1120	1180	106	56-148	
1,1,2,2-Tetrachloroethane	ug/kg	ND	1120	1100	99	36-150	N2
1,1,2-Trichloroethane	ug/kg	ND	1120	1130	101	67-148	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	1120	1020	92	60-142	
1,1-Dichloroethane	ug/kg	ND	1120	1020	92	57-140	
1,1-Dichloroethene	ug/kg	ND	1120	1100	98	59-139	
1,1-Dichloropropene	ug/kg	ND	1120	1170	105	61-142	
1,2,3-Trichlorobenzene	ug/kg	ND	1120	1050	94	69-150	
1,2,3-Trichloropropane	ug/kg	ND	1120	1020	92	64-150	
1,2,4-Trichlorobenzene	ug/kg	ND	1120	1080	97	71-149	
1,2,4-Trimethylbenzene	ug/kg	ND	1120	1120	97	67-149	
1,2-Dibromo-3-chloropropane	ug/kg	ND	2790	2450	88	61-150	
1,2-Dibromoethane (EDB)	ug/kg	ND	1120	1090	97	67-147	
1,2-Dichlorobenzene	ug/kg	ND	1120	1020	92	70-142	
1,2-Dichloroethane	ug/kg	ND	1120	968	87	58-132	
1,2-Dichloropropane	ug/kg	ND	1120	1080	97	64-144	
1,3,5-Trimethylbenzene	ug/kg	ND	1120	1060	94	71-146	
1,3-Dichlorobenzene	ug/kg	ND	1120	1020	91	71-142	
1,3-Dichloropropane	ug/kg	ND	1120	1070	96	68-140	
1,4-Dichlorobenzene	ug/kg	ND	1120	991	89	68-142	
2,2-Dichloropropane	ug/kg	ND	1120	1190	107	34-150	
2-Butanone (MEK)	ug/kg	ND	5570	5770	104	51-150	
2-Chlorotoluene	ug/kg	ND	1120	1030	92	66-144	
4-Chlorotoluene	ug/kg	ND	1120	1030	93	66-140	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	5570	5310	95	63-150	
Acetone	ug/kg	ND	5570	6740	121	54-150	
Allyl chloride	ug/kg	ND	1120	1070	96	53-135	
Benzene	ug/kg	1290	1120	2490	107	65-135	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

MATRIX SPIKE SAMPLE: 2873980		10425099001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/kg	ND	1120	1030	92	71-141	
Bromochloromethane	ug/kg	ND	1120	1050	94	62-145	
Bromodichloromethane	ug/kg	ND	1120	1140	103	59-148	
Bromoform	ug/kg	ND	1120	973	87	57-145	
Bromomethane	ug/kg	ND	1120	954	86	51-129	
Carbon tetrachloride	ug/kg	ND	1120	1160	104	55-144	
Chlorobenzene	ug/kg	ND	1120	1070	96	70-142	
Chloroethane	ug/kg	ND	1120	900	81	61-135	
Chloroform	ug/kg	ND	1120	949	85	58-135	
Chloromethane	ug/kg	ND	1120	910	82	37-125	
cis-1,2-Dichloroethene	ug/kg	ND	1120	1020	92	60-138	
cis-1,3-Dichloropropene	ug/kg	ND	1120	1150	103	62-142	
Dibromochloromethane	ug/kg	ND	1120	1030	93	65-141	
Dibromomethane	ug/kg	ND	1120	1080	97	72-150	
Dichlorodifluoromethane	ug/kg	ND	1120	713	64	30-125	
Dichlorofluoromethane	ug/kg	ND	1120	883	79	62-148	
Diethyl ether (Ethyl ether)	ug/kg	ND	1120	2070	185	62-135	M0
Ethylbenzene	ug/kg	277	1120	1340	95	72-138	
Hexachloro-1,3-butadiene	ug/kg	ND	1120	1220	109	38-150	
Isopropylbenzene (Cumene)	ug/kg	ND	1120	1120	100	75-148	
Methyl-tert-butyl ether	ug/kg	ND	1120	1000	90	63-139	
Methylene Chloride	ug/kg	ND	1120	973	87	58-135	
n-Butylbenzene	ug/kg	ND	1120	1140	102	63-150	
n-Propylbenzene	ug/kg	ND	1120	1090	97	70-146	
Naphthalene	ug/kg	ND	1120	1090	97	63-150	
p-Isopropyltoluene	ug/kg	165	1120	1280	100	72-150	
sec-Butylbenzene	ug/kg	ND	1120	1110	99	66-150	
Styrene	ug/kg	ND	1120	1110	100	72-146	
tert-Butylbenzene	ug/kg	ND	1120	1080	97	71-148	
Tetrachloroethene	ug/kg	ND	1120	1090	98	70-150	
Tetrahydrofuran	ug/kg	ND	11200	14100	127	62-150	
Toluene	ug/kg	985	1120	2400	127	65-142	
trans-1,2-Dichloroethene	ug/kg	ND	1120	1070	96	55-141	
trans-1,3-Dichloropropene	ug/kg	ND	1120	1090	98	57-147	
Trichloroethene	ug/kg	ND	1120	1090	98	62-150	N2
Trichlorofluoromethane	ug/kg	ND	1120	867	78	51-150	
Vinyl chloride	ug/kg	ND	1120	978	88	45-132	
Xylene (Total)	ug/kg	1060	3350	4460	101	75-140	
1,2-Dichloroethane-d4 (S)	%					93	75-125
4-Bromofluorobenzene (S)	%					99	75-125
Toluene-d8 (S)	%					99	75-125

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

SAMPLE DUPLICATE: 2873981

Parameter	Units	10425099002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,1-Trichloroethane	ug/kg	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND		30	N2
1,1,2-Trichloroethane	ug/kg	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	ND		30	
1,1-Dichloroethane	ug/kg	ND	ND		30	
1,1-Dichloroethene	ug/kg	ND	ND		30	
1,1-Dichloropropene	ug/kg	ND	ND		30	
1,2,3-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,3-Trichloropropane	ug/kg	ND	ND		30	
1,2,4-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,4-Trimethylbenzene	ug/kg	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/kg	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	ND		30	
1,2-Dichlorobenzene	ug/kg	ND	ND		30	
1,2-Dichloroethane	ug/kg	ND	ND		30	
1,2-Dichloropropane	ug/kg	ND	ND		30	
1,3,5-Trimethylbenzene	ug/kg	ND	ND		30	
1,3-Dichlorobenzene	ug/kg	ND	ND		30	
1,3-Dichloropropane	ug/kg	ND	ND		30	
1,4-Dichlorobenzene	ug/kg	ND	ND		30	
2,2-Dichloropropane	ug/kg	ND	ND		30	
2-Butanone (MEK)	ug/kg	ND	ND		30	
2-Chlorotoluene	ug/kg	ND	ND		30	
4-Chlorotoluene	ug/kg	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND		30	
Acetone	ug/kg	ND	ND		30	
Allyl chloride	ug/kg	ND	ND		30	
Benzene	ug/kg	ND	ND		30	
Bromobenzene	ug/kg	ND	ND		30	
Bromochloromethane	ug/kg	ND	ND		30	
Bromodichloromethane	ug/kg	ND	ND		30	
Bromoform	ug/kg	ND	ND		30	
Bromomethane	ug/kg	ND	ND		30	
Carbon tetrachloride	ug/kg	ND	ND		30	
Chlorobenzene	ug/kg	ND	ND		30	
Chloroethane	ug/kg	ND	ND		30	
Chloroform	ug/kg	ND	ND		30	
Chloromethane	ug/kg	ND	ND		30	
cis-1,2-Dichloroethene	ug/kg	ND	ND		30	
cis-1,3-Dichloropropene	ug/kg	ND	ND		30	
Dibromochloromethane	ug/kg	ND	ND		30	
Dibromomethane	ug/kg	ND	ND		30	
Dichlorodifluoromethane	ug/kg	ND	ND		30	
Dichlorofluoromethane	ug/kg	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/kg	ND	ND		30	
Ethylbenzene	ug/kg	ND	ND		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

SAMPLE DUPLICATE: 2873981

Parameter	Units	10425099002 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	ND	ND		30	
Isopropylbenzene (Cumene)	ug/kg	ND	ND		30	
Methyl-tert-butyl ether	ug/kg	ND	ND		30	
Methylene Chloride	ug/kg	ND	ND		30	
n-Butylbenzene	ug/kg	ND	ND		30	
n-Propylbenzene	ug/kg	ND	ND		30	
Naphthalene	ug/kg	ND	ND		30	
p-Isopropyltoluene	ug/kg	ND	ND		30	
sec-Butylbenzene	ug/kg	ND	ND		30	
Styrene	ug/kg	ND	ND		30	
tert-Butylbenzene	ug/kg	ND	ND		30	
Tetrachloroethene	ug/kg	ND	ND		30	
Tetrahydrofuran	ug/kg	ND	ND		30	
Toluene	ug/kg	ND	ND		30	
trans-1,2-Dichloroethene	ug/kg	ND	ND		30	
trans-1,3-Dichloropropene	ug/kg	ND	ND		30	
Trichloroethene	ug/kg	ND	ND		30	N2
Trichlorofluoromethane	ug/kg	ND	ND		30	
Vinyl chloride	ug/kg	ND	ND		30	
Xylene (Total)	ug/kg	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	92	92	3		
4-Bromofluorobenzene (S)	%.	102	102	2		
Toluene-d8 (S)	%.	97	99	0		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529466 Analysis Method: EPA 8081B
 QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2873686 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/05/18 18:14	
4,4'-DDE	ug/kg	ND	3.3	04/05/18 18:14	
4,4'-DDT	ug/kg	ND	3.3	04/05/18 18:14	
Aldrin	ug/kg	ND	1.7	04/05/18 18:14	
alpha-BHC	ug/kg	ND	1.7	04/05/18 18:14	
alpha-Chlordane	ug/kg	ND	1.7	04/05/18 18:14	
beta-BHC	ug/kg	ND	1.7	04/05/18 18:14	
Chlordane (Technical)	ug/kg	ND	16.7	04/05/18 18:14	
delta-BHC	ug/kg	ND	1.7	04/05/18 18:14	
Dieldrin	ug/kg	ND	3.3	04/05/18 18:14	
Endosulfan I	ug/kg	ND	1.7	04/05/18 18:14	
Endosulfan II	ug/kg	ND	3.3	04/05/18 18:14	
Endosulfan sulfate	ug/kg	ND	3.3	04/05/18 18:14	
Endrin	ug/kg	ND	3.3	04/05/18 18:14	
Endrin aldehyde	ug/kg	ND	3.3	04/05/18 18:14	
Endrin ketone	ug/kg	ND	3.3	04/05/18 18:14	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/05/18 18:14	
gamma-Chlordane	ug/kg	ND	1.7	04/05/18 18:14	
Heptachlor	ug/kg	ND	1.7	04/05/18 18:14	
Heptachlor epoxide	ug/kg	ND	1.7	04/05/18 18:14	
Methoxychlor	ug/kg	ND	16.7	04/05/18 18:14	
Toxaphene	ug/kg	ND	50.0	04/05/18 18:14	
Decachlorobiphenyl (S)	%	95	30-150	04/05/18 18:14	
Tetrachloro-m-xylene (S)	%	91	30-150	04/05/18 18:14	

LABORATORY CONTROL SAMPLE: 2873687

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	33.1	99	62-127	
4,4'-DDE	ug/kg	33.3	32.4	97	66-125	
4,4'-DDT	ug/kg	33.3	33.2	99	67-128	CH
Aldrin	ug/kg	16.7	14.5	87	66-125	
alpha-BHC	ug/kg	16.7	14.8	89	64-125	
alpha-Chlordane	ug/kg	16.7	15.2	91	68-125	
beta-BHC	ug/kg	16.7	15.3	92	69-125	
delta-BHC	ug/kg	16.7	9.8	59	42-133	
Dieldrin	ug/kg	33.3	33.7	101	69-126	
Endosulfan I	ug/kg	16.7	14.1	85	63-125	
Endosulfan II	ug/kg	33.3	33.0	99	69-125	
Endosulfan sulfate	ug/kg	33.3	27.6	83	56-137	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

LABORATORY CONTROL SAMPLE: 2873687

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	31.1	93	69-125	
Endrin aldehyde	ug/kg	33.3	31.3	94	65-125	
Endrin ketone	ug/kg	33.3	34.0	102	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	15.3	92	67-125	
gamma-Chlordane	ug/kg	16.7	13.8	83	63-125	
Heptachlor	ug/kg	16.7	15.3	92	69-125	
Heptachlor epoxide	ug/kg	16.7	15.3	92	68-125	
Methoxychlor	ug/kg	167	165	99	65-134	CH
Decachlorobiphenyl (S)	%			90	30-150	
Tetrachloro-m-xylene (S)	%			86	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873688 2873689

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424793001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
4,4'-DDD	ug/kg	ND	166	166	147	154	89	93	56-125	5	20	
4,4'-DDE	ug/kg	ND	166	166	154	164	93	99	32-150	6	20	
4,4'-DDT	ug/kg	ND	166	166	154	158	93	95	60-132	2	20	CH
Aldrin	ug/kg	ND	82.5	83	61.8	64.2	75	78	56-125	4	20	
alpha-BHC	ug/kg	ND	82.5	83	74.1	80.9	90	98	54-136	9	20	
alpha-Chlordane	ug/kg	147	82.5	83	169	140	26	-9	54-133	19	20	M1
beta-BHC	ug/kg	64.3	82.5	83	79.8	87.9	19	28	30-150	10	20	M1
delta-BHC	ug/kg	ND	82.5	83	49.8	54.9	60	66	45-145	10	20	
Dieldrin	ug/kg	ND	166	166	142	143	86	86	47-150	0	20	
Endosulfan I	ug/kg	ND	82.5	83	66.2	70.2	80	85	35-145	6	20	
Endosulfan II	ug/kg	ND	166	166	139	142	84	86	50-147	2	20	
Endosulfan sulfate	ug/kg	ND	166	166	118	120	71	73	54-132	2	20	
Endrin	ug/kg	ND	166	166	126	128	76	78	62-125	2	20	
Endrin aldehyde	ug/kg	ND	166	166	132	132	80	80	33-150	1	20	
Endrin ketone	ug/kg	ND	166	166	144	146	87	88	56-144	1	20	
gamma-BHC (Lindane)	ug/kg	ND	82.5	83	66.3	68.3	80	82	63-125	3	20	
gamma-Chlordane	ug/kg	129	82.5	83	141	118	14	-14	45-132	18	20	M1
Heptachlor	ug/kg	ND	82.5	83	77.5	95.3	94	115	51-142	21	20	R1
Heptachlor epoxide	ug/kg	ND	82.5	83	65.2	69.5	79	84	50-142	6	20	
Methoxychlor	ug/kg	ND	825	830	810	820	98	99	58-139	1	20	CH
Decachlorobiphenyl (S)	%						60	64	30-150			
Tetrachloro-m-xylene (S)	%						57	64	30-150			6M,D4

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report
Pace Project No.: 10425111

QC Batch: 529467 Analysis Method: EPA 8082A
QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2873690 Matrix: Solid
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/02/18 10:11	
Decachlorobiphenyl (S)	%	88	30-134	04/02/18 10:11	
Tetrachloro-m-xylene (S)	%	88	48-125	04/02/18 10:11	

LABORATORY CONTROL SAMPLE: 2873691

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	569	85	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	575	86	62-125	
Decachlorobiphenyl (S)	%			90	30-134	
Tetrachloro-m-xylene (S)	%			90	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873692 2873693

Parameter	Units	10424793002		2873692		2873693		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
PCB-1016 (Aroclor 1016)	ug/kg	ND	930	930	789	769	85	83	30-150	3	30		
PCB-1260 (Aroclor 1260)	ug/kg	ND	930	930	906	896	97	96	30-138	1	30		
Decachlorobiphenyl (S)	%						77	74	30-134				
Tetrachloro-m-xylene (S)	%						76	69	48-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529689 Analysis Method: EPA 8270D
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2874965 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/05/18 11:11	
1,2-Dichlorobenzene	ug/kg	ND	330	04/05/18 11:11	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/05/18 11:11	
1,3-Dichlorobenzene	ug/kg	ND	330	04/05/18 11:11	
1,4-Dichlorobenzene	ug/kg	ND	330	04/05/18 11:11	
1-Methylnaphthalene	ug/kg	ND	330	04/05/18 11:11	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/05/18 11:11	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/05/18 11:11	
2,4-Dichlorophenol	ug/kg	ND	330	04/05/18 11:11	
2,4-Dimethylphenol	ug/kg	ND	330	04/05/18 11:11	
2,4-Dinitrophenol	ug/kg	ND	330	04/05/18 11:11	
2,4-Dinitrotoluene	ug/kg	ND	330	04/05/18 11:11	
2,6-Dinitrotoluene	ug/kg	ND	330	04/05/18 11:11	
2-Chloronaphthalene	ug/kg	ND	330	04/05/18 11:11	
2-Chlorophenol	ug/kg	ND	330	04/05/18 11:11	
2-Methylnaphthalene	ug/kg	ND	330	04/05/18 11:11	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/05/18 11:11	
2-Nitroaniline	ug/kg	ND	330	04/05/18 11:11	
2-Nitrophenol	ug/kg	ND	330	04/05/18 11:11	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/05/18 11:11	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/05/18 11:11	
3-Nitroaniline	ug/kg	ND	330	04/05/18 11:11	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/05/18 11:11	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/05/18 11:11	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/05/18 11:11	
4-Chloroaniline	ug/kg	ND	330	04/05/18 11:11	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/05/18 11:11	
4-Nitroaniline	ug/kg	ND	330	04/05/18 11:11	
4-Nitrophenol	ug/kg	ND	330	04/05/18 11:11	
Acenaphthene	ug/kg	ND	330	04/05/18 11:11	
Acenaphthylene	ug/kg	ND	330	04/05/18 11:11	
Anthracene	ug/kg	ND	330	04/05/18 11:11	
Benzo(a)anthracene	ug/kg	ND	330	04/05/18 11:11	
Benzo(a)pyrene	ug/kg	ND	330	04/05/18 11:11	
Benzo(b)fluoranthene	ug/kg	ND	330	04/05/18 11:11	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/05/18 11:11	
Benzo(k)fluoranthene	ug/kg	ND	330	04/05/18 11:11	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/05/18 11:11	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/05/18 11:11	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/05/18 11:11	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/05/18 11:11	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

METHOD BLANK: 2874965

Matrix: Solid

Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/05/18 11:11	
Carbazole	ug/kg	ND	330	04/05/18 11:11	
Chrysene	ug/kg	ND	330	04/05/18 11:11	
Di-n-butylphthalate	ug/kg	ND	330	04/05/18 11:11	
Di-n-octylphthalate	ug/kg	ND	330	04/05/18 11:11	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/05/18 11:11	
Dibenzofuran	ug/kg	ND	330	04/05/18 11:11	
Diethylphthalate	ug/kg	ND	330	04/05/18 11:11	
Dimethylphthalate	ug/kg	ND	330	04/05/18 11:11	
Fluoranthene	ug/kg	ND	330	04/05/18 11:11	
Fluorene	ug/kg	ND	330	04/05/18 11:11	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/05/18 11:11	
Hexachlorobenzene	ug/kg	ND	330	04/05/18 11:11	
Hexachloroethane	ug/kg	ND	330	04/05/18 11:11	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/05/18 11:11	
Isophorone	ug/kg	ND	330	04/05/18 11:11	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/05/18 11:11	
N-Nitrosodimethylamine	ug/kg	ND	330	04/05/18 11:11	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/05/18 11:11	
Naphthalene	ug/kg	ND	330	04/05/18 11:11	
Nitrobenzene	ug/kg	ND	330	04/05/18 11:11	
Pentachlorophenol	ug/kg	ND	670	04/05/18 11:11	
Phenanthrene	ug/kg	ND	330	04/05/18 11:11	
Phenol	ug/kg	ND	330	04/05/18 11:11	
Pyrene	ug/kg	ND	330	04/05/18 11:11	
2,4,6-Tribromophenol (S)	%	81	60-125	04/05/18 11:11	
2-Fluorobiphenyl (S)	%	99	30-132	04/05/18 11:11	
2-Fluorophenol (S)	%	92	40-125	04/05/18 11:11	
Nitrobenzene-d5 (S)	%	80	43-125	04/05/18 11:11	
p-Terphenyl-d14 (S)	%	109	62-125	04/05/18 11:11	
Phenol-d6 (S)	%	91	48-125	04/05/18 11:11	

LABORATORY CONTROL SAMPLE: 2874966

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1310	79	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1270	76	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1280	77	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1260	76	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1300	78	39-125	
1-Methylnaphthalene	ug/kg	1670	1340	80	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1430	86	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1430	86	61-125	
2,4-Dichlorophenol	ug/kg	1670	1320	79	57-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

LABORATORY CONTROL SAMPLE: 2874966

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1280	77	51-125	
2,4-Dinitrophenol	ug/kg	1670	936	56	30-132	7M
2,4-Dinitrotoluene	ug/kg	1670	1410	85	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1390	84	63-125	
2-Chloronaphthalene	ug/kg	1670	1390	83	61-125	
2-Chlorophenol	ug/kg	1670	1310	79	46-125	
2-Methylnaphthalene	ug/kg	1670	1360	82	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1250	75	50-125	
2-Nitroaniline	ug/kg	1670	1270	76	61-125	
2-Nitrophenol	ug/kg	1670	1350	81	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1270	76	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1350	81	47-125	
3-Nitroaniline	ug/kg	1670	1260	75	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1130J	68	30-141	7M
4-Bromophenylphenyl ether	ug/kg	1670	1390	84	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1340	80	64-125	
4-Chloroaniline	ug/kg	1670	1080	65	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1420	85	64-125	
4-Nitroaniline	ug/kg	1670	1330	80	59-125	
4-Nitrophenol	ug/kg	1670	1170	70	54-125	
Acenaphthene	ug/kg	1670	1370	82	62-125	
Acenaphthylene	ug/kg	1670	1430	86	61-125	
Anthracene	ug/kg	1670	1470	88	66-125	
Benzo(a)anthracene	ug/kg	1670	1540	92	69-125	
Benzo(a)pyrene	ug/kg	1670	1490	89	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1480	89	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1490	89	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1460	88	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1270	76	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1170	70	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1140	68	37-125	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1480	89	69-131	
Butylbenzylphthalate	ug/kg	1670	1470	88	69-129	
Carbazole	ug/kg	1670	1450	87	66-125	
Chrysene	ug/kg	1670	1500	90	68-125	
Di-n-butylphthalate	ug/kg	1670	1410	85	69-125	
Di-n-octylphthalate	ug/kg	1670	1600	96	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1490	89	64-125	
Dibenzofuran	ug/kg	1670	1430	86	65-125	
Diethylphthalate	ug/kg	1670	1410	84	67-125	
Dimethylphthalate	ug/kg	1670	1410	85	67-125	
Fluoranthene	ug/kg	1670	1450	87	66-125	
Fluorene	ug/kg	1670	1400	84	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1270	76	40-125	
Hexachlorobenzene	ug/kg	1670	1390	83	62-125	
Hexachloroethane	ug/kg	1670	1200	72	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1510	91	64-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

LABORATORY CONTROL SAMPLE: 2874966

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1310	79	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1250	75	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1260	76	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1420	85	65-125	
Naphthalene	ug/kg	1670	1340	81	48-125	
Nitrobenzene	ug/kg	1670	1210	73	48-125	
Pentachlorophenol	ug/kg	1670	1220	73	41-125	
Phenanthrene	ug/kg	1670	1450	87	66-125	
Phenol	ug/kg	1670	1280	77	46-125	
Pyrene	ug/kg	1670	1510	90	69-125	
2,4,6-Tribromophenol (S)	%			89	60-125	
2-Fluorobiphenyl (S)	%			93	30-132	
2-Fluorophenol (S)	%			85	40-125	
Nitrobenzene-d5 (S)	%			78	43-125	
p-Terphenyl-d14 (S)	%			100	62-125	
Phenol-d6 (S)	%			85	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874967 2874968

Parameter	Units	10425121002		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
1,2,4-Trichlorobenzene	ug/kg	<66.6	1730	1730	1210	1060	70	61	30-127	13	30		
1,2-Dichlorobenzene	ug/kg	<64.8	1730	1730	1210	1050	70	61	30-125	14	30		
1,2-Diphenylhydrazine	ug/kg	<62.0	1730	1730	1220	1090	71	63	30-150	11	30		
1,3-Dichlorobenzene	ug/kg	<64.0	1730	1730	1200	1060	69	61	30-125	12	30		
1,4-Dichlorobenzene	ug/kg	<62.5	1730	1730	1200	1060	70	62	30-125	12	30		
1-Methylnaphthalene	ug/kg	<53.9	1730	1730	1270	1130	73	66	42-125	11	30		
2,4,5-Trichlorophenol	ug/kg	<67.0	1730	1730	1380	1220	80	71	30-150	12	30		
2,4,6-Trichlorophenol	ug/kg	<48.7	1730	1730	1380	1210	80	70	30-150	14	30		
2,4-Dichlorophenol	ug/kg	<64.7	1730	1730	1290	1140	74	66	30-135	12	30		
2,4-Dimethylphenol	ug/kg	<129	1730	1730	1200	1080	69	63	30-148	10	30		
2,4-Dinitrophenol	ug/kg	<77.2	1730	1730	326J	351	19	20	30-125		30	7M, M1	
2,4-Dinitrotoluene	ug/kg	<46.4	1730	1730	1340	1220	77	71	30-150	9	30		
2,6-Dinitrotoluene	ug/kg	<47.9	1730	1730	1340	1200	78	70	30-150	11	30		
2-Chloronaphthalene	ug/kg	<48.7	1730	1730	1330	1160	77	67	30-138	14	30		
2-Chlorophenol	ug/kg	<68.2	1730	1730	1220	1060	70	61	30-130	14	30		
2-Methylnaphthalene	ug/kg	<53.2	1730	1730	1280	1120	74	65	46-125	13	30		
2-Methylphenol(o-Cresol)	ug/kg	<86.4	1730	1730	1150	1000	67	58	30-133	14	30		
2-Nitroaniline	ug/kg	<75.8	1730	1730	1240	1120	72	65	30-150	10	30		
2-Nitrophenol	ug/kg	<64.6	1730	1730	1200	1080	70	62	30-134	11	30		
3&4-Methylphenol(m&p Cresol)	ug/kg	<77.4	1730	1730	1220	1060	70	62	30-138	14	30		
3,3'-Dichlorobenzidine	ug/kg	<82.1	1730	1730	1550	1420	90	82	30-149	9	30		
3-Nitroaniline	ug/kg	<84.0	1730	1730	1280	1190	74	69	30-150	7	30		
4,6-Dinitro-2-methylphenol	ug/kg	<138	1730	1730	441J	462J	26	27	30-133		30	7M, M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2874967		2874968										
Parameter	Units	MS		MSD		MS		MSD		% Rec	Limits	RPD	Max RPD	Qual
		10425121002	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
4-Bromophenylphenyl ether	ug/kg	<57.9	1730	1730	1310	1170	76	68	44-125	11	30			
4-Chloro-3-methylphenol	ug/kg	<47.6	1730	1730	1290	1180	75	69	30-150	9	30			
4-Chloroaniline	ug/kg	<96.1	1730	1730	1040	1050	60	61	30-125	1	30			
4-Chlorophenylphenyl ether	ug/kg	<47.0	1730	1730	1360	1210	79	70	44-125	12	30			
4-Nitroaniline	ug/kg	<61.2	1730	1730	1220	1130	71	65	30-150	8	30			
4-Nitrophenol	ug/kg	<99.1	1730	1730	1120	991	65	57	30-150	12	30			
Acenaphthene	ug/kg	<56.2	1730	1730	1270	1130	74	65	40-125	12	30			
Acenaphthylene	ug/kg	<47.1	1730	1730	1350	1190	78	69	30-150	13	30			
Anthracene	ug/kg	<49.4	1730	1730	1360	1210	79	70	30-150	12	30			
Benzo(a)anthracene	ug/kg	<39.9	1730	1730	1430	1260	83	73	30-150	13	30			
Benzo(a)pyrene	ug/kg	<38.9	1730	1730	1410	1260	81	73	30-150	11	30			
Benzo(b)fluoranthene	ug/kg	<41.6	1730	1730	1460	1330	85	77	30-150	10	30			
Benzo(g,h,i)perylene	ug/kg	<29.7	1730	1730	1300	1180	75	69	30-150	9	30			
Benzo(k)fluoranthene	ug/kg	<41.6	1730	1730	1390	1220	80	70	30-150	13	30			
bis(2-Chloroethoxy)methane	ug/kg	<66.6	1730	1730	1180	1060	69	62	30-134	11	30			
bis(2-Chloroethyl) ether	ug/kg	<75.2	1730	1730	1080	954	63	55	30-125	13	30			
bis(2-Chloroisopropyl) ether	ug/kg	<79.7	1730	1730	1040	909	60	53	30-125	13	30			
bis(2-Ethylhexyl)phthalate	ug/kg	<87.8	1730	1730	1380	1220	80	71	30-150	12	30			
Butylbenzylphthalate	ug/kg	<76.0	1730	1730	1350	1200	78	69	30-150	12	30			
Carbazole	ug/kg	<46.1	1730	1730	1340	1200	78	70	41-125	11	30			
Chrysene	ug/kg	<34.5	1730	1730	1400	1260	81	73	30-150	11	30			
Di-n-butylphthalate	ug/kg	<47.0	1730	1730	1330	1180	77	68	30-150	12	30			
Di-n-octylphthalate	ug/kg	<105	1730	1730	1490	1300	86	75	30-150	14	30			
Dibenz(a,h)anthracene	ug/kg	<35.4	1730	1730	1310	1190	76	69	30-150	10	30			
Dibenzofuran	ug/kg	<49.9	1730	1730	1360	1210	79	70	45-125	12	30			
Diethylphthalate	ug/kg	<40.7	1730	1730	1350	1200	78	70	30-150	12	30			
Dimethylphthalate	ug/kg	<52.9	1730	1730	1380	1220	80	71	30-150	12	30			
Fluoranthene	ug/kg	<36.7	1730	1730	1360	1220	79	70	30-150	11	30			
Fluorene	ug/kg	<47.9	1730	1730	1360	1180	79	68	30-150	14	30			
Hexachloro-1,3-butadiene	ug/kg	<79.2	1730	1730	1190	1050	69	61	30-128	13	30			
Hexachlorobenzene	ug/kg	<44.4	1730	1730	1270	1150	74	67	30-150	10	30			
Hexachloroethane	ug/kg	<70.2	1730	1730	1050	917	61	53	30-125	14	30			
Indeno(1,2,3-cd)pyrene	ug/kg	<40.0	1730	1730	1330	1190	77	69	30-150	11	30			
Isophorone	ug/kg	<78.7	1730	1730	1240	1100	72	64	30-140	12	30			
N-Nitroso-di-n-propylamine	ug/kg	<105	1730	1730	1190	1020	69	59	30-147	15	30			
N-Nitrosodimethylamine	ug/kg	<89.9	1730	1730	1210	1080	70	63	30-125	11	30			
N-Nitrosodiphenylamine	ug/kg	<42.2	1730	1730	1310	1160	76	67	30-150	13	30			
Naphthalene	ug/kg	<65.3	1730	1730	1250	1080	72	63	44-125	14	30			
Nitrobenzene	ug/kg	<69.0	1730	1730	1150	1000	67	58	30-136	14	30			
Pentachlorophenol	ug/kg	<101	1730	1730	1110	1010	64	59	30-150	9	30			
Phenanthrene	ug/kg	<47.1	1730	1730	1340	1190	77	69	30-150	12	30			
Phenol	ug/kg	<66.4	1730	1730	1220	1050	71	61	30-129	15	30			
Pyrene	ug/kg	<36.2	1730	1730	1370	1240	79	72	30-150	10	30			
2,4,6-Tribromophenol (S)	%						82	72	60-125					
2-Fluorobiphenyl (S)	%						84	73	30-132					
2-Fluorophenol (S)	%						76	66	40-125					

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Parameter	Units	2874967		2874968		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Nitrobenzene-d5 (S)	%.					70	61	43-125			
p-Terphenyl-d14 (S)	%.					90	79	62-125			
Phenol-d6 (S)	%.					77	67	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report
Pace Project No.: 10425111

QC Batch: 529470 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111006

METHOD BLANK: 2873704 Matrix: Solid
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	03/30/18 12:54	
Acenaphthylene	ug/kg	ND	10.0	03/30/18 12:54	
Anthracene	ug/kg	ND	10.0	03/30/18 12:54	
Benzo(a)anthracene	ug/kg	ND	10.0	03/30/18 12:54	
Benzo(a)pyrene	ug/kg	ND	10.0	03/30/18 12:54	
Benzo(b)fluoranthene	ug/kg	ND	10.0	03/30/18 12:54	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	03/30/18 12:54	
Benzo(k)fluoranthene	ug/kg	ND	10.0	03/30/18 12:54	
Chrysene	ug/kg	ND	10.0	03/30/18 12:54	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	03/30/18 12:54	
Fluoranthene	ug/kg	ND	10.0	03/30/18 12:54	
Fluorene	ug/kg	ND	10.0	03/30/18 12:54	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	03/30/18 12:54	
Naphthalene	ug/kg	ND	10.0	03/30/18 12:54	
Phenanthrene	ug/kg	ND	10.0	03/30/18 12:54	
Pyrene	ug/kg	ND	10.0	03/30/18 12:54	
2-Fluorobiphenyl (S)	%	78	42-125	03/30/18 12:54	
p-Terphenyl-d14 (S)	%	93	57-125	03/30/18 12:54	

LABORATORY CONTROL SAMPLE: 2873705

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	26.2	79	52-125	
Acenaphthylene	ug/kg	33.3	27.7	83	50-125	
Anthracene	ug/kg	33.3	31.2	94	65-125	
Benzo(a)anthracene	ug/kg	33.3	31.5	94	60-125	
Benzo(a)pyrene	ug/kg	33.3	30.9	93	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	31.4	94	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	25.1	75	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	28.9	87	67-125	
Chrysene	ug/kg	33.3	28.7	86	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	23.7	71	63-125	
Fluoranthene	ug/kg	33.3	31.2	94	75-125	
Fluorene	ug/kg	33.3	25.9	78	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	24.5	73	63-125	
Naphthalene	ug/kg	33.3	26.0	78	49-125	
Phenanthrene	ug/kg	33.3	25.0	75	65-125	
Pyrene	ug/kg	33.3	29.0	87	64-125	
2-Fluorobiphenyl (S)	%			78	42-125	
p-Terphenyl-d14 (S)	%			91	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Parameter	Units	2873706		2873707		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10425098001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Acenaphthene	ug/kg	ND	34.9	34.8	26.2	26.6	75	76	30-125	1	30		
Acenaphthylene	ug/kg	ND	34.9	34.8	30.8	30.2	88	86	30-133	2	30		
Anthracene	ug/kg	0.018 mg/kg	34.9	34.8	39.3	41.9	60	67	30-150	6	30		
Benzo(a)anthracene	ug/kg	0.13 mg/kg	34.9	34.8	111	112	-58	-58	30-150	0	30	M1	
Benzo(a)pyrene	ug/kg	0.13 mg/kg	34.9	34.8	112	110	-50	-55	30-150	2	30	M1	
Benzo(b)fluoranthene	ug/kg	0.13 mg/kg	34.9	34.8	115	114	-35	-35	30-150	0	30	M1	
Benzo(g,h,i)perylene	ug/kg	0.059 mg/kg	34.9	34.8	63.1	61.2	11	6	30-150	3	30	M1	
Benzo(k)fluoranthene	ug/kg	0.064 mg/kg	34.9	34.8	66.9	68.4	10	14	30-150	2	30	M1	
Chrysene	ug/kg	0.11 mg/kg	34.9	34.8	93.5	92.7	-37	-39	30-150	1	30	M1	
Dibenz(a,h)anthracene	ug/kg	0.012 mg/kg	34.9	34.8	32.7	30.1	58	51	30-131	8	30		
Fluoranthene	ug/kg	0.24 mg/kg	34.9	34.8	176	176	-183	-183	30-150	0	30	M1	
Fluorene	ug/kg	ND	34.9	34.8	27.0	26.3	77	75	30-147	2	30		
Indeno(1,2,3-cd)pyrene	ug/kg	0.049 mg/kg	34.9	34.8	55.6	51.5	19	7	30-150	8	30	M1	
Naphthalene	ug/kg	ND	34.9	34.8	25.3	26.4	72	76	30-131	5	30		
Phenanthrene	ug/kg	0.057 mg/kg	34.9	34.8	49.2	53.5	-24	-11	30-150	8	30	M1	
Pyrene	ug/kg	0.26 mg/kg	34.9	34.8	189	189	-211	-213	30-150	0	30	M1	
2-Fluorobiphenyl (S)	%.						73	71	42-125				
p-Terphenyl-d14 (S)	%.						89	87	57-125				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report
Pace Project No.: 10425111

QC Batch: 530507 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
Associated Lab Samples: 10425111005

METHOD BLANK: 2879475 Matrix: Solid
Associated Lab Samples: 10425111005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/04/18 10:44	
Acenaphthylene	ug/kg	ND	10.0	04/04/18 10:44	
Anthracene	ug/kg	ND	10.0	04/04/18 10:44	
Benzo(a)anthracene	ug/kg	ND	10.0	04/04/18 10:44	
Benzo(a)pyrene	ug/kg	ND	10.0	04/04/18 10:44	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/04/18 10:44	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/04/18 10:44	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/04/18 10:44	
Chrysene	ug/kg	ND	10.0	04/04/18 10:44	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/04/18 10:44	
Fluoranthene	ug/kg	ND	10.0	04/04/18 10:44	
Fluorene	ug/kg	ND	10.0	04/04/18 10:44	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/04/18 10:44	
Naphthalene	ug/kg	ND	10.0	04/04/18 10:44	
Phenanthrene	ug/kg	ND	10.0	04/04/18 10:44	
Pyrene	ug/kg	ND	10.0	04/04/18 10:44	
2-Fluorobiphenyl (S)	%	81	42-125	04/04/18 10:44	
p-Terphenyl-d14 (S)	%	90	57-125	04/04/18 10:44	

LABORATORY CONTROL SAMPLE: 2879476

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	20.8	62	52-125	
Acenaphthylene	ug/kg	33.3	20.0	60	50-125	
Anthracene	ug/kg	33.3	28.2	85	65-125	
Benzo(a)anthracene	ug/kg	33.3	29.0	87	60-125	
Benzo(a)pyrene	ug/kg	33.3	28.9	87	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	32.7	98	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	31.6	95	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	29.1	87	67-125	
Chrysene	ug/kg	33.3	30.8	92	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	34.3	103	63-125	
Fluoranthene	ug/kg	33.3	30.5	92	75-125	
Fluorene	ug/kg	33.3	23.1	69	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	33.3	100	63-125	
Naphthalene	ug/kg	33.3	18.7	56	49-125	
Phenanthrene	ug/kg	33.3	28.0	84	65-125	
Pyrene	ug/kg	33.3	29.8	90	64-125	
2-Fluorobiphenyl (S)	%			60	42-125	
p-Terphenyl-d14 (S)	%			89	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Parameter	Units	2879477		2879478		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10425835002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Acenaphthene	ug/kg	ND	35.1	35.1	20.6	25.3	59	72	30-125	21	30		
Acenaphthylene	ug/kg	ND	35.1	35.1	21.0	24.7	60	71	30-133	16	30		
Anthracene	ug/kg	ND	35.1	35.1	27.5	26.8	78	77	30-150	2	30		
Benzo(a)anthracene	ug/kg	ND	35.1	35.1	30.2	29.2	86	83	30-150	3	30		
Benzo(a)pyrene	ug/kg	ND	35.1	35.1	29.8	28.8	85	82	30-150	3	30		
Benzo(b)fluoranthene	ug/kg	ND	35.1	35.1	31.2	30.0	89	85	30-150	4	30		
Benzo(g,h,i)perylene	ug/kg	ND	35.1	35.1	33.2	33.1	95	94	30-150	0	30		
Benzo(k)fluoranthene	ug/kg	ND	35.1	35.1	33.3	31.9	95	91	30-150	4	30		
Chrysene	ug/kg	ND	35.1	35.1	30.5	29.5	87	84	30-150	4	30		
Dibenz(a,h)anthracene	ug/kg	ND	35.1	35.1	35.9	34.9	102	100	30-131	3	30		
Fluoranthene	ug/kg	ND	35.1	35.1	31.5	29.7	90	85	30-150	6	30		
Fluorene	ug/kg	ND	35.1	35.1	22.5	26.0	64	74	30-147	14	30		
Indeno(1,2,3-cd)pyrene	ug/kg	ND	35.1	35.1	34.7	33.6	99	96	30-150	3	30		
Naphthalene	ug/kg	ND	35.1	35.1	19.2	24.9	55	71	30-131	26	30		
Phenanthrene	ug/kg	ND	35.1	35.1	27.6	28.2	79	80	30-150	2	30		
Pyrene	ug/kg	ND	35.1	35.1	31.1	30.4	89	87	30-150	2	30		
2-Fluorobiphenyl (S)	%.						59	77	42-125				
p-Terphenyl-d14 (S)	%.						85	85	57-125				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report
Pace Project No.: 10425111

QC Batch: 529569 Analysis Method: EPA 8270D
QC Batch Method: EPA 3546 Analysis Description: MDA2 Solid MSSV
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2874519 Matrix: Solid
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,5-T	mg/kg	ND	0.033	04/04/18 13:35	
2,4,5-TP (Silvex)	mg/kg	ND	0.033	04/04/18 13:35	
2,4-D	mg/kg	ND	0.033	04/04/18 13:35	
2,4-DB	mg/kg	ND	0.033	04/04/18 13:35	
Bentazon	mg/kg	ND	0.033	04/04/18 13:35	
Dicamba	mg/kg	ND	0.033	04/04/18 13:35	
Dinoseb	mg/kg	ND	0.033	04/04/18 13:35	
MCPA	mg/kg	ND	0.033	04/04/18 13:35	
Pentachlorophenol	mg/kg	ND	0.033	04/04/18 13:35	
Picloram	mg/kg	ND	0.033	04/04/18 13:35	
Triclopyr	mg/kg	ND	0.033	04/04/18 13:35	
2,4-DCAA (S)	%	78	46-125	04/04/18 13:35	

LABORATORY CONTROL SAMPLE: 2874520

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,5-T	mg/kg	.33	0.28	83	60-125	
2,4,5-TP (Silvex)	mg/kg	.33	0.26	79	61-125	
2,4-D	mg/kg	.33	0.29	86	63-125	
2,4-DB	mg/kg	.33	0.28	83	59-125	
Bentazon	mg/kg	.33	0.25	76	58-125	
Dicamba	mg/kg	.33	0.27	80	52-125	
Dinoseb	mg/kg	.33	0.18	53	35-126	
MCPA	mg/kg	.33	0.27	82	57-125	
Pentachlorophenol	mg/kg	.33	0.21	63	48-125	
Picloram	mg/kg	.33	0.24	72	47-125	
Triclopyr	mg/kg	.33	0.28	83	68-125	
2,4-DCAA (S)	%			77	46-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874521 2874522

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10425111006 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
2,4,5-T	mg/kg	ND	.45	.45	0.19	0.21	42	45	30-145	8	20	
2,4,5-TP (Silvex)	mg/kg	ND	.45	.45	0.28	0.26	63	58	30-130	7	20	
2,4-D	mg/kg	ND	.45	.45	0.18	0.20	40	44	30-150	9	20	
2,4-DB	mg/kg	ND	.45	.45	0.35	0.33	77	72	45-126	7	20	
Bentazon	mg/kg	ND	.45	.45	0.33	0.32	73	71	30-133	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Parameter	Units	2874521		2874522		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10425111006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Dicamba	mg/kg	ND	.45	.45	0.13	0.17	29	38	30-140	28	20	M1, R1	
Dinoseb	mg/kg	ND	.45	.45	0.39	0.31	86	69	30-136	23	20	R1	
MCPA	mg/kg	ND	.45	.45	0.24	0.22	53	49	30-136	9	20		
Pentachlorophenol	mg/kg	ND	.45	.45	0.28	0.25	63	55	44-125	13	20		
Picloram	mg/kg	ND	.45	.45	.016J	0.098	3	22	30-125		20	M1	
Triclopyr	mg/kg	ND	.45	.45	0.23	0.22	51	50	30-149	3	20		
2,4-DCAA (S)	%.						65	60	46-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529461	Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO	Analysis Description: WIDRO GCS
Associated Lab Samples: 10425111001	

METHOD BLANK: 2873677 Matrix: Solid

Associated Lab Samples: 10425111001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	03/29/18 10:21	
n-Triacontane (S)	%.	80	50-150	03/29/18 10:21	

LABORATORY CONTROL SAMPLE & LCSD: 2873678

2873679

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	69.1	90.2	86	113	70-120	26	20	R1
n-Triacontane (S)	%.				82	75	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529510 Analysis Method: WI MOD DRO
 QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS
 Associated Lab Samples: 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2874000 Matrix: Solid
 Associated Lab Samples: 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	03/29/18 13:11	
n-Triacontane (S)	%.	79	50-150	03/29/18 13:11	

LABORATORY CONTROL SAMPLE & LCSD: 2874001

Parameter	Units	2874002								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	89.9	95.8	112	120	70-120	6	20	
n-Triacontane (S)	%.				78	82	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch:	435086	Analysis Method:	EPA 7196A
QC Batch Method:	EPA 3060A	Analysis Description:	7196 Chromium, Hexavalent
Associated Lab Samples:	10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006		

METHOD BLANK: 2009757 Matrix: Solid
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/04/18 12:49	

LABORATORY CONTROL SAMPLE: 2009758

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	981	901	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009842 2009843

Parameter	Units	10424937001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	1420	1360	ND	ND	0	0	75-125		20	2M, M3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009844 2009845

Parameter	Units	10424937001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	54.8	54.3	ND	ND	12	18	75-125		20	M3

SAMPLE DUPLICATE: 2009846

Parameter	Units	50193299003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 285232 Analysis Method: EPA 9012
 QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 1669245 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/05/18 14:27	

LABORATORY CONTROL SAMPLE: 1669246

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1669247 1669248

Parameter	Units	40166647001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.10J	2.5	2.5	2.3	2.5	88	96	80-120	7	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1669249 1669250

Parameter	Units	40166870001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.16J	2.37	2.49	2.4	2.3	94	89	80-120	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 139758

Analysis Method: EPA 9056A

QC Batch Method: EPA 300.0

Analysis Description: 9056 IC Anions, Soil

Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 553544

Matrix: Solid

Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	1.0	04/03/18 15:44	

LABORATORY CONTROL SAMPLE: 553543

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	50.2	51.9	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553545 553546

Parameter	Units	10425111001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/kg	2.3	50	49.3	13.7	18.4	23	33	80-120	29	20	M1,R1

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth

PASI-G Pace Analytical Services - Green Bay

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

ANALYTE QUALIFIERS

1M RPD value is outside control limits due to sample non-homogeneity.

2M Redox (174 mv) and pH (8.13) values indicate a naturally reducing matrix. This accounts for poor recovery values on the sample per method Eh/pH phase diagram.

3M Sample was black in color and slightly viscous. Sample was centrifuged and decanted.

4M Sample was black in color and viscous. Sample was centrifuged and decanted.

5M Sample was light brown in color.

6M Sample was yellow in color.

7M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

B Analyte was detected in the associated method blank.

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

D4 Sample was diluted due to the presence of high levels of target analytes.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

ANALYTE QUALIFIERS

- L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- N2 The lab does not hold NELAC/TNI accreditation for this parameter.
- N3 Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
- P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
- R1 RPD value was outside control limits.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.
- T6 High boiling point hydrocarbons are present in the sample.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Solid-Revised Report
Pace Project No.: 10425111

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10425111001	FD-SB-A2 (10-20 S)	EPA 1630 (1998)	140178	EPA 1630 (1998)	140181
10425111002	FD-SB-B2 (12-21 WM)	EPA 1630 (1998)	140178	EPA 1630 (1998)	140181
10425111003	FD-SB-C2 (5-17 WM)	EPA 1630 (1998)	140178	EPA 1630 (1998)	140181
10425111004	FD-SB-D2 (3-12 WM)	EPA 1630 (1998)	140178	EPA 1630 (1998)	140181
10425111005	FD-SB-E2 (11-21 S)	EPA 1630 (1998)	140178	EPA 1630 (1998)	140181
10425111006	FD-SB-F2 (7-13 WM)	EPA 1630 (1998)	140178	EPA 1630 (1998)	140181
10425111001	FD-SB-A2 (10-20 S)	EPA 3550	529466	EPA 8081B	530402
10425111002	FD-SB-B2 (12-21 WM)	EPA 3550	529466	EPA 8081B	530402
10425111003	FD-SB-C2 (5-17 WM)	EPA 3550	529466	EPA 8081B	530402
10425111004	FD-SB-D2 (3-12 WM)	EPA 3550	529466	EPA 8081B	530402
10425111005	FD-SB-E2 (11-21 S)	EPA 3550	529466	EPA 8081B	530402
10425111006	FD-SB-F2 (7-13 WM)	EPA 3550	529466	EPA 8081B	530402
10425111001	FD-SB-A2 (10-20 S)	EPA 3550	529467	EPA 8082A	530082
10425111002	FD-SB-B2 (12-21 WM)	EPA 3550	529467	EPA 8082A	530082
10425111003	FD-SB-C2 (5-17 WM)	EPA 3550	529467	EPA 8082A	530082
10425111004	FD-SB-D2 (3-12 WM)	EPA 3550	529467	EPA 8082A	530082
10425111005	FD-SB-E2 (11-21 S)	EPA 3550	529467	EPA 8082A	530082
10425111006	FD-SB-F2 (7-13 WM)	EPA 3550	529467	EPA 8082A	530082
10425111001	FD-SB-A2 (10-20 S)	WI MOD DRO	529461	WI MOD DRO	529593
10425111002	FD-SB-B2 (12-21 WM)	WI MOD DRO	529510	WI MOD DRO	529595
10425111003	FD-SB-C2 (5-17 WM)	WI MOD DRO	529510	WI MOD DRO	529595
10425111004	FD-SB-D2 (3-12 WM)	WI MOD DRO	529510	WI MOD DRO	529595
10425111005	FD-SB-E2 (11-21 S)	WI MOD DRO	529510	WI MOD DRO	529595
10425111006	FD-SB-F2 (7-13 WM)	WI MOD DRO	529510	WI MOD DRO	529595
10425111001	FD-SB-A2 (10-20 S)	EPA 5030 Medium Soil	530355	WI MOD GRO	530506
10425111002	FD-SB-B2 (12-21 WM)	EPA 5030 Medium Soil	530355	WI MOD GRO	530506
10425111003	FD-SB-C2 (5-17 WM)	EPA 5030 Medium Soil	530355	WI MOD GRO	530506
10425111004	FD-SB-D2 (3-12 WM)	EPA 5030 Medium Soil	530355	WI MOD GRO	530506
10425111005	FD-SB-E2 (11-21 S)	EPA 5030 Medium Soil	530355	WI MOD GRO	530506
10425111006	FD-SB-F2 (7-13 WM)	EPA 5030 Medium Soil	530355	WI MOD GRO	530506
10425111001	FD-SB-A2 (10-20 S)	EPA 3050	529753	EPA 6010C	529832
10425111002	FD-SB-B2 (12-21 WM)	EPA 3050	529753	EPA 6010C	529832
10425111003	FD-SB-C2 (5-17 WM)	EPA 3050	529753	EPA 6010C	529832
10425111004	FD-SB-D2 (3-12 WM)	EPA 3050	529753	EPA 6010C	529832
10425111005	FD-SB-E2 (11-21 S)	EPA 3050	529753	EPA 6010C	529832
10425111006	FD-SB-F2 (7-13 WM)	EPA 3050	529753	EPA 6010C	529832
10425111001	FD-SB-A2 (10-20 S)	EPA 3050B	435596	EPA 6020	435837
10425111002	FD-SB-B2 (12-21 WM)	EPA 3050B	435596	EPA 6020	435837
10425111003	FD-SB-C2 (5-17 WM)	EPA 3050B	435596	EPA 6020	435837
10425111004	FD-SB-D2 (3-12 WM)	EPA 3050B	435596	EPA 6020	435837
10425111005	FD-SB-E2 (11-21 S)	EPA 3050B	435596	EPA 6020	435837
10425111006	FD-SB-F2 (7-13 WM)	EPA 3050B	435596	EPA 6020	435837
10425111001	FD-SB-A2 (10-20 S)	EPA 3050	529754	EPA 6020A	529842
10425111002	FD-SB-B2 (12-21 WM)	EPA 3050	529754	EPA 6020A	529842
10425111003	FD-SB-C2 (5-17 WM)	EPA 3050	529754	EPA 6020A	529842

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10425111004	FD-SB-D2 (3-12 WM)	EPA 3050	529754	EPA 6020A	529842
10425111005	FD-SB-E2 (11-21 S)	EPA 3050	529754	EPA 6020A	529842
10425111006	FD-SB-F2 (7-13 WM)	EPA 3050	529754	EPA 6020A	529842
10425111001	FD-SB-A2 (10-20 S)	EPA 7471	529756	EPA 7471	530150
10425111002	FD-SB-B2 (12-21 WM)	EPA 7471	529756	EPA 7471	530150
10425111003	FD-SB-C2 (5-17 WM)	EPA 7471	529756	EPA 7471	530150
10425111004	FD-SB-D2 (3-12 WM)	EPA 7471	529756	EPA 7471	530150
10425111005	FD-SB-E2 (11-21 S)	EPA 7471	529756	EPA 7471	530150
10425111006	FD-SB-F2 (7-13 WM)	EPA 7471	529756	EPA 7471	530150
10425111001	FD-SB-A2 (10-20 S)	ASTM D2974	529626		
10425111002	FD-SB-B2 (12-21 WM)	ASTM D2974	529626		
10425111003	FD-SB-C2 (5-17 WM)	ASTM D2974	529626		
10425111004	FD-SB-D2 (3-12 WM)	ASTM D2974	529626		
10425111005	FD-SB-E2 (11-21 S)	ASTM D2974	529626		
10425111006	FD-SB-F2 (7-13 WM)	ASTM D2974	529638		
10425111001	FD-SB-A2 (10-20 S)	EPA 3550	529689	EPA 8270D	530831
10425111002	FD-SB-B2 (12-21 WM)	EPA 3550	529689	EPA 8270D	530831
10425111003	FD-SB-C2 (5-17 WM)	EPA 3550	529689	EPA 8270D	530831
10425111004	FD-SB-D2 (3-12 WM)	EPA 3550	529689	EPA 8270D	530831
10425111005	FD-SB-E2 (11-21 S)	EPA 3550	529689	EPA 8270D	530831
10425111006	FD-SB-F2 (7-13 WM)	EPA 3550	529689	EPA 8270D	530831
10425111001	FD-SB-A2 (10-20 S)	EPA 3550	529470	EPA 8270D by SIM	529943
10425111002	FD-SB-B2 (12-21 WM)	EPA 3550	529470	EPA 8270D by SIM	529943
10425111003	FD-SB-C2 (5-17 WM)	EPA 3550	529470	EPA 8270D by SIM	529943
10425111004	FD-SB-D2 (3-12 WM)	EPA 3550	529470	EPA 8270D by SIM	529943
10425111005	FD-SB-E2 (11-21 S)	EPA 3550	530507	EPA 8270D by SIM	530599
10425111006	FD-SB-F2 (7-13 WM)	EPA 3550	529470	EPA 8270D by SIM	529943
10425111001	FD-SB-A2 (10-20 S)	EPA 3546	529569	EPA 8270D	530638
10425111002	FD-SB-B2 (12-21 WM)	EPA 3546	529569	EPA 8270D	530638
10425111003	FD-SB-C2 (5-17 WM)	EPA 3546	529569	EPA 8270D	530638
10425111004	FD-SB-D2 (3-12 WM)	EPA 3546	529569	EPA 8270D	530638
10425111005	FD-SB-E2 (11-21 S)	EPA 3546	529569	EPA 8270D	530638
10425111006	FD-SB-F2 (7-13 WM)	EPA 3546	529569	EPA 8270D	530638
10425111001	FD-SB-A2 (10-20 S)	EPA 5035/5030B	529503	EPA 8260B	529857
10425111002	FD-SB-B2 (12-21 WM)	EPA 5035/5030B	529503	EPA 8260B	529857
10425111003	FD-SB-C2 (5-17 WM)	EPA 5035/5030B	529503	EPA 8260B	529857
10425111004	FD-SB-D2 (3-12 WM)	EPA 5035/5030B	529503	EPA 8260B	529857
10425111005	FD-SB-E2 (11-21 S)	EPA 5035/5030B	529503	EPA 8260B	529857
10425111006	FD-SB-F2 (7-13 WM)	EPA 5035/5030B	529503	EPA 8260B	529857
10425111001	FD-SB-A2 (10-20 S)	EPA 3060A	435086	EPA 7196A	435521
10425111002	FD-SB-B2 (12-21 WM)	EPA 3060A	435086	EPA 7196A	435521
10425111003	FD-SB-C2 (5-17 WM)	EPA 3060A	435086	EPA 7196A	435521
10425111004	FD-SB-D2 (3-12 WM)	EPA 3060A	435086	EPA 7196A	435521
10425111005	FD-SB-E2 (11-21 S)	EPA 3060A	435086	EPA 7196A	435521

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

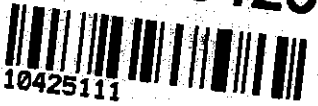
Pace Project No.: 10425111

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10425111006	FD-SB-F2 (7-13 WM)	EPA 3060A	435086	EPA 7196A	435521
10425111001	FD-SB-A2 (10-20 S)	Trivalent Chromium Calculation	436360		
10425111002	FD-SB-B2 (12-21 WM)	Trivalent Chromium Calculation	436360		
10425111003	FD-SB-C2 (5-17 WM)	Trivalent Chromium Calculation	436360		
10425111004	FD-SB-D2 (3-12 WM)	Trivalent Chromium Calculation	436360		
10425111005	FD-SB-E2 (11-21 S)	Trivalent Chromium Calculation	436360		
10425111006	FD-SB-F2 (7-13 WM)	Trivalent Chromium Calculation	436360		
10425111001	FD-SB-A2 (10-20 S)	EPA 9012A	285232	EPA 9012	285274
10425111002	FD-SB-B2 (12-21 WM)	EPA 9012A	285232	EPA 9012	285274
10425111003	FD-SB-C2 (5-17 WM)	EPA 9012A	285232	EPA 9012	285274
10425111004	FD-SB-D2 (3-12 WM)	EPA 9012A	285232	EPA 9012	285274
10425111005	FD-SB-E2 (11-21 S)	EPA 9012A	285232	EPA 9012	285274
10425111006	FD-SB-F2 (7-13 WM)	EPA 9012A	285232	EPA 9012	285274
10425111001	FD-SB-A2 (10-20 S)	EPA 300.0	139758	EPA 9056A	139833
10425111002	FD-SB-B2 (12-21 WM)	EPA 300.0	139758	EPA 9056A	139833
10425111003	FD-SB-C2 (5-17 WM)	EPA 300.0	139758	EPA 9056A	139833
10425111004	FD-SB-D2 (3-12 WM)	EPA 300.0	139758	EPA 9056A	139833
10425111005	FD-SB-E2 (11-21 S)	EPA 300.0	139758	EPA 9056A	139833
10425111006	FD-SB-F2 (7-13 WM)	EPA 300.0	139758	EPA 9056A	139833

REPORT OF LABORATORY ANALYSIS

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WO#: 10425111



Minnesota Pollution Control Agency

Chain-of-Custody Form

Type: Page: 1 of

OC ID: LABORATORY

FOR LAB USE ONLY

PROJECT/CLIENT INFO

Facility Code: Program Code (MDH Lab Only): Lab Name:

Project Name: *MPCA-Freeway/Solids* Project Task Code: Address: *18-00383*

Project Manager: *EPIC Proj # 38716*

Potential Hazard? If yes, add information to Sampler Comments Section Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 Sample=Routine Sample
 S-IVP=Integrated Vertical Profile
 Sample
 S-CWOP=Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES
 DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 W?=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES
 Wn-Ground=Groundwater
 Ws-Surf=Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in feet	End Depth, in feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	LAB SAMPLE NO.	#
<i>FD-SB-AZ (10-20 S)</i>	<i>S</i>	<i>3/27/18</i>	<i>1040</i>	<i>10</i>	<i>20</i>	<i>C</i>	<i>SD</i>				<i>13</i>	<i>See attached for soils/water (C-Dioxins)</i>	<i>001</i>	<i>1</i>
<i>FD-SB-BZ (12-31 WM)</i>	<i>S</i>	<i>3/27/18</i>	<i>115</i>	<i>12</i>	<i>21</i>	<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>002</i>	<i>2</i>
<i>FD-SB-CZ (5-17 WM)</i>	<i>S</i>	<i>3/27/18</i>	<i>1330</i>	<i>5</i>	<i>17</i>	<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>003</i>	<i>3</i>
<i>FD-SB-DZ (3-13 WM)</i>	<i>S</i>	<i>3/27/18</i>	<i>1410</i>	<i>3</i>	<i>12</i>	<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>004</i>	<i>4</i>
<i>FD-SB-EZ (11-21 S)</i>	<i>S</i>	<i>3/27/18</i>	<i>1515</i>	<i>11</i>	<i>21</i>	<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>005</i>	<i>5</i>
<i>FD-SB-FZ (7-13 WM)</i>	<i>S</i>	<i>3/27/18</i>	<i>1620</i>	<i>7</i>	<i>13</i>	<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>006</i>	<i>6</i>
														<i>7</i>
														<i>8</i>
														<i>9</i>
														<i>10</i>

Sampled By: *David Anderson* Sampler's Signature: *David Anderson* Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
<i>David Anderson / Price Analytical</i>	<i>3/27/18/1650</i>	<i>Alan Price</i>	<i>3-27-18 1650 2-7°C</i>

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Sample Condition Upon Receipt **Client Name:** MPCA FSD **Project #:** _____

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____

Tracking Number: _____

WO#: 10425111

PM: BM2 Due Date: 04/10/18
CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer 151401163 **Type of Ice:** Wet Blue None Dry Melted
Used: G87A9155100842

Cooler Temp Read (°C): 2.7 **Cooler Temp Corrected (°C):** 2.9 **Biological Tissue Frozen?** Yes No N/A
Temp should be above freezing to 6°C **Correction Factor:** +0.2 **Date and Initials of Person Examining Contents:** ME 3/27/18

USDA Regulated Soil (N/A, water sample)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	12.
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): _____	


CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ **Date/Time:** _____

Comments/Resolution: _____

Project Manager Review: BA M **Date:** 3/28/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 31Jan2018
	Document No.: F-GB-C-031-rev.06	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace, MN

Project #:

WO#: **40166616**



Courier: CS Logistics Fed Ex Speedee UPS **Waltco**
 Client Pace Other: _____

Tracking #: 1677921

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Custody Seal on Samples Present: yes no Seals intact: yes no

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR - 4 Type of Ice: Blue Dry None

Cooler Temperature Uncorr: 45.3 / Corr: 4, 2.5 Samples on ice, cooling process has begun

Temp Blank Present: yes no

Biological Tissue is Frozen: yes no

Person examining contents:
 Date: 3-29-18
 Initials: [Signature]

Temp should be above freezing to 6°C.
 Biota Samples may be received at ≤ 0°C.

Chain of Custody Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>ES</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: _____ If checked, see attached form for additional comments

Person Contacted: _____ Date/Time: _____
 Comments/ Resolution: Original client label - No times. 3-29-18 [Signature]

Project Manager Review: [Signature] Date: 3/29/18



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50193231

Date/Time and Initials of person examining contents: RM 3/29/18 1040

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 7909

Custody Seal on Cooler/Box Present: Yes No **Seals Intact:** Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F **Ice Type:** Wet Blue None | **Samples collected today and on ice:** Yes No N/A

Cooler Temperature: 1.4/1.1 **Ice Visible in Sample Containers?:** Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C **If temp. is Over 6°C or under 0°C, was the PM Notified?:** Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia?		<input checked="" type="checkbox"/>	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
Document any containers out of temp.		<input checked="" type="checkbox"/>		All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.		
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		<input checked="" type="checkbox"/>	Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Present:	<input checked="" type="checkbox"/>		Dissolved Metals field filtered?:			<input checked="" type="checkbox"/>
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>		Headspace Wisconsin Sulfide			<input checked="" type="checkbox"/>
Short Hold Time Analysis (<72hr)?		<input checked="" type="checkbox"/>	Residual Chlorine Check (SVOC 625 Pest/PCB 608)	<u>Present</u>	<u>Absent</u>	<u>N/A</u>
Analysis:		<input checked="" type="checkbox"/>		Residual Chlorine Check (Total/Amenable/Free Cyanide)		
Time 5035A TC placed in Freezer or Short Holds To Lab:		<input checked="" type="checkbox"/>	Headspace in VOA Vials (>6mm):			<input checked="" type="checkbox"/>
Rush TAT Requested:		<input checked="" type="checkbox"/>	Trip Blank Present?:		<input checked="" type="checkbox"/>	
Containers Intact?:	<input checked="" type="checkbox"/>		Trip Blank Custody Seals?:		<input checked="" type="checkbox"/>	
Sample Labels Match COC?:	<input checked="" type="checkbox"/>					
Except TCs, which only require sample ID						

Comments:

Sample Condition Upon Receipt

Client Name: MPCA FSD P&SI-MN/FLD Project #: _____

WO#: 12106456
 PM: HRZ Due Date: 04/10/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 3.5 Cooler Temp Corrected °C: 3.8 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: 3-28-18 P S

Comments: Bm 3/29/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
- Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N
 Project Manager Review: Angela Loisel Date: 3/29/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10425111 Workorder Name: 18-00383 MPCA Freeway LF Solid Owner Received Date: 3/27/2018 Results Requested By: 4/10/2018

Report To		Subcontract To		Requested Analysis															
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Duluth 4730 Oneota St. Duluth, MN 55807 Phone (218)727-6380																	
						Preserved Containers					Methyl Mercury by 1630								
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved													LAB USE ONLY
1	FD-SB-A2 (10-20 S)	PS	3/27/2018 10:40	10425111001	Solid	1													
2	FD-SB-B2 (12-21 WM)	PS	3/27/2018 11:15	10425111002	Solid	1													
3	FD-SB-C2 (5-17 WM)	PS	3/27/2018 13:30	10425111003	Solid	1													
4	FD-SB-D2 (3-12 WM)	PS	3/27/2018 14:10	10425111004	Solid	1													
5	FD-SB-E2 (11-21 S)	PS	3/27/2018 15:15	10425111005	Solid	1													
6	FD-SB-F2 (7-13 WM)	PS	3/27/2018 16:20	10425111006	Solid	1													

Transfers						Comments											
Released By	Date/Time	Received By	Date/Time														
<i>Long</i>	<i>3/28/18 1725</i>	<i>Pat</i>	<i>3/28/18 1900</i>														
<i>Pat</i>	<i>3/28/18 2145</i>	<i>Pat</i>	<i>3/29/18 0800</i>														

Cooler Temperature on Receipt *0.7* °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace Mpls

Project #:

WO#: 12106456

PM: HRZ Due Date: 04/10/18

CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 01339252/1710 IR-1 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.7 Cooler Temp Corrected °C: 0.7 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6°C Correction Factor: 0.0 Date and Initials of Person Examining Contents: KNH 3/29/18

If temperature is ≤0°C, is there evidence of ice formation? Yes No NA

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____

Angela Loisel

Date: 3/29/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

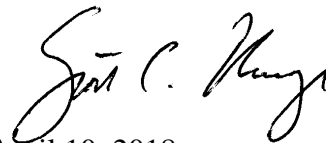
PaceProject#: 10425112
Sample Receipt Date: 03/27/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 10, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

April 10, 2018

DISCUSSION

This report presents the results from the analyses performed on three samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 53-80%. Except for one low value, which was flagged "R" on the results table, the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained. In cases where the estimated detection limits (EDLs) were above the standard reporting limits, the EDLs were reported and flagged "A".

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 109%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10425112

Appendix A

Sample Management

WO#: 10425112



Chain-of-Custody Form

Work Order Number

Turnaround Time

10425112

Page: 1 of

FOR LAB USE ONLY

PROJECT/CLIENT INFO		LABORATORY	
Facility Code:	Program Code (MDH Lab Only):	Lab Name:	
Project Name: <i>MPCA-Freeway/F50118</i>	Project Task Code:	Address: <i>18-00383</i>	
Project Manager:		Epic Proj # <i>38716</i>	
Potential Hazard?	If yes, add information to Sampler Comments Section	Phone No:	

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

Location Identifier	Sample Type	Date	Time	Start Depth, in feet	End Depth, in feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	PRESERV.	ANALYSIS REQUESTED										Lab Sample No.	#		
													1	2	3	4	5	6	7	8	9	10			11	12
<i>EP-SB-A2</i>	<i>S</i>	<i>3/27/18</i>	<i>1040</i>	<i>10</i>	<i>20</i>	<i>C</i>	<i>SD</i>				<i>13</i>		<i>X</i>	<i>X</i>											<i>001</i>	<i>1</i>
<i>EP-SB-B2</i>	<i>S</i>	<i>3/27/18</i>	<i>1115</i>	<i>12</i>	<i>21</i>	<i>C</i>	<i>SD</i>				<i>13</i>		<i>X</i>	<i>X</i>											<i>002</i>	<i>2</i>
<i>EP-SB-C2</i>	<i>S</i>	<i>3/27/18</i>	<i>1330</i>	<i>5</i>	<i>17</i>	<i>C</i>	<i>SD</i>				<i>13</i>		<i>X</i>	<i>X</i>											<i>003</i>	<i>3</i>
<i>EP-SB-D2</i>	<i>S</i>	<i>3/27/18</i>	<i>1410</i>	<i>3</i>	<i>12</i>	<i>C</i>	<i>SD</i>				<i>13</i>		<i>X</i>	<i>X</i>											<i>004</i>	<i>4</i>
<i>EP-SB-E2</i>	<i>S</i>	<i>3/27/18</i>	<i>1515</i>	<i>11</i>	<i>21</i>	<i>C</i>	<i>SD</i>				<i>13</i>		<i>X</i>	<i>X</i>											<i>005</i>	<i>5</i>
<i>EP-SB-F2</i>	<i>S</i>	<i>3/27/18</i>	<i>1620</i>	<i>7</i>	<i>13</i>	<i>C</i>	<i>SD</i>				<i>13</i>		<i>X</i>													<i>6</i>
																										<i>7</i>
																										<i>8</i>
																										<i>9</i>
																										<i>10</i>

Sampled By: *David Anderson* Sampler's Signature: *David Anderson* Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
<i>David Anderson / Price Analytical</i>	<i>3/27/18/1650</i>	<i>Ali Price</i>	<i>3-27-18 1650 2-7°C</i>

Sample Condition Upon Receipt **Client Name:** MPCA FSD **Project #:** _____

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____

Tracking Number: _____

WO#: 10425112

PM: SCU **Due Date: 04/10/18**
CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** **Proj. Due Date:** _____ **Proj. Name:** _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer Used: 151401163 G87A9155100842 **Type of Ice:** Wet Blue None Dry Melted

Cooler Temp Read (°C): 2.7 **Cooler Temp Corrected (°C):** 2.9 **Biological Tissue Frozen?** Yes No N/A
Temp should be above freezing to 6°C **Correction Factor:** +0.2 **Date and Initials of Person Examining Contents:** me 3/27/18

USDA Regulated Soil (N/A, water sample)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature] **Date:** 3/28/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10425112

Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-A2 (10-20 S)		
Lab Sample ID	10425112001		
Filename	U180406A_11		
Injected By	ZMS		
Total Amount Extracted	13.1 g	Matrix	Solid
% Moisture	23.0	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	03/27/2018 10:40
ICAL ID	U180405	Received	03/27/2018 16:50
CCal Filename(s)	U180406A_01 & U180406A_15	Extracted	04/02/2018 14:55
Method Blank ID	BLANK-61474	Analyzed	04/06/2018 18:37

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	80
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	90

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-C2 (5-17 WM)		
Lab Sample ID	10425112002		
Filename	U180406A_12		
Injected By	ZMS		
Total Amount Extracted	14.4 g	Matrix	Solid
% Moisture	30.6	Dilution	NA
Dry Weight Extracted	9.99 g	Collected	03/27/2018 13:30
ICAL ID	U180405	Received	03/27/2018 16:50
CCal Filename(s)	U180406A_01 & U180406A_15	Extracted	04/02/2018 14:55
Method Blank ID	BLANK-61474	Analyzed	04/06/2018 19:25

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	5.0	----	1.5 A	2,3,7,8-TCDD-13C	2.00	44
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	103

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

A = Reporting Limit based on signal to noise
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-E2 (11-21 S)		
Lab Sample ID	10425112003		
Filename	U180406A_13		
Injected By	ZMS		
Total Amount Extracted	15.6 g	Matrix	Solid
% Moisture	35.3	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	03/27/2018 15:15
ICAL ID	U180405	Received	03/27/2018 16:50
CCal Filename(s)	U180406A_01 & U180406A_15	Extracted	04/02/2018 14:55
Method Blank ID	BLANK-61474	Analyzed	04/06/2018 20:14

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	53
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	68

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61474	Matrix	Solid
Filename	U180406A_10	Dilution	NA
Total Amount Extracted	75.3 g	Extracted	04/02/2018 14:55
ICAL ID	U180405	Analyzed	04/06/2018 17:48
CCal Filename(s)	U180406A_01 & U180406A_15	Injected By	ZMS

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	58
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	67

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61475	Matrix	Solid
Filename	U180406A_05	Dilution	NA
Total Amount Extracted	75.1 g	Extracted	04/02/2018 14:55
ICAL ID	U180405	Analyzed	04/06/2018 13:42
CCal Filename(s)	U180406A_01 & U180406A_15	Injected By	
Method Blank ID	BLANK-61474		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.22	109	2,3,7,8-TCDD-13C	2.0	30 R
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	37

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

PaceProject#: 10425249
Sample Receipt Date: 03/28/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:

April 11, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

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The results relate only to the samples included in this report.

Report Prepared Date:

April 11, 2018

DISCUSSION

This report presents the results from the analyses performed on two samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration point and a nominal 1-Liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The samples were received above the recommended temperature range of 0-6 degrees Celsius.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 76-105%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 111-114% with a relative percent difference of 2.7%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE	MN002
Arkansas	88-0680	New York (NEL	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

WO#: 10425249



Chain-of-Custody Form

Work Order Number:

Turnaround Time:

1 of

FOR LAB USE ONLY

Lab Work Order Sticker

Facility Code:	MPCA Freeway LF waters	Program Code (MDH Lab Only):	Lab Name:
Project Name:	MPCA Freeway LF waters	Project Task Code:	Address: 18-00383
Project Manager:			EPIC Profile #38716
Potential Hazard?	If yes, add information to Sampler Comments Section		Phone No:

SAMPLE DETAILS										ANALYSIS REQUESTED												
SAMPLE TYPE CODES				LAB MATRIX CODES				FIELD MATRIX CODES		PRESERV.												
Sample-Routine Sample	QC-FB=Field Blank Sample	DW=Drinking Water	AR=Air	Wtr-Ground=Groundwater																		
S-IVP=Integrated Vertical Profile Sample	QC-FR=Field Replicate Sample	NW=Non-potable Water	BL=Biological Material	Wtr-Surf=Surface Water																		
S-CWOP=Composite Sample	QC-TB=Trip Blank Sample	SD=Soil/Solid	OT=Other	QC-BLANK=Artificial Blank Water																		
		WP=Wipe	TS=Tissue	Leachate=Leachate Sample																		
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS									Lab Sample No.	#
Field Blank	FB	3/28/18	1000			G		QC Blank			16	X	LIST A								001	1
F.D-SB-B3	S	3/28/18	1300			G		Wtr-Ground			41		LIST A/B/C								002	2
DATA 3/28/18																						
DATA 3/28/18																						
DATA 3/28/18																						
DATA 3/28/18																						
DATA 3/28/18																						
DATA 3/28/18																						
DATA 3/28/18																						
DATA 3/28/18																						
DATA 3/28/18																						

Sampled By: David Andersen Sampler's Signature: David Andersen Phone #:

Receiving Comments:			
Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) David Andersen / Pace Analytical	3/28/18 / 1525	UN PAEE 3.28.18	1525

11.0 °C
12.2 °C
11.5 °C

Sample Condition Upon Receipt

Client Name: MPCA - Field Project #: MD 3/28/18

WO#: 10425249
 PM: SCU Due Date: 04/11/18
 CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 10.8, 12.0, 11.3 Cooler Temp Corrected (°C): 11.0, 12.2, 11.5 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: to 2 Date and Initials of Person Examining Contents: MD 3/28/18

USDA Regulated Soil N/A, water sample
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: Nathan Boberg Date: 3/29/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	
	EPA 8270 SIM

- Analysis by MDH Laboratory

**** ADD to Parameter List A:**

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Harness determination)

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMs)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	Field Blank		
Lab Sample ID	10425249001		
Filename	U180405B_14		
Injected By	SMT		
Total Amount Extracted	1010 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/28/2018 10:00
ICAL ID	U180405	Received	03/28/2018 15:25
CCal Filename(s)	U180405B_12	Extracted	04/02/2018 15:10
Method Blank ID	BLANK-61476	Analyzed	04/05/2018 22:38

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	76
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	88

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

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Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-B3		
Lab Sample ID	10425249002		
Filename	U180405B_15		
Injected By	SMT		
Total Amount Extracted	508 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/28/2018 13:00
ICAL ID	U180405	Received	03/28/2018 15:25
CCal Filename(s)	U180405B_12	Extracted	04/02/2018 15:10
Method Blank ID	BLANK-61476	Analyzed	04/05/2018 23:27

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	105
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	112

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61476	Matrix	Water
Filename	F180406A_09	Dilution	NA
Total Amount Extracted	1010 mL	Extracted	04/02/2018 15:10
ICAL ID	F180405	Analyzed	04/06/2018 14:07
CCal Filename(s)	F180406A_01	Injected By	ZMS

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	78
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	100

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61477	Matrix	Water
Filename	F180406A_06	Dilution	NA
Total Amount Extracted	1020 mL	Extracted	04/02/2018 15:10
ICAL ID	F180405	Analyzed	04/06/2018 11:51
CCal Filename	F180406A_01	Injected By	ZMS
Method Blank ID	BLANK-61476		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	11	7.3	14.6	114
2,3,7,8-TCDD-37Cl4	10	10	3.7	15.8	101
2,3,7,8-TCDD-13C	100	88	25.0	141.0	88

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61478	Matrix	Water
Filename	F180406A_07	Dilution	NA
Total Amount Extracted	1020 mL	Extracted	04/02/2018 15:10
ICAL ID	F180405	Analyzed	04/06/2018 12:36
CCal Filename	F180406A_01	Injected By	ZMS
Method Blank ID	BLANK-61476		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	11	7.3	14.6	111
2,3,7,8-TCDD-37Cl4	10	10	3.7	15.8	102
2,3,7,8-TCDD-13C	100	91	25.0	141.0	91

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61477
 Spike 1 Filename F180406A_06

Spike 2 ID LCSD-61478
 Spike 2 Filename F180406A_07

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	114	111	2.7

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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April 19, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 28, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Bob Michels
bob.michels@pacelabs.com
(612)709-5046
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
 A2LA Certification #: 2926.01
 Alabama Certification #: 40770
 Alaska Contaminated Sites Certification #: 17-009
 Alaska DW Certification #: MN00064
 Arizona Certification #: AZ0014
 Arkansas Certification #: 88-0680
 California Certification #: 2929
 CNMI Saipan Certification #: MP0003
 Colorado Certification #: MN00064
 Connecticut Certification #: PH-0256
 EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
 Florida Certification #: E87605
 Georgia Certification #: 959
 Guam EPA Certification #: MN00064
 Hawaii Certification #: MN00064
 Idaho Certification #: MN00064
 Illinois Certification #: 200011
 Indiana Certification #: C-MN-01
 Iowa Certification #: 368
 Kansas Certification #: E-10167
 Kentucky DW Certification #: 90062
 Kentucky WW Certification #: 90062
 Louisiana DEQ Certification #: 03086
 Louisiana DW Certification #: MN00064
 Maine Certification #: MN00064
 Maryland Certification #: 322
 Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
 Minnesota Certification #: 027-053-137
 Mississippi Certification #: MN00064
 Montana Certification #: CERT0092
 Nebraska Certification #: NE-OS-18-06
 Nevada Certification #: MN00064
 New Hampshire Certification #: 2081
 New Jersey Certification #: MN002
 New York Certification #: 11647
 North Carolina DW Certification #: 27700
 North Carolina WW Certification #: 530
 North Dakota Certification #: R-036
 Ohio DW Certification #: 41244
 Ohio VAP Certification #: CL101
 Oklahoma Certification #: 9507
 Oregon NwTPH Certification #: MN300001
 Oregon Secondary Certification #: MN200001
 Pennsylvania Certification #: 68-00563
 Puerto Rico Certification #: MN00064
 South Carolina Certification #: 74003001
 Tennessee Certification #: TN02818
 Texas Certification #: T104704192
 Utah Certification #: MN00064
 Virginia Certification #: 460163
 Washington Certification #: C486
 West Virginia DW Certification #: 9952 C
 West Virginia DEP Certification #: 382
 Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
 Alaska Certification UST-107
 Alaska Certification UST-107
 California Certification #2973
 California Certification #2973
 Montana Certificate #CERT0103
 Alaska Certification #MN01084
 Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
 North Dakota Certification: # R-203
 Wisconsin DNR Certification #: 998027470
 WA Department of Ecology Lab ID# C1007
 Nevada DNR #MN010842018-1
 Oklahoma Department of Environmental Quality
 California Certification #2973

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
 ANAB DOD-ELAP Rad Accreditation #: L2417
 Alabama Certification #: 41590
 Arizona Certification #: AZ0734
 Arkansas Certification
 California Certification #: 04222CA
 Colorado Certification #: PA01547
 Connecticut Certification #: PH-0694
 Delaware Certification
 EPA Region 4 DW Rad

Florida/TNI Certification #: E87683
 Georgia Certification #: C040
 Guam Certification
 Hawaii Certification
 Idaho Certification
 Illinois Certification
 Indiana Certification
 Iowa Certification #: 391
 Kansas/TNI Certification #: E-10358
 Kentucky Certification #: KY90133

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

Pennsylvania Certification IDs

KY WW Permit #: KY0098221	Ohio EPA Rad Approval: #41249
KY WW Permit #: KY0000221	Oregon/TNI Certification #: PA200002-010
Louisiana DHH/TNI Certification #: LA180012	Pennsylvania/TNI Certification #: 65-00282
Louisiana DEQ/TNI Certification #: 4086	Puerto Rico Certification #: PA01457
Maine Certification #: 2017020	Rhode Island Certification #: 65-00282
Maryland Certification #: 308	South Dakota Certification
Massachusetts Certification #: M-PA1457	Tennessee Certification #: 02867
Michigan/PADEP Certification #: 9991	Texas/TNI Certification #: T104704188-17-3
Missouri Certification #: 235	Utah/TNI Certification #: PA014572017-9
Montana Certification #: Cert0082	USDA Soil Permit #: P330-17-00091
Nebraska Certification #: NE-OS-29-14	Vermont Dept. of Health: ID# VT-0282
Nevada Certification #: PA014572018-1	Virgin Island/PADEP Certification
New Hampshire/TNI Certification #: 297617	Virginia/VELAP Certification #: 9526
New Jersey/TNI Certification #: PA051	Washington Certification #: C868
New Mexico Certification #: PA01457	West Virginia DEP Certification #: 143
New York/TNI Certification #: 10888	West Virginia DHHR Certification #: 9964C
North Carolina Certification #: 42706	Wisconsin Approve List for Rad
North Dakota Certification #: R-190	Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174	Nebraska Certification: NE-OS-28-14
Alabama Certification #: 41320	Nevada Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216	New Hampshire Certification #: 2958
Delaware Certification: FL NELAC Reciprocity	New Jersey Certification #: FL022
Florida Certification #: E83079	New York Certification #: 11608
Georgia Certification #: 955	North Carolina Environmental Certificate #: 667
Guam Certification: FL NELAC Reciprocity	North Carolina Certification #: 12710
Hawaii Certification: FL NELAC Reciprocity	Oklahoma Certification #: D9947
Illinois Certification #: 200068	Pennsylvania Certification #: 68-00547
Indiana Certification: FL NELAC Reciprocity	Puerto Rico Certification #: FL01264
Kansas Certification #: E-10383	South Carolina Certification: #96042001
Kentucky Certification #: 90050	Tennessee Certification #: TN02974
Louisiana Certification #: FL NELAC Reciprocity	Texas Certification: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007	US Virgin Islands Certification: FL NELAC Reciprocity
Maryland Certification: #346	Virginia Environmental Certification #: 460165
Michigan Certification #: 9911	Wyoming Certification: FL NELAC Reciprocity
Mississippi Certification: FL NELAC Reciprocity	West Virginia Certification #: 9962C
Missouri Certification #: 236	Wisconsin Certification #: 399079670
Montana Certification #: Cert 0074	Wyoming (EPA Region 8): FL NELAC Reciprocity

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512	New York State Department of Health, Serial #56192 and 56193
Minnesota Department of Health, Certificate #1385941	North Carolina Division of Water Resources, Certificate #659
Arkansas Department of Environmental Quality, Certificate #17-046-0	Virginia Department of General Services, Certificate #9028
Georgia Environmental Protection Division, Stipulation	Wisconsin Department of Natural Resources, Laboratory #999472650
Illinois Environmental Protection Agency, Certificate #004325	U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278
Michigan Department of Environmental Quality, Laboratory #0034	

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10425264001	Field Blank	Water	03/28/18 10:00	03/28/18 15:25
10425264002	FD-SB-B3	Water	03/28/18 13:00	03/28/18 15:25

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10425264001	Field Blank	EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 200.7	IP	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 8270D	AT1	38	PASI-M
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-H+B	JFP	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		EPA 353.2	JFP	3	PASI-M
		EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M
10425264002	FD-SB-B3	EPA 531.1	AC1	3	PASI-O
		EPA 547	AC1	1	PASI-O
		EPA 549.2	AC1	1	PASI-O
		EPA 552.3	LJM	7	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	BJW	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	IP	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 548.1	LAJ	1	PASI-O
		EPA 8270D	AT1	38	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 524.2	AEZ	4	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NEG	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-CIO2	AGS	1	PASI-O
		SM 4500-H+B	JFP	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	KEO	2	PASI-M
		EPA 300.1	CMB	1	PASI-O
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		EPA 353.2	JFP	3	PASI-M
		EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: Field Blank	Lab ID: 10425264001	Collected: 03/28/18 10:00	Received: 03/28/18 15:25	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	309-00-2	
alpha-BHC	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	319-84-6	
beta-BHC	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	319-85-7	
delta-BHC	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	58-89-9	
Chlordane (Technical)	ND	ug/L	0.52	1	03/29/18 14:03	04/06/18 16:11	57-74-9	
alpha-Chlordane	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	5103-71-9	
gamma-Chlordane	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	5103-74-2	
4,4'-DDD	ND	ug/L	0.10	1	03/29/18 14:03	04/06/18 16:11	72-54-8	
4,4'-DDE	ND	ug/L	0.10	1	03/29/18 14:03	04/06/18 16:11	72-55-9	
4,4'-DDT	ND	ug/L	0.10	1	03/29/18 14:03	04/06/18 16:11	50-29-3	
Dieldrin	ND	ug/L	0.10	1	03/29/18 14:03	04/06/18 16:11	60-57-1	
Endosulfan I	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	959-98-8	
Endosulfan II	ND	ug/L	0.10	1	03/29/18 14:03	04/06/18 16:11	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.10	1	03/29/18 14:03	04/06/18 16:11	1031-07-8	
Endrin	ND	ug/L	0.10	1	03/29/18 14:03	04/06/18 16:11	72-20-8	
Endrin aldehyde	ND	ug/L	0.10	1	03/29/18 14:03	04/06/18 16:11	7421-93-4	
Endrin ketone	ND	ug/L	0.10	1	03/29/18 14:03	04/06/18 16:11	53494-70-5	
Heptachlor	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	76-44-8	
Heptachlor epoxide	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	1024-57-3	
Methoxychlor	ND	ug/L	0.52	1	03/29/18 14:03	04/06/18 16:11	72-43-5	
Toxaphene	ND	ug/L	1.5	1	03/29/18 14:03	04/06/18 16:11	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	86	%	62-125	1	03/29/18 14:03	04/06/18 16:11	877-09-8	
Decachlorobiphenyl (S)	59	%	30-143	1	03/29/18 14:03	04/06/18 16:11	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	03/29/18 14:04	04/03/18 11:36	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	03/29/18 14:04	04/03/18 11:36	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	03/29/18 14:04	04/03/18 11:36	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.10	1	03/29/18 14:04	04/03/18 11:36	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	03/29/18 14:04	04/03/18 11:36	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.10	1	03/29/18 14:04	04/03/18 11:36	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	03/29/18 14:04	04/03/18 11:36	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	03/29/18 14:04	04/03/18 11:36	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	03/29/18 14:04	04/03/18 11:36	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	63	%	30-125	1	03/29/18 14:04	04/03/18 11:36	877-09-8	
Decachlorobiphenyl (S)	49	%	30-125	1	03/29/18 14:04	04/03/18 11:36	2051-24-3	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	03/30/18 11:48	04/02/18 13:43	7429-90-5	
Barium, Dissolved	936	ug/L	10.0	1	03/30/18 11:48	04/02/18 13:43	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/30/18 11:48	04/02/18 13:43	7440-50-8	
Manganese, Dissolved	430	ug/L	5.0	1	03/30/18 11:48	04/02/18 13:43	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/30/18 11:48	04/02/18 13:43	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/30/18 11:48	04/02/18 13:43	7440-22-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: Field Blank		Lab ID: 10425264001	Collected: 03/28/18 10:00	Received: 03/28/18 15:25	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Tin, Dissolved	ND	ug/L	75.0	1	03/30/18 11:48	04/02/18 13:43	7440-31-5	
Zinc, Dissolved	ND	ug/L	20.0	1	03/30/18 11:48	04/02/18 13:43	7440-66-6	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Chromium	ND	ug/L	0.50	1	03/30/18 13:50	03/30/18 17:47	7440-47-3	
Total Hardness by 2340B	ND	ug/L	141	1	03/30/18 13:50	03/30/18 17:47		
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	04/02/18 09:38	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	04/02/18 09:38	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/30/18 11:48	04/02/18 09:38	7440-41-7	
Boron, Dissolved	ND	ug/L	5.0	1	03/30/18 11:48	04/02/18 09:38	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/30/18 11:48	04/02/18 09:38	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	04/02/18 09:38	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	04/02/18 09:38	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/30/18 11:48	04/02/18 09:38	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	04/02/18 09:38	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/30/18 11:48	04/02/18 09:38	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	04/02/18 09:38	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/30/18 11:48	04/02/18 09:38	7440-62-2	
245.1 Mercury, Dissolved		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND	ug/L	0.20	1	03/30/18 10:00	04/03/18 17:06	7439-97-6	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	83-32-9	
Anthracene	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	50-32-8	
Benzoic acid	ND	ug/L	52.1	1	03/29/18 14:54	04/04/18 21:10	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	111-44-4	
2-Chlorophenol	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	52.1	1	03/29/18 14:54	04/04/18 21:10	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	120-83-2	
Diethylphthalate	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	84-66-2	
2,4-Dimethylphenol	ND	ug/L	52.1	1	03/29/18 14:54	04/04/18 21:10	105-67-9	
Dimethylphthalate	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	117-81-7	
Fluoranthene	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	206-44-0	
Fluorene	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	86-73-7	
Hexachlorobenzene	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	52.1	1	03/29/18 14:54	04/04/18 21:10	77-47-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: Field Blank	Lab ID: 10425264001	Collected: 03/28/18 10:00	Received: 03/28/18 15:25	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Hexachloroethane	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	67-72-1	
Isophorone	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.8	1	03/29/18 14:54	04/04/18 21:10		
N-Nitrosodiphenylamine	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	86-30-6	
Pentachlorophenol	ND	ug/L	20.8	1	03/29/18 14:54	04/04/18 21:10	87-86-5	
Phenanthrene	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	85-01-8	
Phenol	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	108-95-2	
Pyrene	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	74	%.	60-125	1	03/29/18 14:54	04/04/18 21:10	4165-60-0	
2-Fluorobiphenyl (S)	60	%.	56-125	1	03/29/18 14:54	04/04/18 21:10	321-60-8	
p-Terphenyl-d14 (S)	106	%.	58-125	1	03/29/18 14:54	04/04/18 21:10	1718-51-0	
Phenol-d6 (S)	85	%.	58-125	1	03/29/18 14:54	04/04/18 21:10	13127-88-3	
2-Fluorophenol (S)	76	%.	55-125	1	03/29/18 14:54	04/04/18 21:10	367-12-4	
2,4,6-Tribromophenol (S)	77	%.	65-125	1	03/29/18 14:54	04/04/18 21:10	118-79-6	
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	ND	mg/L	2.0	1	03/29/18 12:02	04/03/18 10:32		B2,B4, B6
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	5.2	1		04/06/18 12:58		
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	0.39	NTU	0.30	1		03/29/18 15:27		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	ND	mg/L	10.0	1		04/03/18 16:10		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	8.1	Std. Units	0.10	1		03/30/18 16:51		H6
Trivalent Chromium Calculation								
Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	ND	mg/L	0.010	1		04/04/18 10:29		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Fluoride	ND	mg/L	0.050	1		03/31/18 02:22	16984-48-8	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr D Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		03/29/18 09:06		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	ND	mg/L	0.10	1	04/04/18 10:00	04/06/18 09:51	7664-41-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: Field Blank		Lab ID: 10425264001	Collected: 03/28/18 10:00	Received: 03/28/18 15:25	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
353.2 Nitrate + Nitrite		Analytical Method: EPA 353.2						
Nitrate as N	ND	mg/L	0.020	1		03/29/18 14:13	14797-55-8	
Nitrite as N	ND	mg/L	0.020	1		03/29/18 14:13	14797-65-0	
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		03/29/18 14:13		
9016 Cyanide, Free		Analytical Method: EPA 9016 Preparation Method: EPA 9016						
Cyanide, Free	ND	ug/L	5.0	1	04/05/18 16:15	04/05/18 17:19		
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	10.0	1	04/03/18 09:46	04/03/18 12:54	57-12-5	
SM4500P-E, Total Phosphorus		Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B						
Phosphorus	ND	mg/L	0.050	1	04/06/18 10:41	04/06/18 13:18	7723-14-0	
Sample: FD-SB-B3		Lab ID: 10425264002	Collected: 03/28/18 13:00	Received: 03/28/18 15:25	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
531.1 HPLC Carbamates		Analytical Method: EPA 531.1						
Aldicarb	ND	ug/L	2.0	1		04/03/18 20:17	116-06-3	
Carbofuran	ND	ug/L	2.0	1		04/03/18 20:17	1563-66-2	
Surrogates								
BDMC (S)	94	%	80-120	1		04/03/18 20:17		
547 HPLC Glyphosate		Analytical Method: EPA 547						
Glyphosate	ND	ug/L	6.0	1		04/04/18 16:27		
549.2 HPLC Paraquat Diquat		Analytical Method: EPA 549.2 Preparation Method: EPA 549.2						
Diquat	ND	ug/L	0.40	1	04/04/18 23:02	04/05/18 19:38	85-00-7	
552.3 Haloacetic Acids		Analytical Method: EPA 552.3 Preparation Method: EPA 552.3						
Dibromoacetic Acid	ND	ug/L	1.0	1	04/04/18 10:30	04/09/18 21:47	631-64-1	
Dichloroacetic Acid	ND	ug/L	1.0	1	04/04/18 10:30	04/09/18 21:47	79-43-6	
Haloacetic Acids (Total)	ND	ug/L	1.0	1	04/04/18 10:30	04/09/18 21:47		
Monobromoacetic Acid	ND	ug/L	1.0	1	04/04/18 10:30	04/09/18 21:47	79-08-3	
Monochloroacetic Acid	ND	ug/L	1.0	1	04/04/18 10:30	04/09/18 21:47	79-11-8	
Trichloroacetic Acid	ND	ug/L	1.0	1	04/04/18 10:30	04/09/18 21:47	76-03-9	
Surrogates								
2,3-Dibromopropanoic Acid (S)	143	%	70-130	1	04/04/18 10:30	04/09/18 21:47	600-05-5	S3
8011 GCS EDB and DBCP		Analytical Method: EPA 8011 Preparation Method: EPA 8011						
1,2-Dibromo-3-chloropropane	ND	ug/L	0.010	1	04/04/18 07:55	04/04/18 22:08	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.010	1	04/04/18 07:55	04/04/18 22:08	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	128	%	30-150	1	04/04/18 07:55	04/04/18 22:08	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: FD-SB-B3	Lab ID: 10425264002	Collected: 03/28/18 13:00	Received: 03/28/18 15:25	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M Alcohols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	mg/L	5.0	1		04/05/18 10:42	67-56-1	
8015M Glycols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/04/18 15:22	107-21-1	
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	309-00-2	
alpha-BHC	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	319-84-6	
beta-BHC	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	319-85-7	
delta-BHC	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	58-89-9	
Chlordane (Technical)	ND	ug/L	0.53	1	03/29/18 14:03	04/06/18 15:53	57-74-9	
alpha-Chlordane	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	5103-71-9	
gamma-Chlordane	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	5103-74-2	
4,4'-DDD	ND	ug/L	0.11	1	03/29/18 14:03	04/06/18 15:53	72-54-8	
4,4'-DDE	ND	ug/L	0.11	1	03/29/18 14:03	04/06/18 15:53	72-55-9	
4,4'-DDT	ND	ug/L	0.11	1	03/29/18 14:03	04/06/18 15:53	50-29-3	
Dieldrin	ND	ug/L	0.11	1	03/29/18 14:03	04/06/18 15:53	60-57-1	
Endosulfan I	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	959-98-8	
Endosulfan II	ND	ug/L	0.11	1	03/29/18 14:03	04/06/18 15:53	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.11	1	03/29/18 14:03	04/06/18 15:53	1031-07-8	
Endrin	ND	ug/L	0.11	1	03/29/18 14:03	04/06/18 15:53	72-20-8	
Endrin aldehyde	ND	ug/L	0.11	1	03/29/18 14:03	04/06/18 15:53	7421-93-4	
Endrin ketone	ND	ug/L	0.11	1	03/29/18 14:03	04/06/18 15:53	53494-70-5	
Heptachlor	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	76-44-8	
Heptachlor epoxide	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	1024-57-3	
Methoxychlor	ND	ug/L	0.53	1	03/29/18 14:03	04/06/18 15:53	72-43-5	
Toxaphene	ND	ug/L	1.6	1	03/29/18 14:03	04/06/18 15:53	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	77	%.	62-125	1	03/29/18 14:03	04/06/18 15:53	877-09-8	
Decachlorobiphenyl (S)	54	%.	30-143	1	03/29/18 14:03	04/06/18 15:53	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.11	1	03/29/18 14:04	04/03/18 11:52	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.11	1	03/29/18 14:04	04/03/18 11:52	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.11	1	03/29/18 14:04	04/03/18 11:52	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.11	1	03/29/18 14:04	04/03/18 11:52	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.11	1	03/29/18 14:04	04/03/18 11:52	12672-29-6	
PCB-1254 (Aroclor 1254)	0.31	ug/L	0.11	1	03/29/18 14:04	04/03/18 11:52	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.11	1	03/29/18 14:04	04/03/18 11:52	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.11	1	03/29/18 14:04	04/03/18 11:52	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.11	1	03/29/18 14:04	04/03/18 11:52	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	69	%.	30-125	1	03/29/18 14:04	04/03/18 11:52	877-09-8	
Decachlorobiphenyl (S)	46	%.	30-125	1	03/29/18 14:04	04/03/18 11:52	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: FD-SB-B3	Lab ID: 10425264002	Collected: 03/28/18 13:00	Received: 03/28/18 15:25	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8315A GCSV Aldehydes								
Analytical Method: EPA 8315A Preparation Method: EPA 8315A								
Formaldehyde	ND	ug/L	100	1	03/30/18 11:30	03/30/18 17:45	50-00-0	
8316 W GCSV Acrylamide								
Analytical Method: EPA 8316								
Acrylamide	ND	ug/L	20.0	1		04/03/18 16:45	79-06-1	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	03/30/18 11:48	04/02/18 13:47	7429-90-5	
Barium, Dissolved	ND	ug/L	10.0	1	03/30/18 11:48	04/02/18 13:47	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/30/18 11:48	04/02/18 13:47	7440-50-8	
Manganese, Dissolved	ND	ug/L	5.0	1	03/30/18 11:48	04/02/18 13:47	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/30/18 11:48	04/02/18 13:47	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/30/18 11:48	04/02/18 13:47	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/30/18 11:48	04/02/18 13:47	7440-31-5	
Zinc, Dissolved	ND	ug/L	20.0	1	03/30/18 11:48	04/02/18 13:47	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	10.4	ug/L	2.5	5	03/30/18 13:50	03/30/18 18:16	7440-47-3	
Total Hardness by 2340B	1280000	ug/L	14100	100	03/30/18 13:50	03/30/18 18:19		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:15	7440-36-0	
Arsenic, Dissolved	1.2	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:15	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/30/18 11:48	03/30/18 13:15	7440-41-7	
Boron, Dissolved	51900	ug/L	1000	200	03/30/18 11:48	03/30/18 16:22	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/30/18 11:48	03/30/18 13:15	7440-43-9	
Chromium, Dissolved	3.2	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:15	7440-47-3	
Cobalt, Dissolved	3.8	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:15	7440-48-4	
Lead, Dissolved	1.6	ug/L	0.10	1	03/30/18 11:48	03/30/18 13:15	7439-92-1	
Selenium, Dissolved	0.79	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:15	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/30/18 11:48	03/30/18 13:15	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:15	7440-61-1	
Vanadium, Dissolved	1.3	ug/L	1.0	1	03/30/18 11:48	03/30/18 13:15	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	03/30/18 10:00	04/03/18 17:08	7439-97-6	
548.1 GCS Endothall								
Analytical Method: EPA 548.1 Preparation Method: EPA 548.1								
Endothall	ND	ug/L	9.0	1	04/04/18 16:08	04/11/18 15:17		L1,L2
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	83-32-9	
Anthracene	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	120-12-7	
Benzo(a)pyrene	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	50-32-8	
Benzoic acid	ND	ug/L	256	5	03/29/18 14:54	04/05/18 14:21	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	101-55-3	
Butylbenzylphthalate	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	85-68-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: FD-SB-B3 **Lab ID: 10425264002** Collected: 03/28/18 13:00 Received: 03/28/18 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

bis(2-Chloroethyl) ether	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	111-44-4	
2-Chlorophenol	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	256	5	03/29/18 14:54	04/05/18 14:21	91-94-1	
2,4-Dichlorophenol	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	120-83-2	
Diethylphthalate	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	84-66-2	
2,4-Dimethylphenol	ND	ug/L	256	5	03/29/18 14:54	04/05/18 14:21	105-67-9	
Dimethylphthalate	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	131-11-3	
Di-n-butylphthalate	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	84-74-2	
2,4-Dinitrophenol	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	51-28-5	
Di-n-octylphthalate	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	117-81-7	
Fluoranthene	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	206-44-0	
Fluorene	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	86-73-7	
Hexachlorobenzene	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	256	5	03/29/18 14:54	04/05/18 14:21	77-47-4	
Hexachloroethane	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	67-72-1	
Isophorone	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	78-59-1	
2-Methylnaphthalene	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	103	5	03/29/18 14:54	04/05/18 14:21		
N-Nitrosodiphenylamine	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	86-30-6	
Pentachlorophenol	ND	ug/L	103	5	03/29/18 14:54	04/05/18 14:21	87-86-5	
Phenanthrene	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	85-01-8	
Phenol	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	108-95-2	
Pyrene	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	77	%	60-125	5	03/29/18 14:54	04/05/18 14:21	4165-60-0	D3
2-Fluorobiphenyl (S)	68	%	56-125	5	03/29/18 14:54	04/05/18 14:21	321-60-8	
p-Terphenyl-d14 (S)	78	%	58-125	5	03/29/18 14:54	04/05/18 14:21	1718-51-0	
Phenol-d6 (S)	81	%	58-125	5	03/29/18 14:54	04/05/18 14:21	13127-88-3	
2-Fluorophenol (S)	76	%	55-125	5	03/29/18 14:54	04/05/18 14:21	367-12-4	
2,4,6-Tribromophenol (S)	103	%	65-125	5	03/29/18 14:54	04/05/18 14:21	118-79-6	

524.2 MSV

Analytical Method: EPA 524.2

Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/06/18 17:54		
Surrogates								
4-Bromofluorobenzene (S)	103	%	75-125	1		04/06/18 17:54	460-00-4	
Toluene-d8 (S)	98	%	75-125	1		04/06/18 17:54	2037-26-5	
1,2-Dichloroethane-d4 (S)	98	%	75-125	1		04/06/18 17:54	17060-07-0	

Field Data

Analytical Method:

Field pH	6.9	Std. Units		1		04/17/18 08:16		
Field Temperature	11.0	deg C		1		04/17/18 08:16		

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: FD-SB-B3	Lab ID: 10425264002	Collected: 03/28/18 13:00	Received: 03/28/18 15:25	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	12.1	mg/L	6.0	3	03/29/18 12:02	04/03/18 10:35		B4,B6
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	5.4	1		04/06/18 12:58		1M
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	416	NTU	15.0	50		03/29/18 15:32		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	113	mg/L	10.0	1		04/03/18 16:10		
4500ClO2 Chlorine Dioxide								
Analytical Method: SM 4500-ClO2								
Chlorine Dioxide	ND	mg/L	0.10	1		04/06/18 13:42		H6
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	6.9	Std. Units	0.10	1		03/30/18 16:56		H6
Trivalent Chromium Calculation								
Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	ND	mg/L	0.010	1		04/04/18 10:29		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	167	mg/L	6.0	5		03/31/18 11:00	16887-00-6	
Fluoride	ND	mg/L	0.050	1		03/31/18 04:25	16984-48-8	
300.1 Oxihalide IC Anions 14d								
Analytical Method: EPA 300.1								
Chlorite	ND	ug/L	500	100		04/02/18 04:16		D3
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr D Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		03/29/18 09:06		FS,M3
350.1 Ammonia, Unionized								
Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	0.052	mg/L	0.010	1		04/17/18 08:17		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	32.8	mg/L	0.50	5	04/04/18 10:00	04/06/18 10:04	7664-41-7	M1
353.2 Nitrate + Nitrite								
Analytical Method: EPA 353.2								
Nitrate as N	0.021	mg/L	0.020	1		03/29/18 14:14	14797-55-8	FS
Nitrite as N	ND	mg/L	0.020	1		03/29/18 14:14	14797-65-0	FS
Nitrogen, NO2 plus NO3	0.021	mg/L	0.020	1		03/29/18 14:14		FS
9016 Cyanide, Free								
Analytical Method: EPA 9016 Preparation Method: EPA 9016								
Cyanide, Free	ND	ug/L	5.0	1	04/05/18 16:15	04/05/18 17:19		

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: FD-SB-B3		Lab ID: 10425264002		Collected: 03/28/18 13:00	Received: 03/28/18 15:25	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	26.8	ug/L	10.0	1	04/03/18 09:46	04/03/18 12:56	57-12-5	
SM4500P-E, Total Phosphorus		Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B						
Phosphorus	0.53	mg/L	0.050	1	04/06/18 10:41	04/06/18 13:19	7723-14-0	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 436885	Analysis Method: EPA 531.1
QC Batch Method: EPA 531.1	Analysis Description: 531.1 HPLC Carbamate
Associated Lab Samples: 10425264002	

METHOD BLANK: 2372516 Matrix: Water

Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aldicarb	ug/L	ND	2.0	04/03/18 05:37	
Carbofuran	ug/L	ND	2.0	04/03/18 05:37	
BDMC (S)	%	93	80-120	04/03/18 05:37	

LABORATORY CONTROL SAMPLE: 2372517

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aldicarb	ug/L	10	9.2	92	80-120	
Carbofuran	ug/L	10	10.6	106	80-120	
BDMC (S)	%			101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2372518 2372519

Parameter	Units	35382635001		2372518		2372519		% Rec	% Rec	% Rec Limits	Max		Qual
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result				RPD	RPD	
Aldicarb	ug/L	<0.64		10	10	9.0	8.4	90	84	80-120	7	20	
Carbofuran	ug/L	<0.32		10	10	13.2	14.6	132	146	80-120	10	20	M1
BDMC (S)	%							108	100	80-120			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 437576 Analysis Method: EPA 547
QC Batch Method: EPA 547 Analysis Description: 547 HPLC Glyphosate
Associated Lab Samples: 10425264002

METHOD BLANK: 2375438 Matrix: Water
Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Glyphosate	ug/L	ND	6.0	04/04/18 11:18	

LABORATORY CONTROL SAMPLE: 2375439

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Glyphosate	ug/L	50	46.9	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2375440 2375441

Parameter	Units	35383136002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	4.2U	50	50	50.8	51.9	102	104	80-120	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2375442 2375443

Parameter	Units	4610024001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	<6.0	50	50	53.0	54.6	106	109	80-120	3	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 435508 Analysis Method: EPA 8015 Alcohol-Glycol
 QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified
 Associated Lab Samples: 10425264002

METHOD BLANK: 2011284 Matrix: Water
 Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methanol	mg/L	ND	5.0	04/04/18 13:46	

LABORATORY CONTROL SAMPLE: 2011285

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methanol	mg/L	50	56.4	113	79-111	L3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2011376 2011377

Parameter	Units	60266710003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methanol	mg/L	ND	50	50	46.8	46.4	94	93	43-138	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 435082 Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10425264002

METHOD BLANK: 2009743 Matrix: Water
Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylene glycol	mg/L	ND	5.0	04/04/18 14:18	

LABORATORY CONTROL SAMPLE: 2009744

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylene glycol	mg/L	25	27.5	110	55-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009947 2009948

Parameter	Units	92378674025 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Ethylene glycol	mg/L	ND	25	25	24.5	25.5	96	100	38-154	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009949 2009950

Parameter	Units	92378674031 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Ethylene glycol	mg/L	ND	25	25	23.2	26.3	91	103	38-154	12	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 19422 Analysis Method: EPA 8316
QC Batch Method: EPA 8316 Analysis Description: 8316 W GCSV Acrylamide
Associated Lab Samples: 10425264002

METHOD BLANK: 77113 Matrix: Water
Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acrylamide	ug/L	ND	20.0	04/03/18 16:28	

LABORATORY CONTROL SAMPLE: 77114

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acrylamide	ug/L	1000	882	88	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 77115 77116

Parameter	Units	10425264002		77115		77116		% Rec Limits	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Acrylamide	ug/L	ND	1000	1000	939	903	94	90	78-135	4	16

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 529772	Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1	Analysis Description: 245.1 Mercury - Dissolved
Associated Lab Samples: 10425264001, 10425264002	

METHOD BLANK: 2875568 Matrix: Water

Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	04/03/18 16:57	

LABORATORY CONTROL SAMPLE & LCSD: 2875569 2875570

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury, Dissolved	ug/L	5	5.3	5.3	105	106	85-115	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 529771 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2875565 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/02/18 13:27	
Barium, Dissolved	ug/L	ND	10.0	04/02/18 13:27	
Copper, Dissolved	ug/L	ND	10.0	04/02/18 13:27	
Manganese, Dissolved	ug/L	ND	5.0	04/02/18 13:27	
Nickel, Dissolved	ug/L	ND	20.0	04/02/18 13:27	
Silver, Dissolved	ug/L	ND	10.0	04/02/18 13:27	
Tin, Dissolved	ug/L	ND	75.0	04/02/18 13:27	
Zinc, Dissolved	ug/L	ND	20.0	04/02/18 13:27	

LABORATORY CONTROL SAMPLE & LCSD: 2875566

Parameter	Units	2875567							RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits				
Aluminum, Dissolved	ug/L	20000	20500	20900	103	104	85-115	2	20		
Barium, Dissolved	ug/L	1000	1020	1040	102	104	85-115	2	20		
Copper, Dissolved	ug/L	1000	985	1000	98	100	85-115	2	20		
Manganese, Dissolved	ug/L	1000	1010	1020	101	102	85-115	2	20		
Nickel, Dissolved	ug/L	1000	1010	1030	101	103	85-115	2	20		
Silver, Dissolved	ug/L	500	493	501	99	100	85-115	1	20		
Tin, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20		
Zinc, Dissolved	ug/L	1000	1020	1040	102	104	85-115	1	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 529767 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2875545 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	0.50	03/30/18 17:44	

LABORATORY CONTROL SAMPLE: 2875546

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	100	107	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875547 2875548

Parameter	Units	10425362001		2875547		2875548		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Chromium	ug/L	4.8	100	100	100	111	107	106	102	70-130	4	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 529770 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2875559 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Arsenic, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Beryllium, Dissolved	ug/L	ND	0.20	04/02/18 09:36	
Boron, Dissolved	ug/L	ND	5.0	04/02/18 09:36	
Cadmium, Dissolved	ug/L	ND	0.080	04/02/18 09:36	
Chromium, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Cobalt, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Lead, Dissolved	ug/L	ND	0.10	04/02/18 09:36	
Selenium, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Thallium, Dissolved	ug/L	ND	0.10	04/02/18 09:36	
Uranium-238, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Vanadium, Dissolved	ug/L	ND	1.0	04/02/18 09:36	

LABORATORY CONTROL SAMPLE & LCSD: 2875560

Parameter	Units	2875564								Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	
Antimony, Dissolved	ug/L	100	104	104	104	104	85-115	0	20	
Arsenic, Dissolved	ug/L	100	105	104	105	104	85-115	1	20	
Beryllium, Dissolved	ug/L	100	110	109	110	109	85-115	1	20	
Boron, Dissolved	ug/L	100	106	110	106	110	85-115	4	20	
Cadmium, Dissolved	ug/L	100	106	105	106	105	85-115	1	20	
Chromium, Dissolved	ug/L	100	106	105	106	105	85-115	1	20	
Cobalt, Dissolved	ug/L	100	107	106	107	106	85-115	0	20	
Lead, Dissolved	ug/L	100	109	107	109	107	85-115	1	20	
Selenium, Dissolved	ug/L	100	107	106	107	106	85-115	1	20	
Thallium, Dissolved	ug/L	100	107	105	107	105	85-115	2	20	
Uranium-238, Dissolved	ug/L	100	111	111	111	111	85-115	0	20	
Vanadium, Dissolved	ug/L	100	103	104	103	104	85-115	0	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 531079 Analysis Method: EPA 524.2
 QC Batch Method: EPA 524.2 Analysis Description: 524.2 MSV
 Associated Lab Samples: 10425264002

METHOD BLANK: 2883584 Matrix: Water

Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	ND	4.0	04/06/18 12:23	
1,2-Dichloroethane-d4 (S)	%.	102	75-125	04/06/18 12:23	
4-Bromofluorobenzene (S)	%.	99	75-125	04/06/18 12:23	
Toluene-d8 (S)	%.	99	75-125	04/06/18 12:23	

LABORATORY CONTROL SAMPLE: 2883585

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	80	80.8	101	70-130	
1,2-Dichloroethane-d4 (S)	%.			100	75-125	
4-Bromofluorobenzene (S)	%.			97	75-125	
Toluene-d8 (S)	%.			98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2885151 2885152

Parameter	Units	10426572001		2885151		2885152		% Rec	% Rec	% Rec	Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
Total Trihalomethanes (Calc.)	ug/L	ND	80	80	76.8	82.7	96	103	70-130	7	20		
1,2-Dichloroethane-d4 (S)	%.						101	99	75-125				
4-Bromofluorobenzene (S)	%.						101	99	75-125				
Toluene-d8 (S)	%.						99	98	75-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 437555 Analysis Method: EPA 548.1
QC Batch Method: EPA 548.1 Analysis Description: 548 GCS Endothall
Associated Lab Samples: 10425264002

METHOD BLANK: 2375305 Matrix: Water
Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Endothall	ug/L	ND	9.0	04/11/18 14:41	

LABORATORY CONTROL SAMPLE: 2375306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	50	ND	0	64-137	L2

LABORATORY CONTROL SAMPLE: 2375307

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	9	22.1	246	50-150	L1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2376829 2376830

Parameter	Units	35383245001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
										RPD	RPD	
Endothall	ug/L	<4.3	50	50	10.6	5.9J	21	12	64-137	30	M0	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2376831 2376833

Parameter	Units	35382684001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
										RPD	RPD	
Endothall	ug/L	4.3U	50	50	9.8	6.6J	20	13	64-137	30	M0	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 437867 Analysis Method: EPA 549.2
QC Batch Method: EPA 549.2 Analysis Description: 549 HPLC Paraquat Diquat
Associated Lab Samples: 10425264002

METHOD BLANK: 2376996 Matrix: Water
Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diquat	ug/L	ND	0.40	04/05/18 18:44	

LABORATORY CONTROL SAMPLE: 2376997

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	2	1.6	78	70-130	

LABORATORY CONTROL SAMPLE: 2376998

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	.4	0.58	145	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2377632 2377635

Parameter	Units	35382816003 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Spike Conc.	Conc.						
Diquat	ug/L	<0.30	2	2	1.9	1.8	93	90	70-130	4	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2377634 2377635

Parameter	Units	35382800001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Spike Conc.	Conc.						
Diquat	ug/L	<0.30	2	2	1.9	1.9	95	95	70-130	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 437540 Analysis Method: EPA 552.3
 QC Batch Method: EPA 552.3 Analysis Description: 5523 Haloacetic Acids
 Associated Lab Samples: 10425264002

METHOD BLANK: 2375214 Matrix: Water

Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromoacetic Acid	ug/L	ND	1.0	04/09/18 19:20	
Dichloroacetic Acid	ug/L	ND	1.0	04/09/18 19:20	
Haloacetic Acids (Total)	ug/L	ND	1.0	04/09/18 19:20	
Monobromoacetic Acid	ug/L	ND	1.0	04/09/18 19:20	
Monochloroacetic Acid	ug/L	ND	1.0	04/09/18 19:20	
Trichloroacetic Acid	ug/L	ND	1.0	04/09/18 19:20	
2,3-Dibromopropanoic Acid (S)	%	119	70-130	04/09/18 19:20	

LABORATORY CONTROL SAMPLE: 2375215

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromoacetic Acid	ug/L	10	11.2	112	70-130	
Dichloroacetic Acid	ug/L	10	11.4	114	70-130	
Haloacetic Acids (Total)	ug/L	50	58.0	116	70-130	
Monobromoacetic Acid	ug/L	10	11.6	116	70-130	
Monochloroacetic Acid	ug/L	10	11.9	119	70-130	
Trichloroacetic Acid	ug/L	10	11.9	119	70-130	
2,3-Dibromopropanoic Acid (S)	%			125	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2375474 2375475

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		35382042001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Dibromoacetic Acid	ug/L	<0.43	10	10	12.1	11.9	121	119	70-130	2	30	
Dichloroacetic Acid	ug/L	<0.24	10	10	11.6	11.4	116	114	70-130	2	30	
Haloacetic Acids (Total)	ug/L	<0.67	50	50	58.5	57.8	117	116	70-130	1	30	
Monobromoacetic Acid	ug/L	<0.29	10	10	11.0	11.1	110	111	70-130	1	30	
Monochloroacetic Acid	ug/L	<0.90	10	10	11.4	11.1	114	111	70-130	2	30	
Trichloroacetic Acid	ug/L	<0.26	10	10	12.4	12.2	124	122	70-130	2	30	
2,3-Dibromopropanoic Acid (S)	%						121	124	70-130		30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2376481 2376482

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		35382993001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Dibromoacetic Acid	ug/L	4.1	10	10	15.5	15.5	114	113	70-130	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Parameter	Units	35382993001		2376481		2376482		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec							
Dichloroacetic Acid	ug/L	16.4	10	10	27.2	27.3	108	109	70-130	0	30			
Haloacetic Acids (Total)	ug/L	28.9	50	50	101	103	145	149	70-130	2	30			
Monobromoacetic Acid	ug/L	0.29U	10	10	16.4	17.9	164	179	70-130	9	30	M1		
Monochloroacetic Acid	ug/L	0.90U	10	10	22.2	22.7	222	227	70-130	3	30	M1		
Trichloroacetic Acid	ug/L	8.3	10	10	20.1	20.0	118	117	70-130	1	30			
2,3-Dibromopropanoic Acid (S)	%						132	148	70-130		30	S0		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 530540

Analysis Method: EPA 8011

QC Batch Method: EPA 8011

Analysis Description: GCS 8011 EDB DBCP

Associated Lab Samples: 10425264002

METHOD BLANK: 2879655

Matrix: Water

Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	ND	0.010	04/04/18 18:16	
1,2-Dibromoethane (EDB)	ug/L	ND	0.010	04/04/18 18:16	
4-Bromofluorobenzene (S)	%.	96	30-150	04/04/18 18:16	

LABORATORY CONTROL SAMPLE & LCSD: 2879656

2879657

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	.11	0.11	0.11	98	100	60-140	2	20	
1,2-Dibromoethane (EDB)	ug/L	.11	0.11	0.11	98	98	60-140	1	20	
4-Bromofluorobenzene (S)	%.				101	105	30-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 529686 Analysis Method: EPA 8081B
QC Batch Method: EPA Mod. 3510C Analysis Description: 8081B GCS Pesticides
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2874942 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/06/18 14:58	
4,4'-DDE	ug/L	ND	0.10	04/06/18 14:58	
4,4'-DDT	ug/L	ND	0.10	04/06/18 14:58	
Aldrin	ug/L	ND	0.050	04/06/18 14:58	
alpha-BHC	ug/L	ND	0.050	04/06/18 14:58	
alpha-Chlordane	ug/L	ND	0.050	04/06/18 14:58	
beta-BHC	ug/L	ND	0.050	04/06/18 14:58	
Chlordane (Technical)	ug/L	ND	0.50	04/06/18 14:58	
delta-BHC	ug/L	ND	0.050	04/06/18 14:58	
Dieldrin	ug/L	ND	0.10	04/06/18 14:58	
Endosulfan I	ug/L	ND	0.050	04/06/18 14:58	
Endosulfan II	ug/L	ND	0.10	04/06/18 14:58	
Endosulfan sulfate	ug/L	ND	0.10	04/06/18 14:58	
Endrin	ug/L	ND	0.10	04/06/18 14:58	
Endrin aldehyde	ug/L	ND	0.10	04/06/18 14:58	
Endrin ketone	ug/L	ND	0.10	04/06/18 14:58	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/06/18 14:58	
gamma-Chlordane	ug/L	ND	0.050	04/06/18 14:58	
Heptachlor	ug/L	ND	0.050	04/06/18 14:58	
Heptachlor epoxide	ug/L	ND	0.050	04/06/18 14:58	
Methoxychlor	ug/L	ND	0.50	04/06/18 14:58	
Toxaphene	ug/L	ND	1.5	04/06/18 14:58	
Decachlorobiphenyl (S)	%	77	30-143	04/06/18 14:58	
Tetrachloro-m-xylene (S)	%	83	62-125	04/06/18 14:58	

LABORATORY CONTROL SAMPLE & LCSD: 2874943

Parameter	Units	2874944							RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits				
4,4'-DDD	ug/L	1	0.98	1.0	98	101	67-125	3	20		
4,4'-DDE	ug/L	1	0.94	0.97	94	97	68-125	3	20		
4,4'-DDT	ug/L	1	0.98	0.99	98	99	66-125	1	20		
Aldrin	ug/L	.5	0.38	0.41	76	83	46-125	8	20		
alpha-BHC	ug/L	.5	0.48	0.48	95	97	66-125	2	20		
alpha-Chlordane	ug/L	.5	0.46	0.47	92	94	72-125	2	20		
beta-BHC	ug/L	.5	0.46	0.47	93	94	72-125	1	20		
delta-BHC	ug/L	.5	0.47	0.48	95	96	37-141	1	20		
Dieldrin	ug/L	1	1.0	1.0	102	104	71-125	2	20		
Endosulfan I	ug/L	.5	0.44	0.45	88	89	69-125	2	20		
Endosulfan II	ug/L	1	1.0	1.0	100	101	73-125	1	20		
Endosulfan sulfate	ug/L	1	0.91	0.92	91	92	63-127	1	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

LABORATORY CONTROL SAMPLE & LCSD: 2874943		2874944									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Endrin	ug/L	1	0.94	0.96	94	96	72-125	2	20		
Endrin aldehyde	ug/L	1	0.94	0.96	94	96	70-125	1	20		
Endrin ketone	ug/L	1	1.0	1.0	102	104	72-127	1	20		
gamma-BHC (Lindane)	ug/L	.5	0.47	0.48	95	96	69-125	2	20		
gamma-Chlordane	ug/L	.5	0.41	0.42	81	83	64-125	3	20		
Heptachlor	ug/L	.5	0.42	0.45	85	90	54-125	6	20		
Heptachlor epoxide	ug/L	.5	0.46	0.47	93	94	72-125	2	20		
Methoxychlor	ug/L	5	4.8	4.9	96	99	67-127	2	20		
Decachlorobiphenyl (S)	%				86	89	30-143				
Tetrachloro-m-xylene (S)	%				89	91	62-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 529687 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2874946 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/03/18 11:04	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/03/18 11:04	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/03/18 11:04	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/03/18 11:04	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/03/18 11:04	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/03/18 11:04	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/03/18 11:04	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/03/18 11:04	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/03/18 11:04	
Decachlorobiphenyl (S)	%	84	30-125	04/03/18 11:04	
Tetrachloro-m-xylene (S)	%	66	30-125	04/03/18 11:04	

LABORATORY CONTROL SAMPLE & LCSD: 2874947

Parameter	Units	2874948								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.4	1.5	71	75	47-125	6	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.6	1.6	79	81	54-125	2	20	
Decachlorobiphenyl (S)	%				82	83	30-125			
Tetrachloro-m-xylene (S)	%				55	66	30-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 529677 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2874915 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/03/18 17:31	
2,4-Dichlorophenol	ug/L	ND	10.0	04/03/18 17:31	
2,4-Dimethylphenol	ug/L	ND	50.0	04/03/18 17:31	
2,4-Dinitrophenol	ug/L	ND	10.0	04/03/18 17:31	
2-Chlorophenol	ug/L	ND	10.0	04/03/18 17:31	
2-Methylnaphthalene	ug/L	ND	10.0	04/03/18 17:31	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/03/18 17:31	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/03/18 17:31	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/03/18 17:31	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/03/18 17:31	
Acenaphthene	ug/L	ND	10.0	04/03/18 17:31	
Anthracene	ug/L	ND	10.0	04/03/18 17:31	
Benzo(a)pyrene	ug/L	ND	10.0	04/03/18 17:31	
Benzoic acid	ug/L	ND	50.0	04/03/18 17:31	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/03/18 17:31	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/03/18 17:31	
Butylbenzylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Di-n-butylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Di-n-octylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Diethylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Dimethylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Fluoranthene	ug/L	ND	10.0	04/03/18 17:31	
Fluorene	ug/L	ND	10.0	04/03/18 17:31	
Hexachlorobenzene	ug/L	ND	10.0	04/03/18 17:31	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/03/18 17:31	
Hexachloroethane	ug/L	ND	10.0	04/03/18 17:31	
Isophorone	ug/L	ND	10.0	04/03/18 17:31	
N-Nitrosodiphenylamine	ug/L	ND	10.0	04/03/18 17:31	
Pentachlorophenol	ug/L	ND	20.0	04/03/18 17:31	
Phenanthrene	ug/L	ND	10.0	04/03/18 17:31	
Phenol	ug/L	ND	10.0	04/03/18 17:31	
Pyrene	ug/L	ND	10.0	04/03/18 17:31	
2,4,6-Tribromophenol (S)	%	81	65-125	04/03/18 17:31	
2-Fluorobiphenyl (S)	%	74	56-125	04/03/18 17:31	
2-Fluorophenol (S)	%	83	55-125	04/03/18 17:31	
Nitrobenzene-d5 (S)	%	81	60-125	04/03/18 17:31	
p-Terphenyl-d14 (S)	%	107	58-125	04/03/18 17:31	
Phenol-d6 (S)	%	87	58-125	04/03/18 17:31	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

LABORATORY CONTROL SAMPLE & LCSD: 2874916			2874917							
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	41.4	42.1	83	84	74-125	2	20	
2,4-Dichlorophenol	ug/L	50	39.2	39.7	78	79	68-125	1	20	
2,4-Dimethylphenol	ug/L	50	28.9J	31J	58	62	33-125		20	
2,4-Dinitrophenol	ug/L	50	34.2	36.8	68	74	30-127	7	20	
2-Chlorophenol	ug/L	50	38.3	37.2	77	74	61-125	3	20	
2-Methylnaphthalene	ug/L	50	38.0	38.8	76	78	67-125	2	20	
2-Methylphenol(o-Cresol)	ug/L	50	36.4	35.0	73	70	63-125	4	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	37.3	36.8	75	74	67-125	1	20	
3,3'-Dichlorobenzidine	ug/L	50	45.7J	48.1J	91	96	60-125		20	
4-Bromophenylphenyl ether	ug/L	50	43.2	43.6	86	87	75-125	1	20	
Acenaphthene	ug/L	50	40.1	40.9	80	82	74-125	2	20	
Anthracene	ug/L	50	43.5	43.9	87	88	75-125	1	20	
Benzo(a)pyrene	ug/L	50	42.7	42.4	85	85	75-125	1	20	
Benzoic acid	ug/L	50	21.9J	22.1J	44	44	30-125		20	2M
bis(2-Chloroethyl) ether	ug/L	50	35.4	34.0	71	68	55-125	4	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	41.0	41.6	82	83	72-129	1	20	
Butylbenzylphthalate	ug/L	50	41.2	41.2	82	82	69-127	0	20	
Di-n-butylphthalate	ug/L	50	41.5	42.0	83	84	75-125	1	20	
Di-n-octylphthalate	ug/L	50	41.6	41.4	83	83	69-131	1	20	
Diethylphthalate	ug/L	50	42.5	43.0	85	86	75-125	1	20	
Dimethylphthalate	ug/L	50	42.6	43.0	85	86	75-125	1	20	
Fluoranthene	ug/L	50	42.6	44.2	85	88	75-125	4	20	
Fluorene	ug/L	50	41.7	42.4	83	85	75-125	2	20	
Hexachlorobenzene	ug/L	50	42.0	42.3	84	85	74-125	1	20	
Hexachlorocyclopentadiene	ug/L	50	ND	ND	30	31	30-125		20	
Hexachloroethane	ug/L	50	28.9	26.6	58	53	30-125	9	20	
Isophorone	ug/L	50	37.8	38.4	76	77	72-125	2	20	
N-Nitrosodiphenylamine	ug/L	50	41.5	41.7	83	83	75-125	0	20	
Pentachlorophenol	ug/L	50	35.5	36.9	71	74	52-125	4	20	
Phenanthrene	ug/L	50	43.3	43.5	87	87	75-125	1	20	
Phenol	ug/L	50	38.0	36.7	76	73	59-125	3	20	
Pyrene	ug/L	50	44.1	44.3	88	89	75-125	0	20	
2,4,6-Tribromophenol (S)	%				90	92	65-125			
2-Fluorobiphenyl (S)	%				80	82	56-125			
2-Fluorophenol (S)	%				80	77	55-125			
Nitrobenzene-d5 (S)	%				76	77	60-125			
p-Terphenyl-d14 (S)	%				99	101	58-125			
Phenol-d6 (S)	%				82	81	58-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 529611 Analysis Method: Hach 10360 Rev 1.1
QC Batch Method: Hach 10360 Analysis Description: Hach 10360 Rev 1.1, BOD
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2874632 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	04/03/18 10:09	B4,B6

LABORATORY CONTROL SAMPLE: 2874634

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	230	116	85-115	B4,B6

SAMPLE DUPLICATE: 2874635

Parameter	Units	10425153001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	646	638	1	20	B4,B6

SAMPLE DUPLICATE: 2875024

Parameter	Units	10425370001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	4390	3740	16	20	B4,B6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 530982 Analysis Method: EPA 1664A OG
QC Batch Method: EPA 1664A OG Analysis Description: 1664 HEM, Oil and Grease
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2883199 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	04/06/18 09:14	

LABORATORY CONTROL SAMPLE: 2883200

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	31.8	80	78-114	

MATRIX SPIKE SAMPLE: 2883202

Parameter	Units	10425716001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	ND	44	35.1	77	78-114	M1

SAMPLE DUPLICATE: 2883201

Parameter	Units	10425987001 Result	Dup Result	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	57.0	60.4	6	18	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 529722

Analysis Method: EPA 180.1

QC Batch Method: EPA 180.1

Analysis Description: 180.1 Turbidity

Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2875161

Matrix: Water

Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	03/29/18 15:26	

LABORATORY CONTROL SAMPLE: 2875162

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.3	101	90-110	

SAMPLE DUPLICATE: 2875163

Parameter	Units	10425264002 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	416	406	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 530305 Analysis Method: SM 2540D
 QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
 Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2878449 Matrix: Water

Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	04/03/18 16:10	

LABORATORY CONTROL SAMPLE: 2878450

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	90.0	90	80-120	

SAMPLE DUPLICATE: 2878452

Parameter	Units	10425301001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	84.0	80.0	5	10	

SAMPLE DUPLICATE: 2878909

Parameter	Units	10425211001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 438356	Analysis Method: SM 4500-CIO2
QC Batch Method: SM 4500-CIO2	Analysis Description: 4500CIO2 Chlorine Dioxide
Associated Lab Samples: 10425264002	

METHOD BLANK: 2380118 Matrix: Water

Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorine Dioxide	mg/L	ND	0.10	04/06/18 13:42	H6

LABORATORY CONTROL SAMPLE: 2380119

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorine Dioxide	mg/L	2.5	2.3	94	90-110	H6

SAMPLE DUPLICATE: 2380120

Parameter	Units	10424606001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	0.25	0.25	0	20	H6

SAMPLE DUPLICATE: 2380121

Parameter	Units	7584977001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	0.95	0.96	1	20	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 529922 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 10425264001, 10425264002

LABORATORY CONTROL SAMPLE: 2876210

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	100	98-102	H6

SAMPLE DUPLICATE: 2876211

Parameter	Units	10425038001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.5	7.6	1	3	H6

SAMPLE DUPLICATE: 2876212

Parameter	Units	10425367003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.1	1	3	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 529627 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2874679 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	03/30/18 20:53	
Fluoride	mg/L	ND	0.050	03/30/18 20:53	

LABORATORY CONTROL SAMPLE: 2874680

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	11.6	93	90-110	
Fluoride	mg/L	1	0.96	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874681 2874682

Parameter	Units	10424547001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result						
Chloride	mg/L	8.6	12.5	12.5	19.8	19.8	89	90	90-110	0	20	M1
Fluoride	mg/L	0.29	1	1	1.3	1.3	98	99	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874683 2874684

Parameter	Units	10424924002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result						
Chloride	mg/L	156	62.5	62.5	207	207	81	81	90-110	0	20	M1
Fluoride	mg/L	0.065	1	1	1.1	1.1	103	104	90-110	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 437078 Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1 Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10425264002

METHOD BLANK: 2373461 Matrix: Water
Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorite	ug/L	ND	5.0	04/01/18 11:32	

LABORATORY CONTROL SAMPLE: 2373462

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	40	37.5	94	85-115	

MATRIX SPIKE SAMPLE: 2373464

Parameter	Units	35382915001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	638U	20000	18500	93	75-125	

SAMPLE DUPLICATE: 2373463

Parameter	Units	35382915001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorite	ug/L	638U	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 529585 Analysis Method: SM 3500-Cr D Modified
 QC Batch Method: SM 3500-Cr D Modified Analysis Description: Chromium, Hexavalent by 3500
 Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2874562 Matrix: Water

Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	03/29/18 09:06	FS

LABORATORY CONTROL SAMPLE: 2874563

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.21	104	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874564 2874565

Parameter	Units	10425264002		2874564		2874565		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Chromium, Hexavalent	mg/L	ND	.2	.2	.0034J	.0042J	0	0	85-115	20	FS,M3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 139871 Analysis Method: EPA 350.1 rev. 2 (1993)
QC Batch Method: EPA 350.1 rev. 2 (1993) Analysis Description: 350.1 Ammonia Distilled
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 553942 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	04/06/18 09:50	

LABORATORY CONTROL SAMPLE: 553943

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	10	10.1	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553944 553945

Parameter	Units	553944		553945		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10425264002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Nitrogen, Ammonia	mg/L	32.8	10	10	39.0	38.3	62	56	90-110	2	10 M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 529706 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2875009 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	03/29/18 14:18	FS
Nitrite as N	mg/L	ND	0.020	03/29/18 14:18	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	03/29/18 14:18	FS

LABORATORY CONTROL SAMPLE: 2875010

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	0.98	98	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	0.95	95	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875011 2875012

Parameter	Units	10425264002		2875011		2875012		% Rec Limits	RPD	Max RPD	Qual	
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec					MSD % Rec
Nitrite as N	mg/L	ND	1	1	0.99	0.97	99	97	90-110	2	20	FS
Nitrogen, NO2 plus NO3	mg/L	0.021	1	1	0.94	0.95	92	93	90-110	2	20	FS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 19623 Analysis Method: EPA 9016
 QC Batch Method: EPA 9016 Analysis Description: 9016 Free Cyanide
 Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 77969 Matrix: Water

Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/05/18 17:03	

LABORATORY CONTROL SAMPLE: 77970

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	151	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 77971 77972

Parameter	Units	10424606001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide, Free	ug/L	ND	150	150	160	160	106	106	80-120	0	11	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 530296 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2878424 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/03/18 12:40	

LABORATORY CONTROL SAMPLE: 2878425

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	241	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878426 2878427

Parameter	Units	10423797004 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Cyanide	ug/L	1.5 mg/L	250	250	1950	1840	172	128	80-120	6	30	H3,M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878428 2878429

Parameter	Units	10425152001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Cyanide	ug/L	38.4	250	250	269	268	92	92	80-120	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 530990 Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2883227 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	04/06/18 13:06	

LABORATORY CONTROL SAMPLE: 2883228

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	1.0	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2883229 2883230

Parameter	Units	10425457001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	ND	1	1	0.99	1.0	97	102	80-120	5	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2883231 2883232

Parameter	Units	10425982002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.53	1	1	1.5	1.6	101	111	80-120	7	30	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: FD-SB-B3 **Lab ID: 10425264002** Collected: 03/28/18 13:00 Received: 03/28/18 15:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	5.96 ± 2.57 (2.98) C:NA T:NA	pCi/L	04/05/18 09:17	12587-46-1	
Gross Beta	EPA 900.0	98.4 ± 18.0 (2.66) C:NA T:NA	pCi/L	04/05/18 09:17	12587-47-2	
Radium-226	EPA 903.1	0.486 ± 0.413 (0.581) C:NA T:93%	pCi/L	04/12/18 21:18	13982-63-3	
Radium-228	EPA 904.0	0.462 ± 0.345 (0.667) C:72% T:75%	pCi/L	04/10/18 13:24	15262-20-1	
Total Radium	Total Radium Calculation	0.948 ± 0.758 (1.25)	pCi/L	04/19/18 11:02	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 293307

Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0

Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 10425264002

METHOD BLANK: 1435471

Matrix: Water

Associated Lab Samples: 10425264002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.025 ± 0.367 (1.14) C:NA T:NA	pCi/L	04/05/18 08:54	
Gross Beta	0.724 ± 0.848 (1.83) C:NA T:NA	pCi/L	04/05/18 08:54	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 293327

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 10425264002

METHOD BLANK: 1435510

Matrix: Water

Associated Lab Samples: 10425264002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.436 ± 0.363 (0.727) C:77% T:72%	pCi/L	04/10/18 13:21	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 293258

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 10425264002

METHOD BLANK: 1435309

Matrix: Water

Associated Lab Samples: 10425264002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.262 ± 0.310 (0.487) C:NA T:92%	pCi/L	04/12/18 20:30	

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Act - Activity
Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).
Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)
(MDC) - Minimum Detectable Concentration
Trac - Tracer Recovery (%)
Carr - Carrier Recovery (%)
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan
PASI-I Pace Analytical Services - Indianapolis
PASI-M Pace Analytical Services - Minneapolis
PASI-O Pace Analytical Services - Ormond Beach
PASI-PA Pace Analytical Services - Greensburg
PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10425264
[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 19214
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

BATCH QUALIFIERS

Batch: 529937

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 529951

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 530304

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 530440

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 530842

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 530982

[BE] Batch extracted by solid phase extraction (SPE).

ANALYTE QUALIFIERS

- 1M Sample pH adjusted using 6mL 6N HCl.
- 2M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
- B2 Oxygen usage is less than 2.0 for all dilutions set. The reported value is an estimated less than value and is calculated for the dilution using the most amount of sample.
- B4 The glucose/glutamic acid standard exceeded the range of 198 plus or minus 30.5 mg/L.
- B6 The calculated seed correction exceeded the range of 0.6 to 1.0 mg/L.
- D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
- FS The sample was filtered in the laboratory prior to analysis.
- H3 Sample was received or analysis requested beyond the recognized method holding time.
- H6 Analysis initiated outside of the 15 minute EPA required holding time.
- L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
- L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
- L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- S0 Surrogate recovery outside laboratory control limits.
- S3 Surrogate recovery exceeded laboratory control limits. Analyte presence below reporting limits in associated samples.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10425264002	FD-SB-B3	EPA 531.1	436885		
10425264002	FD-SB-B3	EPA 547	437576		
10425264002	FD-SB-B3	EPA 549.2	437867	EPA 549.2	438016
10425264002	FD-SB-B3	EPA 552.3	437540	EPA 552.3	437945
10425264002	FD-SB-B3	EPA 8011	530540	EPA 8011	530842
10425264002	FD-SB-B3	EPA 8015 Alcohol-Glycol	435508		
10425264002	FD-SB-B3	EPA 8015 Alcohol-Glycol	435082		
10425264001	Field Blank	EPA Mod. 3510C	529686	EPA 8081B	530443
10425264002	FD-SB-B3	EPA Mod. 3510C	529686	EPA 8081B	530443
10425264001	Field Blank	EPA Mod. 3510C	529687	EPA 8082A	530304
10425264002	FD-SB-B3	EPA Mod. 3510C	529687	EPA 8082A	530304
10425264002	FD-SB-B3	EPA 8315A	19135	EPA 8315A	19214
10425264002	FD-SB-B3	EPA 8316	19422		
10425264001	Field Blank	EPA 200.7	529771	EPA 200.7	529951
10425264002	FD-SB-B3	EPA 200.7	529771	EPA 200.7	529951
10425264001	Field Blank	EPA 200.8	529767	EPA 200.8	529968
10425264002	FD-SB-B3	EPA 200.8	529767	EPA 200.8	529968
10425264001	Field Blank	EPA 200.8	529770	EPA 200.8	529937
10425264002	FD-SB-B3	EPA 200.8	529770	EPA 200.8	529937
10425264001	Field Blank	EPA 245.1	529772	EPA 245.1	530149
10425264002	FD-SB-B3	EPA 245.1	529772	EPA 245.1	530149
10425264002	FD-SB-B3	EPA 548.1	437555	EPA 548.1	438087
10425264001	Field Blank	EPA 3520	529677	EPA 8270D	530440
10425264002	FD-SB-B3	EPA 3520	529677	EPA 8270D	530440
10425264002	FD-SB-B3	EPA 524.2	531079		
10425264002	FD-SB-B3				
10425264002	FD-SB-B3	EPA 900.0	293307		
10425264002	FD-SB-B3	EPA 903.1	293258		
10425264002	FD-SB-B3	EPA 904.0	293327		
10425264002	FD-SB-B3	Total Radium Calculation	295020		
10425264001	Field Blank	Hach 10360	529611	Hach 10360 Rev 1.1	529900
10425264002	FD-SB-B3	Hach 10360	529611	Hach 10360 Rev 1.1	529900
10425264001	Field Blank	EPA 1664A OG	530982		
10425264002	FD-SB-B3	EPA 1664A OG	530982		
10425264001	Field Blank	EPA 180.1	529722		
10425264002	FD-SB-B3	EPA 180.1	529722		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10425264001	Field Blank	SM 2540D	530305		
10425264002	FD-SB-B3	SM 2540D	530305		
10425264002	FD-SB-B3	SM 4500-CIO2	438356		
10425264001	Field Blank	SM 4500-H+B	529922		
10425264002	FD-SB-B3	SM 4500-H+B	529922		
10425264001	Field Blank	Trivalent Chromium Calculation	530596		
10425264002	FD-SB-B3	Trivalent Chromium Calculation	530596		
10425264001	Field Blank	EPA 300.0	529627		
10425264002	FD-SB-B3	EPA 300.0	529627		
10425264002	FD-SB-B3	EPA 300.1	437078		
10425264002	FD-SB-B3	EPA 300.1	437079		
10425264001	Field Blank	SM 3500-Cr D Modified	529585		
10425264002	FD-SB-B3	SM 3500-Cr D Modified	529585		
10425264002	FD-SB-B3	EPA 350.1			
10425264001	Field Blank	EPA 350.1 rev. 2 (1993)	139871	EPA 350.1 rev. 2 (1993)	140053
10425264002	FD-SB-B3	EPA 350.1 rev. 2 (1993)	139871	EPA 350.1 rev. 2 (1993)	140053
10425264001	Field Blank	EPA 353.2	529706		
10425264002	FD-SB-B3	EPA 353.2	529706		
10425264001	Field Blank	EPA 9016	19623	EPA 9016	19643
10425264002	FD-SB-B3	EPA 9016	19623	EPA 9016	19643
10425264001	Field Blank	SM 4500-CN-E	530296	SM 4500-CN-E	530376
10425264002	FD-SB-B3	SM 4500-CN-E	530296	SM 4500-CN-E	530376
10425264001	Field Blank	SM 4500-P B	530990	SM 4500-P E	531088
10425264002	FD-SB-B3	SM 4500-P B	530990	SM 4500-P E	531088

REPORT OF LABORATORY ANALYSIS

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WO#: 10425264



Chain-of-Custody Form

Work Order Number:

Turnaround Time:

Page: 1 of

PROJECT/CLIENT INFO

Facility Code: MPCA Freeway LF Waters Program Code (MDH Lab Only):
 Project Name: MPCA Freeway LF Waters Project Task Code:
 Project Manager:
 Potential Hazard? If yes, add information to Sampler Comments Section

Lab Name:
 Address: 18-00383
Epic Profile #38716
 Phone No:

FOR LAB USE ONLY

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 Sample-Routine Sample
 S-IVP=Integrated Vertical Profile Sample
 S-CWOP=Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES
 DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES
 Wtr-Ground=Groundwater
 Wtr-Surf=Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS		Lab Sample No.	#
												PRESERV.			
Field Blank	QC-FB	3/28/18	1000			G		QC-Blank			15	X	LIST A	001	1
F.D-SB-B3	S	3/28/18	1300			G		Wtr-Ground			41	X	LIST A, B, C	002	2
															3
															4
															5
															6
															7
															8
															9
															10

DATA 3/28/18

Sampled By: David Anderson

Sampler's Signature: David Anderson

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) <u>David Anderson / Proce Analytical</u>	<u>3/28/18 / 1525</u>	<u>UW Proce 3-28-18</u>	<u>1525</u>

11.0 °C
 17.2 °C
 11.5 °C

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigaiton Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO3	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

** ADD to Parameter List A:

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Hardness determination)

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (THMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Sample Condition Upon Receipt Client Name: MPCA - Field Project #: WO#: 10425264
 Courier: Fed Ex UPS USPS Client ^{MD 3/28/18}
 Commercial Pace SpeedDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No
 Thermometer 151401163 Used: G87A9155100842 Type of Ice: Wet Blue None Dry Melted
 Cooler Temp Read (°C): 10.8, 12.0, 11.3 Cooler Temp Corrected (°C): 11.0, 12.2, 11.5 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: MD 3/28/18
 USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	12.
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exception: <u>VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N Sample #1: <u>3/2 1-2: 1/1</u> <u>1/1</u> sample 002 2: <u>5/5</u> PH = 11.0 Initial when completed: <u>MD</u> Lot # of added preservative: <u>1117041</u>
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Pace Trip Blank Lot # (if purchased): _____	15.

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: BA VC Date: 3/29/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Chain of Custody

WO#: 12106520

 12106520

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10425264 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 3/28/2018 Results Requested By: 4/11/2018

Report To		Subcontract To				Requested Analysis																										
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042				<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Nitrogen, unionized ammonia, as N</div> <div style="border: 1px solid black; width: 100%; height: 100%;"></div> </div>																										
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix													Preserved Containers						LAB USE ONLY								
																		H2SO4														
1	Field Blank	PS	3/28/2018 10:00	10425264001	Water													1														
2	FD-SB-B3	PS	3/28/2018 13:00	10425264002	Water													1														
3																																
4																																
5																																

Transfers						Comments
Released By	Date/Time	Received By	Date/Time			
<i>[Signature]</i>	3/29/18 17:40	<i>[Signature]</i>	3-29-18/815			
<i>[Signature]</i>	3-29-18 22:30	<i>[Signature]</i>	3/30/18 06:15			

Cooler Temperature on Receipt: 1.0 °C Custody Seal: Y or N Received on Ice: Y or N Samples Intact: Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: MPCA PAST-MNFLD Project #: _____

WO#: 12106520
 PM: HRZ Due Date: 04/11/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.7 Cooler Temp Corrected °C: 1.0 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: 3-27-18 DC

Comments: Bm 3/30/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N
 Project Manager Review: Angela R... Date: 3/30/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody Return to Sender

WO# : 12106520

 12106520

Samples were sent directly to the Subcontracting Laboratory.


State Of Origin: MN

Workorder: 10425264 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 3/28/2018 Results Requested By: 4/11/2018

Report To: **Bob Michels** Subcontract To: **Pace Analytical Virginia MN** Requested Analysis: **NO3-N**

Bob Michels
 Pace Analytical Minnesota
 1700 Elm Street
 Suite 200
 Minneapolis, MN 55414
 Phone (612)607-6452

Pace Analytical Virginia MN
 315 Chestnut Street
 Virginia, MN 55792
 Phone (218)742-1042

WO# : 10425264

 10425264

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Nitrogen, unionized ammonia, as N	LAB USE ONLY
						H2SO4					
1	Field Blank	PS	3/28/2018 10:00	10425264001	Water	1				X	
2	FD-SB-B3	PS	3/28/2018 13:00	10425264002	Water	1				X	
3											
4											
5											

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	3/29/18 17:40	DJ Crisp	3-29-18 18:15	
2	<i>[Signature]</i>	3-29-18 22:30	B. Mathers	3/30/18 06:15	
3			<i>[Signature]</i>	4/3/18 15:30	

Cooler Temperature on Receipt 1.0 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Relinquished: *[Signature]* 4/4/18 18:35

[Signature] 4/4/18 18:35
 T= 2:1



Document Name:
Sample Condition Upon Receipt Form
 Document No.:
F-MN-L-213-rev.22

Document Revised: 14Dec2017
 Page 1 of 2
 Issuing Authority:
 Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name:

Pace MN

Project #:

WO# : 10425264

PM: BM2

Due Date: 04/11/18

CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No

Seals Intact? Yes No

Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____

Temp Blank? Yes No

Thermometer Used: 151401163
 G87A9155100842

Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 1.9 Cooler Temp Corrected (°C): 2.1

Biological Tissue Frozen? Yes No N/A

Temp should be above freezing to 6°C

Correction Factor: +0.2

Date and Initials of Person Examining Contents: ME 4/4/18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1. <i>Return Sample</i>
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-2</u> <u>1/1</u>
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____

Date/Time: _____

Comments/Resolution: _____

Project Manager Review:

Date: _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).



SAMPLE RECEIVING / LOG-IN CHECKLIST

Client <u>Pace Minnesota</u>	Work Order # <u>4610126</u>
Receipt Record Page/Line # <u>21-4</u>	Project Chemist _____ Sample #s _____

Recorded by (initials/date) <u>PS 3/30/18</u>	<input checked="" type="checkbox"/> Cooler <input type="checkbox"/> Box <input type="checkbox"/> Other _____	Qty Received <u>1</u>	<input checked="" type="checkbox"/> IR Gun (#202) Thermometer Used <input type="checkbox"/> Digital Thermometer (#54) <input type="checkbox"/> See Additional Cooler Information Form <input type="checkbox"/> Other (# _____)
--	--	--------------------------	--

Cooler #	Time	Cooler #	Time	Cooler #	Time	Cooler #	Time
<u>Blue</u>	<u>0942</u>						
Custody Seals: <input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact	
Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None	
Coolant Location: <input checked="" type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom	
Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No	
If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative	
	Observed °C	Correction Factor °C	Actual °C		Observed °C	Correction Factor °C	Actual °C
Temp Blank:				Temp Blank:			
Sample 1:	<u>2.7</u>	<u> </u>	<u>2.7</u>	Sample 1:			
Sample 2:	<u>2.4</u>	<u> </u>	<u>2.4</u>	Sample 2:			
Sample 3:	<u>2.8</u>	<u> </u>	<u>2.8</u>	Sample 3:			
3 Sample Average °C: _____				3 Sample Average °C: _____			
<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?				<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?			

If any shaded areas checked, complete Sample Receiving Non-Conformance and/or Inventory Form

Paperwork Received

Yes No Chain of Custody record(s)? If No, Initiated By _____
 Received for Lab Signed/Date/Time? _____
 Shipping document?
 Other _____

COC Information

Pace COC Other _____
 COC ID Numbers: _____

Check COC for Accuracy

Yes No Analysis Requested?
 Sample ID matches COC?
 Sample Date and Time matches COC?
 Container type completed on COC?
 All container types indicated are received?

Sample Condition Summary

N/A	Yes	No	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Broken containers/lids?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Missing or incomplete labels?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Illegible information on labels?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Low volume received?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Inappropriate or non-Pace containers received?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	VOC vials / TOX containers have headspace?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A Yes No Temperature Blank OR average sample temperature, ≥6° C?
 If either is ≥6° C, was thermal preservation required?
 If "Yes", Project Chemist Approval Initials: _____
 If "Yes" Completed Non Con Cooler - Cont Inventory Form?
 Completed Sample Preservation Verification Form?
 Samples chemically preserved correctly?
 If "No", added orange tag?
 Received pre-preserved VOC soils?
 MeOH Na₂SO₄

Check for Short Hold-Time Prep/Analyses

Bacteriological
 Air Bags
 EnCores / Methanol Pre-Preserved
 Formaldehyde/Aldehyde
 Green-tagged containers
 Yellow/White-tagged 1 L ambers (SV Prep-Lab)

AFTER HOURS ONLY:
 COPIES OF COC TO LAB AREA(S)
 NONE RECEIVED
 RECEIVED, COCs TO LAB(S)

Notes

Trip Blank received Trip Blank not listed on COC

Cooler Received (Date/Time) <u>PS 3/30/18</u>	Paperwork Delivered (Date/Time) <u>PS 3/30/18</u>	≤1 Hour Goal Met? <u>Yes / No</u>
--	--	--------------------------------------

AQUEOUS SAMPLE PRESERVATION VERIFICATION

Client <u>Pace Minnesota</u>	Work Order # <u>4610126</u>
Receipt Log # <u>21-4</u>	Completed By (initials/date) <u>JS 8/30/18</u>
Project Manager _____	

COC ID # _____												Adjusted by: _____	
												Date: _____	
Container Type	5 / 23		4		13		6		15				
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1	✓												
COC Line #2	✓, 10												
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													
Comments: _____													

pH Strip Reagent or Lot #
<input checked="" type="checkbox"/> HC727135
<input type="checkbox"/> Other

Place a check mark in the Received box if pH is acceptable. If pH is not acceptable, document the Received and Adjusted pH values in the appropriate columns (all adjustments must be reviewed by the project manager). Never add more than 2x the default preservation volume (see table below for default volumes). Complete and attach an orange preservation tag to all adjusted samples. A Sample Receiving Non-Conformance Report must be completed if a pH adjustment was required.

COC ID # _____												Adjusted by: _____	
												Date: _____	
Container Type	5 / 23		4		13		6		15				
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1													
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													
Comments: _____													

Container Size (mL)	Default Preservative Volume (mL)
Container Types 5 / 23	NaOH
250	1.3
Container Type 4	H ₂ SO ₄
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H ₂ SO ₄
500	2.5
Container Types 6 / 15	HNO ₃
125	0.7
250	1.25
500	2.5
1000	5.0

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN



Workorder: 10425264 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 3/28/2018 Results Requested By: 4/11/2018

Report To		Subcontract To					Requested Analysis								
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600					<div style="background-color: yellow; padding: 5px;"> WO#: 30247798 30247798 </div>								
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	HNO3	Preserved Containers				Gross Alpha/Beta	Radium 226	Radium 228	Radium, total	LAB USE ONLY
1	FD-SB-B3	PS	3/28/2018 13:00	10425264002	Water	3					X	X	X	X	001
2															
3															
4															
5															

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	3/29/18 1700	<i>[Signature]</i>	3/30/18 0950	
2					
3					

Cooler Temperature on Receipt W/A°C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: Pace Mn

Project # 30247798

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 747598318618

Label	<u>ZH</u>
LIMS Login	<u>ZH</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>10D1071</u>	<u>ZH 3/30/18</u>
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.	
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.	
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.	
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.	
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.	
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.	
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.	
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.	
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.	
Hex Cr Aqueous Compliance/NPDES sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.	
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.	
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.	
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.	<u>Pitzer</u>
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>ZH</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.	
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.	
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Rad Aqueous Samples Screened > 0.5 mrem/hr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>ZH</u>	Date: <u>3/30/18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 5019 3384 **Date/Time and Initials of person examining contents:** 3/30/18 1442 DJ

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 8662

Custody Seal on Cooler/Box Present: Yes No **Seals Intact:** Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 123456 ABCDEF **Ice Type:** Wet Blue None | **Samples collected today and on ice:** Yes No N/A

Cooler Temperature: 0.5/0.7 **Ice Visible in Sample Containers?:** Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C **If temp. is Over 6°C or under 0°C, was the PM Notified?:** Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.			All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl. All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)						
Chain of Custody Present:			Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:			Dissolved Metals field filtered?:			
Short Hold Time Analysis (<72hr)?: Analysis:			Headspace Wisconsin Sulfide			
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608) Residual Chlorine Check (Total/Amenable/Free Cyanide)	Present	Absent	N/A
Rush TAT Requested:			Headspace in VOA Vials (>6mm):			
Containers Intact?:			Trip Blank Present?:			
Sample Labels Match COC?: Except TCs, which only require sample ID			Trip Blank Custody Seals?:			

Comments:

Sample Container Count

WO#: 50193384



50193384

CLIENT: Pace MW
 COC PAGE 1 of 1
 COC ID# _____

Project # 50193384

Sample Line Item	DG9H VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	Bulk Kit	Matrix (Soil/Water/Aqueous)	pH <2	pH >9	pH >12	
																		DG9U					
1																		R	DG9U				
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
YSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
WGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
WGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

NO# : 35382986
PM: ADC **Due Date: 04/13/18**
CLIENT: PACMIN

Project #
Project Manager:
Client:

Date and Initials of person:
Examining contents:
Label: _____
Deliver: _____
pH: _____

Thermometer Used: T336 Date: 3/30/18 Time: 1030 Initials: JLC

State of Origin: _____

- | | |
|---|--|
| Cooler #1 Temp. °C <u>5.1</u> (Visual) <u>0.4</u> (Correction Factor) <u>4.7</u> (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #2 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #3 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #4 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #5 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #6 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7473 9831 8607

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No Ice: Wet Blue Dry None

Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (If Yes, complete) Shorted Date: _____ Shorted Time: _____ Qty: _____

Comments:

Chain of Custody Present	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Preservation Information: Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution:
 Person Contacted: _____ Date/Time: _____

Comments/ Resolution (use back for additional comments):

Project Manager Review: _____ Date: _____



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April 11, 2018

Bob Michels
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 03/30/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



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Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Water - MN Project Number: 10425264 Project Manager: Bob Michels
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ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-SB-B3 (10425264002)	A181320-01	Water	03/28/2018	03/30/2018

CASE NARRATIVE

Sample Receipt Information:

1 sample was received on 03/30/2018. Sample was received at 1.3 degrees Celsius. Sample was received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Laboratory Control Samples (LCS):

The LCS recovery indicates a potential high bias for 2,4,5-TP, 2,4-D, 2,4-DB, bentazon, dicamba, MCPA and triclopyr for sample A181320-01. Sample was less than the reporting limit for these analytes so no further action is required.



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Pace Analytical
1700 Elm Street, Suite 200
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Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10425264
Project Manager: Bob Michels

FD-SB-B3 (10425264002)

Date Sampled

A181320-01 (Water)

03/28/2018 13:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804106

Acetochlor	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	

Surrogate: Atrazine-d5		88.5 %		65.1-122	04/03/2018	04/06/2018 10:51	EPA 8270D	
Surrogate: Parathion-d10		89.4 %		22.3-159	04/03/2018	04/06/2018 10:51	EPA 8270D	
Surrogate: Triphenyl phosphate		185 %		65.2-151	04/03/2018	04/06/2018 10:51	EPA 8270D	S

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804111

2,4-D	ND	0.50	ug/L	1	04/04/2018	04/07/2018 05:57	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/04/2018	04/07/2018 05:57	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/04/2018	04/07/2018 05:57	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/04/2018	04/07/2018 05:57	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/04/2018	04/07/2018 05:57	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/04/2018	04/07/2018 05:57	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/04/2018	04/07/2018 05:57	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/04/2018	04/07/2018 05:57	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/04/2018	04/07/2018 05:57	EPA 8151A	

Surrogate: 2,4-D-d5		102 %		44.2-121	04/04/2018	04/07/2018 05:57	EPA 8151A	
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Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10425264
 Project Manager: Bob Michels

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804106 - EPA 3510C

Blank (A804106-BLK1)

Prepared: 04/03/2018 Analyzed: 04/06/2018 02:45

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>85.9</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>76.5</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.526</i>		<i>ug/L</i>	<i>0.5000</i>		<i>105</i>	<i>65.2-151</i>			

LCS (A804106-BS1)

Prepared: 04/03/2018 Analyzed: 04/06/2018 01:14

Acetochlor	0.820	0.50	ug/L	1.000		82.0	67.5-120			
Alachlor	0.941	0.50	ug/L	1.000		94.1	71.7-120			
Atrazine	0.885	0.50	ug/L	1.000		88.5	72.8-113			
Chlorpyrifos	0.874	0.50	ug/L	1.000		87.4	65.3-119			
Cyanazine	0.935	0.20	ug/L	1.000		93.5	49.5-140			
Desethylatrazine	0.845	0.50	ug/L	1.000		84.5	66.9-116			
Deisopropylatrazine	0.800	0.50	ug/L	1.000		80.0	44.3-110			
Dimethenamid	0.897	0.50	ug/L	1.000		89.7	63.8-116			
EPTC	0.715	0.50	ug/L	1.000		71.5	41.7-102			
Ethalfuralin	0.593	0.50	ug/L	1.000		59.3	41-127			
Fonofos	0.860	0.50	ug/L	1.000		86.0	59.7-118			
Metolachlor	0.968	0.50	ug/L	1.000		96.8	71.7-122			
Metribuzin	0.897	0.50	ug/L	1.000		89.7	66.6-128			
Pendimethalin	0.889	0.50	ug/L	1.000		88.9	55.5-137			
Phorate	0.599	0.30	ug/L	1.000		59.9	41.2-114			
Prometon	0.924	0.50	ug/L	1.000		92.4	66.3-120			
Propachlor	0.863	0.50	ug/L	1.000		86.3	65.8-119			



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Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10425264
Project Manager: Bob Michels

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804106 - EPA 3510C

LCS (A804106-BS1)

Prepared: 04/03/2018 Analyzed: 04/06/2018 01:14

Propazine	0.861	0.50	ug/L	1.000		86.1	72-122			
Simazine	0.919	0.50	ug/L	1.000		91.9	72.8-113			
Terbufos	0.607	0.20	ug/L	1.000		60.7	38.6-115			
Triallate	0.842	0.50	ug/L	1.000		84.2	51.4-116			
Trifluralin	0.660	0.50	ug/L	1.000		66.0	46.1-134			
Surrogate: Atrazine-d5	0.421		ug/L	0.5000		84.2	65.1-122			
Surrogate: Parathion-d10	0.481		ug/L	0.5000		96.2	22.3-159			
Surrogate: Triphenyl phosphate	0.504		ug/L	0.5000		101	65.2-151			

Matrix Spike (A804106-MS1)

Source: A181314-05

Prepared: 04/03/2018 Analyzed: 04/06/2018 01:44

Acetochlor	1.00	0.50	ug/L	1.020	ND	98.4	67.3-128			
Alachlor	1.11	0.50	ug/L	1.020	ND	109	58.2-150			
Atrazine	1.66	0.50	ug/L	1.020	0.768	87.7	70.1-120			
Chlorpyrifos	1.04	0.50	ug/L	1.020	ND	102	73.3-118			
Cyanazine	1.12	0.20	ug/L	1.020	ND	110	60.6-140			
Desethylatrazine	1.29	0.50	ug/L	1.020	0.332	94.3	69.7-122			
Deisopropylatrazine	1.03	0.50	ug/L	1.020	0.204	80.5	48-121			
Dimethenamid	1.10	0.50	ug/L	1.020	ND	108	63.7-123			
EPTC	0.984	0.50	ug/L	1.020	ND	96.4	58-109			
Ethalfluralin	1.01	0.50	ug/L	1.020	ND	98.7	59.3-129			
Fonofos	1.03	0.50	ug/L	1.020	ND	101	73.5-108			
Metolachlor	22.0	5.0	ug/L	1.020	19.5	250	40.9-156			M1, D
Metribuzin	1.05	0.50	ug/L	1.020	ND	103	70.9-136			
Pendimethalin	1.18	0.50	ug/L	1.020	ND	115	55.4-155			
Phorate	0.711	0.30	ug/L	1.020	ND	69.7	60.2-108			
Prometon	1.03	0.50	ug/L	1.020	ND	101	74.7-124			
Propachlor	1.05	0.50	ug/L	1.020	ND	103	72.3-115			
Propazine	0.996	0.50	ug/L	1.020	ND	97.7	73.7-124			
Simazine	1.03	0.50	ug/L	1.020	0.0619	95.2	74.8-114			
Terbufos	0.786	0.20	ug/L	1.020	ND	77.1	56.1-114			
Triallate	1.06	0.50	ug/L	1.020	ND	104	65.5-107			
Trifluralin	0.896	0.50	ug/L	1.020	ND	87.9	58-149			
Surrogate: Atrazine-d5	0.509		ug/L	0.5102		99.9	65.1-122			
Surrogate: Parathion-d10	0.607		ug/L	0.5102		119	22.3-159			
Surrogate: Triphenyl phosphate	0.615		ug/L	0.5102		121	65.2-151			

Matrix Spike Dup (A804106-MSD1)

Source: A181314-05

Prepared: 04/03/2018 Analyzed: 04/06/2018 02:15

Acetochlor	1.00	0.50	ug/L	1.042	ND	96.0	67.3-128	0.386	20	
Alachlor	1.25	0.50	ug/L	1.042	ND	120	58.2-150	11.3	20	
Atrazine	1.73	0.50	ug/L	1.042	0.768	92.8	70.1-120	4.26	20	
Chlorpyrifos	1.04	0.50	ug/L	1.042	ND	99.7	73.3-118	0.371	20	
Cyanazine	1.12	0.20	ug/L	1.042	ND	107	60.6-140	0.0547	20	
Desethylatrazine	1.34	0.50	ug/L	1.042	0.332	96.5	69.7-122	3.21	20	
Deisopropylatrazine	1.12	0.50	ug/L	1.042	0.204	87.6	48-121	8.48	20	



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 Project Number: 10425264
 Project Manager: Bob Michels

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804106 - EPA 3510C

Matrix Spike Dup (A804106-MSD1)

Source: A181314-05

Prepared: 04/03/2018 Analyzed: 04/06/2018 02:15

Dimethenamid	1.11	0.50	ug/L	1.042	ND	106	63.7-123	0.973	20	
EPTC	0.942	0.50	ug/L	1.042	ND	90.5	58-109	4.33	20	
Ethalfuralin	0.864	0.50	ug/L	1.042	ND	82.9	59.3-129	15.4	20	
Fonofos	1.02	0.50	ug/L	1.042	ND	97.9	73.5-108	1.21	20	
Metolachlor	21.7	5.0	ug/L	1.042	19.5	215	40.9-156	1.41	20	M1, D
Metribuzin	1.10	0.50	ug/L	1.042	ND	105	70.9-136	4.50	20	
Pendimethalin	1.14	0.50	ug/L	1.042	ND	109	55.4-155	3.46	20	
Phorate	0.692	0.30	ug/L	1.042	ND	66.4	60.2-108	2.73	20	
Prometon	1.14	0.50	ug/L	1.042	ND	109	74.7-124	9.82	20	
Propachlor	1.07	0.50	ug/L	1.042	ND	103	72.3-115	2.23	20	
Propazine	0.992	0.50	ug/L	1.042	ND	95.2	73.7-124	0.484	20	
Simazine	1.06	0.50	ug/L	1.042	0.0619	96.1	74.8-114	2.86	20	
Terbufos	0.743	0.20	ug/L	1.042	ND	71.3	56.1-114	5.71	20	
Triallate	0.985	0.50	ug/L	1.042	ND	94.6	65.5-107	7.67	20	
Trifluralin	0.976	0.50	ug/L	1.042	ND	93.7	58-149	8.45	20	
<i>Surrogate: Atrazine-d5</i>	<i>0.492</i>		<i>ug/L</i>	<i>0.5208</i>		<i>94.5</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.580</i>		<i>ug/L</i>	<i>0.5208</i>		<i>111</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.696</i>		<i>ug/L</i>	<i>0.5208</i>		<i>134</i>	<i>65.2-151</i>			



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Project Number: 10425264
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Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804111 - EPA 3510C

Blank (A804111-BLK1)

Prepared: 04/04/2018 Analyzed: 04/06/2018 22:20

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							

Surrogate: 2,4-D-d5

2.31 ug/L 2.016 115 44.2-121

LCS (A804111-BS1)

Prepared: 04/04/2018 Analyzed: 04/07/2018 01:52

2,4-D	3.13	0.50	ug/L	2.000		157	64.6-148			
2,4-DB	2.91	0.50	ug/L	2.000		145	66.7-143			
2,4,5-T	2.59	0.50	ug/L	2.000		129	63.4-133			
2,4,5-TP (Silvex)	3.08	0.50	ug/L	2.000		154	63-145			
Bentazon	1.38	0.50	ug/L	1.000		138	52.5-139			
Dicamba	2.92	0.50	ug/L	2.000		146	55.4-143			
MCPA	3.00	0.30	ug/L	2.000		150	33.5-143			
Picloram	1.13	0.50	ug/L	1.000		113	47.9-113			
Triclopyr	2.89	0.50	ug/L	2.000		144	65.1-141			

Surrogate: 2,4-D-d5

2.32 ug/L 2.016 115 44.2-121

LCS Dup (A804111-BSD1)

Prepared: 04/04/2018 Analyzed: 04/07/2018 02:27

2,4-D	3.06	0.50	ug/L	2.000		153	64.6-148	2.15	20	
2,4-DB	2.77	0.50	ug/L	2.000		139	66.7-143	4.71	20	
2,4,5-T	2.67	0.50	ug/L	2.000		133	63.4-133	3.13	20	
2,4,5-TP (Silvex)	3.15	0.50	ug/L	2.000		158	63-145	2.45	20	
Bentazon	1.40	0.50	ug/L	1.000		140	52.5-139	1.22	20	
Dicamba	3.19	0.50	ug/L	2.000		159	55.4-143	8.83	20	
MCPA	3.11	0.30	ug/L	2.000		155	33.5-143	3.37	20	
Picloram	1.11	0.50	ug/L	1.000		111	47.9-113	2.12	20	
Triclopyr	3.03	0.50	ug/L	2.000		152	65.1-141	4.96	20	

Surrogate: 2,4-D-d5

2.26 ug/L 2.016 112 44.2-121



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10425264
Project Manager: Bob Michels

Notes and Definitions

- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- M1 Spike recoveries were not evaluated because of elevated levels of the spiked analyte in the parent sample.
- D Data reported from a dilution
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference



www.pacelabs.com

Pace Analytical Services, Inc.

1700 Elm Street

Minneapolis, MN 55414

Phone: 612.607.1700

Fax: 612.607.6444

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

PaceProject#: 10425426

Sample Receipt Date: 03/27/2018

Client Project #: MPCA Freeway LF Wat

Client Sub PO #: N/A

State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:

April 10, 2018

Scott Unze, Project Manager

(612) 607-6383

(612) 607-6444 (fax)

scott.unze@pacelabs.com



Report of Laboratory Analysis

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The results relate only to the samples included in this report.

Report Prepared Date:

April 10, 2018



DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of PACE Minnesota Field. The sample was analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration points and a nominal 1-liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The isotopically-labeled TCDD internal standard in the sample extract was recovered at 84%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 99-101% with a relative percent difference of 2.0%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New Hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L


REPORT OF LABORATORY ANALYSIS


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Report No.....10425426

Appendix A

Sample Management

WO#: 10425426

 10425426

 Chain-of-Custody Form <small>REVISED 2/16/2018</small>										Work Order Number: _____ Turnaround Time: _____																																																																																																																																																																																				
PROJECT/CLIENT INFO																																																																																																																																																																																														
Facility Code: <i>MPCA Freeway LF Waters</i>					Program Code (MDH Lab Only): _____					Lab Name: _____																																																																																																																																																																																				
Project Name: <i>MPCA Freeway LF Waters</i>					Project Task Code: _____					Address: <i>18-00383</i>																																																																																																																																																																																				
Project Manager: _____					Potential Hazard? _____					If yes, add information to Sampler Comments Section																																																																																																																																																																																				
Phone No: _____					Lab Work Order Sticker																																																																																																																																																																																									
SAMPLE DETAILS										ANALYSIS REQUESTED																																																																																																																																																																																				
SAMPLE TYPE CODES Sample=Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample			LAB MATRIX CODES DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe			FIELD MATRIX CODES Wtr-Ground=Groundwater Wtr-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample			AR=Air BL=Biological Material OT=Other TS=Tissue		PRESERV. _____																																																																																																																																																																																			
<table border="1"> <thead> <tr> <th>Location Identifier</th> <th>Sample Type</th> <th>Date</th> <th>Time</th> <th>Start Depth, in meters</th> <th>End Depth, in meters</th> <th>Grab (G) or Composite (C) Sample</th> <th>Lab Matrix Code</th> <th>Field Matrix Code</th> <th>AIS</th> <th>Sampler Comments (filter volume, special handling, etc.)</th> <th># of Cont</th> <th>ANALYSIS</th> <th>LABORATORY</th> <th>Lab Sample No.</th> <th>#</th> </tr> </thead> <tbody> <tr> <td>FD-SB-B4</td> <td>S</td> <td>3/26/18</td> <td></td> <td></td> <td></td> <td>G</td> <td>NW</td> <td></td> <td></td> <td>partial List A</td> <td>6</td> <td>LIST A</td> <td></td> <td>001</td> <td>1</td> </tr> <tr> <td>FD-SB-A3</td> <td>S</td> <td>3/26/18</td> <td></td> <td></td> <td></td> <td>G</td> <td>NW</td> <td></td> <td></td> <td>partial List A</td> <td>8</td> <td>LIST A, B, C partial List A</td> <td></td> <td>002</td> <td>2</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>3</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>4</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>5</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>6</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>7</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>8</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>9</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>10</td> </tr> </tbody> </table>															Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	LABORATORY	Lab Sample No.	#	FD-SB-B4	S	3/26/18				G	NW			partial List A	6	LIST A		001	1	FD-SB-A3	S	3/26/18				G	NW			partial List A	8	LIST A, B, C partial List A		002	2																3																4																5																6																7																8																9																10
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Sampled By: <i>David Anderson</i>					Sampler's Signature: <i>David Anderson</i>					Phone #: _____																																																																																																																																																																																				
Receiving Comments: _____																																																																																																																																																																																														
Relinquished By/Affiliation										Date/Time																																																																																																																																																																																				
(Sampler) <i>David Anderson / Pace</i>										<i>3/27/18/0700</i>																																																																																																																																																																																				
Accepted By/ Affiliation										Date/Time																																																																																																																																																																																				
<i>W. Pace</i>										<i>3-27-18 8:15 5.1°C</i>																																																																																																																																																																																				

① partial List A for FD-SB-A3,
 ② continuation of partial List A for FD-SB-B4

Sample Condition Upon Receipt

Client Name: Pace FSD Project #: _____

WO# : 10425426

PM: SCU Due Date: 04/10/18
 CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 Type of Ice: Wet Blue None Dry Melted
 Used: G87A9155100842

Cooler Temp Read (°C): 4.9 Cooler Temp Corrected (°C): 5.1 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: 10.2 Date and Initials of Person Examining Contents: BYL 3/27/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MIN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No?	5. <u>not time on cont. for hex chrome</u>
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8. <u>only partial analysis of list possible</u>
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9. <u>as stated on COC</u>
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res Chlorine? <input checked="" type="checkbox"/> Y
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1</u> <u>2 3/2</u> <u>1</u> <u>1/1</u> <u>1/1</u> <u>wait for sample 3 initial range</u>
(HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No

Comments/Resolution: Analyze sample 001 only, not enough volume for 002

Project Manager Review: Walter Berg Date: 4/2/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent <i>(unfiltered)</i>	calculated
Chromium, hexavalent	SM3500CRB
Mercury Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

*** ADD to Parameter List A:

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Hardness determination)

Dissolved-Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Matt Unholz (MPCA).
 BGJ-Pace

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270-SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothal	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10425426

Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-B4		
Lab Sample ID	10425426001		
Filename	F180406B_08		
Injected By	ZMS		
Total Amount Extracted	501 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/26/2018 15:00
ICAL ID	F180405	Received	03/27/2018 08:15
CCal Filename(s)	F180406B_01	Extracted	04/04/2018 16:50
Method Blank ID	BLANK-61551	Analyzed	04/07/2018 14:54

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	84
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	106

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61551	Matrix	Water
Filename	U180407A_06	Dilution	NA
Total Amount Extracted	1030 mL	Extracted	04/04/2018 16:50
ICAL ID	U180405	Analyzed	04/07/2018 14:40
CCal Filename(s)	U180406B_14	Injected By	ZMS

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	80
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	93

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61552	Matrix	Water
Filename	U180407A_01	Dilution	NA
Total Amount Extracted	978 mL	Extracted	04/04/2018 16:50
ICAL ID	U180405	Analyzed	04/07/2018 10:37
CCal Filename	U180406B_14	Injected By	ZMS
Method Blank ID	BLANK-61551		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	9.9	7.3	14.6	99
2,3,7,8-TCDD-37Cl4	10	9.7	3.7	15.8	97
2,3,7,8-TCDD-13C	100	90	25.0	141.0	90

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61553	Matrix	Water
Filename	U180407A_02	Dilution	NA
Total Amount Extracted	996 mL	Extracted	04/04/2018 16:50
ICAL ID	U180405	Analyzed	04/07/2018 11:24
CCal Filename	U180406B_14	Injected By	ZMS
Method Blank ID	BLANK-61551		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	10	7.3	14.6	101
2,3,7,8-TCDD-37Cl4	10	8.4	3.7	15.8	84
2,3,7,8-TCDD-13C	100	81	25.0	141.0	81

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61552
 Spike 1 Filename U180407A_01

Spike 2 ID LCSD-61553
 Spike 2 Filename U180407A_02

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	99	101	2.0

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

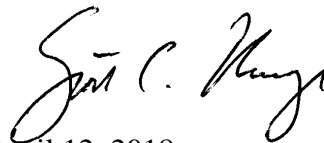
PaceProject#: 10425439
Sample Receipt Date: 03/29/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 12, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

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The results relate only to the samples included in this report.

Report Prepared Date:

April 12, 2018

DISCUSSION

This report presents the results from the analyses performed on two samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration point and a nominal 1-Liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The samples were received above the recommended temperature range of 0-6 degrees Celsius.

The isotopically-labeled TCDD internal standard in the sample extracts was recovered at 73%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 99-101% with a relative percent difference of 2.0%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10425439

Appendix A

Sample Management

WO#: 10425439



Report No.: 10425439_1613TCDD_DFR

Study Form		Work Order Number:		COC Type:		Page: 1 of									
		Turnaround Time:		COC ID:		FOR LAB USE ONLY									
SCT/CLIENT INFO				LABORATORY											
Facility Code: MPCA Freeway LF Waters		Program Code (MDH Lab Only):		Lab Name:											
Project Name: MPCA Freeway LF Waters		Project Task Code:		Address: 15-00383											
Project Manager:				EPIC Profile # 38716											
Potential Hazard?		If yes, add information to Sampler Comments Section		Phone No:		Lab Work Order Sticker									
SAMPLE DETAILS				ANALYSIS REQUESTED											
SAMPLE TYPE CODES S-Routine Sample S-IVP-Integrated Vertical Profile Sample S-CWOP-Composite Sample		LAB MATRIX CODES DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe		FIELD MATRIX CODES Wtr-Ground=Groundwater Wtr-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample											
		QC-FB=Field Blank Sample QC-FR=Field Replicate Sample QC-TB=Trip Blank Sample		AR=Air BL=Biological Material OT=Other TS=Tissue											
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	LABORATORY	Lab Sample No.	#
FD-SB-A3	S	3/29/18	1220			G	NW	Wtr-Ground			7	XX		001	1
FD-SB-B4	S	3/29/18	1340			G	NW	Wtr-Ground			2	XX		002	2
FD-SB-D5	S	3/29/18	1300			G	NW	Wtr-Ground			25				3
Field Replicate	QC-FR	3/29/18				G	NW	Wtr-Ground			25				4
															5
															6
															7
															8
															9
															10
Sampled By: David Anderson				Sampler's Signature: David Anderson				Phone #:							
Receiving Comments:															
Relinquished By/Affiliation				Date/Time				Accepted By/Affiliation				Date/Time			
(Sampler) David Anderson / PACE Analyzed!				3/29/18/1626				W. PACE				3-29-18 1626			

① collected from FD-SB-A3 = (6) GL, (1) GL H=1
 ② collected from FD-SB-B4 = (2) GL

6.9, 7.1, 6.8, 8.2 °C

Sample Condition Upon Receipt

Client Name: MPLA-FSD

Project #: **WO#: 10425439**
 PM: SCU Due Date: 04/12/18
 CLIENT: PASI-MNFL

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 G87A9155100842
 Used: _____ Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 6.2 / 6.9 / 6.4 / 6.0 Cooler Temp Corrected (°C): 6.9 / 7.7
 Temp should be above freezing to 6°C Correction Factor: 10.2 Biological Tissue Frozen? Yes No N/A
 Date and Initials of Person Examining Contents: 3/29/18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. <u>Samples not labeled. Came in individual coolers w/ sample ID</u>
-Includes Date/Time/ID/Analysis Matrix: <u>WST</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: Nathan Boberg

Date: 4/2/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc.
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals - Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury - Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

** ADD to Parameter List A:

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Hardness determination)

Dissolved-Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/15/18 email from Mark Umholtz (WPCA).
 BGJ-Pace

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA-8270-SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMs)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10425439

Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-A3		
Lab Sample ID	10425439001		
Filename	F180406B_09		
Injected By	ZMS		
Total Amount Extracted	503 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/29/2018 12:30
ICAL ID	F180405	Received	03/29/2018 16:26
CCal Filename(s)	F180406B_01	Extracted	04/04/2018 16:50
Method Blank ID	BLANK-61551	Analyzed	04/07/2018 15:39

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	73
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	93

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-B4		
Lab Sample ID	10425439002		
Filename	F180406B_10		
Injected By	ZMS		
Total Amount Extracted	511 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/29/2018 13:40
ICAL ID	F180405	Received	03/29/2018 16:26
CCal Filename(s)	F180406B_01	Extracted	04/04/2018 16:50
Method Blank ID	BLANK-61551	Analyzed	04/07/2018 16:24

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	73
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	96

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61551	Matrix	Water
Filename	U180407A_06	Dilution	NA
Total Amount Extracted	1030 mL	Extracted	04/04/2018 16:50
ICAL ID	U180405	Analyzed	04/07/2018 14:40
CCal Filename(s)	U180406B_14	Injected By	ZMS

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	80
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	93

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61552	Matrix	Water
Filename	U180407A_01	Dilution	NA
Total Amount Extracted	978 mL	Extracted	04/04/2018 16:50
ICAL ID	U180405	Analyzed	04/07/2018 10:37
CCal Filename	U180406B_14	Injected By	ZMS
Method Blank ID	BLANK-61551		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	9.9	7.3	14.6	99
2,3,7,8-TCDD-37Cl4	10	9.7	3.7	15.8	97
2,3,7,8-TCDD-13C	100	90	25.0	141.0	90

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61553	Matrix	Water
Filename	U180407A_02	Dilution	NA
Total Amount Extracted	996 mL	Extracted	04/04/2018 16:50
ICAL ID	U180405	Analyzed	04/07/2018 11:24
CCal Filename	U180406B_14	Injected By	ZMS
Method Blank ID	BLANK-61551		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	10	7.3	14.6	101
2,3,7,8-TCDD-37Cl4	10	8.4	3.7	15.8	84
2,3,7,8-TCDD-13C	100	81	25.0	141.0	81

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61552
Spike 1 Filename U180407A_01

Spike 2 ID LCSD-61553
Spike 2 Filename U180407A_02

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	99	101	2.0

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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May 02, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 29, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Bob Michels
bob.michels@pacelabs.com
(612)709-5046
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

Pennsylvania Certification IDs

Pennsylvania/TNI Certification #: 65-00282	Vermont Dept. of Health: ID# VT-0282
Puerto Rico Certification #: PA01457	Virgin Island/PADEP Certification
Rhode Island Certification #: 65-00282	Virginia/VELAP Certification #: 9526
South Dakota Certification	Washington Certification #: C868
Tennessee Certification #: 02867	West Virginia DEP Certification #: 143
Texas/TNI Certification #: T104704188-17-3	West Virginia DHHR Certification #: 9964C
Utah/TNI Certification #: PA014572017-9	Wisconsin Approve List for Rad
USDA Soil Permit #: P330-17-00091	Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174	Nebraska Certification: NE-OS-28-14
Alabama Certification #: 41320	Nevada Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216	New Hampshire Certification #: 2958
Delaware Certification: FL NELAC Reciprocity	New Jersey Certification #: FL022
Florida Certification #: E83079	New York Certification #: 11608
Georgia Certification #: 955	North Carolina Environmental Certificate #: 667
Guam Certification: FL NELAC Reciprocity	North Carolina Certification #: 12710
Hawaii Certification: FL NELAC Reciprocity	Oklahoma Certification #: D9947
Illinois Certification #: 200068	Pennsylvania Certification #: 68-00547
Indiana Certification: FL NELAC Reciprocity	Puerto Rico Certification #: FL01264
Kansas Certification #: E-10383	South Carolina Certification: #96042001
Kentucky Certification #: 90050	Tennessee Certification #: TN02974
Louisiana Certification #: FL NELAC Reciprocity	Texas Certification: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007	US Virgin Islands Certification: FL NELAC Reciprocity
Maryland Certification: #346	Virginia Environmental Certification #: 460165
Michigan Certification #: 9911	Wyoming Certification: FL NELAC Reciprocity
Mississippi Certification: FL NELAC Reciprocity	West Virginia Certification #: 9962C
Missouri Certification #: 236	Wisconsin Certification #: 399079670
Montana Certification #: Cert 0074	Wyoming (EPA Region 8): FL NELAC Reciprocity

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512	New York State Department of Health, Serial #56192 and 56193
Minnesota Department of Health, Certificate #1385941	North Carolina Division of Water Resources, Certificate #659
Arkansas Department of Environmental Quality, Certificate #17-046-0	Virginia Department of General Services, Certificate #9028
Georgia Environmental Protection Division, Stipulation	Wisconsin Department of Natural Resources, Laboratory #999472650
Illinois Environmental Protection Agency, Certificate #004325	U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278
Michigan Department of Environmental Quality, Laboratory #0034	

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268	Ohio VAP Certification #: CL-0065
Illinois Certification #: 200074	Oklahoma Certification #: 2017-124
Indiana Certification #: C-49-06	Texas Certification #: T104704355-18-12
Kansas/NELAP Certification #:E-10177	West Virginia Certification #: 330
Kentucky UST Certification #: 80226	Wisconsin Certification #: 999788130
Kentucky WW Certification #:98019	USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10425440001	FD-SB-A3	Water	03/29/18 12:30	03/29/18 16:26
10425440002	FD-SB-B4	Water	03/29/18 13:40	03/29/18 16:26
10425440003	FD-SB-D5	Water	03/29/18 13:00	03/29/18 16:26
10425440004	Field Replicate 1	Water	03/29/18 00:00	03/29/18 16:26

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10425440001	FD-SB-A3	EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	11	PASI-M		
		EPA 8270D	AT1	38	PASI-M		
		EPA 1664A OG	AR3	1	PASI-M		
10425440002	FD-SB-B4	EPA 8270D	AT1	38	PASI-M		
10425440003	FD-SB-D5	EPA 531.1	AC1	3	PASI-O		
		EPA 547	AC1	1	PASI-O		
		EPA 549.2	AC1	1	PASI-O		
		EPA 8011	XV1	3	PASI-M		
		EPA 8015 Alcohol-Glycol	BJW	1	PASI-I		
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I		
		EPA 8315A	JLB	1	PASI-GRMI		
		EPA 8316	JLB	1	PASI-GRMI		
		EPA 548.1	LAJ	1	PASI-O		
		EPA 524.2	AEZ	4	PASI-M		
		EPA 900.0	NJV	2	PASI-PA		
		EPA 903.1	KAC	1	PASI-PA		
		EPA 904.0	JLW	1	PASI-PA		
		Total Radium Calculation	RMK	1	PASI-PA		
		SM 4500-CIO2	AGS	1	PASI-O		
		EPA 300.0	AR3	1	PASI-M		
		EPA 300.1	CMB	1	PASI-O		
		EPA 300.1	CMB	1	PASI-O		
		10425440004	Field Replicate 1	EPA 531.1	AC1	3	PASI-O
				EPA 547	AC1	1	PASI-O
EPA 549.2	AC1			1	PASI-O		
EPA 8011	XV1			3	PASI-M		
EPA 8015 Alcohol-Glycol	BJW			1	PASI-I		
EPA 8015 Alcohol-Glycol	RID			1	PASI-I		
EPA 8315A	JLB			1	PASI-GRMI		
EPA 8316	JLB			1	PASI-GRMI		
EPA 548.1	LAJ			1	PASI-O		
EPA 524.2	AEZ			4	PASI-M		
EPA 900.0	NJV			2	PASI-PA		
EPA 903.1	KAC			1	PASI-PA		
EPA 904.0	JLW			1	PASI-PA		
Total Radium Calculation	RMK			1	PASI-PA		

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 4500-CIO2	AGS	1	PASI-O
		EPA 300.0	AR3	1	PASI-M
		EPA 300.1	CMB	1	PASI-O
		EPA 300.1	CMB	1	PASI-O

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Sample: FD-SB-A3	Lab ID: 10425440001	Collected: 03/29/18 12:30	Received: 03/29/18 16:26	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C						
Aldrin	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	309-00-2	
alpha-BHC	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	319-84-6	
beta-BHC	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	319-85-7	
delta-BHC	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	58-89-9	
Chlordane (Technical)	ND	ug/L	0.58	1	04/03/18 10:22	04/06/18 18:55	57-74-9	
alpha-Chlordane	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	5103-71-9	
gamma-Chlordane	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	5103-74-2	
4,4'-DDD	ND	ug/L	0.12	1	04/03/18 10:22	04/06/18 18:55	72-54-8	
4,4'-DDE	ND	ug/L	0.12	1	04/03/18 10:22	04/06/18 18:55	72-55-9	
4,4'-DDT	ND	ug/L	0.12	1	04/03/18 10:22	04/06/18 18:55	50-29-3	
Dieldrin	ND	ug/L	0.12	1	04/03/18 10:22	04/06/18 18:55	60-57-1	
Endosulfan I	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	959-98-8	
Endosulfan II	ND	ug/L	0.12	1	04/03/18 10:22	04/06/18 18:55	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.12	1	04/03/18 10:22	04/06/18 18:55	1031-07-8	
Endrin	ND	ug/L	0.12	1	04/03/18 10:22	04/06/18 18:55	72-20-8	
Endrin aldehyde	ND	ug/L	0.12	1	04/03/18 10:22	04/06/18 18:55	7421-93-4	
Endrin ketone	ND	ug/L	0.12	1	04/03/18 10:22	04/06/18 18:55	53494-70-5	
Heptachlor	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	76-44-8	
Heptachlor epoxide	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	1024-57-3	
Methoxychlor	ND	ug/L	0.58	1	04/03/18 10:22	04/06/18 18:55	72-43-5	
Toxaphene	ND	ug/L	1.7	1	04/03/18 10:22	04/06/18 18:55	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	85	%	62-125	1	04/03/18 10:22	04/06/18 18:55	877-09-8	
Decachlorobiphenyl (S)	39	%	30-143	1	04/03/18 10:22	04/06/18 18:55	2051-24-3	
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.12	1	04/03/18 10:20	04/04/18 13:31	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.12	1	04/03/18 10:20	04/04/18 13:31	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.12	1	04/03/18 10:20	04/04/18 13:31	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.12	1	04/03/18 10:20	04/04/18 13:31	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.12	1	04/03/18 10:20	04/04/18 13:31	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.12	1	04/03/18 10:20	04/04/18 13:31	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.12	1	04/03/18 10:20	04/04/18 13:31	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.12	1	04/03/18 10:20	04/04/18 13:31	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.12	1	04/03/18 10:20	04/04/18 13:31	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	68	%	30-125	1	04/03/18 10:20	04/04/18 13:31	877-09-8	
Decachlorobiphenyl (S)	53	%	30-125	1	04/03/18 10:20	04/04/18 13:31	2051-24-3	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	83-32-9	
Anthracene	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	120-12-7	
Benzo(a)pyrene	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	50-32-8	
Benzoic acid	ND	ug/L	58.1	1	04/04/18 09:03	04/06/18 21:08	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	101-55-3	
Butylbenzylphthalate	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	85-68-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Sample: FD-SB-A3 **Lab ID: 10425440001** Collected: 03/29/18 12:30 Received: 03/29/18 16:26 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

bis(2-Chloroethyl) ether	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	111-44-4	
2-Chlorophenol	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	58.1	1	04/04/18 09:03	04/06/18 21:08	91-94-1	
2,4-Dichlorophenol	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	120-83-2	
Diethylphthalate	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	84-66-2	
2,4-Dimethylphenol	ND	ug/L	58.1	1	04/04/18 09:03	04/06/18 21:08	105-67-9	
Dimethylphthalate	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	131-11-3	
Di-n-butylphthalate	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	84-74-2	
2,4-Dinitrophenol	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	51-28-5	
Di-n-octylphthalate	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	117-81-7	
Fluoranthene	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	206-44-0	
Fluorene	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	86-73-7	
Hexachlorobenzene	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	58.1	1	04/04/18 09:03	04/06/18 21:08	77-47-4	
Hexachloroethane	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	67-72-1	
Isophorone	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	78-59-1	
2-Methylnaphthalene	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	23.3	1	04/04/18 09:03	04/06/18 21:08		
N-Nitrosodiphenylamine	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	86-30-6	
Pentachlorophenol	ND	ug/L	23.3	1	04/04/18 09:03	04/06/18 21:08	87-86-5	
Phenanthrene	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	85-01-8	
Phenol	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	108-95-2	
Pyrene	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	78	%	60-125	1	04/04/18 09:03	04/06/18 21:08	4165-60-0	
2-Fluorobiphenyl (S)	83	%	56-125	1	04/04/18 09:03	04/06/18 21:08	321-60-8	
p-Terphenyl-d14 (S)	90	%	58-125	1	04/04/18 09:03	04/06/18 21:08	1718-51-0	
Phenol-d6 (S)	78	%	58-125	1	04/04/18 09:03	04/06/18 21:08	13127-88-3	
2-Fluorophenol (S)	78	%	55-125	1	04/04/18 09:03	04/06/18 21:08	367-12-4	
2,4,6-Tribromophenol (S)	99	%	65-125	1	04/04/18 09:03	04/06/18 21:08	118-79-6	

1664 HEM, Oil and Grease

Analytical Method: EPA 1664A OG

Oil and Grease	ND	mg/L	5.2	1		04/11/18 10:37		1M
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Sample: FD-SB-B4 **Lab ID: 10425440002** Collected: 03/29/18 13:40 Received: 03/29/18 16:26 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

Acenaphthene	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	83-32-9	
Anthracene	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	50-32-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Sample: FD-SB-B4		Lab ID: 10425440002	Collected: 03/29/18 13:40	Received: 03/29/18 16:26	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Benzoic acid	ND	ug/L	53.8	1	04/04/18 09:03	04/06/18 21:36	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	111-44-4	
2-Chlorophenol	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	53.8	1	04/04/18 09:03	04/06/18 21:36	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	120-83-2	
Diethylphthalate	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	84-66-2	
2,4-Dimethylphenol	ND	ug/L	53.8	1	04/04/18 09:03	04/06/18 21:36	105-67-9	
Dimethylphthalate	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	117-81-7	
Fluoranthene	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	206-44-0	
Fluorene	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	86-73-7	
Hexachlorobenzene	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	53.8	1	04/04/18 09:03	04/06/18 21:36	77-47-4	
Hexachloroethane	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	67-72-1	
Isophorone	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	21.5	1	04/04/18 09:03	04/06/18 21:36		
N-Nitrosodiphenylamine	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	86-30-6	
Pentachlorophenol	ND	ug/L	21.5	1	04/04/18 09:03	04/06/18 21:36	87-86-5	
Phenanthrene	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	85-01-8	
Phenol	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	108-95-2	
Pyrene	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	83	%	60-125	1	04/04/18 09:03	04/06/18 21:36	4165-60-0	
2-Fluorobiphenyl (S)	88	%	56-125	1	04/04/18 09:03	04/06/18 21:36	321-60-8	
p-Terphenyl-d14 (S)	89	%	58-125	1	04/04/18 09:03	04/06/18 21:36	1718-51-0	
Phenol-d6 (S)	88	%	58-125	1	04/04/18 09:03	04/06/18 21:36	13127-88-3	
2-Fluorophenol (S)	84	%	55-125	1	04/04/18 09:03	04/06/18 21:36	367-12-4	
2,4,6-Tribromophenol (S)	110	%	65-125	1	04/04/18 09:03	04/06/18 21:36	118-79-6	

Sample: FD-SB-D5		Lab ID: 10425440003	Collected: 03/29/18 13:00	Received: 03/29/18 16:26	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
531.1 HPLC Carbamates		Analytical Method: EPA 531.1						
Aldicarb	ND	ug/L	2.0	1		04/13/18 01:19	116-06-3	M1
Carbofuran	ND	ug/L	2.0	1		04/13/18 01:19	1563-66-2	M1
Surrogates								
BDMC (S)	131	%	80-120	1		04/13/18 01:19		S3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Sample: FD-SB-D5	Lab ID: 10425440003	Collected: 03/29/18 13:00	Received: 03/29/18 16:26	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
531.1 HPLC Carbamates	Analytical Method: EPA 531.1							
Surrogates								
BDMC (S)	74	%	80-120	1		04/06/18 16:50		S0
547 HPLC Glyphosate	Analytical Method: EPA 547							
Glyphosate	ND	ug/L	6.0	1		04/04/18 14:40		
549.2 HPLC Paraquat Diquat	Analytical Method: EPA 549.2 Preparation Method: EPA 549.2							
Diquat	ND	ug/L	0.40	1	04/04/18 23:02	04/05/18 20:25	85-00-7	
8011 GCS EDB and DBCP	Analytical Method: EPA 8011 Preparation Method: EPA 8011							
1,2-Dibromo-3-chloropropane	ND	ug/L	0.0098	1	04/04/18 07:55	04/04/18 23:52	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.0098	1	04/04/18 07:55	04/04/18 23:52	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	107	%	30-150	1	04/04/18 07:55	04/04/18 23:52	460-00-4	
8015M Alcohols in water	Analytical Method: EPA 8015 Alcohol-Glycol							
Methanol	ND	mg/L	5.0	1		04/05/18 10:51	67-56-1	
8015M Glycols in water	Analytical Method: EPA 8015 Alcohol-Glycol							
Ethylene glycol	ND	mg/L	5.0	1		04/06/18 09:29	107-21-1	
8315A GCSV Aldehydes	Analytical Method: EPA 8315A Preparation Method: EPA 8315A							
Formaldehyde	ND	ug/L	100	1	04/04/18 12:52	04/06/18 15:33	50-00-0	H2
8316 W GCSV Acrylamide	Analytical Method: EPA 8316							
Acrylamide	841	ug/L	20.0	1		04/03/18 16:54	79-06-1	
548.1 GCS Endothall	Analytical Method: EPA 548.1 Preparation Method: EPA 548.1							
Endothall	ND	ug/L	9.0	1	04/04/18 16:08	04/11/18 16:40		L1,L2
524.2 MSV	Analytical Method: EPA 524.2							
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/06/18 18:18		
Surrogates								
4-Bromofluorobenzene (S)	101	%	75-125	1		04/06/18 18:18	460-00-4	
Toluene-d8 (S)	100	%	75-125	1		04/06/18 18:18	2037-26-5	
1,2-Dichloroethane-d4 (S)	102	%	75-125	1		04/06/18 18:18	17060-07-0	
4500CIO2 Chlorine Dioxide	Analytical Method: SM 4500-CIO2							
Chlorine Dioxide	1.1	mg/L	0.10	1		04/06/18 13:42		H6
300.0 IC Anions	Analytical Method: EPA 300.0							
Chloride	80.1	mg/L	1.2	1		04/12/18 12:00	16887-00-6	FS
300.1 Oxihalide IC Anions 14d	Analytical Method: EPA 300.1							
Chlorite	ND	ug/L	50.0	10		04/08/18 16:17		D3

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Sample: FD-SB-D5		Lab ID: 10425440003	Collected: 03/29/18 13:00	Received: 03/29/18 16:26	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.1 Oxihalide IC Anions 28d		Analytical Method: EPA 300.1						
Bromate	ND	ug/L	10.0	10		04/08/18 16:17	15541-45-4	D3
Sample: Field Replicate 1		Lab ID: 10425440004	Collected: 03/29/18 00:00	Received: 03/29/18 16:26	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
531.1 HPLC Carbamates		Analytical Method: EPA 531.1						
Aldicarb	ND	ug/L	2.0	1		04/06/18 17:28	116-06-3	
Carbofuran	ND	ug/L	2.0	1		04/06/18 17:28	1563-66-2	
Surrogates								
BDMC (S)	93	%	80-120	1		04/06/18 17:28		
547 HPLC Glyphosate		Analytical Method: EPA 547						
Glyphosate	ND	ug/L	6.0	1		04/04/18 14:56		
549.2 HPLC Paraquat Diquat		Analytical Method: EPA 549.2 Preparation Method: EPA 549.2						
Diquat	ND	ug/L	0.40	1	04/04/18 23:02	04/05/18 20:32	85-00-7	
8011 GCS EDB and DBCP		Analytical Method: EPA 8011 Preparation Method: EPA 8011						
1,2-Dibromo-3-chloropropane	ND	ug/L	0.0098	1	04/04/18 07:55	04/05/18 00:18	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.0098	1	04/04/18 07:55	04/05/18 00:18	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	97	%	30-150	1	04/04/18 07:55	04/05/18 00:18	460-00-4	
8015M Alcohols in water		Analytical Method: EPA 8015 Alcohol-Glycol						
Methanol	ND	mg/L	5.0	1		04/05/18 11:00	67-56-1	
8015M Glycols in water		Analytical Method: EPA 8015 Alcohol-Glycol						
Ethylene glycol	ND	mg/L	5.0	1		04/06/18 09:38	107-21-1	
8315A GCSV Aldehydes		Analytical Method: EPA 8315A Preparation Method: EPA 8315A						
Formaldehyde	ND	ug/L	100	1	04/04/18 12:52	04/06/18 15:49	50-00-0	H2
8316 W GCSV Acrylamide		Analytical Method: EPA 8316						
Acrylamide	ND	ug/L	20.0	1		04/03/18 17:02	79-06-1	
548.1 GCS Endothall		Analytical Method: EPA 548.1 Preparation Method: EPA 548.1						
Endothall	ND	ug/L	9.0	1	04/04/18 16:08	04/11/18 16:52		L1,L2
524.2 MSV		Analytical Method: EPA 524.2						
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/06/18 18:41		
Surrogates								
4-Bromofluorobenzene (S)	100	%	75-125	1		04/06/18 18:41	460-00-4	
Toluene-d8 (S)	97	%	75-125	1		04/06/18 18:41	2037-26-5	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Sample: Field Replicate 1		Lab ID: 10425440004	Collected: 03/29/18 00:00	Received: 03/29/18 16:26	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
524.2 MSV	Analytical Method: EPA 524.2							
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	75-125	1		04/06/18 18:41	17060-07-0	
4500ClO2 Chlorine Dioxide	Analytical Method: SM 4500-ClO2							
Chlorine Dioxide	0.81	mg/L	0.10	1		04/06/18 13:42		H6
300.0 IC Anions	Analytical Method: EPA 300.0							
Chloride	82.8	mg/L	1.2	1		04/12/18 12:15	16887-00-6	FS
300.1 Oxihalide IC Anions 14d	Analytical Method: EPA 300.1							
Chlorite	ND	ug/L	50.0	10		04/08/18 17:00		D3
300.1 Oxihalide IC Anions 28d	Analytical Method: EPA 300.1							
Bromate	ND	ug/L	10.0	10		04/08/18 17:00	15541-45-4	D3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 438337 Analysis Method: EPA 531.1
 QC Batch Method: EPA 531.1 Analysis Description: 531.1 HPLC Carbamate
 Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2380051 Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aldicarb	ug/L	ND	2.0	04/06/18 14:17	
Carbofuran	ug/L	ND	2.0	04/06/18 14:17	
BDMC (S)	%	80	80-120	04/06/18 14:17	

LABORATORY CONTROL SAMPLE: 2380052

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aldicarb	ug/L	10	8.4	84	80-120	
Carbofuran	ug/L	10	10.1	101	80-120	
BDMC (S)	%			87	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2380053 2380054

Parameter	Units	10425440003		2380053		2380054		% Rec Limits	RPD	Max RPD	Qual	
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec					MSD % Rec
Aldicarb	ug/L	ND	10	10	5.0	5.3	50	53	80-120	5	20	M1
Carbofuran	ug/L	ND	10	10	5.6	7.5	56	75	80-120	29	20	M1, R1
BDMC (S)	%						54	54	80-120			S0

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 438883	Analysis Method: EPA 531.1
QC Batch Method: EPA 531.1	Analysis Description: 531.1 HPLC Carbamate
Associated Lab Samples: 10425440003	

METHOD BLANK: 2382546 Matrix: Water

Associated Lab Samples: 10425440003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aldicarb	ug/L	ND	2.0	04/12/18 22:46	
Carbofuran	ug/L	ND	2.0	04/12/18 22:46	
BDMC (S)	%	105	80-120	04/12/18 22:46	

LABORATORY CONTROL SAMPLE: 2382547

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aldicarb	ug/L	10	9.4	94	80-120	
Carbofuran	ug/L	10	11.4	114	80-120	
BDMC (S)	%			126	80-120 S0	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2382548 2382549

Parameter	Units	10425440003		2382548		2382549		% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Aldicarb	ug/L	ND	10	10	12.8	12.9	128	129	80-120	1	20	M1
Carbofuran	ug/L	ND	10	10	12.4	12.6	124	126	80-120	1	20	M1
BDMC (S)	%						121	120	80-120			S0

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

QC Batch: 437576 Analysis Method: EPA 547
QC Batch Method: EPA 547 Analysis Description: 547 HPLC Glyphosate
Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2375438 Matrix: Water
Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Glyphosate	ug/L	ND	6.0	04/04/18 11:18	

LABORATORY CONTROL SAMPLE: 2375439

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Glyphosate	ug/L	50	46.9	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2375440 2375441

Parameter	Units	35383136002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	4.2U	50	50	50.8	51.9	102	104	80-120	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2375442 2375443

Parameter	Units	4610024001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	<6.0	50	50	53.0	54.6	106	109	80-120	3	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

QC Batch: 435508 Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2011284 Matrix: Water
Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methanol	mg/L	ND	5.0	04/04/18 13:46	

LABORATORY CONTROL SAMPLE: 2011285

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methanol	mg/L	50	56.4	113	79-111	L3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2011376 2011377

Parameter	Units	60266710003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methanol	mg/L	ND	50	50	46.8	46.4	94	93	43-138	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 435360 Analysis Method: EPA 8015 Alcohol-Glycol
 QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified
 Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2010801 Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylene glycol	mg/L	ND	5.0	04/05/18 16:45	

LABORATORY CONTROL SAMPLE: 2010802

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylene glycol	mg/L	25	28.4	114	55-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2012497 2012498

Parameter	Units	50193471003 Result	MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
			Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec				
Ethylene glycol	mg/L	ND	25	25	18.3	20.4	72	81	38-154	11	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 19422

Analysis Method: EPA 8316

QC Batch Method: EPA 8316

Analysis Description: 8316 W GCSV Acrylamide

Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 77113

Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acrylamide	ug/L	ND	20.0	04/03/18 16:28	

LABORATORY CONTROL SAMPLE: 77114

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acrylamide	ug/L	1000	882	88	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 77115

77116

Parameter	Units	10425264002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Acrylamide	ug/L	ND	1000	1000	939	903	94	90	78-135	4	16	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 531079 Analysis Method: EPA 524.2
QC Batch Method: EPA 524.2 Analysis Description: 524.2 MSV
Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2883584 Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	ND	4.0	04/06/18 12:23	
1,2-Dichloroethane-d4 (S)	%.	102	75-125	04/06/18 12:23	
4-Bromofluorobenzene (S)	%.	99	75-125	04/06/18 12:23	
Toluene-d8 (S)	%.	99	75-125	04/06/18 12:23	

LABORATORY CONTROL SAMPLE: 2883585

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	80	80.8	101	70-130	
1,2-Dichloroethane-d4 (S)	%.			100	75-125	
4-Bromofluorobenzene (S)	%.			97	75-125	
Toluene-d8 (S)	%.			98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2885151 2885152

Parameter	Units	10426572001		2885151		2885152		% Rec	% Rec	% Rec	Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
Total Trihalomethanes (Calc.)	ug/L	ND	80	80	76.8	82.7	96	103	70-130	7	20		
1,2-Dichloroethane-d4 (S)	%.						101	99	75-125				
4-Bromofluorobenzene (S)	%.						101	99	75-125				
Toluene-d8 (S)	%.						99	98	75-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

QC Batch: 437555 Analysis Method: EPA 548.1
QC Batch Method: EPA 548.1 Analysis Description: 548 GCS Endothall
Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2375305 Matrix: Water
Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Endothall	ug/L	ND	9.0	04/11/18 14:41	

LABORATORY CONTROL SAMPLE: 2375306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	50	ND	0	64-137	L2

LABORATORY CONTROL SAMPLE: 2375307

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	9	22.1	246	50-150	L1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2376829 2376830

Parameter	Units	35383245001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Endothall	ug/L	<4.3	50	10.6	50	5.9J	21	12	64-137		30	M0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2376831 2376833

Parameter	Units	35382684001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Endothall	ug/L	4.3U	50	9.8	50	6.6J	20	13	64-137		30	M0

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

QC Batch: 437867 Analysis Method: EPA 549.2
QC Batch Method: EPA 549.2 Analysis Description: 549 HPLC Paraquat Diquat
Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2376996 Matrix: Water
Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diquat	ug/L	ND	0.40	04/05/18 18:44	

LABORATORY CONTROL SAMPLE: 2376997

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	2	1.6	78	70-130	

LABORATORY CONTROL SAMPLE: 2376998

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	.4	0.58	145	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2377632 2377635

Parameter	Units	35382816003 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Diquat	ug/L	<0.30	2	1.9	2	1.8	93	90	70-130	4	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2377634 2377635

Parameter	Units	35382800001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Diquat	ug/L	<0.30	2	1.9	2	1.9	95	95	70-130	0	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 530540 Analysis Method: EPA 8011
QC Batch Method: EPA 8011 Analysis Description: GCS 8011 EDB DBCP
Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2879655 Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	ND	0.010	04/04/18 18:16	
1,2-Dibromoethane (EDB)	ug/L	ND	0.010	04/04/18 18:16	
4-Bromofluorobenzene (S)	%.	96	30-150	04/04/18 18:16	

LABORATORY CONTROL SAMPLE & LCSD: 2879656

2879657

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	.11	0.11	0.11	98	100	60-140	2	20	
1,2-Dibromoethane (EDB)	ug/L	.11	0.11	0.11	98	98	60-140	1	20	
4-Bromofluorobenzene (S)	%.				101	105	30-150			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 530316

Analysis Method: EPA 8081B

QC Batch Method: EPA Mod. 3510C

Analysis Description: 8081B GCS Pesticides

Associated Lab Samples: 10425440001

METHOD BLANK: 2878474

Matrix: Water

Associated Lab Samples: 10425440001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/06/18 16:47	
4,4'-DDE	ug/L	ND	0.10	04/06/18 16:47	
4,4'-DDT	ug/L	ND	0.10	04/06/18 16:47	
Aldrin	ug/L	ND	0.050	04/06/18 16:47	
alpha-BHC	ug/L	ND	0.050	04/06/18 16:47	
alpha-Chlordane	ug/L	ND	0.050	04/06/18 16:47	
beta-BHC	ug/L	ND	0.050	04/06/18 16:47	
Chlordane (Technical)	ug/L	ND	0.50	04/06/18 16:47	
delta-BHC	ug/L	ND	0.050	04/06/18 16:47	
Dieldrin	ug/L	ND	0.10	04/06/18 16:47	
Endosulfan I	ug/L	ND	0.050	04/06/18 16:47	
Endosulfan II	ug/L	ND	0.10	04/06/18 16:47	
Endosulfan sulfate	ug/L	ND	0.10	04/06/18 16:47	
Endrin	ug/L	ND	0.10	04/06/18 16:47	
Endrin aldehyde	ug/L	ND	0.10	04/06/18 16:47	
Endrin ketone	ug/L	ND	0.10	04/06/18 16:47	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/06/18 16:47	
gamma-Chlordane	ug/L	ND	0.050	04/06/18 16:47	
Heptachlor	ug/L	ND	0.050	04/06/18 16:47	
Heptachlor epoxide	ug/L	ND	0.050	04/06/18 16:47	
Methoxychlor	ug/L	ND	0.50	04/06/18 16:47	
Toxaphene	ug/L	ND	1.5	04/06/18 16:47	
Decachlorobiphenyl (S)	%	84	30-143	04/06/18 16:47	
Tetrachloro-m-xylene (S)	%	84	62-125	04/06/18 16:47	

LABORATORY CONTROL SAMPLE: 2878475

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/L	1	1.0	100	67-125	
4,4'-DDE	ug/L	1	0.96	96	68-125	
4,4'-DDT	ug/L	1	1.0	100	66-125	
Aldrin	ug/L	.5	0.39	79	46-125	
alpha-BHC	ug/L	.5	0.48	96	66-125	
alpha-Chlordane	ug/L	.5	0.46	92	72-125	
beta-BHC	ug/L	.5	0.47	94	72-125	
delta-BHC	ug/L	.5	0.44	89	37-141	
Dieldrin	ug/L	1	1.0	103	71-125	
Endosulfan I	ug/L	.5	0.43	87	69-125	
Endosulfan II	ug/L	1	1.0	100	73-125	
Endosulfan sulfate	ug/L	1	0.90	90	63-127	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

LABORATORY CONTROL SAMPLE: 2878475

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/L	1	0.95	95	72-125	
Endrin aldehyde	ug/L	1	0.95	95	70-125	
Endrin ketone	ug/L	1	1.0	102	72-127	
gamma-BHC (Lindane)	ug/L	.5	0.48	96	69-125	
gamma-Chlordane	ug/L	.5	0.41	82	64-125	
Heptachlor	ug/L	.5	0.44	88	54-125	
Heptachlor epoxide	ug/L	.5	0.47	93	72-125	
Methoxychlor	ug/L	5	4.9	99	67-127	
Decachlorobiphenyl (S)	%			86	30-143	
Tetrachloro-m-xylene (S)	%			88	62-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878476 2878477

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10425808008 Result	Spike Conc.	Spike Conc.	MS Result						
4,4'-DDD	ug/L	ND	1.2	1.3	1.1	1.2	92	93	70-130	8	20
4,4'-DDE	ug/L	ND	1.2	1.3	1.1	1.2	91	92	70-130	8	20
4,4'-DDT	ug/L	ND	1.2	1.3	1.4	1.4	109	109	70-130	6	20
Aldrin	ug/L	ND	.62	.67	0.46	0.51	74	76	70-130	10	20
alpha-BHC	ug/L	ND	.62	.67	0.58	0.63	93	94	70-130	7	20
alpha-Chlordane	ug/L	ND	.62	.67	0.64	0.68	102	103	70-130	7	20
beta-BHC	ug/L	ND	.62	.67	0.57	0.62	92	92	70-130	7	20
delta-BHC	ug/L	ND	.62	.67	0.55	0.59	88	89	70-130	8	20
Dieldrin	ug/L	ND	1.2	1.3	1.2	1.3	97	98	70-130	8	20
Endosulfan I	ug/L	ND	.62	.67	0.49	0.53	79	80	70-130	7	20
Endosulfan II	ug/L	ND	1.2	1.3	1.1	1.2	92	93	70-130	8	20
Endosulfan sulfate	ug/L	ND	1.2	1.3	1.0	1.1	83	84	70-130	8	20
Endrin	ug/L	ND	1.2	1.3	1.3	1.4	102	102	70-130	7	20
Endrin aldehyde	ug/L	ND	1.2	1.3	1.1	1.2	87	87	70-130	7	20
Endrin ketone	ug/L	ND	1.2	1.3	1.2	1.3	96	97	70-130	7	20
gamma-BHC (Lindane)	ug/L	ND	.62	.67	0.58	0.62	92	93	70-130	7	20
gamma-Chlordane	ug/L	ND	.62	.67	0.48	0.52	77	78	70-130	8	20
Heptachlor	ug/L	ND	.62	.67	0.53	0.58	85	87	70-130	9	20
Heptachlor epoxide	ug/L	ND	.62	.67	0.70	0.75	113	112	70-130	6	20
Methoxychlor	ug/L	ND	6.2	6.7	6.5	7.0	104	104	70-130	6	20
Decachlorobiphenyl (S)	%						67	67	30-143		
Tetrachloro-m-xylene (S)	%						86	87	62-125		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

QC Batch: 530321 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10425440001

METHOD BLANK: 2878485 Matrix: Water
Associated Lab Samples: 10425440001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/04/18 13:01	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/04/18 13:01	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/04/18 13:01	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/04/18 13:01	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/04/18 13:01	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/04/18 13:01	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/04/18 13:01	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/04/18 13:01	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/04/18 13:01	
Decachlorobiphenyl (S)	%	84	30-125	04/04/18 13:01	
Tetrachloro-m-xylene (S)	%	57	30-125	04/04/18 13:01	

LABORATORY CONTROL SAMPLE & LCSD: 2878486

Parameter	Units	2878487								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.4	1.4	71	72	47-125	2	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.5	1.6	77	78	54-125	2	20	
Decachlorobiphenyl (S)	%				77	77	30-125			
Tetrachloro-m-xylene (S)	%				66	65	30-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 530573 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10425440001, 10425440002

METHOD BLANK: 2879730 Matrix: Water

Associated Lab Samples: 10425440001, 10425440002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/06/18 16:27	
2,4-Dichlorophenol	ug/L	ND	10.0	04/06/18 16:27	
2,4-Dimethylphenol	ug/L	ND	50.0	04/06/18 16:27	
2,4-Dinitrophenol	ug/L	ND	10.0	04/06/18 16:27	
2-Chlorophenol	ug/L	ND	10.0	04/06/18 16:27	
2-Methylnaphthalene	ug/L	ND	10.0	04/06/18 16:27	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/06/18 16:27	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/06/18 16:27	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/06/18 16:27	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/06/18 16:27	
Acenaphthene	ug/L	ND	10.0	04/06/18 16:27	
Anthracene	ug/L	ND	10.0	04/06/18 16:27	
Benzo(a)pyrene	ug/L	ND	10.0	04/06/18 16:27	
Benzoic acid	ug/L	ND	50.0	04/06/18 16:27	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/06/18 16:27	
bis(2-Ethylhexyl)phthalate	ug/L	10.9	10.0	04/06/18 16:27	
Butylbenzylphthalate	ug/L	ND	10.0	04/06/18 16:27	
Di-n-butylphthalate	ug/L	ND	10.0	04/06/18 16:27	
Di-n-octylphthalate	ug/L	ND	10.0	04/06/18 16:27	
Diethylphthalate	ug/L	ND	10.0	04/06/18 16:27	
Dimethylphthalate	ug/L	ND	10.0	04/06/18 16:27	
Fluoranthene	ug/L	ND	10.0	04/06/18 16:27	
Fluorene	ug/L	ND	10.0	04/06/18 16:27	
Hexachlorobenzene	ug/L	ND	10.0	04/06/18 16:27	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/06/18 16:27	
Hexachloroethane	ug/L	ND	10.0	04/06/18 16:27	
Isophorone	ug/L	ND	10.0	04/06/18 16:27	
N-Nitrosodiphenylamine	ug/L	ND	10.0	04/06/18 16:27	
Pentachlorophenol	ug/L	ND	20.0	04/06/18 16:27	
Phenanthrene	ug/L	ND	10.0	04/06/18 16:27	
Phenol	ug/L	ND	10.0	04/06/18 16:27	
Pyrene	ug/L	ND	10.0	04/06/18 16:27	
2,4,6-Tribromophenol (S)	%	99	65-125	04/06/18 16:27	
2-Fluorobiphenyl (S)	%	80	56-125	04/06/18 16:27	
2-Fluorophenol (S)	%	77	55-125	04/06/18 16:27	
Nitrobenzene-d5 (S)	%	74	60-125	04/06/18 16:27	
p-Terphenyl-d14 (S)	%	104	58-125	04/06/18 16:27	
Phenol-d6 (S)	%	77	58-125	04/06/18 16:27	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

LABORATORY CONTROL SAMPLE & LCSD: 2879731		2879732								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	42.4	45.3	85	91	74-125	7	20	
2,4-Dichlorophenol	ug/L	50	42.2	44.4	84	89	68-125	5	20	
2,4-Dimethylphenol	ug/L	50	36.8J	38.4J	74	77	33-125		20	
2,4-Dinitrophenol	ug/L	50	38.9	45.5	78	91	30-127	16	20	
2-Chlorophenol	ug/L	50	40.0	41.7	80	83	61-125	4	20	
2-Methylnaphthalene	ug/L	50	41.1	43.8	82	88	67-125	6	20	
2-Methylphenol(o-Cresol)	ug/L	50	39.6	40.3	79	81	63-125	2	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	39.8	42.6	80	85	67-125	7	20	
3,3'-Dichlorobenzidine	ug/L	50	48.2J	49.8J	96	100	60-125		20	
4-Bromophenylphenyl ether	ug/L	50	46.0	47.6	92	95	75-125	4	20	
Acenaphthene	ug/L	50	42.5	45.4	85	91	74-125	7	20	
Anthracene	ug/L	50	42.9	45.8	86	92	75-125	7	20	
Benzo(a)pyrene	ug/L	50	44.6	47.9	89	96	75-125	7	20	
Benzoic acid	ug/L	50	26.4J	42.4J	53	85	30-125		20	
bis(2-Chloroethyl) ether	ug/L	50	35.1	37.3	70	75	55-125	6	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	46.8	49.9	94	100	72-129	6	20	
Butylbenzylphthalate	ug/L	50	46.2	49.1	92	98	69-127	6	20	
Di-n-butylphthalate	ug/L	50	46.1	49.0	92	98	75-125	6	20	
Di-n-octylphthalate	ug/L	50	45.9	50.3	92	101	69-131	9	20	
Diethylphthalate	ug/L	50	45.1	48.0	90	96	75-125	6	20	
Dimethylphthalate	ug/L	50	45.6	48.7	91	97	75-125	7	20	
Fluoranthene	ug/L	50	46.1	49.1	92	98	75-125	6	20	
Fluorene	ug/L	50	43.6	46.5	87	93	75-125	7	20	
Hexachlorobenzene	ug/L	50	47.4	49.9	95	100	74-125	5	20	
Hexachlorocyclopentadiene	ug/L	50	21.3J	23.3J	43	47	30-125		20	
Hexachloroethane	ug/L	50	35.7	38.7	71	77	30-125	8	20	
Isophorone	ug/L	50	39.7	42.4	79	85	72-125	6	20	
N-Nitrosodiphenylamine	ug/L	50	45.1	46.8	90	94	75-125	4	20	
Pentachlorophenol	ug/L	50	47.1	50.1	94	100	52-125	6	20	
Phenanthrene	ug/L	50	43.7	47.0	87	94	75-125	7	20	
Phenol	ug/L	50	37.2	39.4	74	79	59-125	6	20	
Pyrene	ug/L	50	46.6	49.5	93	99	75-125	6	20	
2,4,6-Tribromophenol (S)	%				97	101	65-125			
2-Fluorobiphenyl (S)	%				81	87	56-125			
2-Fluorophenol (S)	%				75	77	55-125			
Nitrobenzene-d5 (S)	%				75	76	60-125			
p-Terphenyl-d14 (S)	%				97	101	58-125			
Phenol-d6 (S)	%				75	78	58-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 19505

Analysis Method: EPA 8315A

QC Batch Method: EPA 8315A

Analysis Description: 8315 GCSV Aldehydes

Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 77391

Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Formaldehyde	ug/L	ND	100	04/06/18 15:23	

LABORATORY CONTROL SAMPLE: 77392

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	400	455	114	44-176	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 77393

77394

Parameter	Units	10425440003		77394		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Formaldehyde	ug/L	ND	400	400	507	557	121	133	35-167	9	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

QC Batch: 531691 Analysis Method: EPA 1664A OG
QC Batch Method: EPA 1664A OG Analysis Description: 1664 HEM, Oil and Grease
Associated Lab Samples: 10425440001

METHOD BLANK: 2887411 Matrix: Water
Associated Lab Samples: 10425440001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	04/11/18 08:33	

LABORATORY CONTROL SAMPLE: 2887412

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	31.3	78	78-114	

MATRIX SPIKE SAMPLE: 2887413

Parameter	Units	10426156002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	ND	41.2	36.5	85	78-114	

SAMPLE DUPLICATE: 2887414

Parameter	Units	10426326004 Result	Dup Result	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	35.4	32.3	9	18	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 438356 Analysis Method: SM 4500-CIO2
 QC Batch Method: SM 4500-CIO2 Analysis Description: 4500CIO2 Chlorine Dioxide
 Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2380118 Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorine Dioxide	mg/L	ND	0.10	04/06/18 13:42	H6

LABORATORY CONTROL SAMPLE: 2380119

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorine Dioxide	mg/L	2.5	2.3	94	90-110	H6

SAMPLE DUPLICATE: 2380120

Parameter	Units	10424606001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	0.25	0.25	0	20	H6

SAMPLE DUPLICATE: 2380121

Parameter	Units	7584977001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	0.95	0.96	1	20	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 531969

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2888915

Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	04/12/18 10:51	FS

LABORATORY CONTROL SAMPLE: 2888916

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	11.3	90	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2888917 2888918

Parameter	Units	10426987002		2888917		2888918		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Chloride	mg/L	5.2	12.5	12.5	12.5	15.5	15.4	83	82	90-110	1	20 M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

QC Batch: 438646 Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1 Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2381795 Matrix: Water
Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorite	ug/L	ND	5.0	04/08/18 13:22	

LABORATORY CONTROL SAMPLE: 2381796

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	40	38.1	95	85-115	

MATRIX SPIKE SAMPLE: 2381798

Parameter	Units	7046923001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	<50.0		199			

SAMPLE DUPLICATE: 2381797

Parameter	Units	7046923001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorite	ug/L	<50.0	ND			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 438647 Analysis Method: EPA 300.1
 QC Batch Method: EPA 300.1 Analysis Description: 300.1 Oxihalides IC Anions
 Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2381799 Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromate	ug/L	ND	1.0	04/08/18 13:22	

LABORATORY CONTROL SAMPLE: 2381800

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	8	7.4	92	85-115	

MATRIX SPIKE SAMPLE: 2381802

Parameter	Units	7047470003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	<10.0	80	53.3	67	75-125	M6

SAMPLE DUPLICATE: 2381801

Parameter	Units	7047470003 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromate	ug/L	<10.0	ND		20	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Sample: FD-SB-D5		Lab ID: 10425440003	Collected: 03/29/18 13:00	Received: 03/29/18 16:26	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	0.046 ± 2.17 (4.42) C:NA T:NA	pCi/L	04/11/18 19:18	12587-46-1	
Gross Beta	EPA 900.0	48.2 ± 9.69 (5.36) C:NA T:NA	pCi/L	04/11/18 19:18	12587-47-2	
Radium-226	EPA 903.1	0.703 ± 0.520 (0.703) C:NA T:90%	pCi/L	04/17/18 20:03	13982-63-3	
Radium-228	EPA 904.0	0.294 ± 0.378 (0.804) C:76% T:79%	pCi/L	04/13/18 11:50	15262-20-1	
Total Radium	Total Radium Calculation	0.997 ± 0.898 (1.51)	pCi/L	04/23/18 13:05	7440-14-4	

Sample: Field Replicate 1		Lab ID: 10425440004	Collected: 03/29/18 00:00	Received: 03/29/18 16:26	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	2.33 ± 1.72 (2.72) C:NA T:NA	pCi/L	04/10/18 18:53	12587-46-1	
Gross Beta	EPA 900.0	57.2 ± 10.7 (2.64) C:NA T:NA	pCi/L	04/10/18 18:53	12587-47-2	
Radium-226	EPA 903.1	1.25 ± 0.785 (1.04) C:NA T:84%	pCi/L	04/17/18 20:03	13982-63-3	
Radium-228	EPA 904.0	0.249 ± 0.375 (0.810) C:77% T:75%	pCi/L	04/13/18 11:50	15262-20-1	
Total Radium	Total Radium Calculation	1.50 ± 1.16 (1.85)	pCi/L	04/23/18 13:05	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 293694

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 1437839

Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.285 (0.640) C:NA T:90%	pCi/L	04/17/18 20:03	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 293692

Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0

Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 10425440004

METHOD BLANK: 1437819

Matrix: Water

Associated Lab Samples: 10425440004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.067 ± 0.426 (1.07) C:NA T:NA	pCi/L	04/11/18 08:34	
Gross Beta	-0.252 ± 0.489 (1.38) C:NA T:NA	pCi/L	04/11/18 08:34	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 293578

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 1437152

Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.278 ± 0.394 (0.845) C:79% T:78%	pCi/L	04/13/18 11:48	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 294292	Analysis Method: EPA 900.0
QC Batch Method: EPA 900.0	Analysis Description: 900.0 Gross Alpha/Beta
Associated Lab Samples: 10425440003	

METHOD BLANK: 1440957	Matrix: Water
Associated Lab Samples: 10425440003	

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.020 ± 0.242 (0.682) C:NA T:NA	pCi/L	04/11/18 19:13	
Gross Beta	0.216 ± 0.533 (1.19) C:NA T:NA	pCi/L	04/11/18 19:13	

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QUALIFIERS

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Act - Activity
Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).
Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)
(MDC) - Minimum Detectable Concentration
Trac - Tracer Recovery (%)
Carr - Carrier Recovery (%)
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan
PASI-I Pace Analytical Services - Indianapolis
PASI-M Pace Analytical Services - Minneapolis
PASI-O Pace Analytical Services - Ormond Beach
PASI-PA Pace Analytical Services - Greensburg

BATCH QUALIFIERS

Batch: 530640
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
Batch: 530842
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
Batch: 531691
[BE] Batch extracted by solid phase extraction (SPE).

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QUALIFIERS

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

ANALYTE QUALIFIERS

1M	Sample pH adjusted using 9mL 6N HCl.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
FS	The sample was filtered in the laboratory prior to analysis.
H2	Extraction or preparation conducted outside EPA method holding time.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
L3	Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
R1	RPD value was outside control limits.
S0	Surrogate recovery outside laboratory control limits.
S3	Surrogate recovery exceeded laboratory control limits. Analyte presence below reporting limits in associated samples.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10425440003	FD-SB-D5	EPA 531.1	438337		
10425440003	FD-SB-D5	EPA 531.1	438883		
10425440004	Field Replicate 1	EPA 531.1	438337		
10425440003	FD-SB-D5	EPA 547	437576		
10425440004	Field Replicate 1	EPA 547	437576		
10425440003	FD-SB-D5	EPA 549.2	437867	EPA 549.2	438016
10425440004	Field Replicate 1	EPA 549.2	437867	EPA 549.2	438016
10425440003	FD-SB-D5	EPA 8011	530540	EPA 8011	530842
10425440004	Field Replicate 1	EPA 8011	530540	EPA 8011	530842
10425440003	FD-SB-D5	EPA 8015 Alcohol-Glycol	435508		
10425440004	Field Replicate 1	EPA 8015 Alcohol-Glycol	435508		
10425440003	FD-SB-D5	EPA 8015 Alcohol-Glycol	435360		
10425440004	Field Replicate 1	EPA 8015 Alcohol-Glycol	435360		
10425440001	FD-SB-A3	EPA Mod. 3510C	530316	EPA 8081B	530930
10425440001	FD-SB-A3	EPA Mod. 3510C	530321	EPA 8082A	530640
10425440003	FD-SB-D5	EPA 8315A	19505	EPA 8315A	19640
10425440004	Field Replicate 1	EPA 8315A	19505	EPA 8315A	19640
10425440003	FD-SB-D5	EPA 8316	19422		
10425440004	Field Replicate 1	EPA 8316	19422		
10425440003	FD-SB-D5	EPA 548.1	437555	EPA 548.1	438087
10425440004	Field Replicate 1	EPA 548.1	437555	EPA 548.1	438087
10425440001	FD-SB-A3	EPA 3520	530573	EPA 8270D	531095
10425440002	FD-SB-B4	EPA 3520	530573	EPA 8270D	531095
10425440003	FD-SB-D5	EPA 524.2	531079		
10425440004	Field Replicate 1	EPA 524.2	531079		
10425440003	FD-SB-D5	EPA 900.0	294292		
10425440004	Field Replicate 1	EPA 900.0	293692		
10425440003	FD-SB-D5	EPA 903.1	293694		
10425440004	Field Replicate 1	EPA 903.1	293694		
10425440003	FD-SB-D5	EPA 904.0	293578		
10425440004	Field Replicate 1	EPA 904.0	293578		
10425440003	FD-SB-D5	Total Radium Calculation	295609		
10425440004	Field Replicate 1	Total Radium Calculation	295609		
10425440001	FD-SB-A3	EPA 1664A OG	531691		
10425440003	FD-SB-D5	SM 4500-CIO2	438356		
10425440004	Field Replicate 1	SM 4500-CIO2	438356		
10425440003	FD-SB-D5	EPA 300.0	531969		
10425440004	Field Replicate 1	EPA 300.0	531969		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10425440003	FD-SB-D5	EPA 300.1	438646		
10425440004	Field Replicate 1	EPA 300.1	438646		
10425440003	FD-SB-D5	EPA 300.1	438647		
10425440004	Field Replicate 1	EPA 300.1	438647		

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WO#: 10425440



10425440

ly Form

Work Order Number:

COC Type:

Page: 1 of

Turnaround Time:

COC ID:

FOR LAB USE ONLY

LABORATORY

Facility Code: MPCA Freeway LF Waters Program Code (MDH Lab Only):

Lab Name:

Project Name: MPCA Freeway LF Waters Project Task Code:

Address: 18-00383

Project Manager:

EPIC Profile # 38716

Potential Hazard? If yes, add information to Sampler Comments Section

Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 S=Routine Sample
 S-IVP=Integrated Vertical Profile Sample
 S-CWOP=Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES

Wu-Ground-Groundwater
 Ws-Surf-Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	PRESERV.	Lab Sample No.	#
FD-SB-A3	S	3/29/18	1230			G	NW	WTT G FOUND			7			001	1
FD-SB-B4	S	3/29/18	1340			G	NW	WTT G FOUND			2			002	2
FD-SB-D5	S	3/29/18	1300			G	NW	WTT G FOUND			25			003	3
Field Replicate	QC-FR	3/29/18				G	NW	WTT G FOUND			25			004	4
															5
															6
															7
															8
															9
															10

Sampled By: David Anderson Sampler's Signature: David Anderson Phone #:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) <u>David Anderson / Pace Analytical</u>	<u>3/29/18/1626</u>	<u>WLA Pace</u>	<u>3-29-18 1626</u>

- ① collected from FD-SB-A3 = (6) GL, (1) GL HE1
- ② collected from FD-SB-B4 = (2) GL

6.9, 7.1, 6.8, 8.2 °C

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigaiton Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals - Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury - Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	EPA 8270C
PCBs	EPA 8082
PFCs	EPA 537
VOCs	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

**** ADD to Parameter List A:**

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Harness detrmination)

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace

Sample Condition Upon Receipt

Client Name: MPCA - Field

Project #:

WO#: 10425440
 PM: BM2 Due Date: 04/12/18
 CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163
 Used: G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 6.7/6.9/6.6/6.0 Cooler Temp Corrected (°C): 6.9/7.2 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: 3/29/18 JD

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	10. Field Replicate (AG) cap broken & replaced
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. 1st 2 samples not labeled. Came in individual coolers w/sample ID
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>3-4 3/3</u>
Exceptions VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Ben W

Date: 4/2/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).


Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10425440 Workorder Name: 18-00383 MPCA FreewayLF Water Owner Received Date: 3/29/2018 Results Requested By: 4/12/2018

Report To		Subcontract To					Requested Analysis										
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600					<div style="text-align: right; font-size: 24pt; font-weight: bold;">WO# : 30248103</div>  <div style="text-align: right; font-weight: bold;">30248103</div>										
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	HNO3	Preserved Containers				Gross Alpha/Beta	Radium 226	Radium 228	Radium, total	LAB USE ONLY		
1	FD-SB-D5	PS	3/29/2018 13:00	10425440003	Water	3					X	X	X	X		001	
2	Field Replicate 1	PS	3/29/2018 00:00	10425440004	Water	3					X	X	X	X		002	
3																	
4																	
5																	
Transfers	Released By	Date/Time	Received By	Date/Time	Comments												
1	<i>[Signature]</i>	4/02/18 13:00	<i>[Signature]</i>	4/3/18 10:30													
2																	
3																	
Cooler Temperature on Receipt		N/A °C	Custody Seal		Y or <u>N</u>	Received on Ice		Y or <u>N</u>	Samples Intact								<u>Y</u> or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: Face An

Project # 30240103

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 747598319864

Label	<u>DS</u>
LIMS Login	<u>ZH</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C
Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>ZH 4/3/18</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>DHcz</u>
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>ZH</u> Date/time of preservation: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Rad Aqueous Samples Screened > 0.5 mrem/hr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>ZH</u> Date: <u>4/3/18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #
Project Manager:
Client:

NO# : 35383367
PM: ADC **Due Date: 04/12/18**
CLIENT: PACMIN

Date and Initials of person:
Examining contents: KBI
Label: SPK
Deliver: KBI
pH: KBI

Thermometer Used: T337 Date: 4/3/18 Time: 1100 Initials: SS

State of Origin: _____

- | | |
|--|--|
| Cooler #1 Temp. °C <u>3.9</u> (Visual) <u>-0.4</u> (Correction Factor) <u>3.5</u> (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #2 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #3 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #4 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #5 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #6 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |

- Courier: Fed Ex UPS USPS Client Commercial Pace Other _____
- Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9831 9875


- Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No Ice: Wet Blue Dry None
- Packing Material: Bubble Wrap Bubble Bags None Other _____
- Samples shorted to lab (If Yes, complete) Shorted Date: _____ Shorted Time: _____ Qty: _____

Comments:

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Preservation Information: Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	

Client Notification/ Resolution:
Person Contacted: _____ Date/Time: _____

Comments/ Resolution (use back for additional comments): SS2.3 HAA5 container not received for sample #1, FD-SB-05

Sample Condition Upon Receipt	Client Name: <u>FSD (Pace FI)</u>	Project #: _____	<div style="font-size: 2em; font-weight: bold;">WO#: 10425440</div>  <div style="font-weight: bold;">10425440</div>
--------------------------------------	-----------------------------------	------------------	---

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____
Tracking Number: 4278 3969 6010

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 Type of Ice: Wet Blue None Dry Melted
Used: G87A9155100842

Cooler Temp Read (°C): 0.7 Cooler Temp Corrected (°C): 0.9 Biological Tissue Frozen? Yes No N/A
Temp should be above freezing to 6°C Correction Factor: 1.02 Date and Initials of Person Examining Contents: ME 4/12/18

USDA Regulated Soil (N/A, water sample)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1. <u>Return Sample 10425440-003, 004</u>
Chain of Custody Filled Out? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2.
Chain of Custody Relinquished? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>wt</u>	12. <u>No COC</u>
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Exceptions: VOA, Colliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N Sample # Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
Comments/Resolution: _____

Project Manager Review: _____

Date: _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50193520

Date/Time and Initials of person examining contents: JH 4/3/18 10:24

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 9794

Custody Seal on Cooler/Box Present: Yes No **Seals Intact:** Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F C **Ice Type:** Wet Blue None | **Samples collected today and on ice:** Yes No N/A

Cooler Temperature: 4.8/1.9 **Ice Visible in Sample Containers?:** Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C **If temp. is Over 6°C or under 0°C, was the PM Notified?:** Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		X	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl. All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			X
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		X				
Chain of Custody Present:	X		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	X		Dissolved Metals field filtered?:			X
Short Hold Time Analysis (<72hr)?: Analysis:		X	Headspace Wisconsin Sulfide			X
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			X
Rush TAT Requested:		X	Headspace in VOA Vials (>6mm):		X	
Containers Intact?:	X		Trip Blank Present?:		X	
Sample Labels Match COC?: Except TCs, which only require sample ID	X		Trip Blank Custody Seals?:		X	

Comments:

Sample Container Count

WO#: 50193522



50193522

CLIENT: Pace minn

Project # 50193522

COC PAGE ___ of ___

COC ID# _____

Sample Line Item	DG9H	VG9H	Bu Kit												R	DG9U	Matrix (Soil/Aquec)	pH <2	pH >9	pH >12		
			AG0U	AG1H	AG1U	AG2U	AG3S	WGUFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B							BP3N	BP3S
1																	Z		Wt			
2																	Z		Wt			
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
VG/AU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
VG/FU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
VG/FU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				



SAMPLE RECEIVING / LOG-IN CHECKLIST

Client Pace - Minnesota	Work Order # 4610172
Receipt Record Page/Line # 23-2	Project Chemist _____ Sample #s _____

Recorded by (initials/date) TS 3/31/18	<input checked="" type="checkbox"/> Cooler <input type="checkbox"/> Box <input type="checkbox"/> Other _____	Qty Received 1	<input checked="" type="checkbox"/> IR Gun (#202) Thermometer Used <input type="checkbox"/> Digital Thermometer (#54) <input type="checkbox"/> See Additional Cooler Information Form <input type="checkbox"/> Other (# _____)
--	--	--------------------------	--

Cooler #	Time	Cooler #	Time	Cooler #	Time	Cooler #	Time	
Red	0910							
Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		
Coolant Type: <input type="checkbox"/> Loose Ice <input checked="" type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		
Coolant Location: Dispersed / Top / <input checked="" type="checkbox"/> Middle / Bottom Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		Coolant Location: Dispersed / Top / Middle / Bottom Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		Coolant Location: Dispersed / Top / Middle / Bottom Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		Coolant Location: Dispersed / Top / Middle / Bottom Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		
Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C	Actual °C
Temp Blank:			Temp Blank:			Temp Blank:		
Sample 1:	1.9	1.9	Sample 1:			Sample 1:		
Sample 2:	1.7	1.7	Sample 2:			Sample 2:		
Sample 3:	2.4	2.4	Sample 3:			Sample 3:		
3 Sample Average °C:			3 Sample Average °C:			3 Sample Average °C:		
<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?		

If any shaded areas checked, complete Sample Receiving Non-Conformance and/or Inventory Form

Paperwork Received

Yes No

Chain of Custody record(s)? If No, Initiated By _____
 Received for Lab Signed/Date/Time?

Shipping document?

Other _____

COC Information

Pace COC Other _____

COC ID Numbers: _____

Check COC for Accuracy

Yes No

Analysis Requested?

Sample ID matches COC?

Sample Date and Time matches COC?

Container type completed on COC?

All container types indicated are received?

Sample Condition Summary

N/A Yes No

Broken containers/lids?

Missing or incomplete labels?

Illegible information on labels?

Low volume received?

Inappropriate or non-Pace containers received?

VOC vials / TOX containers have headspace?

Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A Yes No

Temperature Blank OR average sample temperature, ≥6° C?

If either is ≥6° C, was thermal preservation required?
 If "Yes", Project Chemist Approval Initials: _____
 If "Yes" Completed Non Con Cooler - Cont Inventory Form?

Completed Sample Preservation Verification Form?

Samples chemically preserved correctly?
 If "No", added orange tag?

Received pre-preserved VOC soils?
 MeOH Na₂SO₄

Check for Short Hold-Time Prep/Analyses

Bacteriological

Air Bags

EnCores / Methanol Pre-Preserved

Formaldehyde/Aldehyde

Green-tagged containers

Yellow/White-tagged 1 L ambers (SV Prep-Lab)

AFTER HOURS ONLY:
 COPIES OF COC TO LAB AREA(S)
 NONE RECEIVED
 RECEIVED, COCs TO LAB(S)

Notes

Trip Blank received Trip Blank not listed on COC

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
TS 3/31/18	TS 3/31/18	Yes / No

Chain of Custody

A181406



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10425440 Workorder Name: 18-00383 MPCA FreewayLF Water Owner Received Date: 3/29/2018 Results Requested By: 4/12/2018

Report To		Subcontract To				Requested Analysis																
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700																				
						Preserved Containers					Herbicides MDA List II EPA 8151			Pesticides MDA List I (8270 Pest)								
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved															LAB USE ONLY	
1	FD-SB-D5	PS	3/29/2018 13:00	10425440003	Water	2																01
2	Field Replicate 1	PS	3/29/2018 00:00	10425440004	Water	2																02
3																						
4																						
5																						
Comments																						
Transfers	Released By	Date/Time	Received By		Date/Time																	
1	<i>[Signature]</i>	4/02/18	<i>[Signature]</i>		4/3/18																	
2					11:49																	
3																						
Cooler Temperature on Receipt		2.3 °C	Custody Seal		Y or N	Received on Ice		Y or N	Samples Intact				Y or N									

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142 274 7/12/18



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April 12, 2018

Bob Michels
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/03/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



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Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Water - MN Project Number: 10425440 Project Manager: Bob Michels
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ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-SB-D5 (10425440003)	A181406-01	Water	03/29/2018	04/03/2018
Field Replicate 1 (10425440004)	A181406-02	Water	03/29/2018	04/03/2018

CASE NARRATIVE

Sample Receipt Information:

2 samples were received on 04/03/2018. Samples were received at 2.3 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Laboratory Control Samples (LCS):

The LCS recovery indicates a potential high bias for 2,4,5-TP, 2,4-D, 2,4-DB, bentazon, dicamba, MCPA and triclopyr for samples A181406-01 and A181406-02. Samples were less than the reporting limit for these analytes so no further action is required.



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Pace Analytical
 1700 Elm Street, Suite 200
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Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10425440
 Project Manager: Bob Michels

FD-SB-D5 (10425440003)

Date Sampled
03/29/2018 13:00

A181406-01 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804115

Acetochlor	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	

Surrogate: Atrazine-d5		105 %		65.1-122	04/05/2018	04/09/2018 10:03	EPA 8270D	
Surrogate: Parathion-d10		120 %		22.3-159	04/05/2018	04/09/2018 10:03	EPA 8270D	
Surrogate: Triphenyl phosphate		153 %		65.2-151	04/05/2018	04/09/2018 10:03	EPA 8270D	S

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804111

2,4-D	ND	0.50	ug/L	1	04/04/2018	04/07/2018 06:32	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/04/2018	04/07/2018 06:32	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/04/2018	04/07/2018 06:32	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/04/2018	04/07/2018 06:32	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/04/2018	04/07/2018 06:32	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/04/2018	04/07/2018 06:32	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/04/2018	04/07/2018 06:32	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/04/2018	04/07/2018 06:32	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/04/2018	04/07/2018 06:32	EPA 8151A	

Surrogate: 2,4-D-d5		139 %		44.2-121	04/04/2018	04/07/2018 06:32	EPA 8151A	S
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Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10425440
Project Manager: Bob Michels

Field Replicate 1 (10425440004)

A181406-02 (Water)

Date Sampled
03/29/2018 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804115

Acetochlor	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Surrogate: Atrazine-d5		101 %		65.1-122	04/05/2018	04/09/2018 10:31	EPA 8270D	
Surrogate: Parathion-d10		113 %		22.3-159	04/05/2018	04/09/2018 10:31	EPA 8270D	
Surrogate: Triphenyl phosphate		177 %		65.2-151	04/05/2018	04/09/2018 10:31	EPA 8270D	S

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804111

2,4-D	ND	0.50	ug/L	1	04/04/2018	04/07/2018 07:07	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/04/2018	04/07/2018 07:07	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/04/2018	04/07/2018 07:07	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/04/2018	04/07/2018 07:07	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/04/2018	04/07/2018 07:07	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/04/2018	04/07/2018 07:07	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/04/2018	04/07/2018 07:07	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/04/2018	04/07/2018 07:07	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/04/2018	04/07/2018 07:07	EPA 8151A	
Surrogate: 2,4-D-d5		124 %		44.2-121	04/04/2018	04/07/2018 07:07	EPA 8151A	S



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 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10425440
 Project Manager: Bob Michels

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804115 - EPA 3510C

Blank (A804115-BLK1)

Prepared: 04/05/2018 Analyzed: 04/09/2018 10:59

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>80.7</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>90.4</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.510</i>		<i>ug/L</i>	<i>0.5000</i>		<i>102</i>	<i>65.2-151</i>			

LCS (A804115-BS1)

Prepared: 04/05/2018 Analyzed: 04/09/2018 11:54

Acetochlor	1.04	0.50	ug/L	1.000		104	67.5-120			
Alachlor	1.07	0.50	ug/L	1.000		107	71.7-120			
Atrazine	1.01	0.50	ug/L	1.000		101	72.8-113			
Chlorpyrifos	0.999	0.50	ug/L	1.000		99.9	65.3-119			
Cyanazine	1.07	0.20	ug/L	1.000		107	49.5-140			
Desethylatrazine	0.971	0.50	ug/L	1.000		97.1	66.9-116			
Deisopropylatrazine	0.786	0.50	ug/L	1.000		78.6	44.3-110			
Dimethenamid	1.05	0.50	ug/L	1.000		105	63.8-116			
EPTC	0.786	0.50	ug/L	1.000		78.6	41.7-102			
Ethalfuralin	0.771	0.50	ug/L	1.000		77.1	41-127			
Fonofos	0.868	0.50	ug/L	1.000		86.8	59.7-118			
Metolachlor	1.08	0.50	ug/L	1.000		108	71.7-122			
Metribuzin	1.04	0.50	ug/L	1.000		104	66.6-128			
Pendimethalin	1.00	0.50	ug/L	1.000		100	55.5-137			
Phorate	0.906	0.30	ug/L	1.000		90.6	41.2-114			
Prometon	1.04	0.50	ug/L	1.000		104	66.3-120			
Propachlor	1.01	0.50	ug/L	1.000		101	65.8-119			



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Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10425440
Project Manager: Bob Michels

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804115 - EPA 3510C

LCS (A804115-BS1)

Prepared: 04/05/2018 Analyzed: 04/09/2018 11:54

Propazine	1.01	0.50	ug/L	1.000		101	72-122			
Simazine	1.00	0.50	ug/L	1.000		100	72.8-113			
Terbufos	0.853	0.20	ug/L	1.000		85.3	38.6-115			
Triallate	0.826	0.50	ug/L	1.000		82.6	51.4-116			
Trifluralin	0.841	0.50	ug/L	1.000		84.1	46.1-134			
<i>Surrogate: Atrazine-d5</i>	<i>0.442</i>		<i>ug/L</i>	<i>0.5000</i>		<i>88.4</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.488</i>		<i>ug/L</i>	<i>0.5000</i>		<i>97.6</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.489</i>		<i>ug/L</i>	<i>0.5000</i>		<i>97.9</i>	<i>65.2-151</i>			

LCS Dup (A804115-BS1)

Prepared: 04/05/2018 Analyzed: 04/09/2018 12:22

Acetochlor	0.959	0.50	ug/L	1.000		95.9	67.5-120	7.72	20	
Alachlor	0.953	0.50	ug/L	1.000		95.3	71.7-120	11.3	20	
Atrazine	0.934	0.50	ug/L	1.000		93.4	72.8-113	8.18	20	
Chlorpyrifos	0.936	0.50	ug/L	1.000		93.6	65.3-119	6.50	20	
Cyanazine	1.03	0.20	ug/L	1.000		103	49.5-140	3.38	20	
Desethylatrazine	0.906	0.50	ug/L	1.000		90.6	66.9-116	6.91	20	
Deisopropylatrazine	0.746	0.50	ug/L	1.000		74.6	44.3-110	5.26	20	
Dimethenamid	0.953	0.50	ug/L	1.000		95.3	63.8-116	9.83	20	
EPTC	0.722	0.50	ug/L	1.000		72.2	41.7-102	8.53	20	
Ethalfluralin	0.721	0.50	ug/L	1.000		72.1	41-127	6.80	20	
Fonofos	0.821	0.50	ug/L	1.000		82.1	59.7-118	5.55	20	
Metolachlor	0.986	0.50	ug/L	1.000		98.6	71.7-122	9.13	20	
Metribuzin	0.940	0.50	ug/L	1.000		94.0	66.6-128	9.71	20	
Pendimethalin	0.935	0.50	ug/L	1.000		93.5	55.5-137	7.02	20	
Phorate	0.783	0.30	ug/L	1.000		78.3	41.2-114	14.5	20	
Prometon	0.949	0.50	ug/L	1.000		94.9	66.3-120	9.04	20	
Propachlor	0.916	0.50	ug/L	1.000		91.6	65.8-119	10.2	20	
Propazine	0.963	0.50	ug/L	1.000		96.3	72-122	4.75	20	
Simazine	0.937	0.50	ug/L	1.000		93.7	72.8-113	6.73	20	
Terbufos	0.778	0.20	ug/L	1.000		77.8	38.6-115	9.20	20	
Triallate	0.741	0.50	ug/L	1.000		74.1	51.4-116	10.9	20	
Trifluralin	0.725	0.50	ug/L	1.000		72.5	46.1-134	14.8	20	
<i>Surrogate: Atrazine-d5</i>	<i>0.405</i>		<i>ug/L</i>	<i>0.5000</i>		<i>80.9</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.423</i>		<i>ug/L</i>	<i>0.5000</i>		<i>84.6</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.464</i>		<i>ug/L</i>	<i>0.5000</i>		<i>92.8</i>	<i>65.2-151</i>			



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Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10425440
Project Manager: Bob Michels

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804111 - EPA 3510C

Blank (A804111-BLK1)

Prepared: 04/04/2018 Analyzed: 04/06/2018 22:20

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							

Surrogate: 2,4-D-d5

2.31 ug/L 2.016 115 44.2-121

LCS (A804111-BS1)

Prepared: 04/04/2018 Analyzed: 04/07/2018 01:52

2,4-D	3.13	0.50	ug/L	2.000		157	64.6-148			
2,4-DB	2.91	0.50	ug/L	2.000		145	66.7-143			
2,4,5-T	2.59	0.50	ug/L	2.000		129	63.4-133			
2,4,5-TP (Silvex)	3.08	0.50	ug/L	2.000		154	63-145			
Bentazon	1.38	0.50	ug/L	1.000		138	52.5-139			
Dicamba	2.92	0.50	ug/L	2.000		146	55.4-143			
MCPA	3.00	0.30	ug/L	2.000		150	33.5-143			
Picloram	1.13	0.50	ug/L	1.000		113	47.9-113			
Triclopyr	2.89	0.50	ug/L	2.000		144	65.1-141			

Surrogate: 2,4-D-d5

2.32 ug/L 2.016 115 44.2-121

LCS Dup (A804111-BSD1)

Prepared: 04/04/2018 Analyzed: 04/07/2018 02:27

2,4-D	3.06	0.50	ug/L	2.000		153	64.6-148	2.15	20	
2,4-DB	2.77	0.50	ug/L	2.000		139	66.7-143	4.71	20	
2,4,5-T	2.67	0.50	ug/L	2.000		133	63.4-133	3.13	20	
2,4,5-TP (Silvex)	3.15	0.50	ug/L	2.000		158	63-145	2.45	20	
Bentazon	1.40	0.50	ug/L	1.000		140	52.5-139	1.22	20	
Dicamba	3.19	0.50	ug/L	2.000		159	55.4-143	8.83	20	
MCPA	3.11	0.30	ug/L	2.000		155	33.5-143	3.37	20	
Picloram	1.11	0.50	ug/L	1.000		111	47.9-113	2.12	20	
Triclopyr	3.03	0.50	ug/L	2.000		152	65.1-141	4.96	20	

Surrogate: 2,4-D-d5

2.26 ug/L 2.016 112 44.2-121



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10425440
Project Manager: Bob Michels

Notes and Definitions

- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

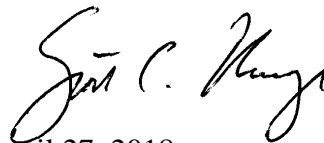
PaceProject#: 10427011
Sample Receipt Date: 04/11/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 27, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

April 27, 2018

DISCUSSION

This report presents the results from the analyses performed on four samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The samples were received above the recommended temperature range of 0-6 degrees Celsius.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 57-62%. All of the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 104%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE	MN002
Arkansas	88-0680	New York (NEL	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management



10427011

Report No.....10427011_8290TCDD

DTA 4/11/18
DTA 4/11/18

Minnesota Pollution Control Agency		Chain-of-Custody Form		Work Order Number: COCT		Turnaround Time: COC ID:		FOR LAB USE ONLY						
PROJECT/CLIENT INFO						LABORATORY								
Facility Code:	MPCA - Freeway LF Solids			Program Code (MDH Lab Only):	Lab Name:									
Project Name:	MPCA - Freeway LF Solids			Project Task Code:	Address: 18-00383									
Project Manager:				EPIC Profile #38716										
Potential Hazard?	If yes, add information to Sampler Comments Section			Phone No:										
SAMPLE DETAILS						ANALYSIS REQUESTED								
SAMPLE TYPE CODES		LAB MATRIX CODES		FIELD MATRIX CODES		PRESERV.								
Sample=Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample		QC-FB=Field Blank Sample QC-FR=Field Replicate Sample QC-TB=Trip Blank Sample		DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe		AR=Air BL=Biological Material OT=Other TS=Tissue		Wt-Ground-Groundwater Wt-Surf-Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample						
Location Identifier	Sample Type	Date	Time	Start Depth, feet	End Depth, feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Lab Sample No.	#
FD-SB	S	4/11/18				C	SD							1
FD-TF-01 (10-13 W/M)	S	4/11/18	1020			C	SD				13	X X		2 001
FD-TF-02 (7-9 W/M)	S	4/11/18	1220			C	SD				13	X X		3
FD-SB-A1 (3-5 W/M)	S	4/11/18	1300			C	SD				13	X X		4 002
FD-SB-A2	S	4/11/18				C	SD				13	X		5
FD-SB-B1 (11-13 W/M)	S	4/11/18	1350			C	SD				13	X X		6
FD-SB-C1 (5-9 W/M)	S	4/11/18	1430			C	SD				13	X X		7 003
FD-TF-03 (2-5 W/M)	S	4/11/18	1450			C	SD				13	X X		8
FD-SB-D1 (11-16 W/M)	S	4/11/18	1535			C	SD				13	X X		9 004
FD-SB-E1 (10-15 W/M)	S	4/11/18	1610			C	SD				13	X		10
Sampled By: David Anderson		Sampler's Signature: David Anderson				Phone #:								
Receiving Comments:														
Relinquished By/Affiliation						Date/Time		Accepted By/ Affiliation				Date/Time		
David Anderson / Pace Analytical						4/11/18/1650		Nancy Williams / Pace				4/11/18/1650		
Nancy Williams / Pace						4/11/18/1713		Mandy / Pace				4/11/18/1713		

T=6.2

Sample Condition Upon Receipt

Client Name:

Project #:

WO#: 10427011

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____

PM: SCU Due Date: 04/19/18
 CLIENT: PASI-MNFLD

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals intact? Yes No Optional: Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 6.0 Cooler Temp Corrected (°C): 6.2 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: ST 4/11/18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, M5, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (international including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MIN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>MES 4/11/18</u>	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review:

San C. Wang

Date: 04/12/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately
 half of the samples. To be determined in the field by MPCA staff.

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-TT-01 (10-12 WM)		
Lab Sample ID	10427011001		
Filename	U180422B_04		
Injected By	BAL		
Total Amount Extracted	13.7 g	Matrix	Solid
% Moisture	34.3	Dilution	NA
Dry Weight Extracted	9.00 g	Collected	04/11/2018 10:20
ICAL ID	U180405	Received	04/11/2018 17:13
CCal Filename(s)	U180422A_16 & U180422B_15	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/22/2018 16:41

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	59
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	57

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-A1 (3-6 S)		
Lab Sample ID	10427011002		
Filename	U180422B_05		
Injected By	BAL		
Total Amount Extracted	15.4 g	Matrix	Solid
% Moisture	31.3	Dilution	NA
Dry Weight Extracted	10.6 g	Collected	04/11/2018 13:00
ICAL ID	U180405	Received	04/11/2018 17:13
CCal Filename(s)	U180422A_16 & U180422B_15	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/22/2018 17:29

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	57
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	57

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-C1 (5-8 WM)		
Lab Sample ID	10427011003		
Filename	U180422B_06		
Injected By	BAL		
Total Amount Extracted	12.5 g	Matrix	Solid
% Moisture	21.5	Dilution	NA
Dry Weight Extracted	9.81 g	Collected	04/11/2018 14:30
ICAL ID	U180405	Received	04/11/2018 17:13
CCal Filename(s)	U180422A_16 & U180422B_15	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/22/2018 18:18

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	1.1	----	1.0	2,3,7,8-TCDD-13C	2.00	60
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	60

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-D1 (11-16 WM)		
Lab Sample ID	10427011004		
Filename	U180426A_13		
Injected By	SMT		
Total Amount Extracted	12.6 g	Matrix	Solid
% Moisture	17.3	Dilution	NA
Dry Weight Extracted	10.4 g	Collected	04/11/2018 15:35
ICAL ID	U180405	Received	04/11/2018 17:13
CCal Filename(s)	U180426A_07 & U180426B_15	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/26/2018 13:09

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	62
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	59

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61774	Matrix	Solid
Filename	Y180422A_04	Dilution	NA
Total Amount Extracted	79.7 g	Extracted	04/17/2018 15:45
ICAL ID	Y180204	Analyzed	04/22/2018 16:10
CCal Filename(s)	Y180421B_16 & Y180422A_12	Injected By	BAL

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	63

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61775	Matrix	Solid
Filename	Y180422A_01	Dilution	NA
Total Amount Extracted	75.1 g	Extracted	04/17/2018 15:45
ICAL ID	Y180204	Analyzed	04/22/2018 13:59
CCal Filename(s)	Y180421B_16 & Y180422A_12	Injected By	BAL
Method Blank ID	BLANK-61774		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.21	104	2,3,7,8-TCDD-13C	2.0	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	62

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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May 01, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427018

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 11, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427018

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Montana Certificate #CERT0103
California Certification #2973
California Certification #2973
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
Montana DHHS Certification #: CERT0102
Minnesota Dept of Health Certification #: 1382680

Nevada DCNR Certification #: MN000372018-1
Wisconsin DNR Certification #: 999446800
North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10427018001	FD-TT-01 (10-12 WM)	Solid	04/11/18 10:20	04/11/18 17:13
10427018002	FD-TT-02 (7-9 WM)	Solid	04/11/18 12:20	04/11/18 17:13
10427018003	FD-SB-A1 (3-6 S)	Solid	04/11/18 13:00	04/11/18 17:13
10427018004	FD-SB-B1 (11-13 WM)	Solid	04/11/18 13:50	04/11/18 17:13
10427018005	FD-SB-C1 (5-8 WM)	Solid	04/11/18 14:30	04/11/18 17:13
10427018006	FD-TT-03 (2-5 WM)	Solid	04/11/18 14:50	04/11/18 17:13
10427018007	FD-SB-D1 (11-16 WM)	Solid	04/11/18 15:35	04/11/18 17:13
10427018008	FD-SB-E1 (10-15 WM)	Solid	04/11/18 16:10	04/11/18 17:13

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427018

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10427018001	FD-TT-01 (10-12 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	EC2	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010C	DM	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	TT3	10	PASI-M		
		EPA 7471	LMW	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	AT1	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10427018002	FD-TT-02 (7-9 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M
WI MOD DRO	EC2			2	PASI-M		
WI MOD GRO	AJR			2	PASI-M		
EPA 6010C	DM			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	TT3			10	PASI-M		
EPA 7471	LMW			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	AT1			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8260B	CD2			70	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
10427018003	FD-SB-A1 (3-6 S)			EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427018004	FD-SB-B1 (11-13 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427018005	FD-SB-C1 (5-8 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427018006	FD-TT-03 (2-5 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427018007	FD-SB-D1 (11-16 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427018008	FD-SB-E1 (10-15 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-01 (10-12 WM) **Lab ID: 10427018001** Collected: 04/11/18 10:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	12.9	1	04/25/18 10:56	04/27/18 14:40	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	309-00-2	
alpha-BHC	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	319-84-6	
beta-BHC	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	319-85-7	
delta-BHC	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	58-89-9	
Chlordane (Technical)	ND	ug/kg	254	10	04/16/18 09:32	04/16/18 21:53	57-74-9	
alpha-Chlordane	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	5103-71-9	
gamma-Chlordane	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	5103-74-2	
4,4'-DDD	ND	ug/kg	50.6	10	04/16/18 09:32	04/16/18 21:53	72-54-8	
4,4'-DDE	ND	ug/kg	50.6	10	04/16/18 09:32	04/16/18 21:53	72-55-9	
4,4'-DDT	ND	ug/kg	50.6	10	04/16/18 09:32	04/16/18 21:53	50-29-3	
Dieldrin	ND	ug/kg	50.6	10	04/16/18 09:32	04/16/18 21:53	60-57-1	
Endosulfan I	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	959-98-8	
Endosulfan II	ND	ug/kg	50.6	10	04/16/18 09:32	04/16/18 21:53	33213-65-9	
Endosulfan sulfate	ND	ug/kg	50.6	10	04/16/18 09:32	04/16/18 21:53	1031-07-8	
Endrin	ND	ug/kg	50.6	10	04/16/18 09:32	04/16/18 21:53	72-20-8	
Endrin aldehyde	ND	ug/kg	50.6	10	04/16/18 09:32	04/16/18 21:53	7421-93-4	
Endrin ketone	ND	ug/kg	50.6	10	04/16/18 09:32	04/16/18 21:53	53494-70-5	
Heptachlor	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	76-44-8	
Heptachlor epoxide	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	1024-57-3	
Methoxychlor	ND	ug/kg	254	10	04/16/18 09:32	04/16/18 21:53	72-43-5	
Toxaphene	ND	ug/kg	760	10	04/16/18 09:32	04/16/18 21:53	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	10	04/16/18 09:32	04/16/18 21:53	877-09-8	4M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	10	04/16/18 09:32	04/16/18 21:53	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	11141-16-5	
PCB-1242 (Aroclor 1242)	746	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	12672-29-6	
PCB-1254 (Aroclor 1254)	118	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	11100-14-4	
PCB, Total	864	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	89	%	48-125	1	04/13/18 19:35	04/16/18 16:02	877-09-8	
Decachlorobiphenyl (S)	81	%	30-134	1	04/13/18 19:35	04/16/18 16:02	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-01 (10-12 WM) Lab ID: 10427018001 Collected: 04/11/18 10:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	1420	mg/kg	119	10	04/12/18 14:19	04/13/18 12:36		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	10	04/12/18 14:19	04/13/18 12:36	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	22.8	mg/kg	16.2	1	04/23/18 09:23	04/23/18 17:21		C0,M1
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%.	80-150	1	04/23/18 09:23	04/23/18 17:21	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	9190	mg/kg	14.4	1	04/13/18 05:02	04/13/18 15:28	7429-90-5	
Barium	344	mg/kg	0.72	1	04/13/18 05:02	04/13/18 15:28	7440-39-3	
Boron	134	mg/kg	10.8	1	04/13/18 05:02	04/13/18 15:28	7440-42-8	
Copper	36.7	mg/kg	0.72	1	04/13/18 05:02	04/13/18 15:28	7440-50-8	
Iron	36800	mg/kg	18.0	5	04/13/18 05:02	04/13/18 15:50	7439-89-6	
Manganese	291	mg/kg	0.36	1	04/13/18 05:02	04/13/18 15:28	7439-96-5	
Nickel	43.1	mg/kg	1.4	1	04/13/18 05:02	04/13/18 15:28	7440-02-0	
Silver	ND	mg/kg	0.72	1	04/13/18 05:02	04/13/18 15:28	7440-22-4	
Tin	20.1	mg/kg	5.4	1	04/13/18 05:02	04/13/18 15:28	7440-31-5	
Titanium	415	mg/kg	1.8	1	04/13/18 05:02	04/13/18 15:28	7440-32-6	
Zinc	1460	mg/kg	1.4	1	04/13/18 05:02	04/13/18 15:28	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	33.3	mg/kg	1.4	5	04/18/18 10:36	04/19/18 06:58	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.3	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:24	7440-36-0	
Arsenic	11.6	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:24	7440-38-2	
Beryllium	1.5	mg/kg	0.29	20	04/13/18 05:01	04/13/18 09:24	7440-41-7	
Cadmium	2.3	mg/kg	0.12	20	04/13/18 05:01	04/13/18 09:24	7440-43-9	
Cobalt	5.6	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:24	7440-48-4	
Lead	150	mg/kg	0.14	20	04/13/18 05:01	04/13/18 09:24	7439-92-1	
Lithium	6.5	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:24	7439-93-2	
Selenium	2.9	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:24	7782-49-2	
Strontium	56.3	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:24	7440-24-6	
Vanadium	132	mg/kg	1.4	20	04/13/18 05:01	04/13/18 09:24	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.14	mg/kg	0.026	1	04/13/18 05:02	04/15/18 18:03	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	34.3	%	0.10	1		04/18/18 12:40		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	5010	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: **FD-TT-01 (10-12 WM)** Lab ID: **10427018001** Collected: 04/11/18 10:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	208-96-8	
Anthracene	15400	ug/kg	5020	10	04/13/18 17:55	04/19/18 20:15	120-12-7	
Benzo(a)anthracene	41400	ug/kg	5020	10	04/13/18 17:55	04/19/18 20:15	56-55-3	
Benzo(a)pyrene	36300	ug/kg	5020	10	04/13/18 17:55	04/19/18 20:15	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	205-99-2	
Benzo(g,h,i)perylene	24800	ug/kg	5020	10	04/13/18 17:55	04/19/18 20:15	191-24-2	
Benzo(k)fluoranthene	18300	ug/kg	5020	10	04/13/18 17:55	04/19/18 20:15	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	101-55-3	
Butylbenzylphthalate	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	85-68-7	
Carbazole	3270	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	59-50-7	
4-Chloroaniline	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	108-60-1	
2-Chloronaphthalene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	91-58-7	
2-Chlorophenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	7005-72-3	
Chrysene	46400	ug/kg	5020	10	04/13/18 17:55	04/19/18 20:15	218-01-9	
Dibenz(a,h)anthracene	1920	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	53-70-3	
Dibenzofuran	2930	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	120-83-2	
Diethylphthalate	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	105-67-9	
Dimethylphthalate	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	131-11-3	
Di-n-butylphthalate	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2580	1	04/13/18 17:55	04/19/18 19:42	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	606-20-2	
Di-n-octylphthalate	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	122-66-7	
bis(2-Ethylhexyl)phthalate	2000	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	117-81-7	
Fluoranthene	107000	ug/kg	10000	20	04/13/18 17:55	04/20/18 16:00	206-44-0	
Fluorene	5970	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	87-68-3	
Hexachlorobenzene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	118-74-1	
Hexachloroethane	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	67-72-1	
Indeno(1,2,3-cd)pyrene	21800	ug/kg	5020	10	04/13/18 17:55	04/19/18 20:15	193-39-5	
Isophorone	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	78-59-1	
1-Methylnaphthalene	642	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	90-12-0	
2-Methylnaphthalene	746	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-01 (10-12 WM) **Lab ID: 10427018001** Collected: 04/11/18 10:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1000	1	04/13/18 17:55	04/19/18 19:42		
Naphthalene	614	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	91-20-3	
2-Nitroaniline	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	88-74-4	
3-Nitroaniline	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	99-09-2	
4-Nitroaniline	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	100-01-6	
Nitrobenzene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	98-95-3	
2-Nitrophenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	88-75-5	
4-Nitrophenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	86-30-6	
Pentachlorophenol	ND	ug/kg	1020	1	04/13/18 17:55	04/19/18 19:42	87-86-5	
Phenanthrene	76800	ug/kg	5020	10	04/13/18 17:55	04/19/18 20:15	85-01-8	
Phenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	108-95-2	
Pyrene	96700	ug/kg	10000	20	04/13/18 17:55	04/20/18 16:00	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	63	%	43-125	1	04/13/18 17:55	04/19/18 19:42	4165-60-0	
2-Fluorobiphenyl (S)	64	%	30-132	1	04/13/18 17:55	04/19/18 19:42	321-60-8	
p-Terphenyl-d14 (S)	118	%	62-125	1	04/13/18 17:55	04/19/18 19:42	1718-51-0	
Phenol-d6 (S)	73	%	48-125	1	04/13/18 17:55	04/19/18 19:42	13127-88-3	
2-Fluorophenol (S)	69	%	40-125	1	04/13/18 17:55	04/19/18 19:42	367-12-4	
2,4,6-Tribromophenol (S)	80	%	60-125	1	04/13/18 17:55	04/19/18 19:42	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	185	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	83-32-9	
Acenaphthylene	ND	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	208-96-8	
Anthracene	351	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	120-12-7	
Benzo(a)anthracene	750	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	56-55-3	
Benzo(a)pyrene	769	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	50-32-8	
Benzo(b)fluoranthene	1100	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	205-99-2	
Benzo(g,h,i)perylene	399	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	191-24-2	
Benzo(k)fluoranthene	354	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	207-08-9	
Chrysene	757	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	218-01-9	
Dibenz(a,h)anthracene	130	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	53-70-3	
Fluoranthene	1770	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	206-44-0	
Fluorene	192	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	86-73-7	
Indeno(1,2,3-cd)pyrene	411	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	193-39-5	
Naphthalene	96.9	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	91-20-3	
Phenanthrene	1350	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	85-01-8	
Pyrene	1450	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	88	%	42-125	5	04/12/18 11:52	04/16/18 21:30	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-01 (10-12 WM) **Lab ID: 10427018001** Collected: 04/11/18 10:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	100	%	57-125	5	04/12/18 11:52	04/16/18 21:30	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1690	1	04/20/18 10:36	04/21/18 06:07	67-64-1	
Allyl chloride	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	107-05-1	
Benzene	ND	ug/kg	33.8	1	04/20/18 10:36	04/21/18 06:07	71-43-2	
Bromobenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	108-86-1	
Bromochloromethane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	74-97-5	
Bromodichloromethane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	75-27-4	
Bromoform	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	75-25-2	
Bromomethane	ND	ug/kg	845	1	04/20/18 10:36	04/21/18 06:07	74-83-9	
2-Butanone (MEK)	ND	ug/kg	422	1	04/20/18 10:36	04/21/18 06:07	78-93-3	
n-Butylbenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	104-51-8	
sec-Butylbenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	135-98-8	
tert-Butylbenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	98-06-6	
Carbon tetrachloride	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	56-23-5	
Chlorobenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	108-90-7	
Chloroethane	ND	ug/kg	845	1	04/20/18 10:36	04/21/18 06:07	75-00-3	
Chloroform	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	67-66-3	
Chloromethane	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	74-87-3	
2-Chlorotoluene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	95-49-8	
4-Chlorotoluene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	845	1	04/20/18 10:36	04/21/18 06:07	96-12-8	
Dibromochloromethane	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	106-93-4	
Dibromomethane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	75-71-8	
1,1-Dichloroethane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	75-34-3	
1,2-Dichloroethane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	107-06-2	
1,1-Dichloroethene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	156-60-5	
Dichlorofluoromethane	ND	ug/kg	845	1	04/20/18 10:36	04/21/18 06:07	75-43-4	
1,2-Dichloropropane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	78-87-5	
1,3-Dichloropropane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	142-28-9	
2,2-Dichloropropane	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	594-20-7	
1,1-Dichloropropene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	60-29-7	
Ethylbenzene	147	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	422	1	04/20/18 10:36	04/21/18 06:07	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-01 (10-12 WM) **Lab ID: 10427018001** Collected: 04/11/18 10:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	98-82-8	
p-Isopropyltoluene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	99-87-6	
Methylene Chloride	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	422	1	04/20/18 10:36	04/21/18 06:07	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	1634-04-4	
Naphthalene	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	91-20-3	
n-Propylbenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	103-65-1	
Styrene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	79-34-5	
Tetrachloroethene	98.0	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	127-18-4	
Tetrahydrofuran	ND	ug/kg	3380	1	04/20/18 10:36	04/21/18 06:07	109-99-9	
Toluene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	79-00-5	
Trichloroethene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	79-01-6	
Trichlorofluoromethane	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	76-13-1	
1,2,4-Trimethylbenzene	415	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	108-67-8	
Vinyl chloride	ND	ug/kg	33.8	1	04/20/18 10:36	04/21/18 06:07	75-01-4	
Xylene (Total)	ND	ug/kg	253	1	04/20/18 10:36	04/21/18 06:07	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%	75-125	1	04/20/18 10:36	04/21/18 06:07	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	04/20/18 10:36	04/21/18 06:07	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125	1	04/20/18 10:36	04/21/18 06:07	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	61.4	20	04/18/18 10:45	04/19/18 13:48	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	33.3	mg/kg	1.0	1		04/26/18 09:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.48	1	04/20/18 10:25	04/20/18 13:36	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	1.7	mg/kg	0.98	1	04/17/18 12:00	04/17/18 21:25	16984-48-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-02 (7-9 WM) **Lab ID:** 10427018002 Collected: 04/11/18 12:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	15.2	1	04/25/18 10:56	04/27/18 14:47	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	309-00-2	
alpha-BHC	ND	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	319-84-6	
beta-BHC	ND	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	319-85-7	
delta-BHC	ND	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	58-89-9	
Chlordane (Technical)	ND	ug/kg	56.3	2	04/16/18 09:32	04/16/18 23:42	57-74-9	
alpha-Chlordane	ND	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	5103-71-9	
gamma-Chlordane	5.6	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	5103-74-2	
4,4'-DDD	28.3	ug/kg	11.2	2	04/16/18 09:32	04/16/18 23:42	72-54-8	
4,4'-DDE	17.0	ug/kg	11.2	2	04/16/18 09:32	04/16/18 23:42	72-55-9	
4,4'-DDT	ND	ug/kg	11.2	2	04/16/18 09:32	04/16/18 23:42	50-29-3	
Dieldrin	24.0	ug/kg	11.2	2	04/16/18 09:32	04/16/18 23:42	60-57-1	
Endosulfan I	ND	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	959-98-8	
Endosulfan II	ND	ug/kg	11.2	2	04/16/18 09:32	04/16/18 23:42	33213-65-9	
Endosulfan sulfate	ND	ug/kg	11.2	2	04/16/18 09:32	04/16/18 23:42	1031-07-8	
Endrin	ND	ug/kg	11.2	2	04/16/18 09:32	04/16/18 23:42	72-20-8	
Endrin aldehyde	ND	ug/kg	11.2	2	04/16/18 09:32	04/16/18 23:42	7421-93-4	
Endrin ketone	ND	ug/kg	11.2	2	04/16/18 09:32	04/16/18 23:42	53494-70-5	
Heptachlor	ND	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	76-44-8	
Heptachlor epoxide	29.8	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	1024-57-3	
Methoxychlor	ND	ug/kg	56.3	2	04/16/18 09:32	04/16/18 23:42	72-43-5	
Toxaphene	ND	ug/kg	169	2	04/16/18 09:32	04/16/18 23:42	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	88	%	30-150	2	04/16/18 09:32	04/16/18 23:42	877-09-8	5M, D4
Decachlorobiphenyl (S)	87	%	30-150	2	04/16/18 09:32	04/16/18 23:42	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	55.5	1	04/13/18 19:35	04/16/18 16:18	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	55.5	1	04/13/18 19:35	04/16/18 16:18	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	55.5	1	04/13/18 19:35	04/16/18 16:18	11141-16-5	
PCB-1242 (Aroclor 1242)	7850	ug/kg	277	5	04/13/18 19:35	04/17/18 09:01	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	55.5	1	04/13/18 19:35	04/16/18 16:18	12672-29-6	
PCB-1254 (Aroclor 1254)	1190	ug/kg	55.5	1	04/13/18 19:35	04/16/18 16:18	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	55.5	1	04/13/18 19:35	04/16/18 16:18	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	55.5	1	04/13/18 19:35	04/16/18 16:18	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	55.5	1	04/13/18 19:35	04/16/18 16:18	11100-14-4	
PCB, Total	9040	ug/kg	277	5	04/13/18 19:35	04/17/18 09:01	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	82	%	48-125	1	04/13/18 19:35	04/16/18 16:18	877-09-8	
Decachlorobiphenyl (S)	79	%	30-134	1	04/13/18 19:35	04/16/18 16:18	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	155	mg/kg	79.0	5	04/12/18 14:19	04/13/18 15:11		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427018

Sample: FD-TT-02 (7-9 WM) Lab ID: 10427018002 Collected: 04/11/18 12:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	86	%	50-150	5	04/12/18 14:19	04/13/18 15:11	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	20.4	1	04/23/18 09:23	04/23/18 23:23		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/23/18 09:23	04/23/18 23:23	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	9140	mg/kg	16.5	1	04/13/18 05:02	04/13/18 15:31	7429-90-5	
Barium	200	mg/kg	0.83	1	04/13/18 05:02	04/13/18 15:31	7440-39-3	
Boron	114	mg/kg	12.4	1	04/13/18 05:02	04/13/18 15:31	7440-42-8	
Copper	166	mg/kg	0.83	1	04/13/18 05:02	04/13/18 15:31	7440-50-8	
Iron	116000	mg/kg	41.3	10	04/13/18 05:02	04/13/18 16:17	7439-89-6	
Manganese	868	mg/kg	2.1	5	04/13/18 05:02	04/13/18 16:00	7439-96-5	
Nickel	57.6	mg/kg	1.7	1	04/13/18 05:02	04/13/18 15:31	7440-02-0	
Silver	0.94	mg/kg	0.83	1	04/13/18 05:02	04/13/18 15:31	7440-22-4	
Tin	190	mg/kg	6.2	1	04/13/18 05:02	04/13/18 15:31	7440-31-5	
Titanium	311	mg/kg	2.1	1	04/13/18 05:02	04/13/18 15:31	7440-32-6	
Zinc	1010	mg/kg	1.7	1	04/13/18 05:02	04/13/18 15:31	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	133	mg/kg	1.6	5	04/18/18 10:36	04/19/18 07:02	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	13.3	mg/kg	0.80	20	04/13/18 05:01	04/13/18 09:27	7440-36-0	
Arsenic	22.8	mg/kg	0.80	20	04/13/18 05:01	04/13/18 09:27	7440-38-2	
Beryllium	0.69	mg/kg	0.32	20	04/13/18 05:01	04/13/18 09:27	7440-41-7	
Cadmium	2.5	mg/kg	0.13	20	04/13/18 05:01	04/13/18 09:27	7440-43-9	
Cobalt	10.1	mg/kg	0.80	20	04/13/18 05:01	04/13/18 09:27	7440-48-4	
Lead	578	mg/kg	0.16	20	04/13/18 05:01	04/13/18 09:27	7439-92-1	
Lithium	4.0	mg/kg	0.80	20	04/13/18 05:01	04/13/18 09:27	7439-93-2	
Selenium	1.2	mg/kg	0.80	20	04/13/18 05:01	04/13/18 09:27	7782-49-2	
Strontium	48.6	mg/kg	0.80	20	04/13/18 05:01	04/13/18 09:27	7440-24-6	
Vanadium	44.9	mg/kg	1.6	20	04/13/18 05:01	04/13/18 09:27	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	1.1	mg/kg	0.032	1	04/13/18 05:02	04/15/18 18:09	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	40.7	%	0.10	1		04/18/18 12:41		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	83-32-9	
Acenaphthylene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-02 (7-9 WM) **Lab ID: 10427018002** Collected: 04/11/18 12:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	120-12-7	
Benzo(a)anthracene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	56-55-3	
Benzo(a)pyrene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	101-55-3	
Butylbenzylphthalate	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	85-68-7	
Carbazole	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	59-50-7	
4-Chloroaniline	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	108-60-1	
2-Chloronaphthalene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	91-58-7	
2-Chlorophenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	7005-72-3	
Chrysene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	53-70-3	
Dibenzofuran	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	120-83-2	
Diethylphthalate	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	105-67-9	
Dimethylphthalate	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	131-11-3	
Di-n-butylphthalate	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2860	1	04/13/18 17:55	04/19/18 19:46	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	606-20-2	
Di-n-octylphthalate	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	122-66-7	
bis(2-Ethylhexyl)phthalate	1020	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	117-81-7	
Fluoranthene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	206-44-0	
Fluorene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	87-68-3	
Hexachlorobenzene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	118-74-1	
Hexachloroethane	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	193-39-5	
Isophorone	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	78-59-1	
1-Methylnaphthalene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	90-12-0	
2-Methylnaphthalene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-02 (7-9 WM) **Lab ID:** 10427018002 Collected: 04/11/18 12:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1110	1	04/13/18 17:55	04/19/18 19:46		
Naphthalene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	91-20-3	
2-Nitroaniline	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	88-74-4	
3-Nitroaniline	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	99-09-2	
4-Nitroaniline	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	100-01-6	
Nitrobenzene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	98-95-3	
2-Nitrophenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	88-75-5	
4-Nitrophenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	86-30-6	
Pentachlorophenol	ND	ug/kg	1130	1	04/13/18 17:55	04/19/18 19:46	87-86-5	
Phenanthrene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	85-01-8	
Phenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	108-95-2	
Pyrene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	58	%.	43-125	1	04/13/18 17:55	04/19/18 19:46	4165-60-0	
2-Fluorobiphenyl (S)	47	%.	30-132	1	04/13/18 17:55	04/19/18 19:46	321-60-8	
p-Terphenyl-d14 (S)	80	%.	62-125	1	04/13/18 17:55	04/19/18 19:46	1718-51-0	
Phenol-d6 (S)	66	%.	48-125	1	04/13/18 17:55	04/19/18 19:46	13127-88-3	
2-Fluorophenol (S)	62	%.	40-125	1	04/13/18 17:55	04/19/18 19:46	367-12-4	
2,4,6-Tribromophenol (S)	58	%.	60-125	1	04/13/18 17:55	04/19/18 19:46	118-79-6	S5
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	83-32-9	
Acenaphthylene	ND	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	208-96-8	
Anthracene	ND	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	120-12-7	
Benzo(a)anthracene	67.3	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	56-55-3	
Benzo(a)pyrene	75.2	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	50-32-8	
Benzo(b)fluoranthene	452	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	205-99-2	
Benzo(g,h,i)perylene	196	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	191-24-2	
Benzo(k)fluoranthene	133	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	207-08-9	
Chrysene	178	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	218-01-9	
Dibenz(a,h)anthracene	81.8	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	53-70-3	
Fluoranthene	38.8	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	206-44-0	
Fluorene	ND	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	86-73-7	
Indeno(1,2,3-cd)pyrene	183	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	193-39-5	
Naphthalene	ND	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	91-20-3	
Phenanthrene	ND	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	85-01-8	
Pyrene	43.2	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	88	%.	42-125	2	04/12/18 11:52	04/17/18 12:15	321-60-8	D3
p-Terphenyl-d14 (S)	98	%.	57-125	2	04/12/18 11:52	04/17/18 12:15	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-02 (7-9 WM) Lab ID: 10427018002 Collected: 04/11/18 12:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1880	1	04/21/18 11:05	04/21/18 21:21	67-64-1	
Allyl chloride	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	107-05-1	
Benzene	ND	ug/kg	37.6	1	04/21/18 11:05	04/21/18 21:21	71-43-2	
Bromobenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	108-86-1	
Bromochloromethane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	74-97-5	
Bromodichloromethane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	75-27-4	
Bromoform	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	75-25-2	
Bromomethane	ND	ug/kg	940	1	04/21/18 11:05	04/21/18 21:21	74-83-9	
2-Butanone (MEK)	ND	ug/kg	470	1	04/21/18 11:05	04/21/18 21:21	78-93-3	
n-Butylbenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	104-51-8	
sec-Butylbenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	135-98-8	
tert-Butylbenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	98-06-6	
Carbon tetrachloride	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	56-23-5	
Chlorobenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	108-90-7	
Chloroethane	ND	ug/kg	940	1	04/21/18 11:05	04/21/18 21:21	75-00-3	
Chloroform	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	67-66-3	
Chloromethane	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	74-87-3	
2-Chlorotoluene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	95-49-8	
4-Chlorotoluene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	940	1	04/21/18 11:05	04/21/18 21:21	96-12-8	
Dibromochloromethane	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	106-93-4	
Dibromomethane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	75-71-8	
1,1-Dichloroethane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	75-34-3	
1,2-Dichloroethane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	107-06-2	
1,1-Dichloroethene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	156-60-5	
Dichlorofluoromethane	ND	ug/kg	940	1	04/21/18 11:05	04/21/18 21:21	75-43-4	
1,2-Dichloropropane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	78-87-5	
1,3-Dichloropropane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	142-28-9	
2,2-Dichloropropane	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	594-20-7	
1,1-Dichloropropene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	60-29-7	
Ethylbenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	470	1	04/21/18 11:05	04/21/18 21:21	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	98-82-8	
p-Isopropyltoluene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	99-87-6	
Methylene Chloride	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	470	1	04/21/18 11:05	04/21/18 21:21	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-02 (7-9 WM) **Lab ID:** 10427018002 Collected: 04/11/18 12:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	1634-04-4	
Naphthalene	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	91-20-3	
n-Propylbenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	103-65-1	
Styrene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	79-34-5	
Tetrachloroethene	122	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	127-18-4	
Tetrahydrofuran	ND	ug/kg	3760	1	04/21/18 11:05	04/21/18 21:21	109-99-9	
Toluene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	79-00-5	
Trichloroethene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	79-01-6	
Trichlorofluoromethane	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	108-67-8	
Vinyl chloride	ND	ug/kg	37.6	1	04/21/18 11:05	04/21/18 21:21	75-01-4	
Xylene (Total)	ND	ug/kg	282	1	04/21/18 11:05	04/21/18 21:21	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1	04/21/18 11:05	04/21/18 21:21	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1	04/21/18 11:05	04/21/18 21:21	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	75-125	1	04/21/18 11:05	04/21/18 21:21	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	67.5	20	04/18/18 10:45	04/19/18 13:48	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	133	mg/kg	1.0	1		04/26/18 09:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	1.2	mg/kg	0.44	1	04/20/18 10:25	04/20/18 13:37	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	1.8	mg/kg	0.98	1	04/17/18 12:00	04/18/18 02:38	16984-48-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-A1 (3-6 S) **Lab ID: 10427018003** Collected: 04/11/18 13:00 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	13.6	1	04/25/18 10:56	04/27/18 14:54	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	309-00-2	
alpha-BHC	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	319-84-6	
beta-BHC	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	319-85-7	
delta-BHC	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	58-89-9	
Chlordane (Technical)	ND	ug/kg	24.2	1	04/16/18 09:32	04/17/18 00:19	57-74-9	
alpha-Chlordane	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	5103-71-9	
gamma-Chlordane	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	5103-74-2	
4,4'-DDD	ND	ug/kg	4.8	1	04/16/18 09:32	04/17/18 00:19	72-54-8	
4,4'-DDE	ND	ug/kg	4.8	1	04/16/18 09:32	04/17/18 00:19	72-55-9	
4,4'-DDT	ND	ug/kg	4.8	1	04/16/18 09:32	04/17/18 00:19	50-29-3	
Dieldrin	ND	ug/kg	4.8	1	04/16/18 09:32	04/17/18 00:19	60-57-1	
Endosulfan I	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	959-98-8	
Endosulfan II	ND	ug/kg	4.8	1	04/16/18 09:32	04/17/18 00:19	33213-65-9	
Endosulfan sulfate	ND	ug/kg	4.8	1	04/16/18 09:32	04/17/18 00:19	1031-07-8	
Endrin	ND	ug/kg	4.8	1	04/16/18 09:32	04/17/18 00:19	72-20-8	
Endrin aldehyde	ND	ug/kg	4.8	1	04/16/18 09:32	04/17/18 00:19	7421-93-4	
Endrin ketone	ND	ug/kg	4.8	1	04/16/18 09:32	04/17/18 00:19	53494-70-5	
Heptachlor	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	76-44-8	
Heptachlor epoxide	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	1024-57-3	
Methoxychlor	ND	ug/kg	24.2	1	04/16/18 09:32	04/17/18 00:19	72-43-5	
Toxaphene	ND	ug/kg	72.6	1	04/16/18 09:32	04/17/18 00:19	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	82	%	30-150	1	04/16/18 09:32	04/17/18 00:19	877-09-8	
Decachlorobiphenyl (S)	80	%	30-150	1	04/16/18 09:32	04/17/18 00:19	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	11100-14-4	
PCB, Total	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	82	%	48-125	1	04/13/18 19:35	04/16/18 16:33	877-09-8	
Decachlorobiphenyl (S)	89	%	30-134	1	04/13/18 19:35	04/16/18 16:33	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	ND	mg/kg	12.3	1	04/12/18 14:19	04/13/18 13:32		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427018

Sample: FD-SB-A1 (3-6 S) **Lab ID: 10427018003** Collected: 04/11/18 13:00 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	74	%	50-150	1	04/12/18 14:19	04/13/18 13:32	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	15.1	1	04/23/18 09:23	04/23/18 15:18		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/23/18 09:23	04/23/18 15:18	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	8780	mg/kg	14.4	1	04/13/18 05:02	04/13/18 15:34	7429-90-5	
Barium	100	mg/kg	0.72	1	04/13/18 05:02	04/13/18 15:34	7440-39-3	
Boron	265	mg/kg	10.8	1	04/13/18 05:02	04/13/18 15:34	7440-42-8	
Copper	18.0	mg/kg	0.72	1	04/13/18 05:02	04/13/18 15:34	7440-50-8	
Iron	23000	mg/kg	18.0	5	04/13/18 05:02	04/13/18 16:03	7439-89-6	
Manganese	159	mg/kg	0.36	1	04/13/18 05:02	04/13/18 15:34	7439-96-5	
Nickel	41.6	mg/kg	1.4	1	04/13/18 05:02	04/13/18 15:34	7440-02-0	
Silver	ND	mg/kg	0.72	1	04/13/18 05:02	04/13/18 15:34	7440-22-4	
Tin	ND	mg/kg	5.4	1	04/13/18 05:02	04/13/18 15:34	7440-31-5	
Titanium	472	mg/kg	1.8	1	04/13/18 05:02	04/13/18 15:34	7440-32-6	
Zinc	127	mg/kg	1.4	1	04/13/18 05:02	04/13/18 15:34	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	43.5	mg/kg	1.4	5	04/18/18 10:36	04/19/18 07:07	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.1	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:30	7440-36-0	
Arsenic	21.7	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:30	7440-38-2	
Beryllium	3.1	mg/kg	0.29	20	04/13/18 05:01	04/13/18 09:30	7440-41-7	
Cadmium	1.9	mg/kg	0.12	20	04/13/18 05:01	04/13/18 09:30	7440-43-9	
Cobalt	6.9	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:30	7440-48-4	
Lead	31.3	mg/kg	0.14	20	04/13/18 05:01	04/13/18 09:30	7439-92-1	
Lithium	10.2	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:30	7439-93-2	
Selenium	2.2	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:30	7782-49-2	
Strontium	57.0	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:30	7440-24-6	
Vanadium	224	mg/kg	1.4	20	04/13/18 05:01	04/13/18 09:30	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	ND	mg/kg	0.028	1	04/13/18 05:02	04/15/18 18:11	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	31.3	%	0.10	1		04/18/18 12:41		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	83-32-9	
Acenaphthylene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	208-96-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: **FD-SB-A1 (3-6 S)** Lab ID: **10427018003** Collected: 04/11/18 13:00 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	120-12-7	
Benzo(a)anthracene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	56-55-3	
Benzo(a)pyrene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	101-55-3	
Butylbenzylphthalate	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	85-68-7	
Carbazole	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	59-50-7	
4-Chloroaniline	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	108-60-1	
2-Chloronaphthalene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	91-58-7	
2-Chlorophenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	7005-72-3	
Chrysene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	53-70-3	
Dibenzofuran	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	120-83-2	
Diethylphthalate	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	105-67-9	
Dimethylphthalate	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	131-11-3	
Di-n-butylphthalate	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2470	1	04/20/18 12:55	04/24/18 15:00	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	606-20-2	
Di-n-octylphthalate	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	117-81-7	
Fluoranthene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	206-44-0	
Fluorene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	87-68-3	
Hexachlorobenzene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	118-74-1	
Hexachloroethane	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	193-39-5	
Isophorone	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	78-59-1	
1-Methylnaphthalene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	90-12-0	
2-Methylnaphthalene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-A1 (3-6 S) **Lab ID: 10427018003** Collected: 04/11/18 13:00 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

3&4-Methylphenol(m&p Cresol)	ND	ug/kg	959	1	04/20/18 12:55	04/24/18 15:00		
Naphthalene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	91-20-3	
2-Nitroaniline	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	88-74-4	
3-Nitroaniline	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	99-09-2	
4-Nitroaniline	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	100-01-6	
Nitrobenzene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	98-95-3	
2-Nitrophenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	88-75-5	
4-Nitrophenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	86-30-6	
Pentachlorophenol	ND	ug/kg	974	1	04/20/18 12:55	04/24/18 15:00	87-86-5	
Phenanthrene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	85-01-8	
Phenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	108-95-2	
Pyrene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	55	%.	43-125	1	04/20/18 12:55	04/24/18 15:00	4165-60-0	
2-Fluorobiphenyl (S)	54	%.	30-132	1	04/20/18 12:55	04/24/18 15:00	321-60-8	
p-Terphenyl-d14 (S)	86	%.	62-125	1	04/20/18 12:55	04/24/18 15:00	1718-51-0	
Phenol-d6 (S)	57	%.	48-125	1	04/20/18 12:55	04/24/18 15:00	13127-88-3	
2-Fluorophenol (S)	56	%.	40-125	1	04/20/18 12:55	04/24/18 15:00	367-12-4	
2,4,6-Tribromophenol (S)	68	%.	60-125	1	04/20/18 12:55	04/24/18 15:00	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	83-32-9	
Acenaphthylene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	208-96-8	
Anthracene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	120-12-7	
Benzo(a)anthracene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	56-55-3	
Benzo(a)pyrene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	50-32-8	
Benzo(b)fluoranthene	15.9	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	207-08-9	
Chrysene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	53-70-3	
Fluoranthene	39.4	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	206-44-0	
Fluorene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	193-39-5	
Naphthalene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	91-20-3	
Phenanthrene	22.0	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	85-01-8	
Pyrene	29.6	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	58	%.	42-125	1	04/12/18 11:52	04/16/18 19:07	321-60-8	
p-Terphenyl-d14 (S)	90	%.	57-125	1	04/12/18 11:52	04/16/18 19:07	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-A1 (3-6 S) **Lab ID: 10427018003** Collected: 04/11/18 13:00 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1450	1	04/21/18 11:05	04/21/18 21:37	67-64-1	
Allyl chloride	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	107-05-1	
Benzene	ND	ug/kg	29.0	1	04/21/18 11:05	04/21/18 21:37	71-43-2	
Bromobenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	108-86-1	
Bromochloromethane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	74-97-5	
Bromodichloromethane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	75-27-4	
Bromoform	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	75-25-2	
Bromomethane	ND	ug/kg	725	1	04/21/18 11:05	04/21/18 21:37	74-83-9	
2-Butanone (MEK)	ND	ug/kg	362	1	04/21/18 11:05	04/21/18 21:37	78-93-3	
n-Butylbenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	104-51-8	
sec-Butylbenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	135-98-8	
tert-Butylbenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	98-06-6	
Carbon tetrachloride	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	56-23-5	
Chlorobenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	108-90-7	
Chloroethane	ND	ug/kg	725	1	04/21/18 11:05	04/21/18 21:37	75-00-3	
Chloroform	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	67-66-3	
Chloromethane	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	74-87-3	
2-Chlorotoluene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	95-49-8	
4-Chlorotoluene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	725	1	04/21/18 11:05	04/21/18 21:37	96-12-8	
Dibromochloromethane	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	106-93-4	
Dibromomethane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	75-71-8	
1,1-Dichloroethane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	75-34-3	
1,2-Dichloroethane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	107-06-2	
1,1-Dichloroethene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	156-60-5	
Dichlorofluoromethane	ND	ug/kg	725	1	04/21/18 11:05	04/21/18 21:37	75-43-4	
1,2-Dichloropropane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	78-87-5	
1,3-Dichloropropane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	142-28-9	
2,2-Dichloropropane	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	594-20-7	
1,1-Dichloropropene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	60-29-7	
Ethylbenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	362	1	04/21/18 11:05	04/21/18 21:37	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	98-82-8	
p-Isopropyltoluene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	99-87-6	
Methylene Chloride	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	362	1	04/21/18 11:05	04/21/18 21:37	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-A1 (3-6 S) **Lab ID: 10427018003** Collected: 04/11/18 13:00 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	1634-04-4	
Naphthalene	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	91-20-3	
n-Propylbenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	103-65-1	
Styrene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	79-34-5	
Tetrachloroethene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	127-18-4	
Tetrahydrofuran	ND	ug/kg	2900	1	04/21/18 11:05	04/21/18 21:37	109-99-9	
Toluene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	79-00-5	
Trichloroethene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	79-01-6	
Trichlorofluoromethane	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	108-67-8	
Vinyl chloride	ND	ug/kg	29.0	1	04/21/18 11:05	04/21/18 21:37	75-01-4	
Xylene (Total)	ND	ug/kg	217	1	04/21/18 11:05	04/21/18 21:37	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	95	%	75-125	1	04/21/18 11:05	04/21/18 21:37	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	04/21/18 11:05	04/21/18 21:37	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125	1	04/21/18 11:05	04/21/18 21:37	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	14.4	5	04/18/18 10:45	04/19/18 13:49	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	43.5	mg/kg	1.0	1		04/26/18 09:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.49	1	04/20/18 10:25	04/20/18 13:37	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	4.6	mg/kg	1.0	1	04/18/18 14:45	04/20/18 03:00	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-B1 (11-13 WM) Lab ID: 10427018004 Collected: 04/11/18 13:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.8	1	04/25/18 10:56	04/27/18 15:00	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	309-00-2	
alpha-BHC	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	319-84-6	
beta-BHC	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	319-85-7	
delta-BHC	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	58-89-9	
Chlordane (Technical)	ND	ug/kg	97.6	5	04/16/18 09:32	04/16/18 23:24	57-74-9	
alpha-Chlordane	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	5103-71-9	
gamma-Chlordane	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	5103-74-2	
4,4'-DDD	ND	ug/kg	19.5	5	04/16/18 09:32	04/16/18 23:24	72-54-8	
4,4'-DDE	ND	ug/kg	19.5	5	04/16/18 09:32	04/16/18 23:24	72-55-9	
4,4'-DDT	ND	ug/kg	19.5	5	04/16/18 09:32	04/16/18 23:24	50-29-3	
Dieldrin	ND	ug/kg	19.5	5	04/16/18 09:32	04/16/18 23:24	60-57-1	
Endosulfan I	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	959-98-8	
Endosulfan II	ND	ug/kg	19.5	5	04/16/18 09:32	04/16/18 23:24	33213-65-9	
Endosulfan sulfate	ND	ug/kg	19.5	5	04/16/18 09:32	04/16/18 23:24	1031-07-8	
Endrin	ND	ug/kg	19.5	5	04/16/18 09:32	04/16/18 23:24	72-20-8	
Endrin aldehyde	ND	ug/kg	19.5	5	04/16/18 09:32	04/16/18 23:24	7421-93-4	
Endrin ketone	ND	ug/kg	19.5	5	04/16/18 09:32	04/16/18 23:24	53494-70-5	
Heptachlor	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	76-44-8	
Heptachlor epoxide	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	1024-57-3	
Methoxychlor	ND	ug/kg	97.6	5	04/16/18 09:32	04/16/18 23:24	72-43-5	
Toxaphene	ND	ug/kg	292	5	04/16/18 09:32	04/16/18 23:24	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	91	%	30-150	5	04/16/18 09:32	04/16/18 23:24	877-09-8	3M, D3
Decachlorobiphenyl (S)	100	%	30-150	5	04/16/18 09:32	04/16/18 23:24	2051-24-3	
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	11100-14-4	
PCB, Total	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	78	%	48-125	1	04/13/18 19:35	04/16/18 16:49	877-09-8	
Decachlorobiphenyl (S)	80	%	30-134	1	04/13/18 19:35	04/16/18 16:49	2051-24-3	
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	186	mg/kg	100	10	04/12/18 14:19	04/13/18 15:04		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Project No.: 10427018

Sample: FD-SB-B1 (11-13 WM) Lab ID: 10427018004 Collected: 04/11/18 13:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	0	%	50-150	10	04/12/18 14:19	04/13/18 15:04	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	17.7	mg/kg	15.7	1	04/23/18 09:23	04/23/18 23:47		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	04/23/18 09:23	04/23/18 23:47	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	4620	mg/kg	11.3	1	04/13/18 05:02	04/13/18 15:36	7429-90-5	
Barium	72.7	mg/kg	0.56	1	04/13/18 05:02	04/13/18 15:36	7440-39-3	
Boron	12.6	mg/kg	8.5	1	04/13/18 05:02	04/13/18 15:36	7440-42-8	
Copper	12.5	mg/kg	0.56	1	04/13/18 05:02	04/13/18 15:36	7440-50-8	
Iron	9730	mg/kg	2.8	1	04/13/18 05:02	04/13/18 15:36	7439-89-6	
Manganese	238	mg/kg	0.28	1	04/13/18 05:02	04/13/18 15:36	7439-96-5	
Nickel	10.5	mg/kg	1.1	1	04/13/18 05:02	04/13/18 15:36	7440-02-0	
Silver	ND	mg/kg	0.56	1	04/13/18 05:02	04/13/18 15:36	7440-22-4	
Tin	ND	mg/kg	4.2	1	04/13/18 05:02	04/13/18 15:36	7440-31-5	
Titanium	185	mg/kg	1.4	1	04/13/18 05:02	04/13/18 15:36	7440-32-6	
Zinc	89.9	mg/kg	1.1	1	04/13/18 05:02	04/13/18 15:36	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	14.2	mg/kg	1.1	5	04/18/18 10:36	04/19/18 07:21	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.58	20	04/13/18 05:01	04/13/18 09:32	7440-36-0	
Arsenic	5.2	mg/kg	0.58	20	04/13/18 05:01	04/13/18 09:32	7440-38-2	
Beryllium	0.51	mg/kg	0.23	20	04/13/18 05:01	04/13/18 09:32	7440-41-7	
Cadmium	0.52	mg/kg	0.092	20	04/13/18 05:01	04/13/18 09:32	7440-43-9	
Cobalt	4.2	mg/kg	0.58	20	04/13/18 05:01	04/13/18 09:32	7440-48-4	
Lead	54.2	mg/kg	0.12	20	04/13/18 05:01	04/13/18 09:32	7439-92-1	
Lithium	5.0	mg/kg	0.58	20	04/13/18 05:01	04/13/18 09:32	7439-93-2	
Selenium	0.59	mg/kg	0.58	20	04/13/18 05:01	04/13/18 09:32	7782-49-2	
Strontium	38.6	mg/kg	0.58	20	04/13/18 05:01	04/13/18 09:32	7440-24-6	
Vanadium	29.8	mg/kg	1.2	20	04/13/18 05:01	04/13/18 09:32	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.037	mg/kg	0.022	1	04/13/18 05:02	04/15/18 18:13	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	14.8	%	0.10	1		04/18/18 12:41		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	83-32-9	
Acenaphthylene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-B1 (11-13 WM) **Lab ID: 10427018004** Collected: 04/11/18 13:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Anthracene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	120-12-7	
Benzo(a)anthracene	708	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	56-55-3	
Benzo(a)pyrene	578	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	50-32-8	
Benzo(b)fluoranthene	772	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	101-55-3	
Butylbenzylphthalate	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	85-68-7	
Carbazole	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	59-50-7	
4-Chloroaniline	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	108-60-1	
2-Chloronaphthalene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	91-58-7	
2-Chlorophenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	7005-72-3	
Chrysene	669	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	53-70-3	
Dibenzofuran	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	120-83-2	
Diethylphthalate	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	105-67-9	
Dimethylphthalate	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	131-11-3	
Di-n-butylphthalate	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	1990	1	04/13/18 17:55	04/19/18 20:39	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	606-20-2	
Di-n-octylphthalate	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	117-81-7	
Fluoranthene	1300	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	206-44-0	
Fluorene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	87-68-3	
Hexachlorobenzene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	118-74-1	
Hexachloroethane	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	193-39-5	
Isophorone	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	78-59-1	
1-Methylnaphthalene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	90-12-0	
2-Methylnaphthalene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-B1 (11-13 WM) **Lab ID: 10427018004** Collected: 04/11/18 13:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	773	1	04/13/18 17:55	04/19/18 20:39		
Naphthalene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	91-20-3	
2-Nitroaniline	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	88-74-4	
3-Nitroaniline	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	99-09-2	
4-Nitroaniline	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	100-01-6	
Nitrobenzene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	98-95-3	
2-Nitrophenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	88-75-5	
4-Nitrophenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	86-30-6	
Pentachlorophenol	ND	ug/kg	785	1	04/13/18 17:55	04/19/18 20:39	87-86-5	
Phenanthrene	887	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	85-01-8	
Phenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	108-95-2	
Pyrene	1180	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	63	%.	43-125	1	04/13/18 17:55	04/19/18 20:39	4165-60-0	
2-Fluorobiphenyl (S)	70	%.	30-132	1	04/13/18 17:55	04/19/18 20:39	321-60-8	
p-Terphenyl-d14 (S)	88	%.	62-125	1	04/13/18 17:55	04/19/18 20:39	1718-51-0	
Phenol-d6 (S)	68	%.	48-125	1	04/13/18 17:55	04/19/18 20:39	13127-88-3	
2-Fluorophenol (S)	65	%.	40-125	1	04/13/18 17:55	04/19/18 20:39	367-12-4	
2,4,6-Tribromophenol (S)	81	%.	60-125	1	04/13/18 17:55	04/19/18 20:39	118-79-6	
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Acenaphthene	89.1	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	83-32-9	
Acenaphthylene	70.0	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	208-96-8	
Anthracene	348	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	120-12-7	
Benzo(a)anthracene	662	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	56-55-3	
Benzo(a)pyrene	515	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	50-32-8	
Benzo(b)fluoranthene	670	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	205-99-2	
Benzo(g,h,i)perylene	274	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	191-24-2	
Benzo(k)fluoranthene	285	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	207-08-9	
Chrysene	593	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	218-01-9	
Dibenz(a,h)anthracene	110	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	53-70-3	
Fluoranthene	1310	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	206-44-0	
Fluorene	130	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	86-73-7	
Indeno(1,2,3-cd)pyrene	278	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	193-39-5	
Naphthalene	ND	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	91-20-3	
Phenanthrene	1000	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	85-01-8	
Pyrene	1060	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	78	%.	42-125	5	04/12/18 11:52	04/17/18 13:57	321-60-8	D3
p-Terphenyl-d14 (S)	85	%.	57-125	5	04/12/18 11:52	04/17/18 13:57	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-B1 (11-13 WM) Lab ID: 10427018004 Collected: 04/11/18 13:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1400	1	04/21/18 11:05	04/21/18 21:54	67-64-1	
Allyl chloride	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	107-05-1	
Benzene	ND	ug/kg	28.0	1	04/21/18 11:05	04/21/18 21:54	71-43-2	
Bromobenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	108-86-1	
Bromochloromethane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	74-97-5	
Bromodichloromethane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	75-27-4	
Bromoform	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	75-25-2	
Bromomethane	ND	ug/kg	699	1	04/21/18 11:05	04/21/18 21:54	74-83-9	
2-Butanone (MEK)	ND	ug/kg	350	1	04/21/18 11:05	04/21/18 21:54	78-93-3	
n-Butylbenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	104-51-8	
sec-Butylbenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	135-98-8	
tert-Butylbenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	98-06-6	
Carbon tetrachloride	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	56-23-5	
Chlorobenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	108-90-7	
Chloroethane	ND	ug/kg	699	1	04/21/18 11:05	04/21/18 21:54	75-00-3	
Chloroform	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	67-66-3	
Chloromethane	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	74-87-3	
2-Chlorotoluene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	95-49-8	
4-Chlorotoluene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	699	1	04/21/18 11:05	04/21/18 21:54	96-12-8	
Dibromochloromethane	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	106-93-4	
Dibromomethane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	75-71-8	
1,1-Dichloroethane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	75-34-3	
1,2-Dichloroethane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	107-06-2	
1,1-Dichloroethene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	156-60-5	
Dichlorofluoromethane	ND	ug/kg	699	1	04/21/18 11:05	04/21/18 21:54	75-43-4	
1,2-Dichloropropane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	78-87-5	
1,3-Dichloropropane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	142-28-9	
2,2-Dichloropropane	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	594-20-7	
1,1-Dichloropropene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	60-29-7	
Ethylbenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	350	1	04/21/18 11:05	04/21/18 21:54	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	98-82-8	
p-Isopropyltoluene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	99-87-6	
Methylene Chloride	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	350	1	04/21/18 11:05	04/21/18 21:54	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-B1 (11-13 WM) Lab ID: 10427018004 Collected: 04/11/18 13:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	1634-04-4	
Naphthalene	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	91-20-3	
n-Propylbenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	103-65-1	
Styrene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	79-34-5	
Tetrachloroethene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	127-18-4	
Tetrahydrofuran	ND	ug/kg	2800	1	04/21/18 11:05	04/21/18 21:54	109-99-9	
Toluene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	79-00-5	
Trichloroethene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	79-01-6	
Trichlorofluoromethane	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	108-67-8	
Vinyl chloride	ND	ug/kg	28.0	1	04/21/18 11:05	04/21/18 21:54	75-01-4	
Xylene (Total)	ND	ug/kg	210	1	04/21/18 11:05	04/21/18 21:54	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1	04/21/18 11:05	04/21/18 21:54	17060-07-0	
Toluene-d8 (S)	99	%.	75-125	1	04/21/18 11:05	04/21/18 21:54	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	75-125	1	04/21/18 11:05	04/21/18 21:54	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	235	100	04/18/18 10:45	04/19/18 14:08	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	14.2	mg/kg	1.0	1		04/26/18 09:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.30	1	04/20/18 10:25	04/20/18 13:40	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	2.1	mg/kg	0.99	1	04/18/18 14:45	04/20/18 01:41	16984-48-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-C1 (5-8 WM) **Lab ID: 10427018005** Collected: 04/11/18 14:30 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.3	1	04/25/18 10:56	04/27/18 15:34	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	309-00-2	
alpha-BHC	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	319-84-6	
beta-BHC	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	319-85-7	
delta-BHC	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	58-89-9	
Chlordane (Technical)	ND	ug/kg	425	20	04/16/18 09:32	04/17/18 02:09	57-74-9	
alpha-Chlordane	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	5103-71-9	
gamma-Chlordane	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	5103-74-2	
4,4'-DDD	ND	ug/kg	84.8	20	04/16/18 09:32	04/17/18 02:09	72-54-8	
4,4'-DDE	ND	ug/kg	84.8	20	04/16/18 09:32	04/17/18 02:09	72-55-9	
4,4'-DDT	ND	ug/kg	84.8	20	04/16/18 09:32	04/17/18 02:09	50-29-3	
Dieldrin	ND	ug/kg	84.8	20	04/16/18 09:32	04/17/18 02:09	60-57-1	
Endosulfan I	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	959-98-8	
Endosulfan II	ND	ug/kg	84.8	20	04/16/18 09:32	04/17/18 02:09	33213-65-9	
Endosulfan sulfate	ND	ug/kg	84.8	20	04/16/18 09:32	04/17/18 02:09	1031-07-8	
Endrin	ND	ug/kg	84.8	20	04/16/18 09:32	04/17/18 02:09	72-20-8	
Endrin aldehyde	ND	ug/kg	84.8	20	04/16/18 09:32	04/17/18 02:09	7421-93-4	
Endrin ketone	ND	ug/kg	84.8	20	04/16/18 09:32	04/17/18 02:09	53494-70-5	
Heptachlor	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	76-44-8	
Heptachlor epoxide	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	1024-57-3	
Methoxychlor	ND	ug/kg	425	20	04/16/18 09:32	04/17/18 02:09	72-43-5	
Toxaphene	ND	ug/kg	1270	20	04/16/18 09:32	04/17/18 02:09	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	04/16/18 09:32	04/17/18 02:09	877-09-8	2M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	20	04/16/18 09:32	04/17/18 02:09	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	11141-16-5	
PCB-1242 (Aroclor 1242)	1240	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	12672-29-6	
PCB-1254 (Aroclor 1254)	170	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	11100-14-4	
PCB, Total	1410	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	82	%	48-125	1	04/13/18 19:35	04/16/18 17:36	877-09-8	
Decachlorobiphenyl (S)	80	%	30-134	1	04/13/18 19:35	04/16/18 17:36	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-C1 (5-8 WM) Lab ID: 10427018005 Collected: 04/11/18 14:30 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	200	mg/kg	106	10	04/12/18 14:19	04/13/18 14:57		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	10	04/12/18 14:19	04/13/18 14:57	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	13.1	1	04/23/18 09:23	04/24/18 00:11		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	04/23/18 09:23	04/24/18 00:11	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	6440	mg/kg	12.5	1	04/13/18 05:02	04/13/18 15:39	7429-90-5	
Barium	114	mg/kg	0.62	1	04/13/18 05:02	04/13/18 15:39	7440-39-3	
Boron	17.0	mg/kg	9.4	1	04/13/18 05:02	04/13/18 15:39	7440-42-8	
Copper	61.2	mg/kg	0.62	1	04/13/18 05:02	04/13/18 15:39	7440-50-8	
Iron	16800	mg/kg	15.6	5	04/13/18 05:02	04/13/18 16:06	7439-89-6	
Manganese	264	mg/kg	0.31	1	04/13/18 05:02	04/13/18 15:39	7439-96-5	
Nickel	16.8	mg/kg	1.2	1	04/13/18 05:02	04/13/18 15:39	7440-02-0	
Silver	ND	mg/kg	0.62	1	04/13/18 05:02	04/13/18 15:39	7440-22-4	
Tin	7.2	mg/kg	4.7	1	04/13/18 05:02	04/13/18 15:39	7440-31-5	
Titanium	317	mg/kg	1.6	1	04/13/18 05:02	04/13/18 15:39	7440-32-6	
Zinc	223	mg/kg	1.2	1	04/13/18 05:02	04/13/18 15:39	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	20.6	mg/kg	1.2	5	04/18/18 10:36	04/19/18 07:53	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.1	mg/kg	0.63	20	04/13/18 05:01	04/13/18 09:35	7440-36-0	
Arsenic	6.0	mg/kg	0.63	20	04/13/18 05:01	04/13/18 09:35	7440-38-2	
Beryllium	0.48	mg/kg	0.25	20	04/13/18 05:01	04/13/18 09:35	7440-41-7	
Cadmium	1.4	mg/kg	0.10	20	04/13/18 05:01	04/13/18 09:35	7440-43-9	
Cobalt	8.6	mg/kg	0.63	20	04/13/18 05:01	04/13/18 09:35	7440-48-4	
Lead	78.9	mg/kg	0.13	20	04/13/18 05:01	04/13/18 09:35	7439-92-1	
Lithium	5.4	mg/kg	0.63	20	04/13/18 05:01	04/13/18 09:35	7439-93-2	
Selenium	ND	mg/kg	0.63	20	04/13/18 05:01	04/13/18 09:35	7782-49-2	
Strontium	38.1	mg/kg	0.63	20	04/13/18 05:01	04/13/18 09:35	7440-24-6	
Vanadium	28.8	mg/kg	1.3	20	04/13/18 05:01	04/13/18 09:35	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	1.1	mg/kg	0.025	1	04/13/18 05:02	04/15/18 18:20	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	21.5	%	0.10	1		04/18/18 12:41		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	83-32-9	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: **FD-SB-C1 (5-8 WM)** Lab ID: **10427018005** Collected: 04/11/18 14:30 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	208-96-8	
Anthracene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	120-12-7	
Benzo(a)anthracene	529	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	56-55-3	
Benzo(a)pyrene	463	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	50-32-8	
Benzo(b)fluoranthene	617	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	101-55-3	
Butylbenzylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	85-68-7	
Carbazole	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	59-50-7	
4-Chloroaniline	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	108-60-1	
2-Chloronaphthalene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	91-58-7	
2-Chlorophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	7005-72-3	
Chrysene	535	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	53-70-3	
Dibenzofuran	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	120-83-2	
Diethylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	105-67-9	
Dimethylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	131-11-3	
Di-n-butylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2160	1	04/13/18 17:55	04/19/18 21:07	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	606-20-2	
Di-n-octylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	117-81-7	
Fluoranthene	1050	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	206-44-0	
Fluorene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	87-68-3	
Hexachlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	118-74-1	
Hexachloroethane	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	193-39-5	
Isophorone	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	78-59-1	
1-Methylnaphthalene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	90-12-0	
2-Methylnaphthalene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-C1 (5-8 WM) **Lab ID: 10427018005** Collected: 04/11/18 14:30 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

2-Methylphenol(o-Cresol)	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	840	1	04/13/18 17:55	04/19/18 21:07		
Naphthalene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	91-20-3	
2-Nitroaniline	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	88-74-4	
3-Nitroaniline	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	99-09-2	
4-Nitroaniline	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	100-01-6	
Nitrobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	98-95-3	
2-Nitrophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	88-75-5	
4-Nitrophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	86-30-6	
Pentachlorophenol	ND	ug/kg	853	1	04/13/18 17:55	04/19/18 21:07	87-86-5	
Phenanthrene	777	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	85-01-8	
Phenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	108-95-2	
Pyrene	1120	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	61	%	43-125	1	04/13/18 17:55	04/19/18 21:07	4165-60-0	
2-Fluorobiphenyl (S)	61	%	30-132	1	04/13/18 17:55	04/19/18 21:07	321-60-8	
p-Terphenyl-d14 (S)	78	%	62-125	1	04/13/18 17:55	04/19/18 21:07	1718-51-0	
Phenol-d6 (S)	62	%	48-125	1	04/13/18 17:55	04/19/18 21:07	13127-88-3	
2-Fluorophenol (S)	62	%	40-125	1	04/13/18 17:55	04/19/18 21:07	367-12-4	
2,4,6-Tribromophenol (S)	74	%	60-125	1	04/13/18 17:55	04/19/18 21:07	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	128	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	83-32-9	
Acenaphthylene	ND	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	208-96-8	
Anthracene	267	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	120-12-7	
Benzo(a)anthracene	601	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	56-55-3	
Benzo(a)pyrene	535	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	50-32-8	
Benzo(b)fluoranthene	699	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	205-99-2	
Benzo(g,h,i)perylene	287	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	191-24-2	
Benzo(k)fluoranthene	244	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	207-08-9	
Chrysene	540	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	218-01-9	
Dibenz(a,h)anthracene	105	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	53-70-3	
Fluoranthene	1150	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	206-44-0	
Fluorene	122	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	86-73-7	
Indeno(1,2,3-cd)pyrene	296	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	193-39-5	
Naphthalene	ND	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	91-20-3	
Phenanthrene	805	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	85-01-8	
Pyrene	994	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	79	%	42-125	5	04/12/18 11:52	04/17/18 14:18	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-C1 (5-8 WM) Lab ID: 10427018005 Collected: 04/11/18 14:30 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	87	%	57-125	5	04/12/18 11:52	04/17/18 14:18	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1300	1	04/21/18 11:05	04/22/18 00:25	67-64-1	
Allyl chloride	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	107-05-1	
Benzene	ND	ug/kg	26.1	1	04/21/18 11:05	04/22/18 00:25	71-43-2	
Bromobenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	108-86-1	
Bromochloromethane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	74-97-5	
Bromodichloromethane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	75-27-4	
Bromoform	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	75-25-2	
Bromomethane	ND	ug/kg	652	1	04/21/18 11:05	04/22/18 00:25	74-83-9	
2-Butanone (MEK)	ND	ug/kg	326	1	04/21/18 11:05	04/22/18 00:25	78-93-3	
n-Butylbenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	104-51-8	
sec-Butylbenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	135-98-8	
tert-Butylbenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	98-06-6	
Carbon tetrachloride	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	56-23-5	
Chlorobenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	108-90-7	
Chloroethane	ND	ug/kg	652	1	04/21/18 11:05	04/22/18 00:25	75-00-3	
Chloroform	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	67-66-3	
Chloromethane	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	74-87-3	
2-Chlorotoluene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	95-49-8	
4-Chlorotoluene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	652	1	04/21/18 11:05	04/22/18 00:25	96-12-8	
Dibromochloromethane	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	106-93-4	
Dibromomethane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	75-71-8	
1,1-Dichloroethane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	75-34-3	
1,2-Dichloroethane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	107-06-2	
1,1-Dichloroethene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	156-60-5	
Dichlorofluoromethane	ND	ug/kg	652	1	04/21/18 11:05	04/22/18 00:25	75-43-4	
1,2-Dichloropropane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	78-87-5	
1,3-Dichloropropane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	142-28-9	
2,2-Dichloropropane	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	594-20-7	
1,1-Dichloropropene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	60-29-7	
Ethylbenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	326	1	04/21/18 11:05	04/22/18 00:25	87-68-3	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-C1 (5-8 WM) **Lab ID: 10427018005** Collected: 04/11/18 14:30 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	98-82-8	
p-Isopropyltoluene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	99-87-6	
Methylene Chloride	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	326	1	04/21/18 11:05	04/22/18 00:25	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	1634-04-4	
Naphthalene	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	91-20-3	
n-Propylbenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	103-65-1	
Styrene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	79-34-5	
Tetrachloroethene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	127-18-4	
Tetrahydrofuran	ND	ug/kg	2610	1	04/21/18 11:05	04/22/18 00:25	109-99-9	
Toluene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	79-00-5	
Trichloroethene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	79-01-6	
Trichlorofluoromethane	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	108-67-8	
Vinyl chloride	ND	ug/kg	26.1	1	04/21/18 11:05	04/22/18 00:25	75-01-4	
Xylene (Total)	ND	ug/kg	196	1	04/21/18 11:05	04/22/18 00:25	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	95	%	75-125	1	04/21/18 11:05	04/22/18 00:25	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	04/21/18 11:05	04/22/18 00:25	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125	1	04/21/18 11:05	04/22/18 00:25	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	50.6	20	04/18/18 10:45	04/19/18 14:09	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	20.6	mg/kg	1.0	1		04/26/18 09:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.32	1	04/20/18 10:25	04/20/18 13:40	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	2.2	mg/kg	0.97	1	04/18/18 14:45	04/20/18 03:19	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-03 (2-5 WM) **Lab ID:** 10427018006 Collected: 04/11/18 14:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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1630 Methyl Mercury

Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)

Methyl Mercury	ND	ng/g	14.4	1	04/25/18 10:56	04/27/18 15:40	7439-97-6	N3
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8081B GCS Pesticides

Analytical Method: EPA 8081B Preparation Method: EPA 3550

Aldrin	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	309-00-2	
alpha-BHC	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	319-84-6	
beta-BHC	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	319-85-7	
delta-BHC	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	58-89-9	
Chlordane (Technical)	ND	ug/kg	25.2	1	04/16/18 09:32	04/17/18 00:37	57-74-9	
alpha-Chlordane	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	5103-71-9	
gamma-Chlordane	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	5103-74-2	
4,4'-DDD	ND	ug/kg	5.0	1	04/16/18 09:32	04/17/18 00:37	72-54-8	
4,4'-DDE	ND	ug/kg	5.0	1	04/16/18 09:32	04/17/18 00:37	72-55-9	
4,4'-DDT	ND	ug/kg	5.0	1	04/16/18 09:32	04/17/18 00:37	50-29-3	
Dieldrin	ND	ug/kg	5.0	1	04/16/18 09:32	04/17/18 00:37	60-57-1	
Endosulfan I	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	959-98-8	
Endosulfan II	ND	ug/kg	5.0	1	04/16/18 09:32	04/17/18 00:37	33213-65-9	
Endosulfan sulfate	ND	ug/kg	5.0	1	04/16/18 09:32	04/17/18 00:37	1031-07-8	
Endrin	ND	ug/kg	5.0	1	04/16/18 09:32	04/17/18 00:37	72-20-8	
Endrin aldehyde	ND	ug/kg	5.0	1	04/16/18 09:32	04/17/18 00:37	7421-93-4	
Endrin ketone	ND	ug/kg	5.0	1	04/16/18 09:32	04/17/18 00:37	53494-70-5	
Heptachlor	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	76-44-8	
Heptachlor epoxide	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	1024-57-3	
Methoxychlor	ND	ug/kg	25.2	1	04/16/18 09:32	04/17/18 00:37	72-43-5	
Toxaphene	ND	ug/kg	75.4	1	04/16/18 09:32	04/17/18 00:37	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	93	%	30-150	1	04/16/18 09:32	04/17/18 00:37	877-09-8	
Decachlorobiphenyl (S)	87	%	30-150	1	04/16/18 09:32	04/17/18 00:37	2051-24-3	

8082A GCS PCB

Analytical Method: EPA 8082A Preparation Method: EPA 3550

PCB-1016 (Aroclor 1016)	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	11100-14-4	
PCB, Total	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	85	%	48-125	1	04/13/18 19:35	04/16/18 17:52	877-09-8	
Decachlorobiphenyl (S)	83	%	30-134	1	04/13/18 19:35	04/16/18 17:52	2051-24-3	

WIDRO GCS

Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO

WDRO C10-C28	ND	mg/kg	14.4	1	04/12/18 14:19	04/13/18 13:11
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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-03 (2-5 WM) **Lab ID:** 10427018006 Collected: 04/11/18 14:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	78	%	50-150	1	04/12/18 14:19	04/13/18 13:11	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	16.9	1	04/23/18 09:23	04/24/18 00:36		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	04/23/18 09:23	04/24/18 00:36	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	13000	mg/kg	15.1	1	04/13/18 05:02	04/13/18 15:42	7429-90-5	
Barium	171	mg/kg	0.76	1	04/13/18 05:02	04/13/18 15:42	7440-39-3	
Boron	145	mg/kg	11.3	1	04/13/18 05:02	04/13/18 15:42	7440-42-8	
Copper	25.1	mg/kg	0.76	1	04/13/18 05:02	04/13/18 15:42	7440-50-8	
Iron	35900	mg/kg	18.9	5	04/13/18 05:02	04/13/18 16:08	7439-89-6	
Manganese	194	mg/kg	0.38	1	04/13/18 05:02	04/13/18 15:42	7439-96-5	
Nickel	25.5	mg/kg	1.5	1	04/13/18 05:02	04/13/18 15:42	7440-02-0	
Silver	ND	mg/kg	0.76	1	04/13/18 05:02	04/13/18 15:42	7440-22-4	
Tin	ND	mg/kg	5.7	1	04/13/18 05:02	04/13/18 15:42	7440-31-5	
Titanium	653	mg/kg	1.9	1	04/13/18 05:02	04/13/18 15:42	7440-32-6	
Zinc	171	mg/kg	1.5	1	04/13/18 05:02	04/13/18 15:42	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	44.0	mg/kg	1.4	5	04/18/18 10:36	04/19/18 07:57	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.7	mg/kg	0.73	20	04/13/18 05:01	04/13/18 09:38	7440-36-0	
Arsenic	24.9	mg/kg	0.73	20	04/13/18 05:01	04/13/18 09:38	7440-38-2	
Beryllium	3.6	mg/kg	0.29	20	04/13/18 05:01	04/13/18 09:38	7440-41-7	
Cadmium	2.2	mg/kg	0.12	20	04/13/18 05:01	04/13/18 09:38	7440-43-9	
Cobalt	8.2	mg/kg	0.73	20	04/13/18 05:01	04/13/18 09:38	7440-48-4	
Lead	30.9	mg/kg	0.15	20	04/13/18 05:01	04/13/18 09:38	7439-92-1	
Lithium	12.0	mg/kg	0.73	20	04/13/18 05:01	04/13/18 09:38	7439-93-2	
Selenium	1.6	mg/kg	0.73	20	04/13/18 05:01	04/13/18 09:38	7782-49-2	
Strontium	66.7	mg/kg	0.73	20	04/13/18 05:01	04/13/18 09:38	7440-24-6	
Vanadium	121	mg/kg	1.5	20	04/13/18 05:01	04/13/18 09:38	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.060	mg/kg	0.030	1	04/13/18 05:02	04/15/18 18:22	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	33.8	%	0.10	1		04/18/18 12:41		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	83-32-9	
Acenaphthylene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: **FD-TT-03 (2-5 WM)** Lab ID: **10427018006** Collected: 04/11/18 14:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	120-12-7	
Benzo(a)anthracene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	56-55-3	
Benzo(a)pyrene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	101-55-3	
Butylbenzylphthalate	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	85-68-7	
Carbazole	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	59-50-7	
4-Chloroaniline	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	108-60-1	
2-Chloronaphthalene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	91-58-7	
2-Chlorophenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	7005-72-3	
Chrysene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	53-70-3	
Dibenzofuran	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	120-83-2	
Diethylphthalate	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	105-67-9	
Dimethylphthalate	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	131-11-3	
Di-n-butylphthalate	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2560	1	04/13/18 17:55	04/19/18 16:52	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	606-20-2	
Di-n-octylphthalate	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	117-81-7	
Fluoranthene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	206-44-0	
Fluorene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	87-68-3	
Hexachlorobenzene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	118-74-1	
Hexachloroethane	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	193-39-5	
Isophorone	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	78-59-1	
1-Methylnaphthalene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	90-12-0	
2-Methylnaphthalene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	95-48-7	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-03 (2-5 WM) **Lab ID: 10427018006** Collected: 04/11/18 14:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

3&4-Methylphenol(m&p Cresol)	ND	ug/kg	993	1	04/13/18 17:55	04/19/18 16:52		
Naphthalene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	91-20-3	
2-Nitroaniline	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	88-74-4	
3-Nitroaniline	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	99-09-2	
4-Nitroaniline	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	100-01-6	
Nitrobenzene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	98-95-3	
2-Nitrophenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	88-75-5	
4-Nitrophenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	86-30-6	
Pentachlorophenol	ND	ug/kg	1010	1	04/13/18 17:55	04/19/18 16:52	87-86-5	
Phenanthrene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	85-01-8	
Phenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	108-95-2	
Pyrene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	58	%.	43-125	1	04/13/18 17:55	04/19/18 16:52	4165-60-0	
2-Fluorobiphenyl (S)	53	%.	30-132	1	04/13/18 17:55	04/19/18 16:52	321-60-8	
p-Terphenyl-d14 (S)	78	%.	62-125	1	04/13/18 17:55	04/19/18 16:52	1718-51-0	
Phenol-d6 (S)	56	%.	48-125	1	04/13/18 17:55	04/19/18 16:52	13127-88-3	
2-Fluorophenol (S)	51	%.	40-125	1	04/13/18 17:55	04/19/18 16:52	367-12-4	
2,4,6-Tribromophenol (S)	54	%.	60-125	1	04/13/18 17:55	04/19/18 16:52	118-79-6	SO

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	83-32-9	
Acenaphthylene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	208-96-8	
Anthracene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	120-12-7	
Benzo(a)anthracene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	56-55-3	
Benzo(a)pyrene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	207-08-9	
Chrysene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	53-70-3	
Fluoranthene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	206-44-0	
Fluorene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	193-39-5	
Naphthalene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	91-20-3	
Phenanthrene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	85-01-8	
Pyrene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	63	%.	42-125	1	04/12/18 11:52	04/16/18 19:27	321-60-8	
p-Terphenyl-d14 (S)	97	%.	57-125	1	04/12/18 11:52	04/16/18 19:27	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-03 (2-5 WM) **Lab ID: 10427018006** Collected: 04/11/18 14:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1570	1	04/21/18 11:05	04/22/18 00:42	67-64-1	
Allyl chloride	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	107-05-1	
Benzene	ND	ug/kg	31.5	1	04/21/18 11:05	04/22/18 00:42	71-43-2	
Bromobenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	108-86-1	
Bromochloromethane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	74-97-5	
Bromodichloromethane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	75-27-4	
Bromoform	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	75-25-2	
Bromomethane	ND	ug/kg	787	1	04/21/18 11:05	04/22/18 00:42	74-83-9	
2-Butanone (MEK)	ND	ug/kg	394	1	04/21/18 11:05	04/22/18 00:42	78-93-3	
n-Butylbenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	104-51-8	
sec-Butylbenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	135-98-8	
tert-Butylbenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	98-06-6	
Carbon tetrachloride	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	56-23-5	
Chlorobenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	108-90-7	
Chloroethane	ND	ug/kg	787	1	04/21/18 11:05	04/22/18 00:42	75-00-3	
Chloroform	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	67-66-3	
Chloromethane	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	74-87-3	
2-Chlorotoluene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	95-49-8	
4-Chlorotoluene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	787	1	04/21/18 11:05	04/22/18 00:42	96-12-8	
Dibromochloromethane	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	106-93-4	
Dibromomethane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	75-71-8	
1,1-Dichloroethane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	75-34-3	
1,2-Dichloroethane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	107-06-2	
1,1-Dichloroethene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	156-60-5	
Dichlorofluoromethane	ND	ug/kg	787	1	04/21/18 11:05	04/22/18 00:42	75-43-4	
1,2-Dichloropropane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	78-87-5	
1,3-Dichloropropane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	142-28-9	
2,2-Dichloropropane	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	594-20-7	
1,1-Dichloropropene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	60-29-7	
Ethylbenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	394	1	04/21/18 11:05	04/22/18 00:42	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	98-82-8	
p-Isopropyltoluene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	99-87-6	
Methylene Chloride	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	394	1	04/21/18 11:05	04/22/18 00:42	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-03 (2-5 WM) **Lab ID:** 10427018006 Collected: 04/11/18 14:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	1634-04-4	
Naphthalene	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	91-20-3	
n-Propylbenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	103-65-1	
Styrene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	79-34-5	
Tetrachloroethene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	127-18-4	
Tetrahydrofuran	ND	ug/kg	3150	1	04/21/18 11:05	04/22/18 00:42	109-99-9	
Toluene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	79-00-5	
Trichloroethene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	79-01-6	
Trichlorofluoromethane	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	108-67-8	
Vinyl chloride	ND	ug/kg	31.5	1	04/21/18 11:05	04/22/18 00:42	75-01-4	
Xylene (Total)	ND	ug/kg	236	1	04/21/18 11:05	04/22/18 00:42	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1	04/21/18 11:05	04/22/18 00:42	17060-07-0	
Toluene-d8 (S)	96	%.	75-125	1	04/21/18 11:05	04/22/18 00:42	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	75-125	1	04/21/18 11:05	04/22/18 00:42	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	14.6	5	04/18/18 10:45	04/19/18 14:23	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	44.0	mg/kg	1.0	1		04/26/18 09:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.53	1	04/20/18 10:25	04/20/18 13:41	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	5.1	mg/kg	0.99	1	04/18/18 14:45	04/20/18 00:03	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-D1 (11-16 WM) Lab ID: 10427018007 Collected: 04/11/18 15:35 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.1	1	04/25/18 10:56	04/27/18 15:47	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	309-00-2	
alpha-BHC	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	319-84-6	
beta-BHC	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	319-85-7	
delta-BHC	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	58-89-9	
Chlordane (Technical)	ND	ug/kg	403	20	04/16/18 09:32	04/17/18 02:27	57-74-9	
alpha-Chlordane	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	5103-71-9	
gamma-Chlordane	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	5103-74-2	
4,4'-DDD	ND	ug/kg	80.4	20	04/16/18 09:32	04/17/18 02:27	72-54-8	
4,4'-DDE	ND	ug/kg	80.4	20	04/16/18 09:32	04/17/18 02:27	72-55-9	
4,4'-DDT	ND	ug/kg	80.4	20	04/16/18 09:32	04/17/18 02:27	50-29-3	
Dieldrin	ND	ug/kg	80.4	20	04/16/18 09:32	04/17/18 02:27	60-57-1	
Endosulfan I	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	959-98-8	
Endosulfan II	ND	ug/kg	80.4	20	04/16/18 09:32	04/17/18 02:27	33213-65-9	
Endosulfan sulfate	ND	ug/kg	80.4	20	04/16/18 09:32	04/17/18 02:27	1031-07-8	
Endrin	ND	ug/kg	80.4	20	04/16/18 09:32	04/17/18 02:27	72-20-8	
Endrin aldehyde	ND	ug/kg	80.4	20	04/16/18 09:32	04/17/18 02:27	7421-93-4	
Endrin ketone	ND	ug/kg	80.4	20	04/16/18 09:32	04/17/18 02:27	53494-70-5	
Heptachlor	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	76-44-8	
Heptachlor epoxide	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	1024-57-3	
Methoxychlor	ND	ug/kg	403	20	04/16/18 09:32	04/17/18 02:27	72-43-5	
Toxaphene	ND	ug/kg	1210	20	04/16/18 09:32	04/17/18 02:27	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	04/16/18 09:32	04/17/18 02:27	877-09-8	2M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	20	04/16/18 09:32	04/17/18 02:27	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	11100-14-4	
PCB, Total	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	85	%	48-125	1	04/13/18 19:35	04/16/18 18:08	877-09-8	
Decachlorobiphenyl (S)	105	%	30-134	1	04/13/18 19:35	04/16/18 18:08	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-D1 (11-16 WM) Lab ID: 10427018007 Collected: 04/11/18 15:35 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	57.5	mg/kg	9.6	1	04/12/18 19:34	04/16/18 12:08		T6
Surrogates								
n-Triacontane (S)	90	%	50-150	1	04/12/18 19:34	04/16/18 12:08	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	15.6	1	04/23/18 09:23	04/24/18 01:24		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/23/18 09:23	04/24/18 01:24	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	6480	mg/kg	12.0	1	04/13/18 05:02	04/13/18 15:45	7429-90-5	
Barium	132	mg/kg	0.60	1	04/13/18 05:02	04/13/18 15:45	7440-39-3	
Boron	34.0	mg/kg	9.0	1	04/13/18 05:02	04/13/18 15:45	7440-42-8	
Copper	25.3	mg/kg	0.60	1	04/13/18 05:02	04/13/18 15:45	7440-50-8	
Iron	19200	mg/kg	15.0	5	04/13/18 05:02	04/13/18 16:11	7439-89-6	
Manganese	594	mg/kg	0.30	1	04/13/18 05:02	04/13/18 15:45	7439-96-5	
Nickel	18.2	mg/kg	1.2	1	04/13/18 05:02	04/13/18 15:45	7440-02-0	
Silver	ND	mg/kg	0.60	1	04/13/18 05:02	04/13/18 15:45	7440-22-4	
Tin	ND	mg/kg	4.5	1	04/13/18 05:02	04/13/18 15:45	7440-31-5	
Titanium	247	mg/kg	1.5	1	04/13/18 05:02	04/13/18 15:45	7440-32-6	
Zinc	187	mg/kg	1.2	1	04/13/18 05:02	04/13/18 15:45	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	27.8	mg/kg	1.2	5	04/18/18 10:36	04/19/18 08:02	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.6	mg/kg	0.59	20	04/13/18 05:01	04/13/18 09:41	7440-36-0	
Arsenic	10.1	mg/kg	0.59	20	04/13/18 05:01	04/13/18 09:41	7440-38-2	
Beryllium	0.56	mg/kg	0.24	20	04/13/18 05:01	04/13/18 09:41	7440-41-7	
Cadmium	0.95	mg/kg	0.095	20	04/13/18 05:01	04/13/18 09:41	7440-43-9	
Cobalt	6.2	mg/kg	0.59	20	04/13/18 05:01	04/13/18 09:41	7440-48-4	
Lead	132	mg/kg	0.12	20	04/13/18 05:01	04/13/18 09:41	7439-92-1	
Lithium	5.1	mg/kg	0.59	20	04/13/18 05:01	04/13/18 09:41	7439-93-2	
Selenium	0.92	mg/kg	0.59	20	04/13/18 05:01	04/13/18 09:41	7782-49-2	
Strontium	40.4	mg/kg	0.59	20	04/13/18 05:01	04/13/18 09:41	7440-24-6	
Vanadium	37.5	mg/kg	1.2	20	04/13/18 05:01	04/13/18 09:41	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.060	mg/kg	0.020	1	04/13/18 05:02	04/15/18 18:24	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	17.3	%	0.10	1		04/18/18 12:41		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	83-32-9	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: **FD-SB-D1 (11-16 WM)** Lab ID: **10427018007** Collected: 04/11/18 15:35 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	745	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	208-96-8	
Anthracene	1480	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	120-12-7	
Benzo(a)anthracene	3460	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	56-55-3	
Benzo(a)pyrene	2620	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	50-32-8	
Benzo(b)fluoranthene	3260	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	205-99-2	
Benzo(g,h,i)perylene	1390	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	191-24-2	
Benzo(k)fluoranthene	1550	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	101-55-3	
Butylbenzylphthalate	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	85-68-7	
Carbazole	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	59-50-7	
4-Chloroaniline	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	108-60-1	
2-Chloronaphthalene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	91-58-7	
2-Chlorophenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	7005-72-3	
Chrysene	3400	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	53-70-3	
Dibenzofuran	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	120-83-2	
Diethylphthalate	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	105-67-9	
Dimethylphthalate	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	131-11-3	
Di-n-butylphthalate	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2050	1	04/13/18 17:55	04/20/18 16:30	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	606-20-2	
Di-n-octylphthalate	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	117-81-7	
Fluoranthene	8050	ug/kg	1990	5	04/13/18 17:55	04/19/18 20:45	206-44-0	
Fluorene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	87-68-3	
Hexachlorobenzene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	118-74-1	
Hexachloroethane	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	67-72-1	
Indeno(1,2,3-cd)pyrene	1230	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	193-39-5	
Isophorone	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	78-59-1	
1-Methylnaphthalene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	90-12-0	
2-Methylnaphthalene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: **FD-SB-D1 (11-16 WM)** Lab ID: **10427018007** Collected: 04/11/18 15:35 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	796	1	04/13/18 17:55	04/20/18 16:30		
Naphthalene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	91-20-3	
2-Nitroaniline	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	88-74-4	
3-Nitroaniline	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	99-09-2	
4-Nitroaniline	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	100-01-6	
Nitrobenzene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	98-95-3	
2-Nitrophenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	88-75-5	
4-Nitrophenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	86-30-6	
Pentachlorophenol	ND	ug/kg	808	1	04/13/18 17:55	04/20/18 16:30	87-86-5	
Phenanthrene	4600	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	85-01-8	
Phenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	108-95-2	
Pyrene	6860	ug/kg	1990	5	04/13/18 17:55	04/19/18 20:45	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	55	%	43-125	1	04/13/18 17:55	04/20/18 16:30	4165-60-0	
2-Fluorobiphenyl (S)	54	%	30-132	1	04/13/18 17:55	04/20/18 16:30	321-60-8	
p-Terphenyl-d14 (S)	67	%	62-125	1	04/13/18 17:55	04/20/18 16:30	1718-51-0	
Phenol-d6 (S)	60	%	48-125	1	04/13/18 17:55	04/20/18 16:30	13127-88-3	
2-Fluorophenol (S)	58	%	40-125	1	04/13/18 17:55	04/20/18 16:30	367-12-4	
2,4,6-Tribromophenol (S)	60	%	60-125	1	04/13/18 17:55	04/20/18 16:30	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	83-32-9	
Acenaphthylene	1190	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	208-96-8	
Anthracene	2070	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	120-12-7	
Benzo(a)anthracene	4880	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	56-55-3	
Benzo(a)pyrene	3730	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	50-32-8	
Benzo(b)fluoranthene	4990	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	205-99-2	
Benzo(g,h,i)perylene	1870	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	191-24-2	
Benzo(k)fluoranthene	1660	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	207-08-9	
Chrysene	4150	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	218-01-9	
Dibenz(a,h)anthracene	697	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	53-70-3	
Fluoranthene	9760	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	206-44-0	
Fluorene	337	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	86-73-7	
Indeno(1,2,3-cd)pyrene	1950	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	193-39-5	
Naphthalene	ND	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	91-20-3	
Phenanthrene	5500	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	85-01-8	
Pyrene	7640	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%	42-125	25	04/12/18 11:52	04/17/18 13:37	321-60-8	D4,S4

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Project No.: 10427018

Sample: FD-SB-D1 (11-16 WM) Lab ID: 10427018007 Collected: 04/11/18 15:35 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	0	%	57-125	25	04/12/18 11:52	04/17/18 13:37	1718-51-0	S4
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1290	1	04/21/18 11:05	04/22/18 00:59	67-64-1	
Allyl chloride	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	107-05-1	
Benzene	ND	ug/kg	25.8	1	04/21/18 11:05	04/22/18 00:59	71-43-2	
Bromobenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	108-86-1	
Bromochloromethane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	74-97-5	
Bromodichloromethane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	75-27-4	
Bromoform	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	75-25-2	
Bromomethane	ND	ug/kg	644	1	04/21/18 11:05	04/22/18 00:59	74-83-9	
2-Butanone (MEK)	ND	ug/kg	322	1	04/21/18 11:05	04/22/18 00:59	78-93-3	
n-Butylbenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	104-51-8	
sec-Butylbenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	135-98-8	
tert-Butylbenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	98-06-6	
Carbon tetrachloride	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	56-23-5	
Chlorobenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	108-90-7	
Chloroethane	ND	ug/kg	644	1	04/21/18 11:05	04/22/18 00:59	75-00-3	
Chloroform	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	67-66-3	
Chloromethane	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	74-87-3	
2-Chlorotoluene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	95-49-8	
4-Chlorotoluene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	644	1	04/21/18 11:05	04/22/18 00:59	96-12-8	
Dibromochloromethane	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	106-93-4	
Dibromomethane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	75-71-8	
1,1-Dichloroethane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	75-34-3	
1,2-Dichloroethane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	107-06-2	
1,1-Dichloroethene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	156-60-5	
Dichlorofluoromethane	ND	ug/kg	644	1	04/21/18 11:05	04/22/18 00:59	75-43-4	
1,2-Dichloropropane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	78-87-5	
1,3-Dichloropropane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	142-28-9	
2,2-Dichloropropane	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	594-20-7	
1,1-Dichloropropene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	60-29-7	
Ethylbenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	322	1	04/21/18 11:05	04/22/18 00:59	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-D1 (11-16 WM) Lab ID: 10427018007 Collected: 04/11/18 15:35 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	98-82-8	
p-Isopropyltoluene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	99-87-6	
Methylene Chloride	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	322	1	04/21/18 11:05	04/22/18 00:59	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	1634-04-4	
Naphthalene	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	91-20-3	
n-Propylbenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	103-65-1	
Styrene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	79-34-5	
Tetrachloroethene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	127-18-4	
Tetrahydrofuran	ND	ug/kg	2580	1	04/21/18 11:05	04/22/18 00:59	109-99-9	
Toluene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	79-00-5	
Trichloroethene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	79-01-6	
Trichlorofluoromethane	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	108-67-8	
Vinyl chloride	ND	ug/kg	25.8	1	04/21/18 11:05	04/22/18 00:59	75-01-4	
Xylene (Total)	ND	ug/kg	193	1	04/21/18 11:05	04/22/18 00:59	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%	75-125	1	04/21/18 11:05	04/22/18 00:59	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	04/21/18 11:05	04/22/18 00:59	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125	1	04/21/18 11:05	04/22/18 00:59	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	119	50	04/18/18 10:45	04/19/18 14:09	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	27.8	mg/kg	1.0	1		04/26/18 09:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.45	1	04/20/18 10:25	04/20/18 13:41	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	2.1	mg/kg	1.0	1	04/18/18 14:45	04/20/18 02:40	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-E1 (10-15 WM) **Lab ID: 10427018008** Collected: 04/11/18 16:10 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.2	1	04/25/18 10:56	04/27/18 15:54	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	309-00-2	
alpha-BHC	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	319-84-6	
beta-BHC	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	319-85-7	
delta-BHC	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	58-89-9	
Chlordane (Technical)	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	57-74-9	
alpha-Chlordane	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	5103-71-9	
gamma-Chlordane	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	5103-74-2	
4,4'-DDD	ND	ug/kg	194	50	04/16/18 09:32	04/17/18 01:32	72-54-8	
4,4'-DDE	ND	ug/kg	194	50	04/16/18 09:32	04/17/18 01:32	72-55-9	
4,4'-DDT	ND	ug/kg	194	50	04/16/18 09:32	04/17/18 01:32	50-29-3	
Dieldrin	ND	ug/kg	194	50	04/16/18 09:32	04/17/18 01:32	60-57-1	
Endosulfan I	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	959-98-8	
Endosulfan II	ND	ug/kg	194	50	04/16/18 09:32	04/17/18 01:32	33213-65-9	
Endosulfan sulfate	ND	ug/kg	194	50	04/16/18 09:32	04/17/18 01:32	1031-07-8	
Endrin	ND	ug/kg	194	50	04/16/18 09:32	04/17/18 01:32	72-20-8	
Endrin aldehyde	ND	ug/kg	194	50	04/16/18 09:32	04/17/18 01:32	7421-93-4	
Endrin ketone	ND	ug/kg	194	50	04/16/18 09:32	04/17/18 01:32	53494-70-5	
Heptachlor	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	76-44-8	
Heptachlor epoxide	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	1024-57-3	
Methoxychlor	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	72-43-5	
Toxaphene	ND	ug/kg	2910	50	04/16/18 09:32	04/17/18 01:32	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	50	04/16/18 09:32	04/17/18 01:32	877-09-8	1M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	50	04/16/18 09:32	04/17/18 01:32	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	53469-21-9	
PCB-1248 (Aroclor 1248)	104	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	12672-29-6	
PCB-1254 (Aroclor 1254)	127	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	11100-14-4	
PCB, Total	231	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	77	%	48-125	1	04/13/18 19:35	04/16/18 18:24	877-09-8	
Decachlorobiphenyl (S)	69	%	30-134	1	04/13/18 19:35	04/16/18 18:24	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-E1 (10-15 WM) Lab ID: 10427018008 Collected: 04/11/18 16:10 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	1520	mg/kg	873	20	04/12/18 19:34	04/16/18 11:19		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	20	04/12/18 19:34	04/16/18 11:19	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	16.0	1	04/23/18 09:23	04/24/18 01:00		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	04/23/18 09:23	04/24/18 01:00	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	6100	mg/kg	11.4	1	04/13/18 05:02	04/13/18 15:47	7429-90-5	
Barium	60.1	mg/kg	0.57	1	04/13/18 05:02	04/13/18 15:47	7440-39-3	
Boron	31.3	mg/kg	8.6	1	04/13/18 05:02	04/13/18 15:47	7440-42-8	
Copper	74.7	mg/kg	0.57	1	04/13/18 05:02	04/13/18 15:47	7440-50-8	
Iron	24800	mg/kg	14.3	5	04/13/18 05:02	04/13/18 16:14	7439-89-6	
Manganese	360	mg/kg	0.29	1	04/13/18 05:02	04/13/18 15:47	7439-96-5	
Nickel	20.6	mg/kg	1.1	1	04/13/18 05:02	04/13/18 15:47	7440-02-0	
Silver	ND	mg/kg	0.57	1	04/13/18 05:02	04/13/18 15:47	7440-22-4	
Tin	11.2	mg/kg	4.3	1	04/13/18 05:02	04/13/18 15:47	7440-31-5	
Titanium	184	mg/kg	1.4	1	04/13/18 05:02	04/13/18 15:47	7440-32-6	
Zinc	227	mg/kg	1.1	1	04/13/18 05:02	04/13/18 15:47	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	21.2	mg/kg	1.1	5	04/18/18 10:36	04/19/18 08:06	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.55	20	04/13/18 05:01	04/13/18 09:44	7440-36-0	
Arsenic	5.6	mg/kg	0.55	20	04/13/18 05:01	04/13/18 09:44	7440-38-2	
Beryllium	0.42	mg/kg	0.22	20	04/13/18 05:01	04/13/18 09:44	7440-41-7	
Cadmium	2.2	mg/kg	0.087	20	04/13/18 05:01	04/13/18 09:44	7440-43-9	
Cobalt	7.1	mg/kg	0.55	20	04/13/18 05:01	04/13/18 09:44	7440-48-4	
Lead	149	mg/kg	0.11	20	04/13/18 05:01	04/13/18 09:44	7439-92-1	
Lithium	3.8	mg/kg	0.55	20	04/13/18 05:01	04/13/18 09:44	7439-93-2	
Selenium	ND	mg/kg	0.55	20	04/13/18 05:01	04/13/18 09:44	7782-49-2	
Strontium	42.3	mg/kg	0.55	20	04/13/18 05:01	04/13/18 09:44	7440-24-6	
Vanadium	24.4	mg/kg	1.1	20	04/13/18 05:01	04/13/18 09:44	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.13	mg/kg	0.020	1	04/13/18 05:02	04/15/18 18:26	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	14.3	%	0.10	1		04/18/18 12:42		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: **FD-SB-E1 (10-15 WM)** Lab ID: **10427018008** Collected: 04/11/18 16:10 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	208-96-8	
Anthracene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	120-12-7	
Benzo(a)anthracene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	56-55-3	
Benzo(a)pyrene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	205-99-2	M1
Benzo(g,h,i)perylene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	101-55-3	
Butylbenzylphthalate	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	85-68-7	
Carbazole	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	59-50-7	
4-Chloroaniline	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	108-60-1	
2-Chloronaphthalene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	91-58-7	
2-Chlorophenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	7005-72-3	
Chrysene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	53-70-3	
Dibenzofuran	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	120-83-2	
Diethylphthalate	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	105-67-9	
Dimethylphthalate	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	131-11-3	
Di-n-butylphthalate	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	19800	1	04/13/18 17:55	04/18/18 18:49	534-52-1	M1
2,4-Dinitrophenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	51-28-5	M1
2,4-Dinitrotoluene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	606-20-2	
Di-n-octylphthalate	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	117-81-7	
Fluoranthene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	206-44-0	M1
Hexachloro-1,3-butadiene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	87-68-3	
Hexachlorobenzene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	118-74-1	
Hexachloroethane	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	67-72-1	M1
Indeno(1,2,3-cd)pyrene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	193-39-5	
Isophorone	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	78-59-1	
1-Methylnaphthalene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	90-12-0	
2-Methylnaphthalene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-E1 (10-15 WM) **Lab ID: 10427018008** Collected: 04/11/18 16:10 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	7690	1	04/13/18 17:55	04/18/18 18:49		
Naphthalene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	91-20-3	
2-Nitroaniline	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	88-74-4	
3-Nitroaniline	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	99-09-2	
4-Nitroaniline	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	100-01-6	
Nitrobenzene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	98-95-3	
2-Nitrophenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	88-75-5	
4-Nitrophenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	86-30-6	
Pentachlorophenol	ND	ug/kg	7800	1	04/13/18 17:55	04/18/18 18:49	87-86-5	
Phenanthrene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	85-01-8	
Phenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	108-95-2	
Pyrene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	129-00-0	M1
1,2,4-Trichlorobenzene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%	43-125	1	04/13/18 17:55	04/18/18 18:49	4165-60-0	P3,S0
2-Fluorobiphenyl (S)	0	%	30-132	1	04/13/18 17:55	04/18/18 18:49	321-60-8	S0
p-Terphenyl-d14 (S)	0	%	62-125	1	04/13/18 17:55	04/18/18 18:49	1718-51-0	S0
Phenol-d6 (S)	0	%	48-125	1	04/13/18 17:55	04/18/18 18:49	13127-88-3	S0
2-Fluorophenol (S)	0	%	40-125	1	04/13/18 17:55	04/18/18 18:49	367-12-4	S0
2,4,6-Tribromophenol (S)	0	%	60-125	1	04/13/18 17:55	04/18/18 18:49	118-79-6	S0
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	83-32-9	
Acenaphthylene	ND	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	208-96-8	
Anthracene	ND	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	120-12-7	
Benzo(a)anthracene	132	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	56-55-3	
Benzo(a)pyrene	143	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	50-32-8	
Benzo(b)fluoranthene	165	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	205-99-2	
Benzo(g,h,i)perylene	219	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	207-08-9	
Chrysene	231	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	53-70-3	
Fluoranthene	229	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	206-44-0	
Fluorene	ND	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	193-39-5	
Naphthalene	ND	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	91-20-3	
Phenanthrene	415	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	85-01-8	
Pyrene	421	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	129-00-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-E1 (10-15 WM) **Lab ID: 10427018008** Collected: 04/11/18 16:10 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
2-Fluorobiphenyl (S)	0	%.	42-125	2	04/12/18 11:52	04/17/18 12:36	321-60-8	D3,P3, S0
p-Terphenyl-d14 (S)	0	%.	57-125	2	04/12/18 11:52	04/17/18 12:36	1718-51-0	S0
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1460	1	04/21/18 11:05	04/22/18 01:16	67-64-1	
Allyl chloride	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	107-05-1	
Benzene	ND	ug/kg	29.3	1	04/21/18 11:05	04/22/18 01:16	71-43-2	
Bromobenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	108-86-1	
Bromochloromethane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	74-97-5	
Bromodichloromethane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	75-27-4	
Bromoform	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	75-25-2	
Bromomethane	ND	ug/kg	732	1	04/21/18 11:05	04/22/18 01:16	74-83-9	
2-Butanone (MEK)	ND	ug/kg	366	1	04/21/18 11:05	04/22/18 01:16	78-93-3	
n-Butylbenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	104-51-8	
sec-Butylbenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	135-98-8	
tert-Butylbenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	98-06-6	
Carbon tetrachloride	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	56-23-5	
Chlorobenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	108-90-7	
Chloroethane	ND	ug/kg	732	1	04/21/18 11:05	04/22/18 01:16	75-00-3	
Chloroform	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	67-66-3	
Chloromethane	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	74-87-3	
2-Chlorotoluene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	95-49-8	
4-Chlorotoluene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	732	1	04/21/18 11:05	04/22/18 01:16	96-12-8	
Dibromochloromethane	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	106-93-4	
Dibromomethane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	75-71-8	
1,1-Dichloroethane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	75-34-3	
1,2-Dichloroethane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	107-06-2	
1,1-Dichloroethene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	156-60-5	
Dichlorofluoromethane	ND	ug/kg	732	1	04/21/18 11:05	04/22/18 01:16	75-43-4	
1,2-Dichloropropane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	78-87-5	
1,3-Dichloropropane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	142-28-9	
2,2-Dichloropropane	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	594-20-7	
1,1-Dichloropropene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	60-29-7	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-E1 (10-15 WM) **Lab ID: 10427018008** Collected: 04/11/18 16:10 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Ethylbenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	366	1	04/21/18 11:05	04/22/18 01:16	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	98-82-8	
p-Isopropyltoluene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	99-87-6	
Methylene Chloride	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	366	1	04/21/18 11:05	04/22/18 01:16	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	1634-04-4	
Naphthalene	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	91-20-3	
n-Propylbenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	103-65-1	
Styrene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	79-34-5	
Tetrachloroethene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	127-18-4	
Tetrahydrofuran	ND	ug/kg	2930	1	04/21/18 11:05	04/22/18 01:16	109-99-9	
Toluene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	79-00-5	
Trichloroethene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	79-01-6	
Trichlorofluoromethane	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	108-67-8	
Vinyl chloride	ND	ug/kg	29.3	1	04/21/18 11:05	04/22/18 01:16	75-01-4	
Xylene (Total)	ND	ug/kg	220	1	04/21/18 11:05	04/22/18 01:16	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%	75-125	1	04/21/18 11:05	04/22/18 01:16	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	04/21/18 11:05	04/22/18 01:16	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125	1	04/21/18 11:05	04/22/18 01:16	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	113	50	04/18/18 10:45	04/19/18 14:10	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	21.2	mg/kg	1.0	1		04/26/18 09:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.39	mg/kg	0.31	1	04/20/18 10:25	04/20/18 13:45	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.99	1	04/18/18 14:45	04/19/18 22:06	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427018

QC Batch: 141622 Analysis Method: EPA 1630 (1998)
QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 559956 Matrix: Solid
Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.16	04/27/18 14:14	N3

METHOD BLANK: 559957 Matrix: Solid
Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.05	04/27/18 14:20	N3

METHOD BLANK: 559958 Matrix: Solid
Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.14	04/27/18 14:27	N3

LABORATORY CONTROL SAMPLE: 559959

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	99.7	116	117	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559960 559961

Parameter	Units	10427018004 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual	
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD		RPD
Methyl Mercury	ng/g	ND	374	387	412	449	110	116	65-135	9	35	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559962 559963

Parameter	Units	10427291002 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual	
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD		RPD
Methyl Mercury	ng/g	ND	344	356	391	403	114	113	65-135	3	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 533563 Analysis Method: WI MOD GRO
 QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2898329 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	04/23/18 14:54	
a,a,a-Trifluorotoluene (S)	%.	98	80-150	04/23/18 14:54	

LABORATORY CONTROL SAMPLE & LCSD: 2898330

2898331

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	42.4	41.8	85	84	80-120	2	20	
a,a,a-Trifluorotoluene (S)	%.				99	98	80-150			

MATRIX SPIKE SAMPLE: 2899187

Parameter	Units	10427018001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	22.8	78.6	175	194	80-120	C0,M1
a,a,a-Trifluorotoluene (S)	%.				98	80-150	

SAMPLE DUPLICATE: 2899188

Parameter	Units	10427018003 Result	Dup Result	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	ND		20	
a,a,a-Trifluorotoluene (S)	%.	99	98	5		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 532184 Analysis Method: EPA 7471
 QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2890276 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.018	04/15/18 17:59	

LABORATORY CONTROL SAMPLE: 2890277

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.5	0.54	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2890278 2890279

Parameter	Units	10427018001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.14	.72	.73	0.92	0.92	108	105	80-120	0	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 532178 Analysis Method: EPA 6010C
 QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2890252 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.7	04/13/18 14:57	
Barium	mg/kg	ND	0.49	04/13/18 14:57	
Boron	mg/kg	ND	7.3	04/13/18 14:57	
Copper	mg/kg	ND	0.49	04/13/18 14:57	
Iron	mg/kg	ND	2.4	04/13/18 14:57	
Manganese	mg/kg	ND	0.24	04/13/18 14:57	
Nickel	mg/kg	ND	0.97	04/13/18 14:57	
Silver	mg/kg	ND	0.49	04/13/18 14:57	
Tin	mg/kg	ND	3.6	04/13/18 14:57	
Titanium	mg/kg	ND	1.2	04/13/18 14:57	
Zinc	mg/kg	ND	0.97	04/13/18 14:57	

LABORATORY CONTROL SAMPLE: 2890253

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	952	938	98	80-120	
Barium	mg/kg	47.6	48.9	103	80-120	
Boron	mg/kg	47.6	43.9	92	80-120	
Copper	mg/kg	47.6	47.5	100	80-120	
Iron	mg/kg	952	972	102	80-120	
Manganese	mg/kg	47.6	50.0	105	80-120	
Nickel	mg/kg	47.6	47.5	100	80-120	
Silver	mg/kg	23.8	22.4	94	80-120	
Tin	mg/kg	47.6	47.9	101	80-120	
Titanium	mg/kg	47.6	48.3	101	80-120	
Zinc	mg/kg	47.6	47.2	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2890254 2890255

Parameter	Units	10427160001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result						
Aluminum	mg/kg	2780	5170	5170	7210	7390	86	89	75-125	3	20	
Barium	mg/kg	752	258	258	779	811	10	23	75-125	4	20	M1
Boron	mg/kg	ND	258	258	237	240	89	90	75-125	1	20	
Copper	mg/kg	567	258	258	743	764	68	76	75-125	3	20	M1
Iron	mg/kg	30200	5170	5170	25700	27900	-87	-45	75-125	8	20	P6
Manganese	mg/kg	2080	258	258	2040	2130	-15	21	75-125	4	20	P6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Parameter	Units	2890254		2890255		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10427160001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Nickel	mg/kg	9.7	258	258	257	260	96	97	75-125	1	20		
Silver	mg/kg	3.2	129	129	121	123	91	93	75-125	2	20		
Tin	mg/kg	29.9	258	258	250	256	85	88	75-125	2	20		
Titanium	mg/kg	222	258	258	378	365	60	56	75-125	3	20	M1	
Zinc	mg/kg	810	258	258	854	892	17	32	75-125	4	20	M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 437311 Analysis Method: EPA 6020
 QC Batch Method: EPA 3050B Analysis Description: 6020 MET
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2020384 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.20	04/19/18 06:49	N2

LABORATORY CONTROL SAMPLE: 2020385

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.9	3.9	102	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2020386 2020387

Parameter	Units	10427018004 Result	MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	% Rec	% Rec						
Chromium	mg/kg	14.2	4.22	18.2	16.5	93	51	75-125	10	20	M0,N2		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 532177 Analysis Method: EPA 6020A
 QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2890248 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.48	04/16/18 14:11	
Arsenic	mg/kg	ND	0.48	04/16/18 14:11	
Beryllium	mg/kg	ND	0.19	04/16/18 14:11	
Cadmium	mg/kg	ND	0.077	04/16/18 14:11	
Cobalt	mg/kg	ND	0.48	04/16/18 14:11	
Lead	mg/kg	ND	0.096	04/16/18 14:11	
Lithium	mg/kg	ND	0.48	04/16/18 14:11	
Selenium	mg/kg	ND	0.48	04/16/18 14:11	
Strontium	mg/kg	ND	0.48	04/16/18 14:11	
Vanadium	mg/kg	ND	0.96	04/16/18 14:11	

LABORATORY CONTROL SAMPLE: 2890249

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	47.6	46.5	98	80-120	
Arsenic	mg/kg	47.6	44.6	94	80-120	
Beryllium	mg/kg	47.6	51.0	107	80-120	
Cadmium	mg/kg	47.6	46.6	98	80-120	
Cobalt	mg/kg	47.6	46.1	97	80-120	
Lead	mg/kg	47.6	46.2	97	80-120	
Lithium	mg/kg	47.6	51.3	108	80-120	
Selenium	mg/kg	47.6	50.0	105	80-120	
Strontium	mg/kg	47.6	44.6	94	80-120	
Vanadium	mg/kg	47.6	45.7	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2890250 2890251

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10427154001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Antimony	mg/kg	2.8	117	115	94.8	94.5	78	80	75-125	0	20	
Arsenic	mg/kg	29.6	117	115	133	135	88	92	75-125	1	20	
Beryllium	mg/kg	ND	117	115	105	103	89	90	75-125	1	20	
Cadmium	mg/kg	2.3	117	115	108	109	90	93	75-125	1	20	
Cobalt	mg/kg	4.4	117	115	112	113	92	95	75-125	1	20	
Lead	mg/kg	36.3	117	115	139	143	88	93	75-125	3	20	
Lithium	mg/kg	3.0	117	115	108	106	90	90	75-125	2	20	
Selenium	mg/kg	4.2	117	115	109	109	90	91	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Parameter	Units	2890250		2890251		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		10427154001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						MSD Result
Strontium	mg/kg	195	117	115	283	304	75	95	75-125	7	20
Vanadium	mg/kg	14.1	117	115	121	123	91	95	75-125	2	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 532990

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

SAMPLE DUPLICATE: 2894446

Parameter	Units	10427653001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.5	10.1	3	30	

SAMPLE DUPLICATE: 2894447

Parameter	Units	10427654004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	4.2	4.1	3	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 533507

Analysis Method: EPA 8260B

QC Batch Method: EPA 5035/5030B

Analysis Description: 8260B MSV 5030 Med Level

Associated Lab Samples: 10427018001

METHOD BLANK: 2898020

Matrix: Solid

Associated Lab Samples: 10427018001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	04/20/18 22:52	
1,1,1-Trichloroethane	ug/kg	ND	50.0	04/20/18 22:52	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	04/20/18 22:52	
1,1,2-Trichloroethane	ug/kg	ND	50.0	04/20/18 22:52	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	04/20/18 22:52	
1,1-Dichloroethane	ug/kg	ND	50.0	04/20/18 22:52	
1,1-Dichloroethene	ug/kg	ND	50.0	04/20/18 22:52	
1,1-Dichloropropene	ug/kg	ND	50.0	04/20/18 22:52	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	04/20/18 22:52	
1,2,3-Trichloropropane	ug/kg	ND	200	04/20/18 22:52	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	04/20/18 22:52	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	04/20/18 22:52	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	04/20/18 22:52	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	04/20/18 22:52	
1,2-Dichlorobenzene	ug/kg	ND	50.0	04/20/18 22:52	
1,2-Dichloroethane	ug/kg	ND	50.0	04/20/18 22:52	
1,2-Dichloropropane	ug/kg	ND	50.0	04/20/18 22:52	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	04/20/18 22:52	
1,3-Dichlorobenzene	ug/kg	ND	50.0	04/20/18 22:52	
1,3-Dichloropropane	ug/kg	ND	50.0	04/20/18 22:52	
1,4-Dichlorobenzene	ug/kg	ND	50.0	04/20/18 22:52	
2,2-Dichloropropane	ug/kg	ND	200	04/20/18 22:52	
2-Butanone (MEK)	ug/kg	ND	250	04/20/18 22:52	
2-Chlorotoluene	ug/kg	ND	50.0	04/20/18 22:52	
4-Chlorotoluene	ug/kg	ND	50.0	04/20/18 22:52	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	04/20/18 22:52	
Acetone	ug/kg	ND	1000	04/20/18 22:52	
Allyl chloride	ug/kg	ND	200	04/20/18 22:52	
Benzene	ug/kg	ND	20.0	04/20/18 22:52	
Bromobenzene	ug/kg	ND	50.0	04/20/18 22:52	
Bromochloromethane	ug/kg	ND	50.0	04/20/18 22:52	
Bromodichloromethane	ug/kg	ND	50.0	04/20/18 22:52	
Bromoform	ug/kg	ND	200	04/20/18 22:52	
Bromomethane	ug/kg	ND	500	04/20/18 22:52	
Carbon tetrachloride	ug/kg	ND	50.0	04/20/18 22:52	
Chlorobenzene	ug/kg	ND	50.0	04/20/18 22:52	
Chloroethane	ug/kg	ND	500	04/20/18 22:52	
Chloroform	ug/kg	ND	50.0	04/20/18 22:52	
Chloromethane	ug/kg	ND	200	04/20/18 22:52	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	04/20/18 22:52	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	04/20/18 22:52	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

METHOD BLANK: 2898020

Matrix: Solid

Associated Lab Samples: 10427018001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	04/20/18 22:52	
Dibromomethane	ug/kg	ND	50.0	04/20/18 22:52	
Dichlorodifluoromethane	ug/kg	ND	200	04/20/18 22:52	
Dichlorofluoromethane	ug/kg	ND	500	04/20/18 22:52	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	04/20/18 22:52	
Ethylbenzene	ug/kg	ND	50.0	04/20/18 22:52	
Hexachloro-1,3-butadiene	ug/kg	ND	250	04/20/18 22:52	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	04/20/18 22:52	
Methyl-tert-butyl ether	ug/kg	ND	50.0	04/20/18 22:52	
Methylene Chloride	ug/kg	ND	200	04/20/18 22:52	
n-Butylbenzene	ug/kg	ND	50.0	04/20/18 22:52	
n-Propylbenzene	ug/kg	ND	50.0	04/20/18 22:52	
Naphthalene	ug/kg	ND	200	04/20/18 22:52	
p-Isopropyltoluene	ug/kg	ND	50.0	04/20/18 22:52	
sec-Butylbenzene	ug/kg	ND	50.0	04/20/18 22:52	
Styrene	ug/kg	ND	50.0	04/20/18 22:52	
tert-Butylbenzene	ug/kg	ND	50.0	04/20/18 22:52	
Tetrachloroethene	ug/kg	ND	50.0	04/20/18 22:52	
Tetrahydrofuran	ug/kg	ND	2000	04/20/18 22:52	
Toluene	ug/kg	ND	50.0	04/20/18 22:52	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	04/20/18 22:52	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	04/20/18 22:52	
Trichloroethene	ug/kg	ND	50.0	04/20/18 22:52	
Trichlorofluoromethane	ug/kg	ND	200	04/20/18 22:52	
Vinyl chloride	ug/kg	ND	20.0	04/20/18 22:52	
Xylene (Total)	ug/kg	ND	150	04/20/18 22:52	
1,2-Dichloroethane-d4 (S)	%	97	75-125	04/20/18 22:52	
4-Bromofluorobenzene (S)	%	101	75-125	04/20/18 22:52	
Toluene-d8 (S)	%	96	75-125	04/20/18 22:52	

LABORATORY CONTROL SAMPLE & LCSD: 2898021

2898022

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	843	866	84	87	59-125	3	20	
1,1,1-Trichloroethane	ug/kg	1000	903	927	90	93	59-125	3	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	870	874	87	87	58-125	0	20	
1,1,2-Trichloroethane	ug/kg	1000	853	868	85	87	64-125	2	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	878	882	88	88	65-125	0	20	
1,1-Dichloroethane	ug/kg	1000	906	939	91	94	63-125	4	20	
1,1-Dichloroethene	ug/kg	1000	918	946	92	95	59-125	3	20	
1,1-Dichloropropene	ug/kg	1000	899	933	90	93	64-125	4	20	
1,2,3-Trichlorobenzene	ug/kg	1000	778	800	78	80	55-126	3	20	
1,2,3-Trichloropropane	ug/kg	1000	859	778	86	78	62-125	10	20	
1,2,4-Trichlorobenzene	ug/kg	1000	810	827	81	83	62-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE & LCSD: 2898021		2898022								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	1000	857	854	86	85	59-125	0	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	1850	1870	74	75	54-125	1	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	852	862	85	86	64-125	1	20	
1,2-Dichlorobenzene	ug/kg	1000	812	814	81	81	63-125	0	20	
1,2-Dichloroethane	ug/kg	1000	837	850	84	85	57-125	2	20	
1,2-Dichloropropane	ug/kg	1000	914	903	91	90	67-125	1	20	
1,3,5-Trimethylbenzene	ug/kg	1000	893	847	89	85	59-125	5	20	
1,3-Dichlorobenzene	ug/kg	1000	763	776	76	78	64-125	2	20	
1,3-Dichloropropane	ug/kg	1000	873	877	87	88	64-125	1	20	
1,4-Dichlorobenzene	ug/kg	1000	852	811	85	81	63-125	5	20	
2,2-Dichloropropane	ug/kg	1000	925	938	93	94	37-126	1	20	
2-Butanone (MEK)	ug/kg	5000	4410	4620	88	92	48-125	5	20	
2-Chlorotoluene	ug/kg	1000	811	817	81	82	62-125	1	20	
4-Chlorotoluene	ug/kg	1000	851	821	85	82	63-125	4	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4420	4660	88	93	52-135	5	20	
Acetone	ug/kg	5000	4790	5000	96	100	65-125	4	20	
Allyl chloride	ug/kg	1000	943	989	94	99	52-125	5	20	
Benzene	ug/kg	1000	899	910	90	91	61-125	1	20	
Bromobenzene	ug/kg	1000	797	841	80	84	64-125	5	20	
Bromochloromethane	ug/kg	1000	886	892	89	89	65-125	1	20	
Bromodichloromethane	ug/kg	1000	870	864	87	86	57-125	1	20	
Bromoform	ug/kg	1000	718	746	72	75	57-125	4	20	
Bromomethane	ug/kg	1000	867	906	87	91	60-125	4	20	
Carbon tetrachloride	ug/kg	1000	887	893	89	89	58-125	1	20	
Chlorobenzene	ug/kg	1000	839	864	84	86	66-125	3	20	
Chloroethane	ug/kg	1000	882	919	88	92	62-125	4	20	
Chloroform	ug/kg	1000	829	844	83	84	59-125	2	20	
Chloromethane	ug/kg	1000	875	920	88	92	50-125	5	20	
cis-1,2-Dichloroethene	ug/kg	1000	882	885	88	89	61-125	0	20	
cis-1,3-Dichloropropene	ug/kg	1000	885	879	89	88	61-125	1	20	
Dibromochloromethane	ug/kg	1000	769	800	77	80	60-125	4	20	
Dibromomethane	ug/kg	1000	872	852	87	85	69-125	2	20	
Dichlorodifluoromethane	ug/kg	1000	707	723	71	72	38-125	2	20	
Dichlorofluoromethane	ug/kg	1000	865	883	86	88	67-125	2	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	1800	1500	180	150	60-125	19	20 L3	
Ethylbenzene	ug/kg	1000	866	868	87	87	62-125	0	20	
Hexachloro-1,3-butadiene	ug/kg	1000	754	772	75	77	56-125	2	20	
Isopropylbenzene (Cumene)	ug/kg	1000	895	896	89	90	65-125	0	20	
Methyl-tert-butyl ether	ug/kg	1000	891	909	89	91	59-125	2	20	
Methylene Chloride	ug/kg	1000	959	959	96	96	64-125	0	20	
n-Butylbenzene	ug/kg	1000	878	861	88	86	59-125	2	20	
n-Propylbenzene	ug/kg	1000	853	868	85	87	61-125	2	20	
Naphthalene	ug/kg	1000	876	863	88	86	53-125	1	20	
p-Isopropyltoluene	ug/kg	1000	867	849	87	85	63-125	2	20	
sec-Butylbenzene	ug/kg	1000	899	881	90	88	62-125	2	20	
Styrene	ug/kg	1000	858	881	86	88	66-125	3	20	
tert-Butylbenzene	ug/kg	1000	840	856	84	86	64-125	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE & LCSD: 2898021

2898022

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Tetrachloroethene	ug/kg	1000	857	870	86	87	67-125	2	20	
Tetrahydrofuran	ug/kg	10000	9790	10200	98	102	62-125	4	20	
Toluene	ug/kg	1000	880	859	88	86	61-125	2	20	
trans-1,2-Dichloroethene	ug/kg	1000	966	977	97	98	64-125	1	20	
trans-1,3-Dichloropropene	ug/kg	1000	890	898	89	90	56-125	1	20	
Trichloroethene	ug/kg	1000	864	847	86	85	67-125	2	20	
Trichlorofluoromethane	ug/kg	1000	833	892	83	89	65-125	7	20	
Vinyl chloride	ug/kg	1000	926	963	93	96	57-125	4	20	
Xylene (Total)	ug/kg	3000	2620	2670	87	89	62-125	2	20	
1,2-Dichloroethane-d4 (S)	%				97	99	75-125			
4-Bromofluorobenzene (S)	%				98	97	75-125			
Toluene-d8 (S)	%				100	100	75-125			

MATRIX SPIKE SAMPLE: 2898023

Parameter	Units	10427374003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	<0.057 mg/kg	1110	1180	107	64-146	
1,1,1-Trichloroethane	ug/kg	<0.057 mg/kg	1110	1230	111	56-148	
1,1,2,2-Tetrachloroethane	ug/kg	<0.057 mg/kg	1110	1210	110	36-150	
1,1,2-Trichloroethane	ug/kg	<0.057 mg/kg	1110	1190	107	67-148	
1,1,2-Trichlorotrifluoroethane	ug/kg	<0.23 mg/kg	1110	1170	106	60-142	
1,1-Dichloroethane	ug/kg	<0.057 mg/kg	1110	1250	113	57-140	
1,1-Dichloroethene	ug/kg	<0.057 mg/kg	1110	1240	112	59-139	
1,1-Dichloropropene	ug/kg	<0.057 mg/kg	1110	1250	113	61-142	
1,2,3-Trichlorobenzene	ug/kg	<0.057 mg/kg	1110	1120	101	69-150	
1,2,3-Trichloropropane	ug/kg	<0.23 mg/kg	1110	1130	102	64-150	
1,2,4-Trichlorobenzene	ug/kg	<0.057 mg/kg	1110	1150	103	71-149	
1,2,4-Trimethylbenzene	ug/kg	<0.057 mg/kg	1110	1190	106	67-149	
1,2-Dibromo-3-chloropropane	ug/kg	<0.57 mg/kg	2770	2570	93	61-150	
1,2-Dibromoethane (EDB)	ug/kg	<0.057 mg/kg	1110	1190	107	67-147	
1,2-Dichlorobenzene	ug/kg	<0.057 mg/kg	1110	1140	103	70-142	
1,2-Dichloroethane	ug/kg	<0.057 mg/kg	1110	1150	104	58-132	
1,2-Dichloropropane	ug/kg	<0.057 mg/kg	1110	1230	111	64-144	
1,3,5-Trimethylbenzene	ug/kg	<0.057 mg/kg	1110	1190	108	71-146	
1,3-Dichlorobenzene	ug/kg	<0.057 mg/kg	1110	1100	100	71-142	
1,3-Dichloropropane	ug/kg	<0.057 mg/kg	1110	1180	107	68-140	
1,4-Dichlorobenzene	ug/kg	<0.057 mg/kg	1110	1090	99	68-142	
2,2-Dichloropropane	ug/kg	<0.23 mg/kg	1110	1240	112	34-150	
2-Butanone (MEK)	ug/kg	<0.28 mg/kg	5540	6550	118	51-150	
2-Chlorotoluene	ug/kg	<0.057 mg/kg	1110	1130	102	66-144	
4-Chlorotoluene	ug/kg	<0.057 mg/kg	1110	1150	104	66-140	
4-Methyl-2-pentanone (MIBK)	ug/kg	<0.28 mg/kg	5540	6100	110	63-150	
Acetone	ug/kg	<1.1 mg/kg	5540	7130	129	54-150	
Allyl chloride	ug/kg	<0.23 mg/kg	1110	1320	119	53-135	
Benzene	ug/kg	<0.023 mg/kg	1110	1240	111	65-135	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

MATRIX SPIKE SAMPLE: 2898023		10427374003	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/kg	<0.057 mg/kg	1110	1150	104	71-141	
Bromochloromethane	ug/kg	<0.057 mg/kg	1110	1220	110	62-145	
Bromodichloromethane	ug/kg	<0.057 mg/kg	1110	1220	110	59-148	
Bromoform	ug/kg	<0.23 mg/kg	1110	1050	95	57-145	
Bromomethane	ug/kg	<0.57 mg/kg	1110	1110	100	51-129	
Carbon tetrachloride	ug/kg	<0.057 mg/kg	1110	1210	109	55-144	
Chlorobenzene	ug/kg	<0.057 mg/kg	1110	1160	105	70-142	
Chloroethane	ug/kg	<0.57 mg/kg	1110	1120	101	61-135	
Chloroform	ug/kg	<0.057 mg/kg	1110	1140	102	58-135	
Chloromethane	ug/kg	<0.23 mg/kg	1110	1020	92	37-125	
cis-1,2-Dichloroethene	ug/kg	<0.057 mg/kg	1110	1240	112	60-138	
cis-1,3-Dichloropropene	ug/kg	<0.057 mg/kg	1110	1230	111	62-142	
Dibromochloromethane	ug/kg	<0.23 mg/kg	1110	1080	97	65-141	
Dibromomethane	ug/kg	<0.057 mg/kg	1110	1210	109	72-150	
Dichlorodifluoromethane	ug/kg	<0.23 mg/kg	1110	663	60	30-125	
Dichlorofluoromethane	ug/kg	<0.57 mg/kg	1110	1050	95	62-148	
Diethyl ether (Ethyl ether)	ug/kg	<0.23 mg/kg	1110	2520	227	62-135	MO
Ethylbenzene	ug/kg	<0.057 mg/kg	1110	1190	107	72-138	
Hexachloro-1,3-butadiene	ug/kg	<0.28 mg/kg	1110	1130	102	38-150	
Isopropylbenzene (Cumene)	ug/kg	<0.057 mg/kg	1110	1220	111	75-148	
Methyl-tert-butyl ether	ug/kg	<0.057 mg/kg	1110	1230	111	63-139	
Methylene Chloride	ug/kg	<0.23 mg/kg	1110	1340	119	58-135	
n-Butylbenzene	ug/kg	<0.057 mg/kg	1110	1220	110	63-150	
n-Propylbenzene	ug/kg	<0.057 mg/kg	1110	1190	107	70-146	
Naphthalene	ug/kg	<0.23 mg/kg	1110	1220	109	63-150	
p-Isopropyltoluene	ug/kg	<0.057 mg/kg	1110	1180	107	72-150	
sec-Butylbenzene	ug/kg	<0.057 mg/kg	1110	1230	111	66-150	
Styrene	ug/kg	<0.057 mg/kg	1110	1250	113	72-146	
tert-Butylbenzene	ug/kg	<0.057 mg/kg	1110	1180	106	71-148	
Tetrachloroethene	ug/kg	<0.057 mg/kg	1110	1170	105	70-150	
Tetrahydrofuran	ug/kg	<2.3 mg/kg	11100	13600	123	62-150	
Toluene	ug/kg	<0.057 mg/kg	1110	1200	107	65-142	
trans-1,2-Dichloroethene	ug/kg	<0.057 mg/kg	1110	1290	116	55-141	
trans-1,3-Dichloropropene	ug/kg	<0.057 mg/kg	1110	1220	110	57-147	
Trichloroethene	ug/kg	<0.057 mg/kg	1110	1170	106	62-150	
Trichlorofluoromethane	ug/kg	<0.23 mg/kg	1110	987	89	51-150	
Vinyl chloride	ug/kg	<0.023 mg/kg	1110	1080	97	45-132	
Xylene (Total)	ug/kg	<0.17 mg/kg	3320	3640	109	75-140	
1,2-Dichloroethane-d4 (S)	%				100	75-125	
4-Bromofluorobenzene (S)	%				101	75-125	
Toluene-d8 (S)	%				100	75-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

SAMPLE DUPLICATE: 2898024

Parameter	Units	10427374004 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	<0.059 mg/kg	ND		30	
1,1,1-Trichloroethane	ug/kg	<0.059 mg/kg	ND		30	
1,1,2,2-Tetrachloroethane	ug/kg	<0.059 mg/kg	ND		30	
1,1,2-Trichloroethane	ug/kg	<0.059 mg/kg	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	<0.24 mg/kg	ND		30	
1,1-Dichloroethane	ug/kg	<0.059 mg/kg	ND		30	
1,1-Dichloroethene	ug/kg	<0.059 mg/kg	ND		30	
1,1-Dichloropropene	ug/kg	<0.059 mg/kg	ND		30	
1,2,3-Trichlorobenzene	ug/kg	<0.059 mg/kg	ND		30	
1,2,3-Trichloropropane	ug/kg	<0.24 mg/kg	ND		30	
1,2,4-Trichlorobenzene	ug/kg	<0.059 mg/kg	ND		30	
1,2,4-Trimethylbenzene	ug/kg	0.14 mg/kg	202	36	30	D6
1,2-Dibromo-3-chloropropane	ug/kg	<0.59 mg/kg	ND		30	
1,2-Dibromoethane (EDB)	ug/kg	<0.059 mg/kg	ND		30	
1,2-Dichlorobenzene	ug/kg	<0.059 mg/kg	ND		30	
1,2-Dichloroethane	ug/kg	<0.059 mg/kg	ND		30	
1,2-Dichloropropane	ug/kg	<0.059 mg/kg	ND		30	
1,3,5-Trimethylbenzene	ug/kg	<0.059 mg/kg	35.7J		30	
1,3-Dichlorobenzene	ug/kg	<0.059 mg/kg	ND		30	
1,3-Dichloropropane	ug/kg	<0.059 mg/kg	ND		30	
1,4-Dichlorobenzene	ug/kg	<0.059 mg/kg	ND		30	
2,2-Dichloropropane	ug/kg	<0.24 mg/kg	ND		30	
2-Butanone (MEK)	ug/kg	<0.29 mg/kg	ND		30	
2-Chlorotoluene	ug/kg	<0.059 mg/kg	ND		30	
4-Chlorotoluene	ug/kg	<0.059 mg/kg	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	<0.29 mg/kg	ND		30	
Acetone	ug/kg	<1.2 mg/kg	ND		30	
Allyl chloride	ug/kg	<0.24 mg/kg	ND		30	
Benzene	ug/kg	0.035 mg/kg	52.0	39	30	D6
Bromobenzene	ug/kg	<0.059 mg/kg	ND		30	
Bromochloromethane	ug/kg	<0.059 mg/kg	ND		30	
Bromodichloromethane	ug/kg	<0.059 mg/kg	ND		30	
Bromoform	ug/kg	<0.24 mg/kg	ND		30	
Bromomethane	ug/kg	<0.59 mg/kg	ND		30	
Carbon tetrachloride	ug/kg	<0.059 mg/kg	ND		30	
Chlorobenzene	ug/kg	<0.059 mg/kg	ND		30	
Chloroethane	ug/kg	<0.59 mg/kg	ND		30	
Chloroform	ug/kg	<0.059 mg/kg	ND		30	
Chloromethane	ug/kg	<0.24 mg/kg	ND		30	
cis-1,2-Dichloroethene	ug/kg	<0.059 mg/kg	ND		30	
cis-1,3-Dichloropropene	ug/kg	<0.059 mg/kg	ND		30	
Dibromochloromethane	ug/kg	<0.24 mg/kg	ND		30	
Dibromomethane	ug/kg	<0.059 mg/kg	ND		30	
Dichlorodifluoromethane	ug/kg	<0.24 mg/kg	ND		30	
Dichlorofluoromethane	ug/kg	<0.59 mg/kg	ND		30	
Diethyl ether (Ethyl ether)	ug/kg	<0.24 mg/kg	ND		30	
Ethylbenzene	ug/kg	0.074 mg/kg	83.3	12	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

SAMPLE DUPLICATE: 2898024

Parameter	Units	10427374004 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	<0.29 mg/kg	ND		30	
Isopropylbenzene (Cumene)	ug/kg	<0.059 mg/kg	55.5J		30	
Methyl-tert-butyl ether	ug/kg	<0.059 mg/kg	ND		30	
Methylene Chloride	ug/kg	<0.24 mg/kg	30.8J		30	
n-Butylbenzene	ug/kg	<0.059 mg/kg	23.8J		30	
n-Propylbenzene	ug/kg	0.059 mg/kg	64.8	9	30	
Naphthalene	ug/kg	<0.24 mg/kg	292		30	
p-Isopropyltoluene	ug/kg	<0.059 mg/kg	18.7J		30	
sec-Butylbenzene	ug/kg	<0.059 mg/kg	22.1J		30	
Styrene	ug/kg	<0.059 mg/kg	ND		30	
tert-Butylbenzene	ug/kg	<0.059 mg/kg	ND		30	
Tetrachloroethene	ug/kg	<0.059 mg/kg	ND		30	
Tetrahydrofuran	ug/kg	<2.4 mg/kg	ND		30	
Toluene	ug/kg	0.20 mg/kg	247	19	30	
trans-1,2-Dichloroethene	ug/kg	<0.059 mg/kg	ND		30	
trans-1,3-Dichloropropene	ug/kg	<0.059 mg/kg	ND		30	
Trichloroethene	ug/kg	<0.059 mg/kg	ND		30	
Trichlorofluoromethane	ug/kg	<0.24 mg/kg	ND		30	
Vinyl chloride	ug/kg	<0.024 mg/kg	ND		30	
Xylene (Total)	ug/kg	0.46 mg/kg	588	24	30	
1,2-Dichloroethane-d4 (S)	%.	97	97	1		
4-Bromofluorobenzene (S)	%.	102	102	1		
Toluene-d8 (S)	%.	97	97	1		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 533615 Analysis Method: EPA 8260B
 QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
 Associated Lab Samples: 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2898727 Matrix: Solid
 Associated Lab Samples: 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	04/21/18 16:19	
1,1,1-Trichloroethane	ug/kg	ND	50.0	04/21/18 16:19	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	04/21/18 16:19	
1,1,2-Trichloroethane	ug/kg	ND	50.0	04/21/18 16:19	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	04/21/18 16:19	
1,1-Dichloroethane	ug/kg	ND	50.0	04/21/18 16:19	
1,1-Dichloroethene	ug/kg	ND	50.0	04/21/18 16:19	
1,1-Dichloropropene	ug/kg	ND	50.0	04/21/18 16:19	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	04/21/18 16:19	
1,2,3-Trichloropropane	ug/kg	ND	200	04/21/18 16:19	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	04/21/18 16:19	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	04/21/18 16:19	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	04/21/18 16:19	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	04/21/18 16:19	
1,2-Dichlorobenzene	ug/kg	ND	50.0	04/21/18 16:19	
1,2-Dichloroethane	ug/kg	ND	50.0	04/21/18 16:19	
1,2-Dichloropropane	ug/kg	ND	50.0	04/21/18 16:19	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	04/21/18 16:19	
1,3-Dichlorobenzene	ug/kg	ND	50.0	04/21/18 16:19	
1,3-Dichloropropane	ug/kg	ND	50.0	04/21/18 16:19	
1,4-Dichlorobenzene	ug/kg	ND	50.0	04/21/18 16:19	
2,2-Dichloropropane	ug/kg	ND	200	04/21/18 16:19	
2-Butanone (MEK)	ug/kg	ND	250	04/21/18 16:19	
2-Chlorotoluene	ug/kg	ND	50.0	04/21/18 16:19	
4-Chlorotoluene	ug/kg	ND	50.0	04/21/18 16:19	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	04/21/18 16:19	
Acetone	ug/kg	ND	1000	04/21/18 16:19	
Allyl chloride	ug/kg	ND	200	04/21/18 16:19	
Benzene	ug/kg	ND	20.0	04/21/18 16:19	
Bromobenzene	ug/kg	ND	50.0	04/21/18 16:19	
Bromochloromethane	ug/kg	ND	50.0	04/21/18 16:19	
Bromodichloromethane	ug/kg	ND	50.0	04/21/18 16:19	
Bromoform	ug/kg	ND	200	04/21/18 16:19	MN
Bromomethane	ug/kg	ND	500	04/21/18 16:19	
Carbon tetrachloride	ug/kg	ND	50.0	04/21/18 16:19	
Chlorobenzene	ug/kg	ND	50.0	04/21/18 16:19	
Chloroethane	ug/kg	ND	500	04/21/18 16:19	
Chloroform	ug/kg	ND	50.0	04/21/18 16:19	
Chloromethane	ug/kg	ND	200	04/21/18 16:19	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	04/21/18 16:19	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	04/21/18 16:19	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

METHOD BLANK: 2898727

Matrix: Solid

Associated Lab Samples: 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	04/21/18 16:19	
Dibromomethane	ug/kg	ND	50.0	04/21/18 16:19	
Dichlorodifluoromethane	ug/kg	ND	200	04/21/18 16:19	
Dichlorofluoromethane	ug/kg	ND	500	04/21/18 16:19	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	04/21/18 16:19	
Ethylbenzene	ug/kg	ND	50.0	04/21/18 16:19	
Hexachloro-1,3-butadiene	ug/kg	ND	250	04/21/18 16:19	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	04/21/18 16:19	
Methyl-tert-butyl ether	ug/kg	ND	50.0	04/21/18 16:19	
Methylene Chloride	ug/kg	ND	200	04/21/18 16:19	
n-Butylbenzene	ug/kg	ND	50.0	04/21/18 16:19	
n-Propylbenzene	ug/kg	ND	50.0	04/21/18 16:19	
Naphthalene	ug/kg	ND	200	04/21/18 16:19	
p-Isopropyltoluene	ug/kg	ND	50.0	04/21/18 16:19	
sec-Butylbenzene	ug/kg	ND	50.0	04/21/18 16:19	
Styrene	ug/kg	ND	50.0	04/21/18 16:19	
tert-Butylbenzene	ug/kg	ND	50.0	04/21/18 16:19	
Tetrachloroethene	ug/kg	ND	50.0	04/21/18 16:19	
Tetrahydrofuran	ug/kg	ND	2000	04/21/18 16:19	
Toluene	ug/kg	ND	50.0	04/21/18 16:19	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	04/21/18 16:19	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	04/21/18 16:19	
Trichloroethene	ug/kg	ND	50.0	04/21/18 16:19	
Trichlorofluoromethane	ug/kg	ND	200	04/21/18 16:19	
Vinyl chloride	ug/kg	ND	20.0	04/21/18 16:19	
Xylene (Total)	ug/kg	ND	150	04/21/18 16:19	
1,2-Dichloroethane-d4 (S)	%	96	75-125	04/21/18 16:19	
4-Bromofluorobenzene (S)	%	101	75-125	04/21/18 16:19	
Toluene-d8 (S)	%	97	75-125	04/21/18 16:19	

LABORATORY CONTROL SAMPLE & LCSD: 2898728

2898729

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	1080	1030	108	103	59-125	5	20	
1,1,1-Trichloroethane	ug/kg	1000	1120	1040	112	104	59-125	8	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	991	956	99	96	58-125	4	20	
1,1,2-Trichloroethane	ug/kg	1000	1030	970	103	97	64-125	6	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	1080	940	108	94	65-125	14	20	
1,1-Dichloroethane	ug/kg	1000	1060	968	106	97	63-125	9	20	
1,1-Dichloroethene	ug/kg	1000	1070	966	107	97	59-125	10	20	
1,1-Dichloropropene	ug/kg	1000	1230	1100	123	110	64-125	10	20	
1,2,3-Trichlorobenzene	ug/kg	1000	992	952	99	95	55-126	4	20	
1,2,3-Trichloropropane	ug/kg	1000	1000	966	100	97	62-125	3	20	
1,2,4-Trichlorobenzene	ug/kg	1000	1000	969	100	97	62-125	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE & LCSD: 2898728		2898729									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,2,4-Trimethylbenzene	ug/kg	1000	1000	961	100	96	59-125	4	20		
1,2-Dibromo-3-chloropropane	ug/kg	2500	2500	2400	100	96	54-125	4	20		
1,2-Dibromoethane (EDB)	ug/kg	1000	1120	1020	112	102	64-125	9	20		
1,2-Dichlorobenzene	ug/kg	1000	1030	972	103	97	63-125	5	20		
1,2-Dichloroethane	ug/kg	1000	983	905	98	90	57-125	8	20		
1,2-Dichloropropane	ug/kg	1000	1020	952	102	95	67-125	7	20		
1,3,5-Trimethylbenzene	ug/kg	1000	1020	982	102	98	59-125	4	20		
1,3-Dichlorobenzene	ug/kg	1000	1020	956	102	96	64-125	7	20		
1,3-Dichloropropane	ug/kg	1000	1020	969	102	97	64-125	5	20		
1,4-Dichlorobenzene	ug/kg	1000	961	927	96	93	63-125	4	20		
2,2-Dichloropropane	ug/kg	1000	1060	990	106	99	37-126	7	20		
2-Butanone (MEK)	ug/kg	5000	5780	5160	116	103	48-125	11	20		
2-Chlorotoluene	ug/kg	1000	1020	966	102	97	62-125	5	20		
4-Chlorotoluene	ug/kg	1000	1020	950	102	95	63-125	7	20		
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4950	4640	99	93	52-135	6	20		
Acetone	ug/kg	5000	6410	5530	128	111	65-125	15	20	L3	
Allyl chloride	ug/kg	1000	1050	946	105	95	52-125	11	20		
Benzene	ug/kg	1000	1070	989	107	99	61-125	8	20		
Bromobenzene	ug/kg	1000	1080	1020	108	102	64-125	6	20		
Bromochloromethane	ug/kg	1000	1070	934	107	93	65-125	14	20		
Bromodichloromethane	ug/kg	1000	1090	1010	109	101	57-125	7	20		
Bromoform	ug/kg	1000	1070	1000	107	100	57-125	7	20		
Bromomethane	ug/kg	1000	887	802	89	80	60-125	10	20		
Carbon tetrachloride	ug/kg	1000	1120	1030	112	103	58-125	9	20		
Chlorobenzene	ug/kg	1000	1030	955	103	95	66-125	8	20		
Chloroethane	ug/kg	1000	898	849	90	85	62-125	6	20		
Chloroform	ug/kg	1000	997	901	100	90	59-125	10	20		
Chloromethane	ug/kg	1000	831	776	83	78	50-125	7	20		
cis-1,2-Dichloroethene	ug/kg	1000	1050	952	105	95	61-125	10	20		
cis-1,3-Dichloropropene	ug/kg	1000	1100	1030	110	103	61-125	7	20		
Dibromochloromethane	ug/kg	1000	1010	943	101	94	60-125	7	20		
Dibromomethane	ug/kg	1000	1110	1000	111	100	69-125	11	20		
Dichlorodifluoromethane	ug/kg	1000	717	630	72	63	38-125	13	20		
Dichlorofluoromethane	ug/kg	1000	1000	883	100	88	67-125	12	20		
Diethyl ether (Ethyl ether)	ug/kg	1000	2280	2050	228	205	60-125	11	20	L3,SS	
Ethylbenzene	ug/kg	1000	1070	989	107	99	62-125	8	20		
Hexachloro-1,3-butadiene	ug/kg	1000	1070	1010	107	101	56-125	5	20		
Isopropylbenzene (Cumene)	ug/kg	1000	1100	1030	110	103	65-125	6	20		
Methyl-tert-butyl ether	ug/kg	1000	965	891	97	89	59-125	8	20		
Methylene Chloride	ug/kg	1000	978	908	98	91	64-125	7	20		
n-Butylbenzene	ug/kg	1000	1050	1020	105	102	59-125	3	20		
n-Propylbenzene	ug/kg	1000	1060	987	106	99	61-125	7	20		
Naphthalene	ug/kg	1000	995	970	99	97	53-125	3	20		
p-Isopropyltoluene	ug/kg	1000	1060	1000	106	100	63-125	6	20		
sec-Butylbenzene	ug/kg	1000	1020	980	102	98	62-125	4	20		
Styrene	ug/kg	1000	1030	994	103	99	66-125	3	20		
tert-Butylbenzene	ug/kg	1000	1030	984	103	98	64-125	4	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE & LCSD: 2898728

2898729

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Tetrachloroethene	ug/kg	1000	1130	1030	113	103	67-125	10	20	
Tetrahydrofuran	ug/kg	10000	10600	9790	106	98	62-125	8	20	
Toluene	ug/kg	1000	988	931	99	93	61-125	6	20	
trans-1,2-Dichloroethene	ug/kg	1000	1110	1010	111	101	64-125	10	20	
trans-1,3-Dichloropropene	ug/kg	1000	1060	1000	106	100	56-125	6	20	
Trichloroethene	ug/kg	1000	1130	1030	113	103	67-125	9	20	
Trichlorofluoromethane	ug/kg	1000	1050	949	105	95	65-125	10	20	
Vinyl chloride	ug/kg	1000	964	875	96	88	57-125	10	20	
Xylene (Total)	ug/kg	3000	3080	2900	103	97	62-125	6	20	
1,2-Dichloroethane-d4 (S)	%				97	98	75-125			
4-Bromofluorobenzene (S)	%				97	100	75-125			
Toluene-d8 (S)	%				99	100	75-125			

MATRIX SPIKE SAMPLE: 2898730

Parameter	Units	10427790001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	1130	1150	102	64-146	
1,1,1-Trichloroethane	ug/kg	ND	1130	1230	109	56-148	
1,1,2,2-Tetrachloroethane	ug/kg	ND	1130	1240	110	36-150	
1,1,2-Trichloroethane	ug/kg	ND	1130	1190	106	67-148	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	1130	1160	103	60-142	
1,1-Dichloroethane	ug/kg	ND	1130	1270	113	57-140	
1,1-Dichloroethene	ug/kg	ND	1130	1270	113	59-139	
1,1-Dichloropropene	ug/kg	ND	1130	1240	111	61-142	
1,2,3-Trichlorobenzene	ug/kg	ND	1130	1090	97	69-150	
1,2,3-Trichloropropane	ug/kg	ND	1130	1170	104	64-150	
1,2,4-Trichlorobenzene	ug/kg	ND	1130	1130	101	71-149	
1,2,4-Trimethylbenzene	ug/kg	ND	1130	1160	103	67-149	
1,2-Dibromo-3-chloropropane	ug/kg	ND	2810	2470	88	61-150	
1,2-Dibromoethane (EDB)	ug/kg	ND	1130	1170	105	67-147	
1,2-Dichlorobenzene	ug/kg	ND	1130	1120	100	70-142	
1,2-Dichloroethane	ug/kg	ND	1130	1140	102	58-132	
1,2-Dichloropropane	ug/kg	ND	1130	1260	112	64-144	
1,3,5-Trimethylbenzene	ug/kg	ND	1130	1210	108	71-146	
1,3-Dichlorobenzene	ug/kg	ND	1130	1100	98	71-142	
1,3-Dichloropropane	ug/kg	ND	1130	1180	105	68-140	
1,4-Dichlorobenzene	ug/kg	ND	1130	1130	101	68-142	
2,2-Dichloropropane	ug/kg	ND	1130	1330	118	34-150	
2-Butanone (MEK)	ug/kg	ND	5620	6160	110	51-150	
2-Chlorotoluene	ug/kg	ND	1130	1100	98	66-144	
4-Chlorotoluene	ug/kg	ND	1130	1150	102	66-140	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	5620	6050	108	63-150	
Acetone	ug/kg	ND	5620	6420	114	54-150	
Allyl chloride	ug/kg	ND	1130	1310	117	53-135	
Benzene	ug/kg	ND	1130	1250	111	65-135	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

MATRIX SPIKE SAMPLE: 2898730		10427790001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/kg	ND	1130	1150	102	71-141	
Bromochloromethane	ug/kg	ND	1130	1210	107	62-145	
Bromodichloromethane	ug/kg	ND	1130	1200	107	59-148	
Bromoform	ug/kg	ND	1130	994	88	57-145	
Bromomethane	ug/kg	ND	1130	1090	97	51-129	
Carbon tetrachloride	ug/kg	ND	1130	1200	107	55-144	
Chlorobenzene	ug/kg	ND	1130	1150	102	70-142	
Chloroethane	ug/kg	ND	1130	1160	103	61-135	
Chloroform	ug/kg	ND	1130	1130	100	58-135	
Chloromethane	ug/kg	ND	1130	1100	98	37-125	
cis-1,2-Dichloroethene	ug/kg	ND	1130	1210	107	60-138	
cis-1,3-Dichloropropene	ug/kg	ND	1130	1220	109	62-142	
Dibromochloromethane	ug/kg	ND	1130	1050	93	65-141	
Dibromomethane	ug/kg	ND	1130	1180	105	72-150	
Dichlorodifluoromethane	ug/kg	ND	1130	785	70	30-125	
Dichlorofluoromethane	ug/kg	ND	1130	1090	97	62-148	
Diethyl ether (Ethyl ether)	ug/kg	ND	1130	2490	221	62-135	M0,SS
Ethylbenzene	ug/kg	ND	1130	1170	104	72-138	
Hexachloro-1,3-butadiene	ug/kg	ND	1130	1030	91	38-150	
Isopropylbenzene (Cumene)	ug/kg	ND	1130	1240	110	75-148	
Methyl-tert-butyl ether	ug/kg	ND	1130	1250	112	63-139	
Methylene Chloride	ug/kg	ND	1130	1280	114	58-135	
n-Butylbenzene	ug/kg	ND	1130	1210	108	63-150	
n-Propylbenzene	ug/kg	ND	1130	1200	107	70-146	
Naphthalene	ug/kg	ND	1130	1170	104	63-150	
p-Isopropyltoluene	ug/kg	ND	1130	1190	106	72-150	
sec-Butylbenzene	ug/kg	ND	1130	1250	111	66-150	
Styrene	ug/kg	ND	1130	1220	109	72-146	
tert-Butylbenzene	ug/kg	ND	1130	1170	104	71-148	
Tetrachloroethene	ug/kg	ND	1130	1180	105	70-150	
Tetrahydrofuran	ug/kg	ND	11300	12900	115	62-150	
Toluene	ug/kg	ND	1130	1180	105	65-142	
trans-1,2-Dichloroethene	ug/kg	ND	1130	1290	115	55-141	
trans-1,3-Dichloropropene	ug/kg	ND	1130	1210	107	57-147	
Trichloroethene	ug/kg	ND	1130	1210	108	62-150	
Trichlorofluoromethane	ug/kg	ND	1130	1080	96	51-150	
Vinyl chloride	ug/kg	ND	1130	1160	103	45-132	
Xylene (Total)	ug/kg	ND	3370	3640	108	75-140	
1,2-Dichloroethane-d4 (S)	%					99	75-125
4-Bromofluorobenzene (S)	%					103	75-125
Toluene-d8 (S)	%					98	75-125

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

SAMPLE DUPLICATE: 2898731

Parameter	Units	10427790002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,1-Trichloroethane	ug/kg	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,2-Trichloroethane	ug/kg	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	ND		30	
1,1-Dichloroethane	ug/kg	ND	ND		30	
1,1-Dichloroethene	ug/kg	ND	ND		30	
1,1-Dichloropropene	ug/kg	ND	ND		30	
1,2,3-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,3-Trichloropropane	ug/kg	ND	ND		30	
1,2,4-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,4-Trimethylbenzene	ug/kg	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/kg	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	ND		30	
1,2-Dichlorobenzene	ug/kg	ND	ND		30	
1,2-Dichloroethane	ug/kg	ND	ND		30	
1,2-Dichloropropane	ug/kg	ND	ND		30	
1,3,5-Trimethylbenzene	ug/kg	ND	ND		30	
1,3-Dichlorobenzene	ug/kg	ND	ND		30	
1,3-Dichloropropane	ug/kg	ND	ND		30	
1,4-Dichlorobenzene	ug/kg	ND	ND		30	
2,2-Dichloropropane	ug/kg	ND	ND		30	
2-Butanone (MEK)	ug/kg	ND	ND		30	
2-Chlorotoluene	ug/kg	ND	ND		30	
4-Chlorotoluene	ug/kg	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND		30	
Acetone	ug/kg	ND	ND		30	
Allyl chloride	ug/kg	ND	ND		30	
Benzene	ug/kg	ND	ND		30	
Bromobenzene	ug/kg	ND	ND		30	
Bromochloromethane	ug/kg	ND	ND		30	
Bromodichloromethane	ug/kg	ND	ND		30	
Bromoform	ug/kg	ND	ND		30	
Bromomethane	ug/kg	ND	ND		30	
Carbon tetrachloride	ug/kg	ND	ND		30	
Chlorobenzene	ug/kg	ND	ND		30	
Chloroethane	ug/kg	ND	ND		30	
Chloroform	ug/kg	ND	ND		30	
Chloromethane	ug/kg	ND	ND		30	
cis-1,2-Dichloroethene	ug/kg	ND	ND		30	
cis-1,3-Dichloropropene	ug/kg	ND	ND		30	
Dibromochloromethane	ug/kg	ND	ND		30	
Dibromomethane	ug/kg	ND	ND		30	
Dichlorodifluoromethane	ug/kg	ND	ND		30	
Dichlorofluoromethane	ug/kg	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/kg	ND	ND		30	
Ethylbenzene	ug/kg	ND	ND		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

SAMPLE DUPLICATE: 2898731

Parameter	Units	10427790002 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	ND	ND		30	
Isopropylbenzene (Cumene)	ug/kg	ND	ND		30	
Methyl-tert-butyl ether	ug/kg	ND	ND		30	
Methylene Chloride	ug/kg	ND	ND		30	
n-Butylbenzene	ug/kg	ND	ND		30	
n-Propylbenzene	ug/kg	ND	ND		30	
Naphthalene	ug/kg	ND	ND		30	
p-Isopropyltoluene	ug/kg	ND	ND		30	
sec-Butylbenzene	ug/kg	ND	ND		30	
Styrene	ug/kg	ND	ND		30	
tert-Butylbenzene	ug/kg	ND	ND		30	
Tetrachloroethene	ug/kg	ND	ND		30	
Tetrahydrofuran	ug/kg	ND	ND		30	
Toluene	ug/kg	ND	ND		30	
trans-1,2-Dichloroethene	ug/kg	ND	ND		30	
trans-1,3-Dichloropropene	ug/kg	ND	ND		30	
Trichloroethene	ug/kg	ND	ND		30	
Trichlorofluoromethane	ug/kg	ND	ND		30	
Vinyl chloride	ug/kg	ND	ND		30	
Xylene (Total)	ug/kg	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	97	97	1		
4-Bromofluorobenzene (S)	%.	99	101	1		
Toluene-d8 (S)	%.	97	97	1		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 532491 Analysis Method: EPA 8081B
 QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2891843 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/16/18 21:16	
4,4'-DDE	ug/kg	ND	3.3	04/16/18 21:16	
4,4'-DDT	ug/kg	ND	3.3	04/16/18 21:16	
Aldrin	ug/kg	ND	1.7	04/16/18 21:16	
alpha-BHC	ug/kg	ND	1.7	04/16/18 21:16	
alpha-Chlordane	ug/kg	ND	1.7	04/16/18 21:16	
beta-BHC	ug/kg	ND	1.7	04/16/18 21:16	
Chlordane (Technical)	ug/kg	ND	16.7	04/16/18 21:16	
delta-BHC	ug/kg	ND	1.7	04/16/18 21:16	
Dieldrin	ug/kg	ND	3.3	04/16/18 21:16	
Endosulfan I	ug/kg	ND	1.7	04/16/18 21:16	
Endosulfan II	ug/kg	ND	3.3	04/16/18 21:16	
Endosulfan sulfate	ug/kg	ND	3.3	04/16/18 21:16	
Endrin	ug/kg	ND	3.3	04/16/18 21:16	
Endrin aldehyde	ug/kg	ND	3.3	04/16/18 21:16	
Endrin ketone	ug/kg	ND	3.3	04/16/18 21:16	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/16/18 21:16	
gamma-Chlordane	ug/kg	ND	1.7	04/16/18 21:16	
Heptachlor	ug/kg	ND	1.7	04/16/18 21:16	
Heptachlor epoxide	ug/kg	ND	1.7	04/16/18 21:16	
Methoxychlor	ug/kg	ND	16.7	04/16/18 21:16	
Toxaphene	ug/kg	ND	50.0	04/16/18 21:16	
Decachlorobiphenyl (S)	%	96	30-150	04/16/18 21:16	
Tetrachloro-m-xylene (S)	%	98	30-150	04/16/18 21:16	

LABORATORY CONTROL SAMPLE: 2891844

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	33.5	100	62-127	
4,4'-DDE	ug/kg	33.3	33.3	100	66-125	
4,4'-DDT	ug/kg	33.3	33.6	101	67-128	
Aldrin	ug/kg	16.7	15.1	91	66-125	
alpha-BHC	ug/kg	16.7	16.1	96	64-125	
alpha-Chlordane	ug/kg	16.7	15.5	93	68-125	
beta-BHC	ug/kg	16.7	15.4	93	69-125	
delta-BHC	ug/kg	16.7	13.0	78	42-133	
Dieldrin	ug/kg	33.3	34.2	103	69-126	
Endosulfan I	ug/kg	16.7	14.2	85	63-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE: 2891844

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endosulfan II	ug/kg	33.3	33.0	99	69-125	
Endosulfan sulfate	ug/kg	33.3	28.8	87	56-137	
Endrin	ug/kg	33.3	31.5	95	69-125	
Endrin aldehyde	ug/kg	33.3	31.4	94	65-125	
Endrin ketone	ug/kg	33.3	33.1	99	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	15.9	95	67-125	
gamma-Chlordane	ug/kg	16.7	14.0	84	63-125	
Heptachlor	ug/kg	16.7	16.2	97	69-125	
Heptachlor epoxide	ug/kg	16.7	15.5	93	68-125	
Methoxychlor	ug/kg	167	163	98	65-134	
Decachlorobiphenyl (S)	%			94	30-150	
Tetrachloro-m-xylene (S)	%			98	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891845 2891846

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10427018001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
4,4'-DDD	ug/kg	ND	50.7	50.5	53.3	56.7	105	112	56-125	6	20	
4,4'-DDE	ug/kg	ND	50.7	50.5	56.1	55.9	111	110	32-150	0	20	
4,4'-DDT	ug/kg	ND	50.7	50.5	54.8	52.9	108	105	60-132	4	20	
Aldrin	ug/kg	ND	25.4	25.3	20J	21.5J	79	85	56-125		20	
alpha-BHC	ug/kg	ND	25.4	25.3	25.2J	24.3J	99	96	54-136		20	
alpha-Chlordane	ug/kg	ND	25.4	25.3	25.7	28.8	101	114	54-133	12	20	
beta-BHC	ug/kg	ND	25.4	25.3	26.7	26.6	105	105	30-150	0	20	
delta-BHC	ug/kg	ND	25.4	25.3	17.1J	18.7J	68	74	45-145		20	
Dieldrin	ug/kg	ND	50.7	50.5	63.9	54.7	126	108	47-150	15	20	
Endosulfan I	ug/kg	ND	25.4	25.3	24.1J	24.4J	95	97	35-145		20	
Endosulfan II	ug/kg	ND	50.7	50.5	46.4J	49.1J	92	97	50-147		20	
Endosulfan sulfate	ug/kg	ND	50.7	50.5	39.2J	44J	77	87	54-132		20	
Endrin	ug/kg	ND	50.7	50.5	41.8J	44.2J	82	87	62-125		20	
Endrin aldehyde	ug/kg	ND	50.7	50.5	45.3J	48.8J	89	97	33-150		20	
Endrin ketone	ug/kg	ND	50.7	50.5	45.9J	49.7J	91	98	56-144		20	
gamma-BHC (Lindane)	ug/kg	ND	25.4	25.3	23.7J	25.1J	94	99	63-125		20	
gamma-Chlordane	ug/kg	ND	25.4	25.3	21.9J	23.2J	86	92	45-132		20	
Heptachlor	ug/kg	ND	25.4	25.3	21.1J	23.1J	83	91	51-142		20	
Heptachlor epoxide	ug/kg	ND	25.4	25.3	14.1J	25.5	56	101	50-142		20	
Methoxychlor	ug/kg	ND	254	253	278	283	109	112	58-139	2	20	
Decachlorobiphenyl (S)	%						0	0	30-150			S4
Tetrachloro-m-xylene (S)	%						0	0	30-150			4M, D3, S4

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427018

QC Batch: 532316 Analysis Method: EPA 8082A
QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2890749 Matrix: Solid
Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/16/18 15:30	
Decachlorobiphenyl (S)	%.	90	30-134	04/16/18 15:30	
Tetrachloro-m-xylene (S)	%.	89	48-125	04/16/18 15:30	

LABORATORY CONTROL SAMPLE: 2890750

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	578	87	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	588	88	62-125	
Decachlorobiphenyl (S)	%.			97	30-134	
Tetrachloro-m-xylene (S)	%.			97	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2890820 2890821

Parameter	Units	10427018004		2890820		2890821		% Rec	% Rec	% Rec	Limits	RPD	RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.							
PCB-1016 (Aroclor 1016)	ug/kg	ND	779	782	625	654	80	84	30-150	5	30			
PCB-1260 (Aroclor 1260)	ug/kg	ND	779	782	650	643	83	82	30-138	1	30			
Decachlorobiphenyl (S)	%.						80	76	30-134					
Tetrachloro-m-xylene (S)	%.						80	80	48-125					

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 532275 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10427018001, 10427018002, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2890574 Matrix: Solid
Associated Lab Samples: 10427018001, 10427018002, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/18/18 16:57	
1,2-Dichlorobenzene	ug/kg	ND	330	04/18/18 16:57	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/18/18 16:57	
1,3-Dichlorobenzene	ug/kg	ND	330	04/18/18 16:57	
1,4-Dichlorobenzene	ug/kg	ND	330	04/18/18 16:57	
1-Methylnaphthalene	ug/kg	ND	330	04/18/18 16:57	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/18/18 16:57	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/18/18 16:57	
2,4-Dichlorophenol	ug/kg	ND	330	04/18/18 16:57	
2,4-Dimethylphenol	ug/kg	ND	330	04/18/18 16:57	
2,4-Dinitrophenol	ug/kg	ND	330	04/18/18 16:57	
2,4-Dinitrotoluene	ug/kg	ND	330	04/18/18 16:57	
2,6-Dinitrotoluene	ug/kg	ND	330	04/18/18 16:57	
2-Chloronaphthalene	ug/kg	ND	330	04/18/18 16:57	
2-Chlorophenol	ug/kg	ND	330	04/18/18 16:57	
2-Methylnaphthalene	ug/kg	ND	330	04/18/18 16:57	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/18/18 16:57	
2-Nitroaniline	ug/kg	ND	330	04/18/18 16:57	
2-Nitrophenol	ug/kg	ND	330	04/18/18 16:57	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/18/18 16:57	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/18/18 16:57	
3-Nitroaniline	ug/kg	ND	330	04/18/18 16:57	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/18/18 16:57	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/18/18 16:57	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/18/18 16:57	
4-Chloroaniline	ug/kg	ND	330	04/18/18 16:57	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/18/18 16:57	
4-Nitroaniline	ug/kg	ND	330	04/18/18 16:57	
4-Nitrophenol	ug/kg	ND	330	04/18/18 16:57	
Acenaphthene	ug/kg	ND	330	04/18/18 16:57	
Acenaphthylene	ug/kg	ND	330	04/18/18 16:57	
Anthracene	ug/kg	ND	330	04/18/18 16:57	
Benzo(a)anthracene	ug/kg	ND	330	04/18/18 16:57	
Benzo(a)pyrene	ug/kg	ND	330	04/18/18 16:57	
Benzo(b)fluoranthene	ug/kg	ND	330	04/18/18 16:57	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/18/18 16:57	
Benzo(k)fluoranthene	ug/kg	ND	330	04/18/18 16:57	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/18/18 16:57	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/18/18 16:57	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/18/18 16:57	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/18/18 16:57	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427018

METHOD BLANK: 2890574 Matrix: Solid
Associated Lab Samples: 10427018001, 10427018002, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/18/18 16:57	
Carbazole	ug/kg	ND	330	04/18/18 16:57	
Chrysene	ug/kg	ND	330	04/18/18 16:57	
Di-n-butylphthalate	ug/kg	ND	330	04/18/18 16:57	
Di-n-octylphthalate	ug/kg	ND	330	04/18/18 16:57	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/18/18 16:57	
Dibenzofuran	ug/kg	ND	330	04/18/18 16:57	
Diethylphthalate	ug/kg	ND	330	04/18/18 16:57	
Dimethylphthalate	ug/kg	ND	330	04/18/18 16:57	
Fluoranthene	ug/kg	ND	330	04/18/18 16:57	
Fluorene	ug/kg	ND	330	04/18/18 16:57	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/18/18 16:57	
Hexachlorobenzene	ug/kg	ND	330	04/18/18 16:57	
Hexachloroethane	ug/kg	ND	330	04/18/18 16:57	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/18/18 16:57	
Isophorone	ug/kg	ND	330	04/18/18 16:57	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/18/18 16:57	
N-Nitrosodimethylamine	ug/kg	ND	330	04/18/18 16:57	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/18/18 16:57	
Naphthalene	ug/kg	ND	330	04/18/18 16:57	
Nitrobenzene	ug/kg	ND	330	04/18/18 16:57	
Pentachlorophenol	ug/kg	ND	670	04/18/18 16:57	
Phenanthrene	ug/kg	ND	330	04/18/18 16:57	
Phenol	ug/kg	ND	330	04/18/18 16:57	
Pyrene	ug/kg	ND	330	04/18/18 16:57	
2,4,6-Tribromophenol (S)	%	77	60-125	04/18/18 16:57	
2-Fluorobiphenyl (S)	%	79	30-132	04/18/18 16:57	
2-Fluorophenol (S)	%	72	40-125	04/18/18 16:57	
Nitrobenzene-d5 (S)	%	71	43-125	04/18/18 16:57	
p-Terphenyl-d14 (S)	%	86	62-125	04/18/18 16:57	
Phenol-d6 (S)	%	72	48-125	04/18/18 16:57	

LABORATORY CONTROL SAMPLE: 2890575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	983	59	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1010	61	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1320	79	63-125	
1,3-Dichlorobenzene	ug/kg	1670	980	59	38-125	
1,4-Dichlorobenzene	ug/kg	1670	984	59	39-125	
1-Methylnaphthalene	ug/kg	1670	1190	72	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1340	81	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1340	80	61-125	
2,4-Dichlorophenol	ug/kg	1670	1230	74	57-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE: 2890575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1140	69	51-125	
2,4-Dinitrophenol	ug/kg	1670	1290	78	30-132	6M
2,4-Dinitrotoluene	ug/kg	1670	1580	95	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1490	89	63-125	
2-Chloronaphthalene	ug/kg	1670	1310	79	61-125	
2-Chlorophenol	ug/kg	1670	987	59	46-125	
2-Methylnaphthalene	ug/kg	1670	1160	70	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1070	64	50-125	
2-Nitroaniline	ug/kg	1670	1330	80	61-125	
2-Nitrophenol	ug/kg	1670	1110	66	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1150	69	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1260	75	47-125	
3-Nitroaniline	ug/kg	1670	1270	76	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1540J	93	30-141	6M
4-Bromophenylphenyl ether	ug/kg	1670	1380	83	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1360	82	64-125	
4-Chloroaniline	ug/kg	1670	853	51	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1390	83	64-125	
4-Nitroaniline	ug/kg	1670	1290	77	59-125	
4-Nitrophenol	ug/kg	1670	1300	78	54-125	
Acenaphthene	ug/kg	1670	1320	79	62-125	
Acenaphthylene	ug/kg	1670	1320	79	61-125	
Anthracene	ug/kg	1670	1360	81	66-125	
Benzo(a)anthracene	ug/kg	1670	1410	84	69-125	
Benzo(a)pyrene	ug/kg	1670	1410	85	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1410	85	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1470	88	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1440	87	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1070	64	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	914	55	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	773	46	37-125	6M
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1530	92	69-131	
Butylbenzylphthalate	ug/kg	1670	1500	90	69-129	
Carbazole	ug/kg	1670	1430	86	66-125	
Chrysene	ug/kg	1670	1430	86	68-125	
Di-n-butylphthalate	ug/kg	1670	1510	90	69-125	
Di-n-octylphthalate	ug/kg	1670	1580	95	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1510	91	64-125	
Dibenzofuran	ug/kg	1670	1410	84	65-125	
Diethylphthalate	ug/kg	1670	1450	87	67-125	
Dimethylphthalate	ug/kg	1670	1440	86	67-125	
Fluoranthene	ug/kg	1670	1430	86	66-125	
Fluorene	ug/kg	1670	1390	83	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	951	57	40-125	
Hexachlorobenzene	ug/kg	1670	1400	84	62-125	
Hexachloroethane	ug/kg	1670	939	56	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1490	90	64-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE: 2890575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1170	70	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1090	65	50-125	
N-Nitrosodimethylamine	ug/kg	1670	956	57	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1390	84	65-125	
Naphthalene	ug/kg	1670	1040	62	48-125	
Nitrobenzene	ug/kg	1670	984	59	48-125	
Pentachlorophenol	ug/kg	1670	1300	78	41-125	
Phenanthrene	ug/kg	1670	1350	81	66-125	
Phenol	ug/kg	1670	1000	60	46-125	
Pyrene	ug/kg	1670	1420	85	69-125	
2,4,6-Tribromophenol (S)	%			84	60-125	
2-Fluorobiphenyl (S)	%			69	30-132	
2-Fluorophenol (S)	%			52	40-125	
Nitrobenzene-d5 (S)	%			53	43-125	
p-Terphenyl-d14 (S)	%			85	62-125	
Phenol-d6 (S)	%			57	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2890607 2890608

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427018008 Result	Spike Conc.	Spike Conc.	Result								
1,2,4-Trichlorobenzene	ug/kg	ND	1940	1950	1400J	1390J	73	71	30-127		30		
1,2-Dichlorobenzene	ug/kg	ND	1940	1950	1330J	1150J	69	59	30-125		30		
1,2-Diphenylhydrazine	ug/kg	ND	1940	1950	1410J	1360J	73	70	30-150		30		
1,3-Dichlorobenzene	ug/kg	ND	1940	1950	1270J	1060J	66	54	30-125		30		
1,4-Dichlorobenzene	ug/kg	ND	1940	1950	1280J	1100J	66	57	30-125		30		
1-Methylnaphthalene	ug/kg	ND	1940	1950	1560J	1520J	79	76	42-125		30		
2,4,5-Trichlorophenol	ug/kg	ND	1940	1950	1400J	1400J	73	72	30-150		30		
2,4,6-Trichlorophenol	ug/kg	ND	1940	1950	1450J	1420J	75	73	30-150		30		
2,4-Dichlorophenol	ug/kg	ND	1940	1950	1490J	1420J	77	73	30-135		30		
2,4-Dimethylphenol	ug/kg	ND	1940	1950	1540J	1470J	79	76	30-148		30		
2,4-Dinitrophenol	ug/kg	ND	1940	1950	ND	ND	0	0	30-125		30	M1	
2,4-Dinitrotoluene	ug/kg	ND	1940	1950	1030J	818J	53	42	30-150		30		
2,6-Dinitrotoluene	ug/kg	ND	1940	1950	1150J	1010J	60	52	30-150		30		
2-Chloronaphthalene	ug/kg	ND	1940	1950	1460J	1430J	76	74	30-138		30		
2-Chlorophenol	ug/kg	ND	1940	1950	1480J	1380J	76	71	30-130		30		
2-Methylnaphthalene	ug/kg	ND	1940	1950	1570J	1510J	79	76	46-125		30		
2-Methylphenol(o-Cresol)	ug/kg	ND	1940	1950	1440J	1440J	75	74	30-133		30		
2-Nitroaniline	ug/kg	ND	1940	1950	1610J	1580J	83	81	30-150		30		
2-Nitrophenol	ug/kg	ND	1940	1950	813J	ND	42	31	30-134		30		
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	1940	1950	1460J	1380J	75	71	30-138		30		
3,3'-Dichlorobenzidine	ug/kg	ND	1940	1950	ND	ND	32	41	30-149		30		
3-Nitroaniline	ug/kg	ND	1940	1950	1780J	1750J	92	90	30-150		30		
4,6-Dinitro-2-methylphenol	ug/kg	ND	1940	1950	ND	ND	0	0	30-133		30	M1	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2890607			2890608								
Parameter	Units	10427018008 Result	MS	MSD	MS	MSD	MS	MSD	% Rec Limits	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec			
4-Bromophenylphenyl ether	ug/kg	ND	1940	1950	1520J	1460J	79	75	44-125	30	
4-Chloro-3-methylphenol	ug/kg	ND	1940	1950	1490J	1440J	77	74	30-150	30	
4-Chloroaniline	ug/kg	ND	1940	1950	ND	ND	49	46	30-125	30	
4-Chlorophenylphenyl ether	ug/kg	ND	1940	1950	1530J	1440J	79	74	44-125	30	
4-Nitroaniline	ug/kg	ND	1940	1950	1670J	1750J	86	90	30-150	30	
4-Nitrophenol	ug/kg	ND	1940	1950	ND	1280J	47	66	30-150	30	
Acenaphthene	ug/kg	ND	1940	1950	1540J	1790J	80	92	40-125	30	
Acenaphthylene	ug/kg	ND	1940	1950	1560J	1460J	81	75	30-150	30	
Anthracene	ug/kg	ND	1940	1950	1650J	2080J	77	99	30-150	30	
Benzo(a)anthracene	ug/kg	ND	1940	1950	1910J	3050J	78	136	30-150	30	
Benzo(a)pyrene	ug/kg	ND	1940	1950	1810J	2600J	94	134	30-150	30	
Benzo(b)fluoranthene	ug/kg	ND	1940	1950	1910J	2960J	99	152	30-150	30	M1
Benzo(g,h,i)perylene	ug/kg	ND	1940	1950	1930J	2310J	99	119	30-150	30	
Benzo(k)fluoranthene	ug/kg	ND	1940	1950	1630J	2200J	84	113	30-150	30	
bis(2-Chloroethoxy)methane	ug/kg	ND	1940	1950	1420J	1370J	73	70	30-134	30	
bis(2-Chloroethyl) ether	ug/kg	ND	1940	1950	1210J	1180J	62	61	30-125	30	
bis(2-Chloroisopropyl) ether	ug/kg	ND	1940	1950	1150J	1050J	59	54	30-125	30	6M
bis(2-Ethylhexyl)phthalate	ug/kg	ND	1940	1950	3800J	2960J	76	33	30-150	30	
Butylbenzylphthalate	ug/kg	ND	1940	1950	1790J	1760J	93	91	30-150	30	
Carbazole	ug/kg	ND	1940	1950	1650J	1960J	82	98	41-125	30	
Chrysene	ug/kg	ND	1940	1950	2000J	3120J	82	139	30-150	30	
Di-n-butylphthalate	ug/kg	ND	1940	1950	2730J	1930J	141	99	30-150	30	
Di-n-octylphthalate	ug/kg	ND	1940	1950	1870J	1770J	96	91	30-150	30	
Dibenz(a,h)anthracene	ug/kg	ND	1940	1950	1570J	1660J	81	85	30-150	30	
Dibenzofuran	ug/kg	ND	1940	1950	1620J	1590J	84	82	45-125	30	
Diethylphthalate	ug/kg	ND	1940	1950	1530J	1530J	79	79	30-150	30	
Dimethylphthalate	ug/kg	ND	1940	1950	1600J	1500J	82	77	30-150	30	
Fluoranthene	ug/kg	ND	1940	1950	2260J	5090	76	221	30-150	30	M1
Fluorene	ug/kg	ND	1940	1950	1660J	1740J	77	81	30-150	30	
Hexachloro-1,3-butadiene	ug/kg	ND	1940	1950	1420J	1230J	73	63	30-128	30	
Hexachlorobenzene	ug/kg	ND	1940	1950	1570J	1500J	81	77	30-150	30	
Hexachloroethane	ug/kg	ND	1940	1950	ND	ND	41	26	30-125	30	M1
Indeno(1,2,3-cd)pyrene	ug/kg	ND	1940	1950	1690J	2080J	88	107	30-150	30	
Isophorone	ug/kg	ND	1940	1950	1440J	1380J	74	71	30-140	30	
N-Nitroso-di-n-propylamine	ug/kg	ND	1940	1950	1410J	1300J	73	67	30-147	30	
N-Nitrosodimethylamine	ug/kg	ND	1940	1950	ND	ND	52	45	30-125	30	
N-Nitrosodiphenylamine	ug/kg	ND	1940	1950	1760J	1700J	91	87	30-150	30	
Naphthalene	ug/kg	ND	1940	1950	1470J	1460J	76	75	44-125	30	
Nitrobenzene	ug/kg	ND	1940	1950	1290J	1270J	67	65	30-136	30	
Pentachlorophenol	ug/kg	ND	1940	1950	ND	ND	56	48	30-150	30	
Phenanthrene	ug/kg	ND	1940	1950	2210J	4090	53	150	30-150	30	
Phenol	ug/kg	ND	1940	1950	1380J	1340J	71	69	30-129	30	
Pyrene	ug/kg	ND	1940	1950	2560J	5020	76	203	30-150	30	M1
2,4,6-Tribromophenol (S)	%						64	68	60-125		
2-Fluorobiphenyl (S)	%						61	64	30-132		
2-Fluorophenol (S)	%						54	56	40-125		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Parameter	Units	2890607		2890608		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					
Nitrobenzene-d5 (S)	%.	10427018008 Result				50	52	43-125		P3
p-Terphenyl-d14 (S)	%.					79	78	62-125		
Phenol-d6 (S)	%.					59	57	48-125		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 533467

Analysis Method: EPA 8270D

QC Batch Method: EPA 3550

Analysis Description: 8270D Solid MSSV

Associated Lab Samples: 10427018003

METHOD BLANK: 2897876

Matrix: Solid

Associated Lab Samples: 10427018003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/24/18 14:01	
1,2-Dichlorobenzene	ug/kg	ND	330	04/24/18 14:01	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/24/18 14:01	
1,3-Dichlorobenzene	ug/kg	ND	330	04/24/18 14:01	
1,4-Dichlorobenzene	ug/kg	ND	330	04/24/18 14:01	
1-Methylnaphthalene	ug/kg	ND	330	04/24/18 14:01	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/24/18 14:01	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/24/18 14:01	
2,4-Dichlorophenol	ug/kg	ND	330	04/24/18 14:01	
2,4-Dimethylphenol	ug/kg	ND	330	04/24/18 14:01	
2,4-Dinitrophenol	ug/kg	ND	330	04/24/18 14:01	
2,4-Dinitrotoluene	ug/kg	ND	330	04/24/18 14:01	
2,6-Dinitrotoluene	ug/kg	ND	330	04/24/18 14:01	
2-Chloronaphthalene	ug/kg	ND	330	04/24/18 14:01	
2-Chlorophenol	ug/kg	ND	330	04/24/18 14:01	
2-Methylnaphthalene	ug/kg	ND	330	04/24/18 14:01	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/24/18 14:01	
2-Nitroaniline	ug/kg	ND	330	04/24/18 14:01	
2-Nitrophenol	ug/kg	ND	330	04/24/18 14:01	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/24/18 14:01	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/24/18 14:01	
3-Nitroaniline	ug/kg	ND	330	04/24/18 14:01	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/24/18 14:01	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/24/18 14:01	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/24/18 14:01	
4-Chloroaniline	ug/kg	ND	330	04/24/18 14:01	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/24/18 14:01	
4-Nitroaniline	ug/kg	ND	330	04/24/18 14:01	
4-Nitrophenol	ug/kg	ND	330	04/24/18 14:01	
Acenaphthene	ug/kg	ND	330	04/24/18 14:01	
Acenaphthylene	ug/kg	ND	330	04/24/18 14:01	
Anthracene	ug/kg	ND	330	04/24/18 14:01	
Benzo(a)anthracene	ug/kg	ND	330	04/24/18 14:01	
Benzo(a)pyrene	ug/kg	ND	330	04/24/18 14:01	
Benzo(b)fluoranthene	ug/kg	ND	330	04/24/18 14:01	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/24/18 14:01	
Benzo(k)fluoranthene	ug/kg	ND	330	04/24/18 14:01	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/24/18 14:01	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/24/18 14:01	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/24/18 14:01	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/24/18 14:01	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

METHOD BLANK: 2897876

Matrix: Solid

Associated Lab Samples: 10427018003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/24/18 14:01	
Carbazole	ug/kg	ND	330	04/24/18 14:01	
Chrysene	ug/kg	ND	330	04/24/18 14:01	
Di-n-butylphthalate	ug/kg	ND	330	04/24/18 14:01	
Di-n-octylphthalate	ug/kg	ND	330	04/24/18 14:01	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/24/18 14:01	
Dibenzofuran	ug/kg	ND	330	04/24/18 14:01	
Diethylphthalate	ug/kg	ND	330	04/24/18 14:01	
Dimethylphthalate	ug/kg	ND	330	04/24/18 14:01	
Fluoranthene	ug/kg	ND	330	04/24/18 14:01	
Fluorene	ug/kg	ND	330	04/24/18 14:01	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/24/18 14:01	
Hexachlorobenzene	ug/kg	ND	330	04/24/18 14:01	
Hexachloroethane	ug/kg	ND	330	04/24/18 14:01	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/24/18 14:01	
Isophorone	ug/kg	ND	330	04/24/18 14:01	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/24/18 14:01	
N-Nitrosodimethylamine	ug/kg	ND	330	04/24/18 14:01	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/24/18 14:01	
Naphthalene	ug/kg	ND	330	04/24/18 14:01	
Nitrobenzene	ug/kg	ND	330	04/24/18 14:01	
Pentachlorophenol	ug/kg	ND	670	04/24/18 14:01	
Phenanthrene	ug/kg	ND	330	04/24/18 14:01	
Phenol	ug/kg	ND	330	04/24/18 14:01	
Pyrene	ug/kg	ND	330	04/24/18 14:01	
2,4,6-Tribromophenol (S)	%	93	60-125	04/24/18 14:01	
2-Fluorobiphenyl (S)	%	90	30-132	04/24/18 14:01	
2-Fluorophenol (S)	%	85	40-125	04/24/18 14:01	
Nitrobenzene-d5 (S)	%	85	43-125	04/24/18 14:01	
p-Terphenyl-d14 (S)	%	108	62-125	04/24/18 14:01	
Phenol-d6 (S)	%	85	48-125	04/24/18 14:01	

LABORATORY CONTROL SAMPLE: 2897877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1270	76	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1260	75	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1430	86	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1220	73	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1230	74	39-125	
1-Methylnaphthalene	ug/kg	1670	1360	82	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1490	89	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1470	88	61-125	
2,4-Dichlorophenol	ug/kg	1670	1440	86	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE: 2897877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1350	81	51-125	
2,4-Dinitrophenol	ug/kg	1670	1200	72	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1740	104	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1630	98	63-125	
2-Chloronaphthalene	ug/kg	1670	1430	86	61-125	
2-Chlorophenol	ug/kg	1670	1270	76	46-125	
2-Methylnaphthalene	ug/kg	1670	1340	81	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1290	77	50-125	
2-Nitroaniline	ug/kg	1670	1510	91	61-125	
2-Nitrophenol	ug/kg	1670	1350	81	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1360	81	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1450	87	47-125	
3-Nitroaniline	ug/kg	1670	1460	88	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1530J	92	30-141	
4-Bromophenylphenyl ether	ug/kg	1670	1520	91	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1560	93	64-125	
4-Chloroaniline	ug/kg	1670	1050	63	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1500	90	64-125	
4-Nitroaniline	ug/kg	1670	1510	91	59-125	
4-Nitrophenol	ug/kg	1670	1430	86	54-125	
Acenaphthene	ug/kg	1670	1440	87	62-125	
Acenaphthylene	ug/kg	1670	1450	87	61-125	
Anthracene	ug/kg	1670	1490	89	66-125	
Benzo(a)anthracene	ug/kg	1670	1580	95	69-125	
Benzo(a)pyrene	ug/kg	1670	1560	94	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1540	92	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1650	99	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1590	96	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1310	79	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1200	72	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1030	62	37-125 6M	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1800	108	69-131	
Butylbenzylphthalate	ug/kg	1670	1740	104	69-129	
Carbazole	ug/kg	1670	1580	95	66-125	
Chrysene	ug/kg	1670	1580	95	68-125	
Di-n-butylphthalate	ug/kg	1670	1700	102	69-125	
Di-n-octylphthalate	ug/kg	1670	1830	110	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1680	101	64-125	
Dibenzofuran	ug/kg	1670	1500	90	65-125	
Diethylphthalate	ug/kg	1670	1600	96	67-125	
Dimethylphthalate	ug/kg	1670	1590	95	67-125	
Fluoranthene	ug/kg	1670	1560	94	66-125	
Fluorene	ug/kg	1670	1490	89	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1210	72	40-125	
Hexachlorobenzene	ug/kg	1670	1550	93	62-125	
Hexachloroethane	ug/kg	1670	1230	74	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1650	99	64-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE: 2897877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1350	81	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1260	75	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1170	70	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1570	94	65-125	
Naphthalene	ug/kg	1670	1270	76	48-125	
Nitrobenzene	ug/kg	1670	1250	75	48-125	
Pentachlorophenol	ug/kg	1670	1220	73	41-125	
Phenanthrene	ug/kg	1670	1490	89	66-125	
Phenol	ug/kg	1670	1250	75	46-125	
Pyrene	ug/kg	1670	1600	96	69-125	
2,4,6-Tribromophenol (S)	%			97	60-125	
2-Fluorobiphenyl (S)	%			81	30-132	
2-Fluorophenol (S)	%			74	40-125	
Nitrobenzene-d5 (S)	%			72	43-125	
p-Terphenyl-d14 (S)	%			99	62-125	
Phenol-d6 (S)	%			74	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897878 2897879

Parameter	Units	10427906003		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec							
1,2,4-Trichlorobenzene	ug/kg	<70.8	1850	1840	1210	1310	66	71	30-127	8	30				
1,2-Dichlorobenzene	ug/kg	<68.9	1850	1840	1250	1250	68	68	30-125	0	30				
1,2-Diphenylhydrazine	ug/kg	<66.0	1850	1840	1010	1080	55	59	30-150	7	30				
1,3-Dichlorobenzene	ug/kg	<68.1	1850	1840	1220	1220	66	66	30-125	0	30				
1,4-Dichlorobenzene	ug/kg	<66.5	1850	1840	1230	1210	67	66	30-125	2	30				
1-Methylnaphthalene	ug/kg	<57.3	1850	1840	1270	1360	69	74	42-125	7	30				
2,4,5-Trichlorophenol	ug/kg	<71.3	1850	1840	1160	1250	63	68	30-150	8	30				
2,4,6-Trichlorophenol	ug/kg	<51.8	1850	1840	1240	1360	67	74	30-150	9	30				
2,4-Dichlorophenol	ug/kg	<68.8	1850	1840	1290	1390	70	75	30-135	8	30				
2,4-Dimethylphenol	ug/kg	<137	1850	1840	1290	1430	70	78	30-148	10	30				
2,4-Dinitrophenol	ug/kg	<82.1	1850	1840	ND	ND	0	0	30-125		30	M1			
2,4-Dinitrotoluene	ug/kg	<49.4	1850	1840	555	642	30	35	30-150	14	30				
2,6-Dinitrotoluene	ug/kg	<50.9	1850	1840	710	771	39	42	30-150	8	30				
2-Chloronaphthalene	ug/kg	<51.8	1850	1840	1250	1330	68	72	30-138	6	30				
2-Chlorophenol	ug/kg	<72.6	1850	1840	1320	1350	72	74	30-130	2	30				
2-Methylnaphthalene	ug/kg	<56.6	1850	1840	1260	1350	68	73	46-125	7	30				
2-Methylphenol(o-Cresol)	ug/kg	<91.9	1850	1840	1310	1370	71	74	30-133	4	30				
2-Nitroaniline	ug/kg	<80.6	1850	1840	1610	1730	87	94	30-150	7	30				
2-Nitrophenol	ug/kg	<68.7	1850	1840	562	610	30	33	30-134	8	30				
3&4-Methylphenol(m&p Cresol)	ug/kg	<82.3	1850	1840	1330	1390	72	75	30-138	5	30				
3,3'-Dichlorobenzidine	ug/kg	<87.3	1850	1840	1460	1420	79	77	30-149	2	30				
3-Nitroaniline	ug/kg	<89.4	1850	1840	1860	1890	101	102	30-150	1	30				
4,6-Dinitro-2-methylphenol	ug/kg	<147	1850	1840	ND	ND	0	0	30-133		30	M1			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897878												2897879											
Parameter	Units	10427906003		MS		MSD		MS		MSD		% Rec		Max		Qual							
		Result	Conc.	Spike Conc.	MSD Spike Conc.	Result	MSD Result	% Rec	MSD % Rec	Limits	RPD	RPD											
4-Bromophenylphenyl ether	ug/kg	<61.5	1850	1840	1260	1390	68	76	44-125	10	30												
4-Chloro-3-methylphenol	ug/kg	<50.6	1850	1840	1280	1420	70	77	30-150	10	30												
4-Chloroaniline	ug/kg	<102	1850	1840	1060	953	57	52	30-125	11	30												
4-Chlorophenylphenyl ether	ug/kg	<49.9	1850	1840	1280	1360	69	74	44-125	6	30												
4-Nitroaniline	ug/kg	<65.1	1850	1840	1800	1850	97	100	30-150	3	30												
4-Nitrophenol	ug/kg	<105	1850	1840	1100	1160	60	63	30-150	6	30												
Acenaphthene	ug/kg	<59.8	1850	1840	1150	1250	63	68	40-125	8	30												
Acenaphthylene	ug/kg	<50.0	1850	1840	1220	1320	66	72	30-150	8	30												
Anthracene	ug/kg	<52.6	1850	1840	1220	1340	66	73	30-150	9	30												
Benzo(a)anthracene	ug/kg	<42.4	1850	1840	1220	1340	66	73	30-150	10	30												
Benzo(a)pyrene	ug/kg	<41.3	1850	1840	1120	1270	61	69	30-150	13	30												
Benzo(b)fluoranthene	ug/kg	<44.2	1850	1840	1200	1290	65	70	30-150	7	30												
Benzo(g,h,i)perylene	ug/kg	<31.6	1850	1840	967	1090	53	59	30-150	12	30												
Benzo(k)fluoranthene	ug/kg	<44.2	1850	1840	1160	1300	63	71	30-150	12	30												
bis(2-Chloroethoxy)methane	ug/kg	<70.8	1850	1840	1300	1370	71	74	30-134	5	30												
bis(2-Chloroethyl) ether	ug/kg	<80.0	1850	1840	1200	1280	65	70	30-125	7	30												
bis(2-Chloroisopropyl) ether	ug/kg	<84.7	1850	1840	1050	1060	57	57	30-125	1	30	6M											
bis(2-Ethylhexyl)phthalate	ug/kg	104J	1850	1840	1490	1660	75	84	30-150	11	30												
Butylbenzylphthalate	ug/kg	140J	1850	1840	1560	1660	77	83	30-150	7	30												
Carbazole	ug/kg	<49.1	1850	1840	1360	1450	74	79	41-125	7	30												
Chrysene	ug/kg	<36.7	1850	1840	1210	1350	66	73	30-150	11	30												
Di-n-butylphthalate	ug/kg	<49.9	1850	1840	1430	1550	78	84	30-150	8	30												
Di-n-octylphthalate	ug/kg	<112	1850	1840	1450	1570	79	85	30-150	7	30												
Dibenz(a,h)anthracene	ug/kg	<37.7	1850	1840	1150	1260	63	69	30-150	9	30												
Dibenzofuran	ug/kg	<53.0	1850	1840	1270	1370	69	74	45-125	7	30												
Diethylphthalate	ug/kg	<43.3	1850	1840	1380	1480	75	81	30-150	7	30												
Dimethylphthalate	ug/kg	<56.2	1850	1840	1400	1470	76	80	30-150	5	30												
Fluoranthene	ug/kg	<39.0	1850	1840	1210	1340	65	72	30-150	10	30												
Fluorene	ug/kg	<50.9	1850	1840	1260	1340	68	73	30-150	6	30												
Hexachloro-1,3-butadiene	ug/kg	<84.2	1850	1840	1150	1270	62	69	30-128	9	30												
Hexachlorobenzene	ug/kg	<47.2	1850	1840	1060	1220	58	66	30-150	14	30												
Hexachloroethane	ug/kg	<74.7	1850	1840	303J	252J	16	14	30-125		30	M1											
Indeno(1,2,3-cd)pyrene	ug/kg	<42.5	1850	1840	1070	1180	58	64	30-150	9	30												
Isophorone	ug/kg	<83.7	1850	1840	1230	1350	67	73	30-140	9	30												
N-Nitroso-di-n-propylamine	ug/kg	<112	1850	1840	1300	1290	70	70	30-147	0	30												
N-Nitrosodimethylamine	ug/kg	<95.6	1850	1840	1240	1190	67	65	30-125	4	30												
N-Nitrosodiphenylamine	ug/kg	<44.9	1850	1840	1360	1470	74	80	30-150	8	30												
Naphthalene	ug/kg	<69.5	1850	1840	1240	1320	67	72	44-125	6	30												
Nitrobenzene	ug/kg	<73.4	1850	1840	1180	1230	64	67	30-136	4	30												
Pentachlorophenol	ug/kg	<108	1850	1840	528J	591J	29	32	30-150		30	M1											
Phenanthrene	ug/kg	<50.0	1850	1840	1240	1330	66	71	30-150	8	30												
Phenol	ug/kg	<70.6	1850	1840	1250	1290	68	70	30-129	3	30												
Pyrene	ug/kg	<38.4	1850	1840	1270	1400	67	74	30-150	10	30												
2,4,6-Tribromophenol (S)	%						62	67	60-125														
2-Fluorobiphenyl (S)	%						67	71	30-132														
2-Fluorophenol (S)	%						68	69	40-125														

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Parameter	Units	2897878		2897879		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Nitrobenzene-d5 (S)	%.	10427906003				61	65	43-125			
p-Terphenyl-d14 (S)	%.					72	78	62-125			
Phenol-d6 (S)	%.					66	70	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 532017 Analysis Method: EPA 8270D by SIM
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2889031 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/16/18 10:37	
Acenaphthylene	ug/kg	ND	10.0	04/16/18 10:37	
Anthracene	ug/kg	ND	10.0	04/16/18 10:37	
Benzo(a)anthracene	ug/kg	ND	10.0	04/16/18 10:37	
Benzo(a)pyrene	ug/kg	ND	10.0	04/16/18 10:37	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/16/18 10:37	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/16/18 10:37	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/16/18 10:37	
Chrysene	ug/kg	ND	10.0	04/16/18 10:37	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/16/18 10:37	
Fluoranthene	ug/kg	ND	10.0	04/16/18 10:37	
Fluorene	ug/kg	ND	10.0	04/16/18 10:37	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/16/18 10:37	
Naphthalene	ug/kg	ND	10.0	04/16/18 10:37	
Phenanthrene	ug/kg	ND	10.0	04/16/18 10:37	
Pyrene	ug/kg	ND	10.0	04/16/18 10:37	
2-Fluorobiphenyl (S)	%	67	42-125	04/16/18 10:37	
p-Terphenyl-d14 (S)	%	94	57-125	04/16/18 10:37	

LABORATORY CONTROL SAMPLE: 2889032

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	23.8	71	52-125	
Acenaphthylene	ug/kg	33.3	25.1	75	50-125	
Anthracene	ug/kg	33.3	27.1	81	65-125	
Benzo(a)anthracene	ug/kg	33.3	29.8	89	60-125	
Benzo(a)pyrene	ug/kg	33.3	28.7	86	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	30.9	93	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	30.3	91	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	29.7	89	67-125	
Chrysene	ug/kg	33.3	29.9	90	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	34.4	103	63-125	
Fluoranthene	ug/kg	33.3	30.4	91	75-125	
Fluorene	ug/kg	33.3	24.9	75	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	32.9	99	63-125	
Naphthalene	ug/kg	33.3	24.4	73	49-125	
Phenanthrene	ug/kg	33.3	26.9	81	65-125	
Pyrene	ug/kg	33.3	29.9	90	64-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE: 2889032

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2-Fluorobiphenyl (S)	%.			78	42-125	
p-Terphenyl-d14 (S)	%.			95	57-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2889033 2889034

Parameter	Units	10427017002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Acenaphthene	ug/kg	ND	35.4	35.2	27.4	30.9	78	88	30-125	12	30	
Acenaphthylene	ug/kg	0.018 mg/kg	35.4	35.2	36.3	35.7	51	49	30-133	2	30	
Anthracene	ug/kg	0.030 mg/kg	35.4	35.2	49.3	44.1	55	40	30-150	11	30	
Benzo(a)anthracene	ug/kg	0.11 mg/kg	35.4	35.2	107	91.4	-14	-59	30-150	16	30	M1
Benzo(a)pyrene	ug/kg	0.11 mg/kg	35.4	35.2	108	94.6	-6	-44	30-150	13	30	M1
Benzo(b)fluoranthene	ug/kg	0.14 mg/kg	35.4	35.2	140	107	-8	-101	30-150	27	30	M1
Benzo(g,h,i)perylene	ug/kg	0.059 mg/kg	35.4	35.2	69.7	66.6	31	22	30-150	5	30	M1
Benzo(k)fluoranthene	ug/kg	0.052 mg/kg	35.4	35.2	61.5	68.2	27	46	30-150	10	30	M1
Chrysene	ug/kg	0.12 mg/kg	35.4	35.2	98.6	90.3	-60	-84	30-150	9	30	M1
Dibenz(a,h)anthracene	ug/kg	0.020 mg/kg	35.4	35.2	43.0	35.6	64	43	30-131	19	30	
Fluoranthene	ug/kg	0.20 mg/kg	35.4	35.2	167	135	-85	-174	30-150	21	30	M1
Fluorene	ug/kg	ND	35.4	35.2	30.5	32.5	86	92	30-147	6	30	
Indeno(1,2,3-cd)pyrene	ug/kg	0.058 mg/kg	35.4	35.2	68.8	66.7	31	25	30-150	3	30	M1
Naphthalene	ug/kg	ND	35.4	35.2	20.8	20.3	59	57	30-131	3	30	
Phenanthrene	ug/kg	0.083 mg/kg	35.4	35.2	80.5	69.8	-6	-36	30-150	14	30	M1
Pyrene	ug/kg	0.18 mg/kg	35.4	35.2	157	129	-74	-155	30-150	20	30	M1
2-Fluorobiphenyl (S)	%.						73	78	42-125			
p-Terphenyl-d14 (S)	%.						104	97	57-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 531964 Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS

Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006

METHOD BLANK: 2888898 Matrix: Solid

Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	04/13/18 12:00	
n-Triacontane (S)	%.	93	50-150	04/13/18 12:00	

LABORATORY CONTROL SAMPLE & LCSD: 2888899

2888900

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	71.9	76.6	90	96	70-120	6	20	
n-Triacontane (S)	%.				83	92	50-150			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 532104 Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS

Associated Lab Samples: 10427018007, 10427018008

METHOD BLANK: 2889696 Matrix: Solid

Associated Lab Samples: 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	04/16/18 10:58	
n-Triacontane (S)	%.	95	50-150	04/16/18 10:58	

LABORATORY CONTROL SAMPLE & LCSD: 2889697

2889698

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	82.3	69.9	103	87	70-120	16	20	
n-Triacontane (S)	%.				109	90	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 437577 Analysis Method: EPA 7196A
 QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2021337 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/19/18 13:14	

LABORATORY CONTROL SAMPLE: 2021338

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1110	995	90	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2021707 2021708

Parameter	Units	50194083001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	962	1040	866	884	90	85	75-125	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2021709 2021710

Parameter	Units	50194083001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	38.9	40.3	25.7	34.4	66	85	75-125	29	20	M3,R1

SAMPLE DUPLICATE: 2021711

Parameter	Units	10427018007 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	D3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427018

QC Batch: 140731 Analysis Method: EPA 9056A
QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
Associated Lab Samples: 10427018001, 10427018002

METHOD BLANK: 557012 Matrix: Solid
Associated Lab Samples: 10427018001, 10427018002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	0.99	04/17/18 21:06	

LABORATORY CONTROL SAMPLE: 557011

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	48.7	50.0	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557013 557014

Parameter	Units	10427018001 Result	MS		MSD		% Rec	MSD	% Rec	Limits	RPD	Max	Qual
			Spike Conc.	Conc.	Result	Result							
Fluoride	mg/kg	1.7	48.5	48.9	19.9	18.7	37	35	80-120	7	20	M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557015 557016

Parameter	Units	10427159001 Result	MS		MSD		% Rec	MSD	% Rec	Limits	RPD	Max	Qual
			Spike Conc.	Conc.	Result	Result							
Fluoride	mg/kg	ND	48.8	47.6	23.2	26.5	48	56	80-120	13	20	M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 140842

Analysis Method: EPA 9056A

QC Batch Method: EPA 300.0

Analysis Description: 9056 IC Anions, Soil

Associated Lab Samples: 10427018006, 10427018008

METHOD BLANK: 557419

Matrix: Solid

Associated Lab Samples: 10427018006, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	0.99	04/19/18 16:14	

LABORATORY CONTROL SAMPLE: 557418

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	50.3	52.6	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557420 557421

Parameter	Units	10427291004 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Conc.	Spike Conc.	MS Conc.	% Rec	% Rec						
Fluoride	mg/kg	1.4	49.8	49.8	12.1	12.9	21	23	80-120	7	20	M1		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557422 557423

Parameter	Units	10427291008 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Conc.	Spike Conc.	MS Conc.	% Rec	% Rec						
Fluoride	mg/kg	ND	49.7	49	35.4	35.5	69	71	80-120	0	20	M1		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 140846 Analysis Method: EPA 9056A
 QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
 Associated Lab Samples: 10427018003, 10427018004, 10427018005, 10427018007

METHOD BLANK: 557430 Matrix: Solid
 Associated Lab Samples: 10427018003, 10427018004, 10427018005, 10427018007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	1.0	04/20/18 01:22	

LABORATORY CONTROL SAMPLE: 557429

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	49.7	52.1	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557431 557432

Parameter	Units	10427018004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/kg	2.1	48.9	49.8	35.7	43.7	69	84	80-120	20	20	M1

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth

PASI-G Pace Analytical Services - Green Bay

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10427018

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

ANALYTE QUALIFIERS

1M Sample was black in color and slightly viscous.

2M Sample was black in color.

3M Sample was brown in color.

4M Sample was dark brown in color.

5M Sample was yellow in color.

6M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

C0 Result confirmed by second analysis.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

ANALYTE QUALIFIERS

D4	Sample was diluted due to the presence of high levels of target analytes.
D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
L3	Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M3	Matrix spike recovery was outside laboratory control limits due to matrix interferences.
MN	The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.
N2	The lab does not hold NELAC/TNI accreditation for this parameter.
N3	Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
P3	Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
R1	RPD value was outside control limits.
S0	Surrogate recovery outside laboratory control limits.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
SS	This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.
T6	High boiling point hydrocarbons are present in the sample.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427018001	FD-TT-01 (10-12 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427018002	FD-TT-02 (7-9 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427018003	FD-SB-A1 (3-6 S)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427018004	FD-SB-B1 (11-13 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427018005	FD-SB-C1 (5-8 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427018006	FD-TT-03 (2-5 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427018007	FD-SB-D1 (11-16 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427018008	FD-SB-E1 (10-15 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427018001	FD-TT-01 (10-12 WM)	EPA 3550	532491	EPA 8081B	532802
10427018002	FD-TT-02 (7-9 WM)	EPA 3550	532491	EPA 8081B	532802
10427018003	FD-SB-A1 (3-6 S)	EPA 3550	532491	EPA 8081B	532802
10427018004	FD-SB-B1 (11-13 WM)	EPA 3550	532491	EPA 8081B	532802
10427018005	FD-SB-C1 (5-8 WM)	EPA 3550	532491	EPA 8081B	532802
10427018006	FD-TT-03 (2-5 WM)	EPA 3550	532491	EPA 8081B	532802
10427018007	FD-SB-D1 (11-16 WM)	EPA 3550	532491	EPA 8081B	532802
10427018008	FD-SB-E1 (10-15 WM)	EPA 3550	532491	EPA 8081B	532802
10427018001	FD-TT-01 (10-12 WM)	EPA 3550	532316	EPA 8082A	532613
10427018002	FD-TT-02 (7-9 WM)	EPA 3550	532316	EPA 8082A	532613
10427018003	FD-SB-A1 (3-6 S)	EPA 3550	532316	EPA 8082A	532613
10427018004	FD-SB-B1 (11-13 WM)	EPA 3550	532316	EPA 8082A	532613
10427018005	FD-SB-C1 (5-8 WM)	EPA 3550	532316	EPA 8082A	532613
10427018006	FD-TT-03 (2-5 WM)	EPA 3550	532316	EPA 8082A	532613
10427018007	FD-SB-D1 (11-16 WM)	EPA 3550	532316	EPA 8082A	532613
10427018008	FD-SB-E1 (10-15 WM)	EPA 3550	532316	EPA 8082A	532613
10427018001	FD-TT-01 (10-12 WM)	WI MOD DRO	531964	WI MOD DRO	532306
10427018002	FD-TT-02 (7-9 WM)	WI MOD DRO	531964	WI MOD DRO	532306
10427018003	FD-SB-A1 (3-6 S)	WI MOD DRO	531964	WI MOD DRO	532306
10427018004	FD-SB-B1 (11-13 WM)	WI MOD DRO	531964	WI MOD DRO	532306
10427018005	FD-SB-C1 (5-8 WM)	WI MOD DRO	531964	WI MOD DRO	532306
10427018006	FD-TT-03 (2-5 WM)	WI MOD DRO	531964	WI MOD DRO	532306
10427018007	FD-SB-D1 (11-16 WM)	WI MOD DRO	532104	WI MOD DRO	532518
10427018008	FD-SB-E1 (10-15 WM)	WI MOD DRO	532104	WI MOD DRO	532518
10427018001	FD-TT-01 (10-12 WM)	EPA 5030 Medium Soil	533563	WI MOD GRO	533834
10427018002	FD-TT-02 (7-9 WM)	EPA 5030 Medium Soil	533563	WI MOD GRO	533834
10427018003	FD-SB-A1 (3-6 S)	EPA 5030 Medium Soil	533563	WI MOD GRO	533834
10427018004	FD-SB-B1 (11-13 WM)	EPA 5030 Medium Soil	533563	WI MOD GRO	533834
10427018005	FD-SB-C1 (5-8 WM)	EPA 5030 Medium Soil	533563	WI MOD GRO	533834
10427018006	FD-TT-03 (2-5 WM)	EPA 5030 Medium Soil	533563	WI MOD GRO	533834
10427018007	FD-SB-D1 (11-16 WM)	EPA 5030 Medium Soil	533563	WI MOD GRO	533834
10427018008	FD-SB-E1 (10-15 WM)	EPA 5030 Medium Soil	533563	WI MOD GRO	533834
10427018001	FD-TT-01 (10-12 WM)	EPA 3050	532178	EPA 6010C	532248
10427018002	FD-TT-02 (7-9 WM)	EPA 3050	532178	EPA 6010C	532248
10427018003	FD-SB-A1 (3-6 S)	EPA 3050	532178	EPA 6010C	532248
10427018004	FD-SB-B1 (11-13 WM)	EPA 3050	532178	EPA 6010C	532248
10427018005	FD-SB-C1 (5-8 WM)	EPA 3050	532178	EPA 6010C	532248
10427018006	FD-TT-03 (2-5 WM)	EPA 3050	532178	EPA 6010C	532248

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427018

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427018007	FD-SB-D1 (11-16 WM)	EPA 3050	532178	EPA 6010C	532248
10427018008	FD-SB-E1 (10-15 WM)	EPA 3050	532178	EPA 6010C	532248
10427018001	FD-TT-01 (10-12 WM)	EPA 3050B	437311	EPA 6020	437864
10427018002	FD-TT-02 (7-9 WM)	EPA 3050B	437311	EPA 6020	437864
10427018003	FD-SB-A1 (3-6 S)	EPA 3050B	437311	EPA 6020	437864
10427018004	FD-SB-B1 (11-13 WM)	EPA 3050B	437311	EPA 6020	437864
10427018005	FD-SB-C1 (5-8 WM)	EPA 3050B	437311	EPA 6020	437864
10427018006	FD-TT-03 (2-5 WM)	EPA 3050B	437311	EPA 6020	437864
10427018007	FD-SB-D1 (11-16 WM)	EPA 3050B	437311	EPA 6020	437864
10427018008	FD-SB-E1 (10-15 WM)	EPA 3050B	437311	EPA 6020	437864
10427018001	FD-TT-01 (10-12 WM)	EPA 3050	532177	EPA 6020A	532245
10427018002	FD-TT-02 (7-9 WM)	EPA 3050	532177	EPA 6020A	532245
10427018003	FD-SB-A1 (3-6 S)	EPA 3050	532177	EPA 6020A	532245
10427018004	FD-SB-B1 (11-13 WM)	EPA 3050	532177	EPA 6020A	532245
10427018005	FD-SB-C1 (5-8 WM)	EPA 3050	532177	EPA 6020A	532245
10427018006	FD-TT-03 (2-5 WM)	EPA 3050	532177	EPA 6020A	532245
10427018007	FD-SB-D1 (11-16 WM)	EPA 3050	532177	EPA 6020A	532245
10427018008	FD-SB-E1 (10-15 WM)	EPA 3050	532177	EPA 6020A	532245
10427018001	FD-TT-01 (10-12 WM)	EPA 7471	532184	EPA 7471	532397
10427018002	FD-TT-02 (7-9 WM)	EPA 7471	532184	EPA 7471	532397
10427018003	FD-SB-A1 (3-6 S)	EPA 7471	532184	EPA 7471	532397
10427018004	FD-SB-B1 (11-13 WM)	EPA 7471	532184	EPA 7471	532397
10427018005	FD-SB-C1 (5-8 WM)	EPA 7471	532184	EPA 7471	532397
10427018006	FD-TT-03 (2-5 WM)	EPA 7471	532184	EPA 7471	532397
10427018007	FD-SB-D1 (11-16 WM)	EPA 7471	532184	EPA 7471	532397
10427018008	FD-SB-E1 (10-15 WM)	EPA 7471	532184	EPA 7471	532397
10427018001	FD-TT-01 (10-12 WM)	ASTM D2974	532990		
10427018002	FD-TT-02 (7-9 WM)	ASTM D2974	532990		
10427018003	FD-SB-A1 (3-6 S)	ASTM D2974	532990		
10427018004	FD-SB-B1 (11-13 WM)	ASTM D2974	532990		
10427018005	FD-SB-C1 (5-8 WM)	ASTM D2974	532990		
10427018006	FD-TT-03 (2-5 WM)	ASTM D2974	532990		
10427018007	FD-SB-D1 (11-16 WM)	ASTM D2974	532990		
10427018008	FD-SB-E1 (10-15 WM)	ASTM D2974	532990		
10427018001	FD-TT-01 (10-12 WM)	EPA 3550	532275	EPA 8270D	532657
10427018002	FD-TT-02 (7-9 WM)	EPA 3550	532275	EPA 8270D	532657
10427018003	FD-SB-A1 (3-6 S)	EPA 3550	533467	EPA 8270D	533832
10427018004	FD-SB-B1 (11-13 WM)	EPA 3550	532275	EPA 8270D	532657
10427018005	FD-SB-C1 (5-8 WM)	EPA 3550	532275	EPA 8270D	532657
10427018006	FD-TT-03 (2-5 WM)	EPA 3550	532275	EPA 8270D	532657
10427018007	FD-SB-D1 (11-16 WM)	EPA 3550	532275	EPA 8270D	532657
10427018008	FD-SB-E1 (10-15 WM)	EPA 3550	532275	EPA 8270D	532657
10427018001	FD-TT-01 (10-12 WM)	EPA 3550	532017	EPA 8270D by SIM	532494
10427018002	FD-TT-02 (7-9 WM)	EPA 3550	532017	EPA 8270D by SIM	532494
10427018003	FD-SB-A1 (3-6 S)	EPA 3550	532017	EPA 8270D by SIM	532494

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427018004	FD-SB-B1 (11-13 WM)	EPA 3550	532017	EPA 8270D by SIM	532494
10427018005	FD-SB-C1 (5-8 WM)	EPA 3550	532017	EPA 8270D by SIM	532494
10427018006	FD-TT-03 (2-5 WM)	EPA 3550	532017	EPA 8270D by SIM	532494
10427018007	FD-SB-D1 (11-16 WM)	EPA 3550	532017	EPA 8270D by SIM	532494
10427018008	FD-SB-E1 (10-15 WM)	EPA 3550	532017	EPA 8270D by SIM	532494
10427018001	FD-TT-01 (10-12 WM)	EPA 5035/5030B	533507	EPA 8260B	533754
10427018002	FD-TT-02 (7-9 WM)	EPA 5035/5030B	533615	EPA 8260B	533771
10427018003	FD-SB-A1 (3-6 S)	EPA 5035/5030B	533615	EPA 8260B	533771
10427018004	FD-SB-B1 (11-13 WM)	EPA 5035/5030B	533615	EPA 8260B	533771
10427018005	FD-SB-C1 (5-8 WM)	EPA 5035/5030B	533615	EPA 8260B	533771
10427018006	FD-TT-03 (2-5 WM)	EPA 5035/5030B	533615	EPA 8260B	533771
10427018007	FD-SB-D1 (11-16 WM)	EPA 5035/5030B	533615	EPA 8260B	533771
10427018008	FD-SB-E1 (10-15 WM)	EPA 5035/5030B	533615	EPA 8260B	533771
10427018001	FD-TT-01 (10-12 WM)	EPA 3060A	437577	EPA 7196A	437974
10427018002	FD-TT-02 (7-9 WM)	EPA 3060A	437577	EPA 7196A	437974
10427018003	FD-SB-A1 (3-6 S)	EPA 3060A	437577	EPA 7196A	437974
10427018004	FD-SB-B1 (11-13 WM)	EPA 3060A	437577	EPA 7196A	437974
10427018005	FD-SB-C1 (5-8 WM)	EPA 3060A	437577	EPA 7196A	437974
10427018006	FD-TT-03 (2-5 WM)	EPA 3060A	437577	EPA 7196A	437974
10427018007	FD-SB-D1 (11-16 WM)	EPA 3060A	437577	EPA 7196A	437974
10427018008	FD-SB-E1 (10-15 WM)	EPA 3060A	437577	EPA 7196A	437974
10427018001	FD-TT-01 (10-12 WM)	Trivalent Chromium Calculation	439162		
10427018002	FD-TT-02 (7-9 WM)	Trivalent Chromium Calculation	439162		
10427018003	FD-SB-A1 (3-6 S)	Trivalent Chromium Calculation	439162		
10427018004	FD-SB-B1 (11-13 WM)	Trivalent Chromium Calculation	439162		
10427018005	FD-SB-C1 (5-8 WM)	Trivalent Chromium Calculation	439162		
10427018006	FD-TT-03 (2-5 WM)	Trivalent Chromium Calculation	439162		
10427018007	FD-SB-D1 (11-16 WM)	Trivalent Chromium Calculation	439162		
10427018008	FD-SB-E1 (10-15 WM)	Trivalent Chromium Calculation	439162		
10427018001	FD-TT-01 (10-12 WM)	EPA 9012A	286553	EPA 9012	286614
10427018002	FD-TT-02 (7-9 WM)	EPA 9012A	286553	EPA 9012	286614
10427018003	FD-SB-A1 (3-6 S)	EPA 9012A	286553	EPA 9012	286614
10427018004	FD-SB-B1 (11-13 WM)	EPA 9012A	286553	EPA 9012	286614
10427018005	FD-SB-C1 (5-8 WM)	EPA 9012A	286553	EPA 9012	286614
10427018006	FD-TT-03 (2-5 WM)	EPA 9012A	286553	EPA 9012	286614
10427018007	FD-SB-D1 (11-16 WM)	EPA 9012A	286553	EPA 9012	286614
10427018008	FD-SB-E1 (10-15 WM)	EPA 9012A	286553	EPA 9012	286614
10427018001	FD-TT-01 (10-12 WM)	EPA 300.0	140731	EPA 9056A	140736
10427018002	FD-TT-02 (7-9 WM)	EPA 300.0	140731	EPA 9056A	140736
10427018003	FD-SB-A1 (3-6 S)	EPA 300.0	140846	EPA 9056A	140854

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427018004	FD-SB-B1 (11-13 WM)	EPA 300.0	140846	EPA 9056A	140854
10427018005	FD-SB-C1 (5-8 WM)	EPA 300.0	140846	EPA 9056A	140854
10427018006	FD-TT-03 (2-5 WM)	EPA 300.0	140842	EPA 9056A	140851
10427018007	FD-SB-D1 (11-16 WM)	EPA 300.0	140846	EPA 9056A	140854
10427018008	FD-SB-E1 (10-15 WM)	EPA 300.0	140842	EPA 9056A	140851

REPORT OF LABORATORY ANALYSIS

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WO#: 10427018



10427018



Minnesota Pollution Control Agency

Chain-of-Custody Form

Work Order Number: COC

Turnaround Time: CC

PROJECT/CLIENT INFO

LABORATORY

ONLY

Facility Code: *MPCA - Freeway LF Solids* Program Code (MDH Lab Only):

Lab Name:

Project Name: *MPCA - Freeway LF Solids* Project Task Code:

Address: *18-00383*

Project Manager: Potential Hazard? If yes, add information to Sampler Comments Section

Phone No: *EPIC Profile #38716*

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 Sample-Routine Sample
 S-IV=Integrated Vertical Profile Sample
 S-CWOP=Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES
 DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES
 Wt-Ground=Groundwater
 Wt-Surf=Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

RESERV.

ANALYSIS

see attached for soil waste (-SD) 10X15

+Dioxins

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

Location Identifier	Sample Type	Date	Time	Start Depth, in	End Depth, in	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	RESERV.	Lab Sample No.	#
FD-5B	S	4/11/18				C	SD								
FD-TF-01 (10-12 W/M)	S	4/11/18	10:20			C	SD				13	X	X		2 001
FD-TF-02 (9-9 W/M)	S	4/11/18	12:20			C	SD				13	X			3 002
FD-5B-A1 (3-2 S)	S	4/11/18	13:00			C	SD				13	X	X		4 003
FD-5B-A2	S	4/11/18				C	SD				13	X			
FD-5B-B1 (11-13 W/M)	S	4/11/18	13:50			C	SD				13	X			6 004
FD-5B-C1 (5-5 W/M)	S	4/11/18	14:30			C	SD				13	X	X		7 005
FD-TF-03 (2-5 W/M)	S	4/11/18	14:50			C	SD				13	X			8 006
FD-5B-D1 (11-16 W/M)	S	4/11/18	15:30			C	SD				13	X	X		9 007
FD-5B-E1 (10-15 W/M)	S	4/11/18	16:10			C	SD				13	X			10 008

Sampled By: *David Anderson*

Sampler's Signature: *David Anderson*

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
(Sampler) <i>David Anderson / Pace Analytical</i>	<i>4/11/18/16:50</i>	<i>Nate Williams / Pace</i>	<i>4/11/18/16:50</i>
<i>Nate Williams / Pace</i>	<i>4/11/18/17:13</i>	<i>[Signature] / Pace</i>	<i>4/11/18/17:13</i>

T=6.2

Sample Condition Upon Receipt

Client Name: mn Pollution Control Project #: _____

WO# : 10427018

PM: JMA Due Date: 04/19/18
CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____
 Tracking Number: _____

Optional: Proj. Due Date: _____ Proj. Name: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 6.0 Cooler Temp Corrected (°C): 6.2 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: JMA 4/11/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (international including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>SO</u>	12.
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample # Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION:

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: _____

Date: 04/12/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately
 half of the samples. To be determined in the field by MPCA staff.

WO#: 12107092

Chain of Custody

PM: HRZ Due Date: 04/26/18
 CLIENT: PACE MPLS

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MI

Workorder: 10427018 Workorder Name: 18-00383 MPCA-Freeway LF Solid Owner Received Date: 4/11/2018 Results Requested By: 4/26/2018

Report To		Subcontract To				Requested Analysis																			
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Duluth 4730 Oneota St. Duluth, MN 55807 Phone (218)727-6380																							
						Preserved Containers						Methyl Mercury by 1630						LAB USE ONLY							
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved																			
1	FD-TT-01 (10-12 WM)	PS	4/11/2018 10:20	10427018001	Solid	1																			
2	FD-TT-02 (7-9 WM)	PS	4/11/2018 12:20	10427018002	Solid	1																			
3	FD-SB-A1 (3-6 S)	PS	4/11/2018 13:00	10427018003	Solid	1																			
4	FD-SB-B1 (11-13 WM)	PS	4/11/2018 13:50	10427018004	Solid	1																			
5	FD-SB-C1 (5-8 WM)	PS	4/11/2018 14:30	10427018005	Solid	1																			
6	FD-TT-03 (2-5 WM)	PS	4/11/2018 14:50	10427018006	Solid	1																			
7	FD-SB-D1 (11-16 WM)	PS	4/11/2018 15:35	10427018007	Solid	1																			
8	FD-SB-E1 (10-15 WM)	PS	4/11/2018 16:10	10427018008	Solid	1																			
												Comments													
Transfers		Released By		Date/Time		Received By		Date/Time		Samples also sent to Pace - Virginia															
1		Pace		04/12/18 11:20																					
2		Dale		4/12/18 17:30		Dale		4-12-18 1900																	
3		Dale		4-12-18 2150		Dale		4/12/18 08:00																	
Cooler Temperature on Receipt				2.8 °C		Custody Seal		Y or N		Received on Ice		Y or N		Samples Intact		Y or N									

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:
Sample Condition Upon Receipt Form

Document Revised: 7Mar2018
Page 1 of 1

Document No.:
F-DUL-C-001-rev.05

Issuing Authority:
Pace Duluth Minnesota Quality Office

**Sample Condition
Upon Receipt**

Client Name:

Project #:

WO# : 12107092

PM: HRZ

Due Date: 04/26/18

CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 01339252/1710 IR-1 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.8 Cooler Temp Corrected °C: 2.8 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6°C Correction Factor: 0.0 Date and Initials of Person Examining Contents: 4/13/18 *JR*

If temperature is ≤0°C, is there evidence of ice formation? Yes No NA

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
- Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____

Date: 4/13/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Sample Condition Upon Receipt

Client Name: Pace MN
 Project #: _____

WO#: 12107092
 PM: HRZ
 CLIENT: PACE MPLS
 Due Date: 04/26/18

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No
 Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____
 Temp Blank? Yes No

Thermometer Used: 140792808
 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 4.6
 Cooler Temp Corrected °C: 4.9
 Temp should be above freezing to 6°C
 Correction Factor: 4.3
 Biological Tissue Frozen? Yes No NA
 Date and Initials of Person Examining Contents: 4-13-18, HRZ

Comments: Bm 4/13/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION
 Person Contacted: _____ Date/Time: _____
 Field Data Required? Yes No
 Comments/Resolution: DID NOT RECEIVE "002" RECEIVED TWO CONTAINERS FOR 001 - SEND 1 BACK TO CITY.
Bm 4/13/18

FECAL WAIVER ON FILE Y N
 TEMPERATURE WAIVER ON FILE Y N
 Project Manager Review: Skaller [Signature] Date: 4/13/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

WO#: 10427018



Subcontracting Laboratory.

State Of Origin: MN



Workorder: 10427018

Workorder Name: 18-00383 MPCA-Freeway LF Solid

Owner Received Date: 4/11/2018 Results Requested By: 4/26/2018

Report To		Subcontract To				Requested Analysis														
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																		
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Fluoride by method 9056									LAB USE ONLY	
						Unpreserved														
1	FD-TT-01 (10-12 WM)	PS	4/11/2018 10:20	10427018001	Solid	1					X									
2	FD-TT-02 (7-9 WM)	PS	4/11/2018 12:20	10427018002	Solid	1					X									
3	FD-SB-A1 (3-6 S)	PS	4/11/2018 13:00	10427018003	Solid	1					X									
4	FD-SB-B1 (11-13 WM)	PS	4/11/2018 13:50	10427018004	Solid	1					X									
5	FD-SB-C1 (5-8 WM)	PS	4/11/2018 14:30	10427018005	Solid	1					X									
6	FD-TT-03 (2-5 WM)	PS	4/11/2018 14:50	10427018006	Solid	1					X									
7	FD-SB-D1 (11-16 WM)	PS	4/11/2018 15:35	10427018007	Solid	1					X									
8	FD-SB-E1 (10-15 WM)	PS	4/11/2018 16:10	10427018008	Solid	1					X									
Transfers											Comments									
Released By	Date/Time	Received By	Date/Time																	
<i>[Signature]</i> /Pace	04/12/18 11:17	<i>DJ Clark</i>	4-12-18 1900	<i>Samples also sent to Pace - Duluth.</i>																
<i>[Signature]</i> /CLM	4-12-18 2330	<i>DJ Clark</i>	4-12-18 1415																	
<i>[Signature]</i> /CLM	4-13-18 1800	<i>[Signature]</i> /Pace	4-13-18 1800																	
Cooler Temperature on Receipt 3.8 °C		Custody Seal <input checked="" type="checkbox"/> or N		Received on Ice <input checked="" type="checkbox"/> or N		Samples Intact <input checked="" type="checkbox"/> or N														

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

returning - 001

Chain of Custody

SSM

40167462

Pace Analytical
www.pacelabs.com

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427018 Workorder Name: 18-00383 MPCA-Freeway LF Solid Owner Received Date: 4/11/2018 Results Requested By: 4/26/2018

Report To	Subcontract To	Requested Analysis
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451	Pace Analytical Green Bay 1241 Bellevue Street Suite 9 Green Bay, WI 54302 Phone (920)469-2436	

Cyanide by EPA 9012

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					LAB USE ONLY	
						Unpreserved						
1	FD-TT-01 (10-12 WM)	PS	4/11/2018 10:20	10427018001	Solid	1					X	
2	FD-TT-02 (7-9 WM)	PS	4/11/2018 12:20	10427018002	Solid	1					X	
3	FD-SB-A1 (3-6 S)	PS	4/11/2018 13:00	10427018003	Solid	1					X	
4	FD-SB-B1 (11-13 WM)	PS	4/11/2018 13:50	10427018004	Solid	1					X	
5	FD-SB-C1 (5-8 WM)	PS	4/11/2018 14:30	10427018005	Solid	1					X	
6	FD-TT-03 (2-5 WM)	PS	4/11/2018 14:50	10427018006	Solid	1					X	
7	FD-SB-D1 (11-16 WM)	PS	4/11/2018 15:35	10427018007	Solid	1					X	
8	FD-SB-E1 (10-15 WM)	PS	4/11/2018 16:10	10427018008	Solid	1					X	

001
002
003
004
005
006
007
008

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	Jennifer Anderson / Pace	04/12/18 11:22			
2	Steph Pw Pace	4/12/18 17:20			
3	WATCO	4/13/18 0835	ASONS pace	4/13/18 0835	

Cooler Temperature on Receipt 3.5 °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace MN

Project #:

Courier: CS Logistics Fed Ex Speedee UPS Walto
 Client Pace Other: _____

Tracking #: 1691218-1

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Custody Seal on Samples Present: yes no Seals intact: yes no

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR - 60 Type of Ice: Wet Blue Dry None

Cooler Temperature Uncorr: 3 / Corr: 3.5

Samples on ice, cooling process has begun

Temp Blank Present: yes no

Biological Tissue is Frozen: yes no

Person examining contents:

Date: 4/13/18

Initials: RS

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>IRWO RS 4/13/18</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A MS/MSD	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
-Pace IR Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>no times on client labels RS 4/13/18</u>
-Includes date/time/ID/Analysis Matrix:	<u>S</u>	
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

If checked, see attached form for additional comments

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: CS

Date: 4/13/18



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50194478 **Date/Time and Initials of person examining contents:** _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 1647

Custody Seal on Cooler/Box Present: Yes No **Seals Intact:** Yes No ^{see 4/6/21/18}

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 0 2 3 4 5 6 A B C D E F **Ice Type:** Wet Blue None | **Samples collected today and on ice:** Yes No N/A

Cooler Temperature: 4.5°C / 4.5°C **Ice Visible in Sample Containers?:** Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C **If temp. is Over 6°C or under 0°C, was the PM Notified?:** Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		/	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		/	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			/
Chain of Custody Present:	/		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			/
Chain of Custody Filled Out:	/		Dissolved Metals field filtered?:			/
Short Hold Time Analysis (<72hr)?: Analysis:		/	Headspace Wisconsin Sulfide			/
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			/
Rush TAT Requested:		/	Headspace in VOA Vials (>6mm):			/
Containers Intact?:	/		Trip Blank Present?:		/	
Sample Labels Match COC?: Except TCs, which only require sample ID	/		Trip Blank Custody Seals?:		/	

Comments: _____

Sample Container Count

WO#: 50194478



SBS

Bulk Kit

Matrix SI/
(Soil/Water)
Aqueous

pH <2 pH >9 pH >12

CLIENT: PACE wv
 COC PAGE 1 of 1
 COC ID# _____

Project # 50194478

Sample Line Item	DC9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	Matrix SI/ (Soil/Water) Aqueous	pH <2	pH >9	pH >12	
1								1												31			
2								1															
3								1															
4								1															
5								1															
6								1															
7								1															
8								1															
9																							
10																							
11																							
12																							

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
VGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 25, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Solid - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/17/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427018
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-TT-01 (10-12 WM) (10427018001)	A181603-01	Solid	04/11/2018	04/13/2018
FD-TT-02 (7-9 WM) (10427018002)	A181603-02	Solid	04/11/2018	04/17/2018
FD-SB-A1 (3-6 S) (10427018003)	A181603-03	Solid	04/11/2018	04/13/2018
FD-SB-B1 (11-13 WM) (10427018004)	A181603-04	Solid	04/11/2018	04/17/2018
FD-SB-C1 (5-8 WM) (10427018005)	A181603-05	Solid	04/11/2018	04/13/2018
FD-TT-03 (2-5 WM) (10427018006)	A181603-06	Solid	04/11/2018	04/17/2018
FD-SB-D1 (11-16 WM) (10427018007)	A181603-07	Solid	04/11/2018	04/13/2018
FD-SB-E1 (10-15 WM) (10427018008)	A181603-08	Solid	04/11/2018	04/17/2018

CASE NARRATIVE

Sample Receipt Information:

4 samples were received on 04/13/2018 and 4 samples were received on 04/17/2018. Samples were received at 5.8 and 1.8 degrees Celsius. Samples were received in acceptable condition, with the exception of one label discrepancy.

Sample A181603-06 had a discrepancy between the sample description on the chain of custody (COC) and the sample description on the container. Per the client, the COC sample description is correct.

Please see the COC document at the end of this report for additional information.



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 Madison, WI 53718
 608.221.8700 Phone
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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427018
 Project Manager: Jennifer Anderson

FD-TT-01 (10-12 WM) (10427018001)

Date Sampled

A181603-01 (Solid)

04/11/2018 10:20

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	0.13	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:15	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 11:40	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:15	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 11:40	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:15	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:15	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:15	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:15	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:15	EPA 8321B	
Surrogate: DCAA		90.5 %	70.8-116		04/20/2018	04/21/2018 12:15	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	72.4	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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 Madison, WI 53718
 608.221.8700 Phone
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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427018
 Project Manager: Jennifer Anderson

FD-TT-02 (7-9 WM) (10427018002)
A181603-02 (Solid)

Date Sampled
 04/11/2018 12:20

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 13:22	EPA 8321B	
2,4-DB	0.12	0.10	mg/kg dry	1	04/20/2018	04/21/2018 13:22	EPA 8321B	P
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:46	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:46	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:46	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:46	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 13:22	EPA 8321B	
Picloram	0.16	0.10	mg/kg dry	1	04/20/2018	04/21/2018 13:22	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 13:22	EPA 8321B	

Surrogate: DCAA

82.1 % 70.8-116 04/20/2018 04/21/2018 13:22 EPA 8321B

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	61.3	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427018
 Project Manager: Jennifer Anderson

FD-SB-A1 (3-6 S) (10427018003)

A181603-03 (Solid)

Date Sampled
 04/11/2018 13:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:29	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:29	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:29	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:29	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:29	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:29	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:29	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:29	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:29	EPA 8321B	

Surrogate: DCAA 64.4 % 70.8-116 04/20/2018 04/21/2018 14:29 EPA 8321B S

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	71.6	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427018
Project Manager: Jennifer Anderson

FD-SB-B1 (11-13 WM) (10427018004)
A181603-04 (Solid)

Date Sampled
04/11/2018 13:50

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 15:36	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 15:36	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 15:36	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:57	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 15:36	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 15:36	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 15:36	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 15:36	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 15:36	EPA 8321B	

Surrogate: DCAA 92.5 % 70.8-116 04/20/2018 04/21/2018 15:36 EPA 8321B

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	80.6	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427018
 Project Manager: Jennifer Anderson

FD-SB-C1 (5-8 WM) (10427018005)
A181603-05 (Solid)

Date Sampled
 04/11/2018 14:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 18:15	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 18:57	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 18:15	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 18:57	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 18:57	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 18:57	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 18:57	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 18:57	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 18:57	EPA 8321B	
Surrogate: DCAA		90.1 %		70.8-116	04/20/2018	04/21/2018 18:57	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	83.5	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427018
 Project Manager: Jennifer Anderson

FD-TT-03 (2-5 WM) (10427018006)
A181603-06 (Solid)

Date Sampled
 04/11/2018 14:50

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 20:04	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 20:04	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 20:04	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 20:04	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 19:21	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 20:04	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 20:04	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 20:04	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 20:04	EPA 8321B	
Surrogate: DCAA		70.7 %	70.8-116		04/20/2018	04/21/2018 20:04	EPA 8321B	S

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	67.5	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427018
 Project Manager: Jennifer Anderson

FD-SB-D1 (11-16 WM) (10427018007)
A181603-07 (Solid)

Date Sampled
 04/11/2018 15:35

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 20:27	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 21:11	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 21:11	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 21:11	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 21:11	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 21:11	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 21:11	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 21:11	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 20:27	EPA 8321B	
Surrogate: DCAA		94.9 %		70.8-116	04/20/2018	04/21/2018 21:11	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	85.0	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427018
 Project Manager: Jennifer Anderson

FD-SB-E1 (10-15 WM) (10427018008)
A181603-08 (Solid)

Date Sampled
 04/11/2018 16:10

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 21:33	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 22:18	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 21:33	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 22:18	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 22:18	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 22:18	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 22:18	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 22:18	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 22:18	EPA 8321B	
Surrogate: DCAA		87.0 %		70.8-116	04/20/2018	04/21/2018 22:18	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	86.0	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427018
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804171 - EPA 3570

Blank (A804171-BLK1)										
Prepared: 04/20/2018 Analyzed: 04/20/2018 18:21										
2,4-D	ND	0.10	mg/kg wet							
2,4-D [2C]	ND	0.10	mg/kg wet							
2,4-DB	ND	0.10	mg/kg wet							
2,4-DB [2C]	ND	0.10	mg/kg wet							
2,4,5-T	ND	0.10	mg/kg wet							
2,4,5-T [2C]	ND	0.10	mg/kg wet							
2,4,5-TP	ND	0.10	mg/kg wet							
2,4,5-TP [2C]	ND	0.10	mg/kg wet							
Bentazon	ND	0.10	mg/kg wet							
Bentazon [2C]	ND	0.10	mg/kg wet							
Dicamba	ND	0.10	mg/kg wet							
Dicamba [2C]	ND	0.10	mg/kg wet							
MCPA	ND	0.10	mg/kg wet							
MCPA [2C]	ND	0.10	mg/kg wet							
Picloram	ND	0.10	mg/kg wet							
Picloram [2C]	ND	0.10	mg/kg wet							
Triclopyr	ND	0.10	mg/kg wet							
Triclopyr [2C]	ND	0.10	mg/kg wet							
<i>Surrogate: DCAA</i>	21.2		mg/kg wet	20.00		106	70.8-116			
<i>Surrogate: DCAA [2C]</i>	19.0		mg/kg wet	20.00		95.3	62.3-114			

LCS (A804171-BS1)										
Prepared: 04/20/2018 Analyzed: 04/20/2018 17:14										
2,4-D	1.92	0.10	mg/kg wet	2.000		96.2	81.6-107			
2,4-D [2C]	1.66	0.10	mg/kg wet	2.000		83.2	71.8-120			
2,4-DB	1.77	0.10	mg/kg wet	2.000		88.7	76.4-107			
2,4-DB [2C]	1.69	0.10	mg/kg wet	2.000		84.5	62.2-129			
2,4,5-T	1.93	0.10	mg/kg wet	2.000		96.6	81.2-110			
2,4,5-T [2C]	1.88	0.10	mg/kg wet	2.000		93.8	70.6-125			
2,4,5-TP	1.87	0.10	mg/kg wet	2.000		93.5	79.1-106			
2,4,5-TP [2C]	1.69	0.10	mg/kg wet	2.000		84.4	68.2-118			
Bentazon	1.07	0.10	mg/kg wet	1.000		107	82.5-119			
Bentazon [2C]	0.806	0.10	mg/kg wet	1.000		80.6	73.3-125			
Dicamba	1.98	0.10	mg/kg wet	2.000		98.8	85.1-108			
Dicamba [2C]	1.85	0.10	mg/kg wet	2.000		92.4	71.4-115			
Picloram	0.991	0.10	mg/kg wet	1.000		99.1	86.1-106			
Picloram [2C]	0.878	0.10	mg/kg wet	1.000		87.8	74.5-114			
Triclopyr	1.89	0.10	mg/kg wet	2.000		94.4	78.6-106			
Triclopyr [2C]	1.67	0.10	mg/kg wet	2.000		83.4	69.4-118			
<i>Surrogate: DCAA</i>	20.9		mg/kg wet	20.00		105	70.8-116			
<i>Surrogate: DCAA [2C]</i>	18.7		mg/kg wet	20.00		93.5	62.3-114			

LCS (A804171-BS2)										
Prepared: 04/20/2018 Analyzed: 04/20/2018 16:07										
MCPA	2.15	0.10	mg/kg wet	2.000		107	79.4-116			
MCPA [2C]	1.92	0.10	mg/kg wet	2.000		96.2	77-123			



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Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427018
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804171 - EPA 3570

LCS (A804171-BS2)

Prepared: 04/20/2018 Analyzed: 04/20/2018 16:07

Surrogate: DCAA	21.1		mg/kg wet	20.00		106	70.8-116			
Surrogate: DCAA [2C]	21.1		mg/kg wet	20.00		105	62.3-114			

Matrix Spike (A804171-MS1)

Source: A181607-08

Prepared: 04/20/2018 Analyzed: 04/20/2018 22:50

2,4-D	1.92	0.10	mg/kg dry	2.156	ND	89.2	71.4-105			
2,4-D [2C]	1.82	0.10	mg/kg dry	2.156	0.0525	81.8	50.5-123			
2,4-DB	1.86	0.10	mg/kg dry	2.156	ND	86.1	46.4-117			
2,4-DB [2C]	1.72	0.10	mg/kg dry	2.156	ND	79.7	44.5-121			
2,4,5-T	2.03	0.10	mg/kg dry	2.156	ND	94.1	66.2-110			
2,4,5-T [2C]	1.94	0.10	mg/kg dry	2.156	ND	90.0	43.6-126			
2,4,5-TP	1.97	0.10	mg/kg dry	2.156	ND	91.3	52.4-114			
2,4,5-TP [2C]	1.83	0.10	mg/kg dry	2.156	ND	85.0	47.6-117			
Bentazon	1.02	0.10	mg/kg dry	1.078	0.0456	90.9	61.5-117			
Bentazon [2C]	0.920	0.10	mg/kg dry	1.078	ND	85.3	50.7-127			
Dicamba	1.59	0.10	mg/kg dry	2.156	ND	73.9	48.4-111			
Dicamba [2C]	1.56	0.10	mg/kg dry	2.156	ND	72.3	43.3-108			
Picloram	0.633	0.10	mg/kg dry	1.078	ND	58.7	26.7-110			
Picloram [2C]	0.389	0.10	mg/kg dry	1.078	0.0164	34.6	10.8-110			
Triclopyr	1.95	0.10	mg/kg dry	2.156	ND	90.7	56-113			
Triclopyr [2C]	1.78	0.10	mg/kg dry	2.156	0.0278	81.2	47.9-120			
Surrogate: DCAA	21.4		mg/kg dry	21.56		99.2	70.8-116			
Surrogate: DCAA [2C]	19.1		mg/kg dry	21.56		88.6	62.3-114			

Matrix Spike (A804171-MS2)

Source: A181607-08

Prepared: 04/20/2018 Analyzed: 04/21/2018 01:04

MCPA	2.22	0.10	mg/kg dry	2.156	ND	103	74.2-114			
MCPA [2C]	2.11	0.10	mg/kg dry	2.156	ND	97.8	60.9-122			
Surrogate: DCAA	21.5		mg/kg dry	21.56		99.6	70.8-116			
Surrogate: DCAA [2C]	21.8		mg/kg dry	21.56		101	62.3-114			

Matrix Spike Dup (A804171-MSD1)

Source: A181607-08

Prepared: 04/20/2018 Analyzed: 04/20/2018 23:57

2,4-D	1.96	0.10	mg/kg dry	2.156	ND	90.7	71.4-105	1.67	20	
2,4-D [2C]	1.88	0.10	mg/kg dry	2.156	0.0525	84.8	50.5-123	3.52	20	
2,4-DB	1.86	0.10	mg/kg dry	2.156	ND	86.1	46.4-117	0.0708	20	
2,4-DB [2C]	1.81	0.10	mg/kg dry	2.156	ND	84.1	44.5-121	5.40	20	
2,4,5-T	2.01	0.10	mg/kg dry	2.156	ND	93.3	66.2-110	0.865	20	
2,4,5-T [2C]	1.92	0.10	mg/kg dry	2.156	ND	89.0	43.6-126	1.06	20	
2,4,5-TP	1.95	0.10	mg/kg dry	2.156	ND	90.3	52.4-114	1.05	20	
2,4,5-TP [2C]	1.83	0.10	mg/kg dry	2.156	ND	84.9	47.6-117	0.106	20	
Bentazon	1.04	0.10	mg/kg dry	1.078	0.0456	92.2	61.5-117	1.44	20	
Bentazon [2C]	0.960	0.10	mg/kg dry	1.078	ND	89.1	50.7-127	4.28	20	
Dicamba	1.62	0.10	mg/kg dry	2.156	ND	74.9	48.4-111	1.41	20	
Dicamba [2C]	1.60	0.10	mg/kg dry	2.156	ND	74.1	43.3-108	2.52	20	
Picloram	0.641	0.10	mg/kg dry	1.078	ND	59.5	26.7-110	1.30	20	
Picloram [2C]	0.387	0.10	mg/kg dry	1.078	0.0164	34.4	10.8-110	0.574	20	



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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427018
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804171 - EPA 3570

Matrix Spike Dup (A804171-MSD1)		Source: A181607-08		Prepared: 04/20/2018 Analyzed: 04/20/2018 23:57						
Triclopyr	1.97	0.10	mg/kg dry	2.156	ND	91.4	56-113	0.809	20	
Triclopyr [2C]	1.78	0.10	mg/kg dry	2.156	0.0278	81.1	47.9-120	0.221	20	
Surrogate: DCAA	21.2		mg/kg dry	21.56		98.4	70.8-116			
Surrogate: DCAA [2C]	18.9		mg/kg dry	21.56		87.9	62.3-114			
Matrix Spike Dup (A804171-MSD2)		Source: A181607-08		Prepared: 04/20/2018 Analyzed: 04/21/2018 02:11						
MCPA	2.21	0.10	mg/kg dry	2.156	ND	103	74.2-114	0.307	20	
MCPA [2C]	2.08	0.10	mg/kg dry	2.156	ND	96.5	60.9-122	1.37	20	
Surrogate: DCAA	21.6		mg/kg dry	21.56		100	70.8-116			
Surrogate: DCAA [2C]	21.9		mg/kg dry	21.56		102	62.3-114			



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Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Solid - MN Project Number: 10427018 Project Manager: Jennifer Anderson
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Classical Chemistry Parameters - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804163 - % Solids

Duplicate (A804163-DUP1)	Source: A181607-09		Prepared: 04/18/2018 Analyzed: 04/19/2018 11:20							
% Solids	90.0	0.00	% by Weight		90.3			0.390	20	



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Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427018
Project Manager: Jennifer Anderson

Notes and Definitions

- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- P The difference in the concentrations between the primary and confirmation column was > 40%.
- LC Results may be biased low because of low continuing calibration verification (CCV).
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Chain of Custody

A18 1603



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427018

Workorder Name: 18-00383 MPCA-Freeway LF Solid

Owner Received Date: 4/11/2018

Results Requested By: 4/26/2018

Report To		Subcontract To				Requested Analysis																							
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700				82700 - MSSV MDA LIST 2																							
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix													Unpreserved	LAB USE ONLY										
1	FD-TT-01 (10-12 WM)	PS	4/11/2018 10:20	10427018001	Solid													1											
2	FD-TT-02 (7-9 WM)	PS	4/11/2018 12:20	10427018002	Solid													1											
3	FD-SB-A1 (3-8 S)	PS	4/11/2018 13:00	10427018003	Solid													1											
4	FD-SB-B1 (11-13 WM)	PS	4/11/2018 13:50	10427018004	Solid													1											
5	FD-SB-C1 (5-8 WM)	PS	4/11/2018 14:30	10427018005	Solid													1											
6	FD-TT-03 (2-5 WM)	PS	4/11/2018 14:50	10427018006	Solid													1											
7	FD-SB-D1 (11-16 WM)	PS	4/11/2018 15:35	10427018007	Solid													1											
8	FD-SB-E1 (10-15 WM)	PS	4/11/2018 16:10	10427018008	Solid													1											
Transfers		Released By	Date/Time	Received By	Date/Time	Comments																							
1		<i>[Signature]</i>	4/16/18	<i>[Signature]</i>	4/17/18	Containers for samples -002, -004, -006, -008 (not originally sent 4/12) method 8321																							
2					0906																								
3																													
Cooler Temperature on Receipt		1.8 °C	Custody Seal		(Y) or N	Received on Ice		(Y) or N	Samples Intact				(Y) or N																

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274
exp 7/12/18

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

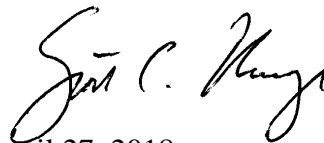
PaceProject#: 10427261
Sample Receipt Date: 04/13/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 27, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

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The results relate only to the samples included in this report.

Report Prepared Date:

April 27, 2018

DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of PACE Minnesota Field. The sample was analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration points and a nominal 1-liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The isotopically-labeled TCDD internal standard in the sample extract was recovered at 72%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained. Concentrations below the calibration range were flagged "J" and should be regarded as estimates.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 112-113% with a relative percent difference of 0.9%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10427261

Appendix A

Sample Management

WO#: 10427261



Chain-of-Custody Form

Work Order Number:

Turnaround Time:

1 of 1

PROJECT/CLIENT INFO

Facility Code: *MPCA-FreewayLF water* Program Code (MDH Lab Only):
 Project Name: *MPCA-FreewayLF water* Project Task Code:
 Project Manager:
 Potential Hazard? If yes, add information to Sampler Comments Section

Lab Name:
 Address: *18-00383*
EPIC Profile # 38716
 Phone No:

FOR LAB USE ONLY

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 S-R=Routine Sample
 S-IVP=Integrated Vertical Profile Sample
 S-CWOP=Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAE MATRIX CODES

DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES

Wn-Ground=Groundwater
 Ws-Surf=Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

PRESERV.

ANALYSIS

List A
 List A,B,C
 Partial List A
 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260, 270, 280, 290, 300, 310, 320, 330, 340, 350, 360, 370, 380, 390, 400, 410, 420, 430, 440, 450, 460, 470, 480, 490, 500, 510, 520, 530, 540, 550, 560, 570, 580, 590, 600, 610, 620, 630, 640, 650, 660, 670, 680, 690, 700, 710, 720, 730, 740, 750, 760, 770, 780, 790, 800, 810, 820, 830, 840, 850, 860, 870, 880, 890, 900, 910, 920, 930, 940, 950, 960, 970, 980, 990, 1000

Location Identifier	Sample Type	Date	Time	Start Depth, in feet	End Depth, in feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont
FD-SB	S					G	NW	WTS			
FD-TT-06	S	4/12/18	1230			G	NW	WTS			41
TS-SB-02	S	4/12/18	1930			G	NW	WTS			1

Sampled By: *David Anderson*

Sampler's Signature: *David Anderson*

Phone #:

Receiving Comments:

Relinquished By/Affiliation

Date/Time

Accepted By/Affiliation

Date/Time

<i>DA 4/12/18</i> <i>David Anderson</i> / <i>Pace Analytical</i>	<i>4/12/18</i>	<i>DR Pace</i>	<i>4/12/18</i>
<i>David Anderson</i> / <i>Pace Analytical</i>	<i>4/13/18 0745</i>		

T=4.3
3.6

Sample Condition Upon Receipt

Client Name: MPCA Project #: _____

WO#: 10427261
 PM: SCU Due Date: 04/27/18
 CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: PTB Temp Blank? Yes No

Thermometer 151401163 G87A9155100842
 Used: 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 4.1, 3.4 Cooler Temp Corrected (°C): 4.3, 3.6 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: RG 4/13/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: [Signature] Date: 04/13/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	EPA 8270C
PCBs	EPA 8082
PFCs	EPA 537
VOCs	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

*** ADD to Parameter List A:

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Hardness determination)

Dissolved-Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/16 email from Mark Umholtz (MPCA).
BGJ-Pace

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500ClO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (THMMs)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10427261

Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-TT-06		
Lab Sample ID	10427261001		
Filename	U180422B_14		
Injected By	BAL		
Total Amount Extracted	510 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	04/12/2018 12:30
ICAL ID	U180405	Received	04/13/2018 12:05
CCal Filename(s)	U180422A_16	Extracted	04/16/2018 14:55
Method Blank ID	BLANK-61751	Analyzed	04/23/2018 00:43

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	17	----	10 J	2,3,7,8-TCDD-13C	2.00	72
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	85

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

J = Estimated value
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61751	Matrix	Water
Filename	U180421A_06	Dilution	NA
Total Amount Extracted	1010 mL	Extracted	04/16/2018 14:55
ICAL ID	U180405	Analyzed	04/21/2018 17:22
CCal Filename(s)	U180420B_15	Injected By	BAL

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	63
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	73

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61752	Matrix	Water
Filename	U180421A_01	Dilution	NA
Total Amount Extracted	1040 mL	Extracted	04/16/2018 14:55
ICAL ID	U180405	Analyzed	04/21/2018 13:22
CCal Filename	U180420B_15	Injected By	BAL
Method Blank ID	BLANK-61751		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	11	7.3	14.6	112
2,3,7,8-TCDD-37Cl4	10	8.8	3.7	15.8	88
2,3,7,8-TCDD-13C	100	74	25.0	141.0	74

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61753	Matrix	Water
Filename	U180421A_02	Dilution	NA
Total Amount Extracted	1030 mL	Extracted	04/16/2018 14:55
ICAL ID	U180405	Analyzed	04/21/2018 14:09
CCal Filename	U180420B_15	Injected By	BAL
Method Blank ID	BLANK-61751		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	11	7.3	14.6	113
2,3,7,8-TCDD-37Cl4	10	9.1	3.7	15.8	91
2,3,7,8-TCDD-13C	100	74	25.0	141.0	74

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61752
 Spike 1 Filename U180421A_01

Spike 2 ID LCSD-61753
 Spike 2 Filename U180421A_02

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	112	113	0.9

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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May 10, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 13, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Alaska Certification UST-107
California Certification #2973
California Certification #2973
Montana Certificate #CERT0103
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad

Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

Pennsylvania Certification IDs

KY WW Permit #: KY0098221	Ohio EPA Rad Approval: #41249
KY WW Permit #: KY0000221	Oregon/TNI Certification #: PA200002-010
Louisiana DHH/TNI Certification #: LA180012	Pennsylvania/TNI Certification #: 65-00282
Louisiana DEQ/TNI Certification #: 4086	Puerto Rico Certification #: PA01457
Maine Certification #: 2017020	Rhode Island Certification #: 65-00282
Maryland Certification #: 308	South Dakota Certification
Massachusetts Certification #: M-PA1457	Tennessee Certification #: 02867
Michigan/PADEP Certification #: 9991	Texas/TNI Certification #: T104704188-17-3
Missouri Certification #: 235	Utah/TNI Certification #: PA014572017-9
Montana Certification #: Cert0082	USDA Soil Permit #: P330-17-00091
Nebraska Certification #: NE-OS-29-14	Vermont Dept. of Health: ID# VT-0282
Nevada Certification #: PA014572018-1	Virgin Island/PADEP Certification
New Hampshire/TNI Certification #: 297617	Virginia/VELAP Certification #: 9526
New Jersey/TNI Certification #: PA051	Washington Certification #: C868
New Mexico Certification #: PA01457	West Virginia DEP Certification #: 143
New York/TNI Certification #: 10888	West Virginia DHHR Certification #: 9964C
North Carolina Certification #: 42706	Wisconsin Approve List for Rad
North Dakota Certification #: R-190	Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174	Nebraska Certification: NE-OS-28-14
Alabama Certification #: 41320	Nevada Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216	New Hampshire Certification #: 2958
Delaware Certification: FL NELAC Reciprocity	New Jersey Certification #: FL022
Florida Certification #: E83079	New York Certification #: 11608
Georgia Certification #: 955	North Carolina Environmental Certificate #: 667
Guam Certification: FL NELAC Reciprocity	North Carolina Certification #: 12710
Hawaii Certification: FL NELAC Reciprocity	Oklahoma Certification #: D9947
Illinois Certification #: 200068	Pennsylvania Certification #: 68-00547
Indiana Certification: FL NELAC Reciprocity	Puerto Rico Certification #: FL01264
Kansas Certification #: E-10383	South Carolina Certification: #96042001
Kentucky Certification #: 90050	Tennessee Certification #: TN02974
Louisiana Certification #: FL NELAC Reciprocity	Texas Certification: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007	US Virgin Islands Certification: FL NELAC Reciprocity
Maryland Certification: #346	Virginia Environmental Certification #: 460165
Michigan Certification #: 9911	Wyoming Certification: FL NELAC Reciprocity
Mississippi Certification: FL NELAC Reciprocity	West Virginia Certification #: 9962C
Missouri Certification #: 236	Wisconsin Certification #: 399079670
Montana Certification #: Cert 0074	Wyoming (EPA Region 8): FL NELAC Reciprocity

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512	New York State Department of Health, Serial #57971 and 57972
Minnesota Department of Health, Certificate #1385941	North Carolina Division of Water Resources, Certificate #659
Arkansas Department of Environmental Quality, Certificate #17-046-0	Virginia Department of General Services, Certificate #9028
Georgia Environmental Protection Division, Stipulation	Wisconsin Department of Natural Resources, Laboratory #999472650
Illinois Environmental Protection Agency, Certificate #004325	U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278
Michigan Department of Environmental Quality, Laboratory #0034	

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10427276001	FD-TT-06	Water	04/12/18 12:30	04/13/18 08:00
10427276002	TS-SB-02	Water	04/12/18 19:30	04/13/18 08:00

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10427276001	FD-TT-06	EPA 531.1	AC1	3	PASI-O
		EPA 547	AC1	1	PASI-O
		EPA 549.2	AC1	2	PASI-O
		EPA 552.3	MMB	7	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 548.1	LAJ	1	PASI-O
		EPA 8270D	AT1	38	PASI-M
		EPA 524.2	AEZ	4	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NEG	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	AR3	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-CIO2	AGS	1	PASI-O
		SM 4500-H+B	AR3	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	AR3	2	PASI-M
		EPA 300.1	CMB	1	PASI-O
		EPA 300.1	CMB	1	PASI-O
		SM 3500-Cr B Modified	JFP	1	PASI-M
EPA 350.1	CLJ	1	PASI-V		
EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
EPA 353.2	JFP	3	PASI-M		

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M
10427276002	TS-SB-02	EPA 200.7	DM	8	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 245.1	LMW	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Project No.: 10427276

Sample: FD-TT-06	Lab ID: 10427276001	Collected: 04/12/18 12:30	Received: 04/13/18 08:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data								
Analytical Method:								
Field pH	6.7	Std. Units	0.10	1		04/12/18 12:30		
Field Temperature	6.5	deg C	0.50	1		04/12/18 12:30		
531.1 HPLC Carbamates								
Analytical Method: EPA 531.1								
Aldicarb	ND	ug/L	2.0	1		05/04/18 07:38	116-06-3	
Carbofuran	ND	ug/L	2.0	1		05/04/18 07:38	1563-66-2	
Surrogates								
BDMC (S)	109	%	80-120	1		05/04/18 07:38		
547 HPLC Glyphosate								
Analytical Method: EPA 547								
Glyphosate	ND	ug/L	6.0	1		04/27/18 02:05		
549.2 HPLC Paraquat Diquat								
Analytical Method: EPA 549.2 Preparation Method: EPA 549.2								
Diquat	ND	ug/L	0.40	1	04/18/18 23:22	04/19/18 19:40	85-00-7	
Paraquat	ND	ug/L	0.40	1	04/18/18 23:22	04/19/18 19:40	1910-42-5	
552.3 Haloacetic Acids								
Analytical Method: EPA 552.3 Preparation Method: EPA 552.3								
Dibromoacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 18:51	631-64-1	
Dichloroacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 18:51	79-43-6	
Haloacetic Acids (Total)	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 18:51		
Monobromoacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 18:51	79-08-3	
Monochloroacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 18:51	79-11-8	
Trichloroacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 18:51	76-03-9	
Surrogates								
2,3-Dibromopropanoic Acid (S)	128	%	70-130	1	04/21/18 00:13	04/25/18 18:51	600-05-5	
8011 GCS EDB and DBCP								
Analytical Method: EPA 8011 Preparation Method: EPA 8011								
1,2-Dibromo-3-chloropropane	ND	ug/L	0.010	1	04/24/18 14:16	04/24/18 23:22	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.010	1	04/24/18 14:16	04/24/18 23:22	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	113	%.	30-150	1	04/24/18 14:16	04/24/18 23:22	460-00-4	
8015M Alcohols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	ug/L	5000	1		04/25/18 15:40	67-56-1	
8015M Glycols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/23/18 15:44	107-21-1	
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	309-00-2	
alpha-BHC	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	319-84-6	
beta-BHC	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	319-85-7	
delta-BHC	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	58-89-9	
Chlordane (Technical)	ND	ug/L	1.0	2	04/13/18 17:03	04/17/18 00:01	57-74-9	
alpha-Chlordane	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	5103-71-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Sample: FD-TT-06	Lab ID: 10427276001	Collected: 04/12/18 12:30	Received: 04/13/18 08:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
gamma-Chlordane	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	5103-74-2	
4,4'-DDD	ND	ug/L	0.21	2	04/13/18 17:03	04/17/18 00:01	72-54-8	
4,4'-DDE	ND	ug/L	0.21	2	04/13/18 17:03	04/17/18 00:01	72-55-9	
4,4'-DDT	ND	ug/L	0.21	2	04/13/18 17:03	04/17/18 00:01	50-29-3	
Dieldrin	ND	ug/L	0.21	2	04/13/18 17:03	04/17/18 00:01	60-57-1	
Endosulfan I	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	959-98-8	
Endosulfan II	ND	ug/L	0.21	2	04/13/18 17:03	04/17/18 00:01	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.21	2	04/13/18 17:03	04/17/18 00:01	1031-07-8	
Endrin	ND	ug/L	0.21	2	04/13/18 17:03	04/17/18 00:01	72-20-8	
Endrin aldehyde	ND	ug/L	0.21	2	04/13/18 17:03	04/17/18 00:01	7421-93-4	
Endrin ketone	ND	ug/L	0.21	2	04/13/18 17:03	04/17/18 00:01	53494-70-5	
Heptachlor	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	76-44-8	
Heptachlor epoxide	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	1024-57-3	
Methoxychlor	ND	ug/L	1.0	2	04/13/18 17:03	04/17/18 00:01	72-43-5	
Toxaphene	ND	ug/L	3.1	2	04/13/18 17:03	04/17/18 00:01	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	87	%.	62-125	2	04/13/18 17:03	04/17/18 00:01	877-09-8	1M,D3
Decachlorobiphenyl (S)	52	%.	30-143	2	04/13/18 17:03	04/17/18 00:01	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	04/13/18 17:03	04/16/18 16:15	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	04/13/18 17:03	04/16/18 16:15	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	04/13/18 17:03	04/16/18 16:15	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.10	1	04/13/18 17:03	04/16/18 16:15	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	04/13/18 17:03	04/16/18 16:15	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.10	1	04/13/18 17:03	04/16/18 16:15	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	04/13/18 17:03	04/16/18 16:15	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	04/13/18 17:03	04/16/18 16:15	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	04/13/18 17:03	04/16/18 16:15	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	76	%.	30-125	1	04/13/18 17:03	04/16/18 16:15	877-09-8	
Decachlorobiphenyl (S)	51	%.	30-125	1	04/13/18 17:03	04/16/18 16:15	2051-24-3	
8315A GCSV Aldehydes								
Analytical Method: EPA 8315A Preparation Method: EPA 8315A								
Formaldehyde	ND	ug/L	100	1	04/19/18 09:11	04/19/18 16:07	50-00-0	H3,R1
8316 W GCSV Acrylamide								
Analytical Method: EPA 8316								
Acrylamide	ND	ug/L	20.0	1		04/18/18 17:33	79-06-1	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	1610	ug/L	200	1	04/17/18 11:11	04/19/18 17:00	7429-90-5	
Barium, Dissolved	407	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:00	7440-39-3	
Copper, Dissolved	54.1	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:00	7440-50-8	
Manganese, Dissolved	738	ug/L	5.0	1	04/17/18 11:11	04/19/18 17:00	7439-96-5	
Nickel, Dissolved	27.4	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:00	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:00	7440-22-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Sample: FD-TT-06	Lab ID: 10427276001	Collected: 04/12/18 12:30	Received: 04/13/18 08:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Tin, Dissolved	ND	ug/L	75.0	1	04/17/18 11:11	04/19/18 17:00	7440-31-5	
Zinc, Dissolved	212	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:00	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	14.6	ug/L	0.50	1	04/16/18 11:40	04/16/18 20:38	7440-47-3	
Total Hardness by 2340B	477000	ug/L	2820	20	04/16/18 11:40	04/16/18 20:41		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	1.3	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:44	7440-36-0	
Arsenic, Dissolved	2.4	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:44	7440-38-2	
Beryllium, Dissolved	0.21	ug/L	0.20	1	04/16/18 06:50	04/18/18 16:44	7440-41-7	
Boron, Dissolved	6600	ug/L	500	100	04/16/18 06:50	04/18/18 15:09	7440-42-8	
Cadmium, Dissolved	0.65	ug/L	0.080	1	04/16/18 06:50	04/18/18 16:44	7440-43-9	
Chromium, Dissolved	3.9	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:44	7440-47-3	
Cobalt, Dissolved	4.6	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:44	7440-48-4	
Lead, Dissolved	21.5	ug/L	0.10	1	04/16/18 06:50	04/18/18 16:44	7439-92-1	
Selenium, Dissolved	2.6	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:44	7782-49-2	
Thallium, Dissolved	0.61	ug/L	0.10	1	04/16/18 06:50	04/18/18 16:44	7440-28-0	
Uranium-238, Dissolved	2.0	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:44	7440-61-1	
Vanadium, Dissolved	4.4	ug/L	1.0	1	04/16/18 06:50	04/18/18 16:44	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	0.26	ug/L	0.20	1	04/16/18 14:31	04/16/18 14:41	7439-97-6	
548.1 GCS Endothall								
Analytical Method: EPA 548.1 Preparation Method: EPA 548.1								
Endothall	ND	ug/L	9.0	1	04/19/18 08:10	04/19/18 22:45		IO
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	83-32-9	
Anthracene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	50-32-8	
Benzoic acid	ND	ug/L	51.8	1	04/16/18 17:28	04/20/18 17:44	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	111-44-4	
2-Chlorophenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	51.8	1	04/16/18 17:28	04/20/18 17:44	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	120-83-2	
Diethylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	84-66-2	
2,4-Dimethylphenol	ND	ug/L	51.8	1	04/16/18 17:28	04/20/18 17:44	105-67-9	
Dimethylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	117-81-7	
Fluoranthene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	206-44-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

Sample: FD-TT-06	Lab ID: 10427276001	Collected: 04/12/18 12:30	Received: 04/13/18 08:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Fluorene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	86-73-7	
Hexachlorobenzene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	51.8	1	04/16/18 17:28	04/20/18 17:44	77-47-4	
Hexachloroethane	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	67-72-1	
Isophorone	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.7	1	04/16/18 17:28	04/20/18 17:44		
N-Nitrosodiphenylamine	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	86-30-6	
Pentachlorophenol	ND	ug/L	20.7	1	04/16/18 17:28	04/20/18 17:44	87-86-5	
Phenanthrene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	85-01-8	
Phenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	108-95-2	
Pyrene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	70	%	60-125	1	04/16/18 17:28	04/20/18 17:44	4165-60-0	
2-Fluorobiphenyl (S)	79	%	56-125	1	04/16/18 17:28	04/20/18 17:44	321-60-8	
p-Terphenyl-d14 (S)	84	%	58-125	1	04/16/18 17:28	04/20/18 17:44	1718-51-0	
Phenol-d6 (S)	73	%	58-125	1	04/16/18 17:28	04/20/18 17:44	13127-88-3	
2-Fluorophenol (S)	68	%	55-125	1	04/16/18 17:28	04/20/18 17:44	367-12-4	
2,4,6-Tribromophenol (S)	96	%	65-125	1	04/16/18 17:28	04/20/18 17:44	118-79-6	
524.2 MSV Analytical Method: EPA 524.2								
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/17/18 14:07		
Surrogates								
4-Bromofluorobenzene (S)	96	%	75-125	1		04/17/18 14:07	460-00-4	
Toluene-d8 (S)	96	%	75-125	1		04/17/18 14:07	2037-26-5	
1,2-Dichloroethane-d4 (S)	103	%	75-125	1		04/17/18 14:07	17060-07-0	
Field Data Analytical Method:								
Field pH	6.7	Std. Units		1		04/12/18 12:30		
Field Temperature	6.5	deg C		1		04/12/18 12:30		
Hach 10360 Rev 1.1 BOD Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	27.7	mg/L	20.0	10	04/13/18 14:56	04/18/18 16:35		
1664 HEM, Oil and Grease Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	4.8	1		04/25/18 12:19		
180.1 Turbidity Analytical Method: EPA 180.1								
Turbidity	315	NTU	7.5	25		04/13/18 15:04		
2540D Total Suspended Solids Analytical Method: SM 2540D								
Total Suspended Solids	230	mg/L	10.0	1		04/18/18 14:24		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Sample: FD-TT-06	Lab ID: 10427276001	Collected: 04/12/18 12:30	Received: 04/13/18 08:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
4500ClO2 Chlorine Dioxide	Analytical Method: SM 4500-ClO2							
Chlorine Dioxide	1.6	mg/L	0.10	1		04/25/18 13:31		H6
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	6.8	Std. Units	0.10	1		04/24/18 14:42		H6
Trivalent Chromium Calculation	Analytical Method: Trivalent Chromium Calculation							
Chromium, Trivalent	ND	mg/L	0.010	1		04/24/18 15:01		
300.0 IC Anions	Analytical Method: EPA 300.0							
Chloride	56.5	mg/L	1.2	1		04/17/18 17:22	16887-00-6	M1
Fluoride	0.14	mg/L	0.050	1		04/17/18 17:22	16984-48-8	M1
300.1 Oxihalide IC Anions 14d	Analytical Method: EPA 300.1							
Chlorite	ND	ug/L	50.0	10		04/22/18 16:38		D3
300.1 Oxihalide IC Anions 28d	Analytical Method: EPA 300.1							
Bromate	ND	ug/L	10.0	10		04/22/18 16:38	15541-45-4	D3
Chromium, Hexavalent	Analytical Method: SM 3500-Cr B Modified							
Chromium, Hexavalent	0.011	mg/L	0.010	1		04/13/18 16:43		FS,H1, M1
350.1 Ammonia, Unionized	Analytical Method: EPA 350.1							
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		05/02/18 09:46		
350.1 Ammonia, Distilled	Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)							
Nitrogen, Ammonia	5.4	mg/L	0.10	1	04/19/18 15:00	04/20/18 07:09	7664-41-7	
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrate as N	0.55	mg/L	0.020	1		04/13/18 16:58	14797-55-8	FS
Nitrite as N	0.032	mg/L	0.020	1		04/13/18 16:58	14797-65-0	FS
Nitrogen, NO2 plus NO3	0.58	mg/L	0.020	1		04/13/18 16:58		FS
9016 Cyanide, Free	Analytical Method: EPA 9016 Preparation Method: EPA 9016							
Cyanide, Free	ND	ug/L	5.0	1	04/24/18 16:40	04/24/18 17:42		
SM4500CN-E Cyanide	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E							
Cyanide	ND	ug/L	10.0	1	04/23/18 09:55	04/23/18 12:31	57-12-5	
SM4500P-E, Total Phosphorus	Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B							
Phosphorus	0.19	mg/L	0.050	1	04/17/18 09:29	04/17/18 13:38	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sample: TS-SB-02								
Lab ID: 10427276002								
Collected: 04/12/18 19:30 Received: 04/13/18 08:00 Matrix: Water								
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	04/17/18 11:11	04/19/18 17:03	7429-90-5	
Barium, Dissolved	796	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:03	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:03	7440-50-8	
Manganese, Dissolved	722	ug/L	5.0	1	04/17/18 11:11	04/19/18 17:03	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:03	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:03	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/17/18 11:11	04/19/18 17:03	7440-31-5	
Zinc, Dissolved	ND	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:03	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	1.5	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:49	7440-36-0	
Arsenic, Dissolved	3.1	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:49	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/16/18 06:50	04/18/18 16:49	7440-41-7	
Boron, Dissolved	582	ug/L	500	100	04/16/18 06:50	04/18/18 15:13	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/16/18 06:50	04/18/18 16:49	7440-43-9	
Chromium, Dissolved	1.1	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:49	7440-47-3	
Cobalt, Dissolved	2.3	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:49	7440-48-4	
Lead, Dissolved	0.36	ug/L	0.10	1	04/16/18 06:50	04/18/18 16:49	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:49	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/16/18 06:50	04/18/18 16:49	7440-28-0	
Uranium-238, Dissolved	0.85	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:49	7440-61-1	
Vanadium, Dissolved	1.3	ug/L	1.0	1	04/16/18 06:50	04/18/18 16:49	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	04/16/18 14:31	04/16/18 14:43	7439-97-6	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 444328 Analysis Method: EPA 531.1
QC Batch Method: EPA 531.1 Analysis Description: 531.1 HPLC Carbamate
Associated Lab Samples: 10427276001

METHOD BLANK: 2409903 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aldicarb	ug/L	ND	2.0	05/03/18 15:06	
Carbofuran	ug/L	ND	2.0	05/03/18 15:06	
BDMC (S)	%	103	80-120	05/03/18 15:06	

LABORATORY CONTROL SAMPLE: 2409904

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aldicarb	ug/L	10	10.4	104	80-120	
Carbofuran	ug/L	10	8.8	88	80-120	
BDMC (S)	%			94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2409905 2409906

Parameter	Units	35385680001 Result	MS		MSD		MS		MSD		% Rec Limits	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	RPD	RPD				
Aldicarb	ug/L	0.64U	10	10	7.9	9.3	79	93	80-120	16	20	M1		
Carbofuran	ug/L	0.32U	10	10	7.7	8.7	77	87	80-120	12	20	M1		
BDMC (S)	%						47	94	80-120			S0		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 441208 Analysis Method: EPA 547
QC Batch Method: EPA 547 Analysis Description: 547 HPLC Glyphosate
Associated Lab Samples: 10427276001

METHOD BLANK: 2394537 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Glyphosate	ug/L	ND	6.0	04/26/18 20:22	

LABORATORY CONTROL SAMPLE: 2394538

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Glyphosate	ug/L	50	50.3	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2394539 2394540

Parameter	Units	92380797002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	ND	50	50	51.6	48.4	103	97	80-120	7	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2394541 2394542

Parameter	Units	35385315001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	<4.2	50	50	52.2	52.2	104	104	80-120	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 438905 Analysis Method: EPA 8015 Alcohol-Glycol
 QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified
 Associated Lab Samples: 10427276001

METHOD BLANK: 2027992 Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methanol	ug/L	ND	5000	04/25/18 14:17	

LABORATORY CONTROL SAMPLE: 2027993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methanol	ug/L	50000	46800	94	79-111	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027994 2027995

Parameter	Units	2027994		2027995		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10428032001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result					
Methanol	ug/L	ND	50000	50000	47100	51900	91	101	43-138	10 20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 438205	Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol	Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10427276001	

METHOD BLANK: 2024704 Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylene glycol	mg/L	ND	5.0	04/23/18 14:09	

LABORATORY CONTROL SAMPLE: 2024705

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylene glycol	mg/L	25	29.3	117	55-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026734 2026735

Parameter	Units	50194690001 Result	MS		MSD		% Rec	% Rec	% Rec	Limits	Max		Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result					RPD	RPD	
Ethylene glycol	mg/L	ND	25	21.9	25	24.7	87	99	38-154	12	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 20643	Analysis Method: EPA 8316
QC Batch Method: EPA 8316	Analysis Description: 8316 W GCSV Acrylamide
Associated Lab Samples: 10427276001	

METHOD BLANK: 82388 Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acrylamide	ug/L	ND	20.0	04/18/18 17:05	

LABORATORY CONTROL SAMPLE: 82389

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acrylamide	ug/L	1000	989	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 82390 82391

Parameter	Units	10427276001		82391		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					
Acrylamide	ug/L	ND	1000	1000	944	963	94	96	78-135	2 16

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532450 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury - Dissolved
Associated Lab Samples: 10427276001, 10427276002

METHOD BLANK: 2891722 Matrix: Water
Associated Lab Samples: 10427276001, 10427276002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	04/16/18 14:29	

LABORATORY CONTROL SAMPLE: 2891723

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	5.2	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891724 2891725

Parameter	Units	10426205002		2891724		2891725		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Mercury, Dissolved	ug/L	<0.062		5	5	5.3	5.1	107	103	70-130	4	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532437 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10427276001, 10427276002

METHOD BLANK: 2891672 Matrix: Water
Associated Lab Samples: 10427276001, 10427276002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/19/18 16:13	
Barium, Dissolved	ug/L	ND	10.0	04/19/18 16:13	
Copper, Dissolved	ug/L	ND	10.0	04/19/18 16:13	
Manganese, Dissolved	ug/L	ND	5.0	04/19/18 16:13	
Nickel, Dissolved	ug/L	ND	20.0	04/19/18 16:13	
Silver, Dissolved	ug/L	ND	10.0	04/19/18 16:13	
Tin, Dissolved	ug/L	ND	75.0	04/19/18 16:13	
Zinc, Dissolved	ug/L	ND	20.0	04/19/18 16:13	

LABORATORY CONTROL SAMPLE: 2891673

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21400	107	85-115	
Barium, Dissolved	ug/L	1000	1040	104	85-115	
Copper, Dissolved	ug/L	1000	1020	102	85-115	
Manganese, Dissolved	ug/L	1000	1040	104	85-115	
Nickel, Dissolved	ug/L	1000	1030	103	85-115	
Silver, Dissolved	ug/L	500	506	101	85-115	
Tin, Dissolved	ug/L	1000	1020	102	85-115	
Zinc, Dissolved	ug/L	1000	1040	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891674 2891675

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427032001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	21600	21800	108	109	70-130	1	30
Barium, Dissolved	ug/L	ND	1000	1000	1010	1020	100	101	70-130	1	30
Copper, Dissolved	ug/L	ND	1000	1000	1050	1050	105	105	70-130	1	30
Manganese, Dissolved	ug/L	8.5	1000	1000	1010	1020	100	101	70-130	1	30
Nickel, Dissolved	ug/L	ND	1000	1000	993	997	99	100	70-130	0	30
Silver, Dissolved	ug/L	ND	500	500	506	508	101	102	70-130	0	30
Tin, Dissolved	ug/L	ND	1000	1000	1030	1020	103	101	70-130	1	30
Zinc, Dissolved	ug/L	ND	1000	1000	1030	1030	102	102	70-130	0	30

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

MATRIX SPIKE SAMPLE: 2893024		10427135002	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Aluminum, Dissolved	ug/L	ND	20000	23000	115	70-130	
Barium, Dissolved	ug/L	22.2	1000	1080	106	70-130	
Copper, Dissolved	ug/L	ND	1000	1080	108	70-130	
Manganese, Dissolved	ug/L	118	1000	1170	105	70-130	
Nickel, Dissolved	ug/L	ND	1000	1010	100	70-130	
Silver, Dissolved	ug/L	ND	500	532	106	70-130	
Tin, Dissolved	ug/L	ND	1000	1030	103	70-130	
Zinc, Dissolved	ug/L	ND	1000	1010	100	70-130	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 532432	Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8	Analysis Description: 200.8 MET
Associated Lab Samples: 10427276001	

METHOD BLANK: 2891650 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	0.50	04/16/18 20:02	

LABORATORY CONTROL SAMPLE: 2891651

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	100	96.9	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891652 2891653

Parameter	Units	10427358001		MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		Result	ND	Spike Conc.	Conc.	Result	Result	% Rec	% Rec					
Chromium	ug/L	ND	100	100	100	102	100	102	70-130	2	20			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532434 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10427276001, 10427276002

METHOD BLANK: 2891658 Matrix: Water
Associated Lab Samples: 10427276001, 10427276002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/18/18 00:27	
Arsenic, Dissolved	ug/L	ND	0.50	04/18/18 00:27	
Beryllium, Dissolved	ug/L	ND	0.20	04/18/18 00:27	
Boron, Dissolved	ug/L	ND	5.0	04/18/18 00:27	
Cadmium, Dissolved	ug/L	ND	0.080	04/18/18 00:27	
Chromium, Dissolved	ug/L	ND	0.50	04/18/18 00:27	
Cobalt, Dissolved	ug/L	ND	0.50	04/18/18 00:27	
Lead, Dissolved	ug/L	ND	0.10	04/18/18 00:27	
Selenium, Dissolved	ug/L	ND	0.50	04/18/18 00:27	
Thallium, Dissolved	ug/L	ND	0.10	04/18/18 14:59	
Uranium-238, Dissolved	ug/L	ND	0.50	04/18/18 00:27	
Vanadium, Dissolved	ug/L	ND	1.0	04/18/18 00:27	

LABORATORY CONTROL SAMPLE: 2891659

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	110	110	85-115	
Arsenic, Dissolved	ug/L	100	110	110	85-115	
Beryllium, Dissolved	ug/L	100	110	110	85-115	
Boron, Dissolved	ug/L	100	104	104	85-115	
Cadmium, Dissolved	ug/L	100	110	110	85-115	
Chromium, Dissolved	ug/L	100	111	111	85-115	
Cobalt, Dissolved	ug/L	100	108	108	85-115	
Lead, Dissolved	ug/L	100	108	108	85-115	
Selenium, Dissolved	ug/L	100	114	114	85-115	
Thallium, Dissolved	ug/L	100	106	106	85-115	
Uranium-238, Dissolved	ug/L	100	108	108	85-115	
Vanadium, Dissolved	ug/L	100	111	111	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891660 2891661

Parameter	Units	10427168001		2891661		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	MS Result	MSD Result						
Antimony, Dissolved	ug/L	ND	100	100	110	109	109	70-130	0	20	
Arsenic, Dissolved	ug/L	1.7	100	100	112	117	110	70-130	4	20	
Beryllium, Dissolved	ug/L	ND	100	100	102	105	102	70-130	3	20	
Boron, Dissolved	ug/L	27.0	100	100	124	124	97	70-130	0	20	
Cadmium, Dissolved	ug/L	0.38	100	100	104	107	104	70-130	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891660												2891661	
Parameter	Units	10427168001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual		
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD			
Chromium, Dissolved	ug/L	ND	100	100	108	112	108	111	70-130	3	20		
Cobalt, Dissolved	ug/L	11.1	100	100	118	122	107	111	70-130	3	20		
Lead, Dissolved	ug/L	0.17	100	100	99.2	102	99	102	70-130	3	20		
Selenium, Dissolved	ug/L	ND	100	100	108	113	108	113	70-130	4	20		
Thallium, Dissolved	ug/L	ND	100	100	101	103	101	103	70-130	2	20		
Uranium-238, Dissolved	ug/L	3.9	100	100	112	115	108	111	70-130	3	20		
Vanadium, Dissolved	ug/L	3.5	100	100	116	119	112	115	70-130	3	20		

MATRIX SPIKE SAMPLE: 2891662											
Parameter	Units	10427135001 Result	Spike	MS	MS	% Rec	Qualifiers				
			Conc.	Result	% Rec	Limits					
Antimony, Dissolved	ug/L	ND	100	107	107	70-130					
Arsenic, Dissolved	ug/L	ND	100	109	109	70-130					
Beryllium, Dissolved	ug/L	ND	100	90.7	91	70-130					
Boron, Dissolved	ug/L	89.0	100	179	90	70-130					
Cadmium, Dissolved	ug/L	ND	100	99.5	100	70-130					
Chromium, Dissolved	ug/L	ND	100	108	108	70-130					
Cobalt, Dissolved	ug/L	ND	100	108	107	70-130					
Lead, Dissolved	ug/L	ND	100	97.0	97	70-130					
Selenium, Dissolved	ug/L	ND	100	106	106	70-130					
Thallium, Dissolved	ug/L	ND	100	98.9	99	70-130					
Uranium-238, Dissolved	ug/L	ND	100	107	107	70-130					
Vanadium, Dissolved	ug/L	ND	100	111	111	70-130					

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532754 Analysis Method: EPA 524.2
QC Batch Method: EPA 524.2 Analysis Description: 524.2 MSV
Associated Lab Samples: 10427276001

METHOD BLANK: 2893227 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	ND	4.0	04/17/18 11:21	
1,2-Dichloroethane-d4 (S)	%.	102	75-125	04/17/18 11:21	
4-Bromofluorobenzene (S)	%.	97	75-125	04/17/18 11:21	
Toluene-d8 (S)	%.	96	75-125	04/17/18 11:21	

LABORATORY CONTROL SAMPLE: 2893228

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	80	77.9	97	70-130	
1,2-Dichloroethane-d4 (S)	%.			103	75-125	
4-Bromofluorobenzene (S)	%.			95	75-125	
Toluene-d8 (S)	%.			97	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897401 2897402

Parameter	Units	10427958001		2897402		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Total Trihalomethanes (Calc.)	ug/L	ND	80	80	73.3	82.0	92	103	70-130	11	20
1,2-Dichloroethane-d4 (S)	%.						104	104	75-125		
4-Bromofluorobenzene (S)	%.						97	96	75-125		
Toluene-d8 (S)	%.						96	95	75-125		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 441140 Analysis Method: EPA 548.1
QC Batch Method: EPA 548.1 Analysis Description: 548 GCS Endothall
Associated Lab Samples: 10427276001

METHOD BLANK: 2394100 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Endothall	ug/L	ND	9.0	04/19/18 21:45	

LABORATORY CONTROL SAMPLE: 2394101

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	50	45.7	91	64-137	

LABORATORY CONTROL SAMPLE: 2394102

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	9	7.4J	82	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2395124 2395125

Parameter	Units	35386626001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Endothall	ug/L	4.3U	50	50	49.5	48.1	99	96	64-137	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2395126 2395127

Parameter	Units	35386626002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Endothall	ug/L	4.3U	50	50	20.6	22.1	41	44	64-137	7	30 M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 440817 Analysis Method: EPA 549.2
QC Batch Method: EPA 549.2 Analysis Description: 549 HPLC Paraquat Diquat
Associated Lab Samples: 10427276001

METHOD BLANK: 2392537 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diquat	ug/L	ND	0.40	04/18/18 19:40	
Paraquat	ug/L	ND	0.40	04/18/18 19:40	

LABORATORY CONTROL SAMPLE: 2392538

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	2	2.1	103	70-130	
Paraquat	ug/L	2	1.7	85	70-130	

LABORATORY CONTROL SAMPLE: 2392539

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	.4	0.58	144	50-150	
Paraquat	ug/L	.4	ND	75	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2393245 2393246

Parameter	Units	35386136002 Result	MS Spike Conc.	MSD Spike Conc.	2393245		2393246		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Diquat	ug/L	0.30U	2	2	ND	ND	0	0	70-130		30	M1
Paraquat	ug/L	0.30U	2	2	ND	ND	0	0	70-130		30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2393247 2393248

Parameter	Units	35386336001 Result	MS Spike Conc.	MSD Spike Conc.	2393247		2393248		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Diquat	ug/L	0.30U	2	2	1.9	2.1	96	103	70-130	7	30	
Paraquat	ug/L	0.30U	2	2	1.9	1.9	95	94	70-130	1	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 441812 Analysis Method: EPA 552.3
QC Batch Method: EPA 552.3 Analysis Description: 5523 Haloacetic Acids
Associated Lab Samples: 10427276001

METHOD BLANK: 2397907 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromoacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Dichloroacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Haloacetic Acids (Total)	ug/L	ND	1.0	04/25/18 15:02	
Monobromoacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Monochloroacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Trichloroacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
2,3-Dibromopropanoic Acid (S)	%	115	70-130	04/25/18 15:02	

LABORATORY CONTROL SAMPLE: 2397908

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromoacetic Acid	ug/L	10	12.4	124	70-130	
Dichloroacetic Acid	ug/L	10	10.5	105	70-130	
Haloacetic Acids (Total)	ug/L	50	55.7	111	70-130	
Monobromoacetic Acid	ug/L	10	10.8	108	70-130	
Monochloroacetic Acid	ug/L	10	10.9	109	70-130	
Trichloroacetic Acid	ug/L	10	11.1	111	70-130	
2,3-Dibromopropanoic Acid (S)	%			123	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398523 2398524

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		35386593001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Dibromoacetic Acid	ug/L	0.75J	10	10	13.2	12.5	125	117	70-130	6	30	
Dichloroacetic Acid	ug/L	28.5	10	10	40.3	37.2	119	87	70-130	8	30	
Haloacetic Acids (Total)	ug/L	33.1	50	50	93.8	88.0	121	110	70-130	6	30	
Monobromoacetic Acid	ug/L	0.29U	10	10	11.0	11.5	110	115	70-130	5	30	
Monochloroacetic Acid	ug/L	0.90U	10	10	13.7	12.1	137	121	70-130	12	30	M1
Trichloroacetic Acid	ug/L	3.9	10	10	15.6	14.7	117	109	70-130	5	30	
2,3-Dibromopropanoic Acid (S)	%						136	114	70-130		30	S0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398525 2398526

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		35386593002 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Dibromoacetic Acid	ug/L	0.76J	10	10	12.5	12.9	117	122	70-130	4	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Parameter	Units	2398525		2398526		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Dichloroacetic Acid	ug/L	28.5	10	10	36.8	36.9	83	84	70-130	0	30	
Haloacetic Acids (Total)	ug/L	33.2	50	50	85.7	87.0	105	108	70-130	2	30	
Monobromoacetic Acid	ug/L	0.29U	10	10	10.9	10.5	109	105	70-130	4	30	
Monochloroacetic Acid	ug/L	0.90U	10	10	11.5	12.0	115	120	70-130	4	30	
Trichloroacetic Acid	ug/L	3.9	10	10	14.0	14.7	101	108	70-130	5	30	
2,3-Dibromopropanoic Acid (S)	%						110	116	70-130		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 534073 Analysis Method: EPA 8011
QC Batch Method: EPA 8011 Analysis Description: GCS 8011 EDB DBCP
Associated Lab Samples: 10427276001

METHOD BLANK: 2901365 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	ND	0.010	04/24/18 22:05	
1,2-Dibromoethane (EDB)	ug/L	ND	0.010	04/24/18 22:05	
4-Bromofluorobenzene (S)	%.	102	30-150	04/24/18 22:05	

LABORATORY CONTROL SAMPLE & LCSD: 2901366

Parameter	Units	2901367								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	.11	0.10	0.097	95	89	60-140	7	20	
1,2-Dibromoethane (EDB)	ug/L	.11	0.11	0.10	100	94	60-140	6	20	
4-Bromofluorobenzene (S)	%.				107	106	30-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 532312

Analysis Method: EPA 8081B

QC Batch Method: EPA Mod. 3510C

Analysis Description: 8081B GCS Pesticides

Associated Lab Samples: 10427276001

METHOD BLANK: 2890735

Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/16/18 17:18	
4,4'-DDE	ug/L	ND	0.10	04/16/18 17:18	
4,4'-DDT	ug/L	ND	0.10	04/16/18 17:18	
Aldrin	ug/L	ND	0.050	04/16/18 17:18	
alpha-BHC	ug/L	ND	0.050	04/16/18 17:18	
alpha-Chlordane	ug/L	ND	0.050	04/16/18 17:18	
beta-BHC	ug/L	ND	0.050	04/16/18 17:18	
Chlordane (Technical)	ug/L	ND	0.50	04/16/18 17:18	
delta-BHC	ug/L	ND	0.050	04/16/18 17:18	
Dieldrin	ug/L	ND	0.10	04/16/18 17:18	
Endosulfan I	ug/L	ND	0.050	04/16/18 17:18	
Endosulfan II	ug/L	ND	0.10	04/16/18 17:18	
Endosulfan sulfate	ug/L	ND	0.10	04/16/18 17:18	
Endrin	ug/L	ND	0.10	04/16/18 17:18	
Endrin aldehyde	ug/L	ND	0.10	04/16/18 17:18	
Endrin ketone	ug/L	ND	0.10	04/16/18 17:18	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/16/18 17:18	
gamma-Chlordane	ug/L	ND	0.050	04/16/18 17:18	
Heptachlor	ug/L	ND	0.050	04/16/18 17:18	
Heptachlor epoxide	ug/L	ND	0.050	04/16/18 17:18	
Methoxychlor	ug/L	ND	0.50	04/16/18 17:18	
Toxaphene	ug/L	ND	1.5	04/16/18 17:18	
Decachlorobiphenyl (S)	%	78	30-143	04/16/18 17:18	
Tetrachloro-m-xylene (S)	%	89	62-125	04/16/18 17:18	

LABORATORY CONTROL SAMPLE & LCSD: 2890736

2890737

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
4,4'-DDD	ug/L	1	0.99	1.0	99	103	67-125	5	20	
4,4'-DDE	ug/L	1	0.97	1.0	97	102	68-125	6	20	
4,4'-DDT	ug/L	1	0.99	1.0	99	103	66-125	4	20	
Aldrin	ug/L	.5	0.41	0.44	83	89	46-125	7	20	
alpha-BHC	ug/L	.5	0.47	0.50	94	99	66-125	5	20	
alpha-Chlordane	ug/L	.5	0.46	0.48	92	97	72-125	5	20	
beta-BHC	ug/L	.5	0.46	0.48	93	97	72-125	4	20	
delta-BHC	ug/L	.5	0.39	0.41	78	82	37-141	4	20	
Dieldrin	ug/L	1	1.0	1.1	102	106	71-125	4	20	
Endosulfan I	ug/L	.5	0.43	0.45	86	89	69-125	4	20	
Endosulfan II	ug/L	1	0.99	1.0	99	103	73-125	4	20	
Endosulfan sulfate	ug/L	1	0.86	0.89	86	89	63-127	4	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Parameter	Units	2890736		2890737			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Endrin	ug/L	1	0.94	0.98	94	98	72-125	4	20	
Endrin aldehyde	ug/L	1	0.94	0.97	94	97	70-125	4	20	
Endrin ketone	ug/L	1	0.99	1.0	99	103	72-127	4	20	
gamma-BHC (Lindane)	ug/L	.5	0.47	0.49	94	99	69-125	5	20	
gamma-Chlordane	ug/L	.5	0.41	0.43	81	85	64-125	4	20	
Heptachlor	ug/L	.5	0.46	0.49	92	98	54-125	6	20	
Heptachlor epoxide	ug/L	.5	0.47	0.48	93	97	72-125	4	20	
Methoxychlor	ug/L	5	4.8	5.0	96	100	67-127	4	20	
Decachlorobiphenyl (S)	%				80	81	30-143			
Tetrachloro-m-xylene (S)	%				90	93	62-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532343 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10427276001

METHOD BLANK: 2891009 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/16/18 15:29	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/16/18 15:29	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/16/18 15:29	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/16/18 15:29	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/16/18 15:29	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/16/18 15:29	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/16/18 15:29	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/16/18 15:29	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/16/18 15:29	
Decachlorobiphenyl (S)	%	56	30-125	04/16/18 15:29	
Tetrachloro-m-xylene (S)	%	68	30-125	04/16/18 15:29	

Parameter	Units	2891010		2891011		% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec				
PCB-1016 (Aroclor 1016)	ug/L	2	1.3	1.4	67	70	47-125	4	20
PCB-1260 (Aroclor 1260)	ug/L	2	1.4	1.4	69	71	54-125	2	20
Decachlorobiphenyl (S)	%				61	61	30-125		
Tetrachloro-m-xylene (S)	%				68	71	30-125		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532581 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10427276001

METHOD BLANK: 2892635 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/20/18 13:29	
2,4-Dichlorophenol	ug/L	ND	10.0	04/20/18 13:29	
2,4-Dimethylphenol	ug/L	ND	50.0	04/20/18 13:29	
2,4-Dinitrophenol	ug/L	ND	10.0	04/20/18 13:29	
2-Chlorophenol	ug/L	ND	10.0	04/20/18 13:29	
2-Methylnaphthalene	ug/L	ND	10.0	04/20/18 13:29	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/20/18 13:29	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/20/18 13:29	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/20/18 13:29	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/20/18 13:29	
Acenaphthene	ug/L	ND	10.0	04/20/18 13:29	
Anthracene	ug/L	ND	10.0	04/20/18 13:29	
Benzo(a)pyrene	ug/L	ND	10.0	04/20/18 13:29	
Benzoic acid	ug/L	ND	50.0	04/20/18 13:29	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/20/18 13:29	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/20/18 13:29	
Butylbenzylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Di-n-butylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Di-n-octylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Diethylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Dimethylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Fluoranthene	ug/L	ND	10.0	04/20/18 13:29	
Fluorene	ug/L	ND	10.0	04/20/18 13:29	
Hexachlorobenzene	ug/L	ND	10.0	04/20/18 13:29	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/20/18 13:29	
Hexachloroethane	ug/L	ND	10.0	04/20/18 13:29	
Isophorone	ug/L	ND	10.0	04/20/18 13:29	
N-Nitrosodiphenylamine	ug/L	ND	10.0	04/20/18 13:29	
Pentachlorophenol	ug/L	ND	20.0	04/20/18 13:29	
Phenanthrene	ug/L	ND	10.0	04/20/18 13:29	
Phenol	ug/L	ND	10.0	04/20/18 13:29	
Pyrene	ug/L	ND	10.0	04/20/18 13:29	
2,4,6-Tribromophenol (S)	%	86	65-125	04/20/18 13:29	
2-Fluorobiphenyl (S)	%	72	56-125	04/20/18 13:29	
2-Fluorophenol (S)	%	71	55-125	04/20/18 13:29	
Nitrobenzene-d5 (S)	%	71	60-125	04/20/18 13:29	
p-Terphenyl-d14 (S)	%	92	58-125	04/20/18 13:29	
Phenol-d6 (S)	%	72	58-125	04/20/18 13:29	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

LABORATORY CONTROL SAMPLE & LCSD: 2892636		2892637									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
2,4,6-Trichlorophenol	ug/L	50	45.9	45.1	92	90	74-125	2	20		
2,4-Dichlorophenol	ug/L	50	46.6	43.2	93	86	68-125	8	20		
2,4-Dimethylphenol	ug/L	50	40.9J	35.4J	82	71	33-125		20		
2,4-Dinitrophenol	ug/L	50	41.2	42.6	82	85	30-127	3	20		
2-Chlorophenol	ug/L	50	44.4	40.1	89	80	61-125	10	20		
2-Methylnaphthalene	ug/L	50	44.6	41.2	89	82	67-125	8	20		
2-Methylphenol(o-Cresol)	ug/L	50	43.3	39.6	87	79	63-125	9	20		
3&4-Methylphenol(m&p Cresol)	ug/L	50	44.7	40.9	89	82	67-125	9	20		
3,3'-Dichlorobenzidine	ug/L	50	54.7	50.0	109	100	60-125	9	20		
4-Bromophenylphenyl ether	ug/L	50	45.6	45.8	91	92	75-125	0	20		
Acenaphthene	ug/L	50	43.7	43.7	87	87	74-125	0	20		
Anthracene	ug/L	50	44.4	44.9	89	90	75-125	1	20		
Benzo(a)pyrene	ug/L	50	46.8	47.3	94	95	75-125	1	20		
Benzoic acid	ug/L	50	19.8J	30.9J	40	62	30-125		20		
bis(2-Chloroethyl) ether	ug/L	50	40.2	36.8	80	74	55-125	9	20		
bis(2-Ethylhexyl)phthalate	ug/L	50	55.5	52.7	111	105	72-129	5	20		
Butylbenzylphthalate	ug/L	50	52.7	51.2	105	102	69-127	3	20		
Di-n-butylphthalate	ug/L	50	49.3	49.3	99	99	75-125	0	20		
Di-n-octylphthalate	ug/L	50	56.2	54.2	112	108	69-131	4	20		
Diethylphthalate	ug/L	50	47.4	47.7	95	95	75-125	1	20		
Dimethylphthalate	ug/L	50	47.5	47.6	95	95	75-125	0	20		
Fluoranthene	ug/L	50	45.8	46.9	92	94	75-125	2	20		
Fluorene	ug/L	50	45.1	45.6	90	91	75-125	1	20		
Hexachlorobenzene	ug/L	50	46.9	47.3	94	95	74-125	1	20		
Hexachlorocyclopentadiene	ug/L	50	23.4J	19J	47	38	30-125		20		
Hexachloroethane	ug/L	50	38.5	35.5	77	71	30-125	8	20		
Isophorone	ug/L	50	44.5	40.9	89	82	72-125	8	20		
N-Nitrosodiphenylamine	ug/L	50	46.1	46.3	92	93	75-125	0	20		
Pentachlorophenol	ug/L	50	40.0	40.3	80	81	52-125	1	20		
Phenanthrene	ug/L	50	44.0	45.0	88	90	75-125	2	20		
Phenol	ug/L	50	41.9	38.1	84	76	59-125	9	20		
Pyrene	ug/L	50	49.5	49.1	99	98	75-125	1	20		
2,4,6-Tribromophenol (S)	%				94	93	65-125				
2-Fluorobiphenyl (S)	%				80	77	56-125				
2-Fluorophenol (S)	%				79	72	55-125				
Nitrobenzene-d5 (S)	%				79	72	60-125				
p-Terphenyl-d14 (S)	%				97	95	58-125				
Phenol-d6 (S)	%				79	72	58-125				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 20633 Analysis Method: EPA 8315A
QC Batch Method: EPA 8315A Analysis Description: 8315 GCSV Aldehydes
Associated Lab Samples: 10427276001

METHOD BLANK: 82358 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Formaldehyde	ug/L	ND	100	04/19/18 15:47	

LABORATORY CONTROL SAMPLE: 82359

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	400	380	95	44-176	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 82485 82486

Parameter	Units	10427276001		82486		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Formaldehyde	ug/L	ND	400	400	527	399	130	98	35-167	28	20 H3,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532263 Analysis Method: Hach 10360 Rev 1.1
QC Batch Method: Hach 10360 Analysis Description: Hach 10360 Rev 1.1, BOD
Associated Lab Samples: 10427276001

METHOD BLANK: 2890529 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	04/18/18 15:52	

LABORATORY CONTROL SAMPLE: 2890531

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	205	104	85-115	

SAMPLE DUPLICATE: 2890532

Parameter	Units	10427086001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	120 U	ND		20	B2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 534191	Analysis Method: EPA 1664A OG
QC Batch Method: EPA 1664A OG	Analysis Description: 1664 HEM, Oil and Grease
Associated Lab Samples: 10427276001	

METHOD BLANK: 2902447 Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	04/25/18 09:37	

LABORATORY CONTROL SAMPLE: 2902448

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	37.9	95	78-114	

MATRIX SPIKE SAMPLE: 2902449

Parameter	Units	10427228001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	<1.1	40	27.7	67	78-114	M1

SAMPLE DUPLICATE: 2902450

Parameter	Units	10428140001 Result	Dup Result	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	4.8	3.6J		18	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 532212	Analysis Method: EPA 180.1
QC Batch Method: EPA 180.1	Analysis Description: 180.1 Turbidity
Associated Lab Samples: 10427276001	

METHOD BLANK: 2890393 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	04/13/18 07:37	

LABORATORY CONTROL SAMPLE: 2890394

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.5	103	90-110	

SAMPLE DUPLICATE: 2890395

Parameter	Units	10426997005 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	842	852	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532921 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10427276001

METHOD BLANK: 2894181 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	04/18/18 14:24	

LABORATORY CONTROL SAMPLE: 2894182

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	82.0	82	80-120	

SAMPLE DUPLICATE: 2894183

Parameter	Units	10427110001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		10	

SAMPLE DUPLICATE: 2894184

Parameter	Units	10427577001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	96.0	94.0	2	10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 442752

Analysis Method: SM 4500-CIO2

QC Batch Method: SM 4500-CIO2

Analysis Description: 4500CIO2 Chlorine Dioxide

Associated Lab Samples: 10427276001

METHOD BLANK: 2402049

Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorine Dioxide	mg/L	ND	0.10	04/25/18 13:30	H6

LABORATORY CONTROL SAMPLE: 2402050

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorine Dioxide	mg/L	2.5	2.3	95	90-110	H6

SAMPLE DUPLICATE: 2402051

Parameter	Units	10427276001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	1.6	1.6	1	20	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 534050 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 10427276001

LABORATORY CONTROL SAMPLE: 2901275

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	99	98-102	H6

SAMPLE DUPLICATE: 2901276

Parameter	Units	10427998001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.6	6.6	0	3	H6

SAMPLE DUPLICATE: 2901277

Parameter	Units	10428020002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	12.0	12.0	0	3	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532702 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10427276001

METHOD BLANK: 2893078 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	04/17/18 09:44	
Fluoride	mg/L	ND	0.050	04/17/18 09:44	

LABORATORY CONTROL SAMPLE: 2893079

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.3	98	90-110	
Fluoride	mg/L	1	1.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2893080 2893081

Parameter	Units	10427348003 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Chloride	mg/L	4.3	12.5	12.5	15.8	16.1	92	94	90-110	2	20	
Fluoride	mg/L	0.32	1	1	1.1	1.1	75	77	90-110	2	20 M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2893082 2893083

Parameter	Units	10427276001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Chloride	mg/L	56.5	12.5	12.5	58.2	59.0	13	20	90-110	1	20 M1	
Fluoride	mg/L	0.14	1	1	0.99	1.0	86	87	90-110	1	20 M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 442023	Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1	Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10427276001	

METHOD BLANK: 2399126 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorite	ug/L	ND	5.0	04/22/18 13:44	

LABORATORY CONTROL SAMPLE: 2399127

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	40	39.8	99	85-115	

MATRIX SPIKE SAMPLE: 2399129

Parameter	Units	10427644001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	ND	400	377	94	75-125	

SAMPLE DUPLICATE: 2399128

Parameter	Units	10427644001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorite	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 442024	Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1	Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10427276001	

METHOD BLANK: 2399130 Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromate	ug/L	ND	1.0	04/22/18 13:44	

LABORATORY CONTROL SAMPLE: 2399131

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	8	8.1	101	85-115	

MATRIX SPIKE SAMPLE: 2399133

Parameter	Units	10427644001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	ND	80	77.2	97	75-125	

SAMPLE DUPLICATE: 2399132

Parameter	Units	10427644001 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromate	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 532346	Analysis Method: SM 3500-Cr B Modified
QC Batch Method: SM 3500-Cr B Modified	Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10427276001	

METHOD BLANK: 2891044 Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	04/13/18 16:43	FS

LABORATORY CONTROL SAMPLE: 2891045

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.20	98	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891046 2891047

Parameter	Units	2891046		2891047		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10427276001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Chromium, Hexavalent	mg/L	0.011	.2	.2	0.012	0.012	1	1	85-115	0	20	FS,H1,M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 140957	Analysis Method: EPA 350.1 rev. 2 (1993)
QC Batch Method: EPA 350.1 rev. 2 (1993)	Analysis Description: 350.1 Ammonia Distilled
Associated Lab Samples: 10427276001	

METHOD BLANK: 557837 Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	04/20/18 07:08	

LABORATORY CONTROL SAMPLE: 557838

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.3	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557839 557840

Parameter	Units	12107304003 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Nitrogen, Ammonia	mg/L	ND	5	4.8	5	5.0	94	99	90-110	5	10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532358 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 10427276001

METHOD BLANK: 2891118 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	04/13/18 17:20	FS
Nitrite as N	mg/L	ND	0.020	04/13/18 17:20	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	04/13/18 17:20	FS

LABORATORY CONTROL SAMPLE: 2891119

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	1.0	102	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	1.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891120 2891121

Parameter	Units	10427206001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Nitrite as N	mg/L	0.020 U	1	1	0.97	1.0	97	101	90-110	4	20				
Nitrogen, NO2 plus NO3	mg/L	4.5	5	5	9.9	9.7	109	105	90-110	2	20				

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891122 2891123

Parameter	Units	10427206006		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Nitrite as N	mg/L	0.020 U	1	1	0.97	1.0	96	102	90-110	6	20				
Nitrogen, NO2 plus NO3	mg/L	30.2	20	20	49.2	50.0	95	99	90-110	2	20 E				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 21104 Analysis Method: EPA 9016
QC Batch Method: EPA 9016 Analysis Description: 9016 Free Cyanide
Associated Lab Samples: 10427276001

METHOD BLANK: 84163 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/24/18 17:31	

LABORATORY CONTROL SAMPLE: 84164

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	148	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 84165 84166

Parameter	Units	10427352003		84166		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Cyanide, Free	ug/L	ND	150	150	142	143	95	95	80-120	1	11

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 533717 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10427276001

METHOD BLANK: 2899085 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/23/18 12:02	

LABORATORY CONTROL SAMPLE: 2899086

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	246	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2899087 2899088

Parameter	Units	10427113002 Result	MS		MSD		% Rec	MSD	% Rec	Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result							
Cyanide	ug/L	ND	250	250	226	235	88	91	80-120	4	30		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2899089 2899090

Parameter	Units	10427114001 Result	MS		MSD		% Rec	MSD	% Rec	Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result							
Cyanide	ug/L	10.5	250	250	242	240	92	92	80-120	1	30		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532682 Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10427276001

METHOD BLANK: 2893041 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	04/17/18 13:20	

LABORATORY CONTROL SAMPLE: 2893042

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	1.0	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2893043 2893044

Parameter	Units	10426966001	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result										
Phosphorus	mg/L	65.6	1	1	62.5	62.4	-312	-320	80-120	0	30	M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2893045 2893046

Parameter	Units	10426983001	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result										
Phosphorus	mg/L	0.30	1	1	1.4	1.4	111	109	80-120	2	30	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Sample: FD-TT-06 **Lab ID: 10427276001** Collected: 04/12/18 12:30 Received: 04/13/18 08:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	8.79 ± 10.4 (18.6) C:NA T:NA	pCi/L	05/09/18 19:18	12587-46-1	
Gross Beta	EPA 900.0	23.9 ± 17.5 (30.2) C:NA T:NA	pCi/L	05/09/18 19:18	12587-47-2	
Radium-226	EPA 903.1	0.821 ± 0.548 (0.680) C:NA T:87%	pCi/L	05/02/18 11:43	13982-63-3	
Radium-228	EPA 904.0	0.217 ± 0.443 (0.976) C:84% T:66%	pCi/L	05/03/18 11:04	15262-20-1	
Total Radium	Total Radium Calculation	1.04 ± 0.991 (1.66)	pCi/L	05/07/18 12:58	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 296913

Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0

Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 10427276001

METHOD BLANK: 1453256

Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.297 ± 0.417 (1.39) C:NA T:NA	pCi/L	05/10/18 08:47	
Gross Beta	0.474 ± 0.723 (1.64) C:NA T:NA	pCi/L	05/10/18 08:47	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch:	295494	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	10427276001		

METHOD BLANK: 1446590 Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.378 ± 0.342 (0.697) C:82% T:92%	pCi/L	05/03/18 11:03	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 295484

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 10427276001

METHOD BLANK: 1446564

Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.110 ± 0.306 (0.595) C:NA T:95%	pCi/L	05/02/18 11:43	

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Act - Activity
Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).
Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)
(MDC) - Minimum Detectable Concentration
Trac - Tracer Recovery (%)
Carr - Carrier Recovery (%)
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan
PASI-I Pace Analytical Services - Indianapolis
PASI-M Pace Analytical Services - Minneapolis
PASI-O Pace Analytical Services - Ormond Beach
PASI-PA Pace Analytical Services - Greensburg
PASI-V Pace Analytical Services - Virginia

BATCH QUALIFIERS

Batch: 532610
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
Batch: 532638
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
Batch: 534191
[BE] Batch extracted by solid phase extraction (SPE).

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

BATCH QUALIFIERS

Batch: 534336

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1M Sample was yellow in color.

B2 Oxygen usage is less than 2.0 for all dilutions set. The reported value is an estimated less than value and is calculated for the dilution using the most amount of sample.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

FS The sample was filtered in the laboratory prior to analysis.

H1 Analysis conducted outside the recognized method holding time.

H3 Sample was received or analysis requested beyond the recognized method holding time.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

IO The internal standard response was outside the laboratory acceptance limits confirmed by reanalysis. The results reported are from the most QC compliant analysis.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

R1 RPD value was outside control limits.

S0 Surrogate recovery outside laboratory control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427276001	FD-TT-06				
10427276001	FD-TT-06	EPA 531.1	444328		
10427276001	FD-TT-06	EPA 547	441208		
10427276001	FD-TT-06	EPA 549.2	440817	EPA 549.2	441186
10427276001	FD-TT-06	EPA 552.3	441812	EPA 552.3	442081
10427276001	FD-TT-06	EPA 8011	534073	EPA 8011	534336
10427276001	FD-TT-06	EPA 8015 Alcohol-Glycol	438905		
10427276001	FD-TT-06	EPA 8015 Alcohol-Glycol	438205		
10427276001	FD-TT-06	EPA Mod. 3510C	532312	EPA 8081B	532638
10427276001	FD-TT-06	EPA Mod. 3510C	532343	EPA 8082A	532610
10427276001	FD-TT-06	EPA 8315A	20633	EPA 8315A	20789
10427276001	FD-TT-06	EPA 8316	20643		
10427276001	FD-TT-06	EPA 200.7	532437	EPA 200.7	532779
10427276002	TS-SB-02	EPA 200.7	532437	EPA 200.7	532779
10427276001	FD-TT-06	EPA 200.8	532432	EPA 200.8	532568
10427276001	FD-TT-06	EPA 200.8	532434	EPA 200.8	532528
10427276002	TS-SB-02	EPA 200.8	532434	EPA 200.8	532528
10427276001	FD-TT-06	EPA 245.1	532450	EPA 245.1	532602
10427276002	TS-SB-02	EPA 245.1	532450	EPA 245.1	532602
10427276001	FD-TT-06	EPA 548.1	441140	EPA 548.1	441552
10427276001	FD-TT-06	EPA 3520	532581	EPA 8270D	532989
10427276001	FD-TT-06	EPA 524.2	532754		
10427276001	FD-TT-06				
10427276001	FD-TT-06	EPA 900.0	296913		
10427276001	FD-TT-06	EPA 903.1	295484		
10427276001	FD-TT-06	EPA 904.0	295494		
10427276001	FD-TT-06	Total Radium Calculation	297265		
10427276001	FD-TT-06	Hach 10360	532263	Hach 10360 Rev 1.1	532509
10427276001	FD-TT-06	EPA 1664A OG	534191		
10427276001	FD-TT-06	EPA 180.1	532212		
10427276001	FD-TT-06	SM 2540D	532921		
10427276001	FD-TT-06	SM 4500-CIO2	442752		
10427276001	FD-TT-06	SM 4500-H+B	534050		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427276001	FD-TT-06	Trivalent Chromium Calculation	534084		
10427276001	FD-TT-06	EPA 300.0	532702		
10427276001	FD-TT-06	EPA 300.1	441891		
10427276001	FD-TT-06	EPA 300.1	442023		
10427276001	FD-TT-06	EPA 300.1	441890		
10427276001	FD-TT-06	EPA 300.1	442024		
10427276001	FD-TT-06	SM 3500-Cr B Modified	532346		
10427276001	FD-TT-06	EPA 350.1			
10427276001	FD-TT-06	EPA 350.1 rev. 2 (1993)	140957	EPA 350.1 rev. 2 (1993)	141065
10427276001	FD-TT-06	EPA 353.2	532358		
10427276001	FD-TT-06	EPA 9016	21104	EPA 9016	21181
10427276001	FD-TT-06	SM 4500-CN-E	533717	SM 4500-CN-E	533784
10427276001	FD-TT-06	SM 4500-P B	532682	SM 4500-P E	532743

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WO#: 10427276



Page: 1 of 1

	Chain-of-Custody Form		Work Order: Turnaro
	PROJECT/CLIENT INFO		
Facility Code: <i>MPCA-Freeway LF waters</i>	Program Code (MDH Lab Only):	Lab Name:	
Project Name: <i>MPCA-Freeway LF waters</i>	Project Task Code:	Address: <i>18-00383</i> <i>EPIC Profile # 38716</i>	
Project Manager:	Potential Hazard? If yes, add information to Sampler Comments Section		Phone No:

FOR LAB USE ONLY
Lab Work Order Sticker

SAMPLE DETAILS										ANALYSIS REQUESTED												
SAMPLE TYPE CODES				LAB MATRIX CODES				FIELD MATRIX CODES		PRESERV.	ANALYSIS											
Sample	Type	Date	Time	Start Depth	End Depth	Grab (G) or Composite (C)	Lab Matrix Code	Field Matrix Code	AIS			Sampler Comments	# of Cont	1	2	3	4	5	6	7	8	9
<i>FD-5B</i>	<i>S</i>					<i>G</i>	<i>NW</i>	<i>Wt Ground</i>														
<i>FD-TT-06</i>	<i>S</i>	<i>4/12/18</i>	<i>1230</i>			<i>G</i>	<i>NW</i>	<i>Wt Ground</i>			<i>41</i>											<i>201</i>
<i>TS-5B-02</i>	<i>S</i>	<i>4/12/18</i>	<i>1930</i>			<i>G</i>	<i>NW</i>	<i>Wt Ground</i>			<i>1</i>											<i>002</i>
<i>DATA 4/12/18</i>																						

Sampled By: *David Anderson*
 Sampler's Signature: *David Anderson*
 Phone #:

Receiving Comments:			
Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
<i>David Anderson / Pace Analytical</i>	<i>4/12/18</i>	<i>DR Pace</i>	<i>4/13/18 800</i>
<i>David Anderson / Pace Analytical</i>	<i>4/13/18 0745</i>		

No sample

DJA 4/12/18

T = 4.3
3.6



Document Name:
Sample Condition Upon Receipt Form

Document No.:
F-MN-L-213-rev.22

Document Revised: 14Dec2017
Page 1 of 2

Issuing Authority:
Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: MPCA Project #: _____

WO#: 10427276

PM: JMA Due Date: 04/27/18
CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: FB Temp Blank? Yes No

Thermometer 151401163 687A9155100842 Used: _____ Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 4.1, 3.4 Cooler Temp Corrected (°C): 4.3, 3.6 Biological Tissue Frozen? Yes No N/A

Temp should be above freezing to 6°C Correction Factor: _____ Date and Initials of Person Examining Contents: R64/13/18

USDA Regulated Soil (N/A, water sample) Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? Y <input checked="" type="checkbox"/> N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1 5/5</u> <u>1/1</u> <u>1/1</u>
Exceptions: <u>VOA</u> , Coliform, TOC/DOC, <u>Oil and Grease</u> DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: <u>2/1/1</u> Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature]

Date: 04/13/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	EPA 8270C
PCBs	EPA 8082
PFCs	EPA 537
VOCs	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

** ADD to Parameter List A:

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Harness determination)

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 801.1
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427276 Workorder Name: 18-00383 MPCA-Freeway LF Water Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To		Subcontract To				Requested Analysis								
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600				WO# : 30249751 30249751								
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Gross Alpha/Beta	Rad 226	Rad 228	Total Radium	LAB USE ONLY
						HNO3								
1	FD-TT-06	PS	4/12/2018 12:30	10427276001	Water	3				X	X	X	X	
2														001
3														
4														
5														
Transfers	Released By	Date/Time	Received By	Date/Time	Comments									
1	<i>[Signature]</i>	4/16/18 15:45	<i>[Signature]</i>	4-17-18 1005										
2														
3														
Cooler Temperature on Receipt		°C	Custody Seal Y or (N)		Received on Ice Y or (N)		Samples Intact (Y) or N							

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: Pace MN

Project # 30249751

Courier: Fed Ex UPS USPS Client Commercial Pace Other

Tracking #: 7475 9832 1967

Label	<u>OV13</u>
LIMS Login	<u>DJM</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used NA Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>DS 4-17-18</u>
	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:	/			4.
Sample Labels match COC:	/			5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):	/			7.
Rush Turn Around Time Requested:	/			8.
Sufficient Volume:	/			9.
Correct Containers Used:	/			10.
-Pace Containers Used:	/			
Containers Intact:	/			11.
Orthophosphate field filtered		/		12.
Hex Cr Aqueous Compliance/NPDES sample field filtered		/		13.
Organic Samples checked for dechlorination:		/		14.
Filtered volume received for Dissolved tests		/		15.
All containers have been checked for preservation.	/			16.
All containers needing preservation are found to be in compliance with EPA recommendation.	/			
exceptions: VOA, coliform, TOC, O&G, Phenolics				
				Initial when completed: <u>DS</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):		/		17.
Trip Blank Present:		/		18.
Trip Blank Custody Seals Present		/		
Rad Aqueous Samples Screened > 0.5 mrem/hr	/			Initial when completed: <u>DS</u> Date: <u>4-17-18</u>

PH < 2

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Sample Condition Upon Receipt

Client Name: Pace - MPLS Project #: _____

WO#: 12107231
 PM: HRZ Due Date: 04/27/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 3.7 Cooler Temp Corrected °C: 4.0 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: 4/17/18 GJ

Comments: Box 4/18/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____

Angela Loisel

Date: 4/18/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

SAMPLE RECEIVING / LOG-IN CHECKLIST

Pace Analytical®

Client Pace Mon
 Receipt Record Page/Line # 9-2

Work Order #: 4610917

Recorded by (initials/date)

PS 4/17/18

Cooler

Qty Received

- Box
 Other

1

IR Gun (#202)

Thermometer Used Digital Thermometer (#54)

IR Gun (#402)

Cooler #	Time	Cooler #	Time	Cooler #	Time	Cooler #	Time
<u>Ble</u>	<u>0950</u>						
Custody Seals: <input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact	
Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None	
Coolant Location: <input checked="" type="checkbox"/> Dispersed / Top / Middle / Bottom		Coolant Location: <input type="checkbox"/> Dispersed / Top / Middle / Bottom		Coolant Location: <input type="checkbox"/> Dispersed / Top / Middle / Bottom		Coolant Location: <input type="checkbox"/> Dispersed / Top / Middle / Bottom	
Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No	
If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative	
	Observed °C	Correction Factor °C	Actual °C		Observed °C	Correction Factor °C	Actual °C
Temp Blank:				Temp Blank:			
Sample 1:	<u>1.7</u>	<u>1</u>	<u>1.7</u>	Sample 1:			
Sample 2:	<u>1.0</u>		<u>1.0</u>	Sample 2:			
Sample 3:	<u>1.1</u>		<u>1.1</u>	Sample 3:			
When above 6 °C take a 3 Sample Average °C: _____				When above 6 °C take a 3 Sample Average °C: _____			
<input type="checkbox"/> VOC Trip Blank received?				<input type="checkbox"/> VOC Trip Blank received?			

If any shaded areas checked, complete Sample Receiving Non-Conformance

Paperwork Received

- Yes No
- Chain of Custody record(s)? If No, Initiated By _____
 Received for Lab Signed/Date/Time?
- USDA Soil Documents?
- Sampling / Field Forms?
- Other _____

COC Information

- Pace COC Other _____
- COC ID Numbers: _____

Check COC for Accuracy

- Yes No
- Analysis Requested?
- Sample ID matches COC?
- Sample Date and Time matches COC?
- All containers indicated are received?

Sample Condition Summary

- N/A Yes No
- Broken containers/lids?
- Missing or incomplete labels?
- Illegible information on labels?
- Low volume received?
- Inappropriate or non-Pace containers received?
- VOC vials have headspace?
- Extra sample locations?
- Containers not listed on COC?

Check Sample Preservation

- N/A Yes No
- Temperature Blank OR average sample temperature, ≥6° C?
- If "Yes" was thermal preservation required?
- If "Yes" were ALL samples collected the same day as receipt?
- Completed Sample Preservation Verification Form?
- Samples chemically preserved correctly?
- If "No", add wire tag and fill out Non-Conformance Form?
- Received unpreserved Terracore kit?
- If "Yes" unpreserved vials must be frozen

Work Order Not Logged In with Short Hold / Rush

- Copies of COC To Lab Areas

Notes

- Yes No
- Were all samples logged into Epic?
- Were all samples labelled?
- Were samples placed on scan locations?

Initial / Date :

AQUEOUS SAMPLE PRESERVATION VERIFICATION

Client: <u>Pace minn</u>	Work Order #: <u>4610917</u>
Receipt Log #: <u>9-2</u>	Project Manager: _____
Completed By (initials/date): <u>PS 4/17/18</u>	

COC ID # <u>WO# 10427276</u>														Adjusted by: _____	
														Date: _____	
Container Type	5 / 23		4		13		6		15						
	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2						
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1	✓														
COC Line #2															
COC Line #3															
COC Line #4															
COC Line #5															
COC Line #6															
COC Line #7															
COC Line #8															
COC Line #9															
COC Line #10															
COC Line #11															
COC Line #12															

pH Strip Reagent or Lot #
<input checked="" type="checkbox"/> HC727135
<input type="checkbox"/> Other

Place a check mark in the Received box if pH is acceptable. If pH is not acceptable, document the Received and Adjusted pH values in the appropriate columns (all adjustments must be reviewed by the project manager). Never add more than 2x the default preservation volume (see table below for default volumes). Complete and attach an orange preservation tag to all adjusted samples. A Sample Receiving Non-Conformance Report must be completed if a pH adjustment was required.

Comments: _____

COC ID # <u>WO # 10427352</u>														Adjusted by: _____	
														Date: _____	
Container Type	5 / 23		4		13		6		15						
	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2						
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1	✓														
COC Line #2															
COC Line #3															
COC Line #4															
COC Line #5															
COC Line #6															
COC Line #7															
COC Line #8															
COC Line #9															
COC Line #10															
COC Line #11															
COC Line #12															

Container Size (mL)	Default Preservative Volume (mL)
Container Types 5 / 23	NaOH
250	1.3
Container Type 4	H ₂ SO ₄
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H ₂ SO ₄
500	2.5
Container Types 6 / 15	HNO ₃
125	0.7
250	1.25
500	2.5
1000	5.0

Comments: _____

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427276 Workorder Name: 18-00383 MPCA-Freeway LF Water Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To		Subcontract To					Requested Analysis																							
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Indianapolis 7726 Moller Road Indianapolis, IN 46268 Phone (317)228-3100					<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Methyl alcohol/Ethylene glycol/EPA</div> <div style="border: 1px solid black; width: 100%; height: 100%; text-align: center;"> <p style="font-size: 2em; margin: 0;">56194585</p> <p style="margin: 0;">LAB USE ONLY</p> <p style="font-size: 1.5em; margin: 0;">001</p> </div> </div>																							
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved											Preserved Containers													
1	FD-TT-06	PS	4/12/2018 12:30	10427276001	Water	3																								
2																														
3																														
4																														
5																														

					Comments				
Transfers	Released By	Date/Time	Received By	Date/Time					
1	<i>[Signature]</i>	4/16/18 1630	<i>[Signature]</i>						
2	<i>[Signature]</i>		<i>[Signature]</i>	4/17/18 0830					
3									

Cooler Temperature on Receipt 23 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50194585

Date/Time and Initials of person examining contents: TRW 4/17/18 0945

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9232 1940

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 2.1/2.3 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		/	All containers needing acid/base pres. Have been checked? exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		/	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			/
Chain of Custody Present:	/		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	/		Dissolved Metals field filtered?:			/
Short Hold Time Analysis (<72hr)?: Analysis:		/	Headspace Wisconsin Sulfide			/
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			/
Rush TAT Requested:		/	Headspace in VOA Vials (>6mm):			/
Containers Intact?:	/		Trip Blank Present?:		/	
Sample Labels Match COC?: Except TCs, which only require sample ID	/		Trip Blank Custody Seals?:		/	

Comments: _____

Sample Container Count

WO#: 50194585



CLIENT: Pace MW

COC PAGE 1 of 1

COC ID# _____

Project # 50194585

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	Bu Kit	R	Matrix (Soil/W Aqueol)	pH <2	pH >9	pH >	
	1																		1614		J			
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
WG AU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

WO#: 35386559

Project #
Project Manager:
Client:

PM: ADC Due Date: 04/27/18
CLIENT: PACMIN

Date and Initials of person:
Examining contents: PLD
Label: _____
Deliver: _____
pH: _____

Thermometer Used: T-338 Date: 4-17-18 Time: 11:00 Initials: NMP

State of Origin: _____

Cooler #1 Temp. °C 3.4 (Visual) +0 (Correction Factor) 3.4 (Actual)
Cooler #2 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #3 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #4 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #5 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #6 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)

- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____
Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9832 2036

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No Ice: Wet Blue Dry None

Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (If Yes, complete) Shorted Date: _____ Shorted Time: _____ Qty: _____

Comments:

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Preservation Information: Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	

Client Notification/ Resolution:
Person Contacted: _____ Date/Time: _____

Comments/ Resolution (use back for additional comments):



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
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April 27, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/17/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427276
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-TT-06 (10427276001)	A181604-01	Water	04/12/2018	04/17/2018

CASE NARRATIVE

Sample Receipt Information:

1 sample was received on 04/17/2018. Sample was received at 4.8 degrees Celsius. Sample was received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Continuing Calibration Verification (CCV):

The LC footnote on sample A181604-01 states that there was a low CCV recovery for prometon. The lower control limit is 80% and the lowest recovery was 77.5%.



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 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10427276
 Project Manager: Jennifer Anderson

FD-TT-06 (10427276001)

Date Sampled

A181604-01 (Water)

04/12/2018 12:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804168

Acetochlor	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	LC
Propachlor	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	

Surrogate: Atrazine-d5		99.3 %		65.1-122	04/19/2018	04/24/2018 13:09	EPA 8270D	
Surrogate: Parathion-d10		139 %		22.3-159	04/19/2018	04/24/2018 13:09	EPA 8270D	
Surrogate: Triphenyl phosphate		149 %		65.2-151	04/19/2018	04/24/2018 13:09	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804156

2,4-D	ND	0.50	ug/L	1	04/18/2018	04/24/2018 21:50	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/18/2018	04/24/2018 21:50	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/18/2018	04/24/2018 21:50	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/18/2018	04/24/2018 21:50	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/18/2018	04/24/2018 21:50	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/18/2018	04/24/2018 21:50	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/18/2018	04/24/2018 21:50	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/18/2018	04/24/2018 21:50	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/18/2018	04/24/2018 21:50	EPA 8151A	

Surrogate: 2,4-D-d5		97.3 %		44.2-121	04/18/2018	04/24/2018 21:50	EPA 8151A	
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Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10427276
 Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804168 - EPA 3510C

Blank (A804168-BLK1)

Prepared: 04/19/2018 Analyzed: 04/24/2018 19:13

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>83.6</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>85.3</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.529</i>		<i>ug/L</i>	<i>0.5000</i>		<i>106</i>	<i>65.2-151</i>			

LCS (A804168-BS1)

Prepared: 04/19/2018 Analyzed: 04/24/2018 21:05

Acetochlor	0.954	0.50	ug/L	1.000		95.4	67.5-120			
Alachlor	0.959	0.50	ug/L	1.000		95.9	71.7-120			
Atrazine	0.891	0.50	ug/L	1.000		89.1	72.8-113			
Chlorpyrifos	0.817	0.50	ug/L	1.000		81.7	65.3-119			
Cyanazine	1.01	0.20	ug/L	1.000		101	49.5-140			
Desethylatrazine	0.951	0.50	ug/L	1.000		95.1	66.9-116			
Deisopropylatrazine	0.729	0.50	ug/L	1.000		72.9	44.3-110			
Dimethenamid	0.964	0.50	ug/L	1.000		96.4	63.8-116			
EPTC	0.559	0.50	ug/L	1.000		55.9	41.7-102			
Ethalfuralin	0.538	0.50	ug/L	1.000		53.8	41-127			
Fonofos	0.709	0.50	ug/L	1.000		70.9	59.7-118			
Metolachlor	0.984	0.50	ug/L	1.000		98.4	71.7-122			
Metribuzin	0.911	0.50	ug/L	1.000		91.1	66.6-128			
Pendimethalin	0.946	0.50	ug/L	1.000		94.6	55.5-137			
Phorate	0.577	0.30	ug/L	1.000		57.7	41.2-114			
Prometon	0.958	0.50	ug/L	1.000		95.8	66.3-120			
Propachlor	0.933	0.50	ug/L	1.000		93.3	65.8-119			



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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427276
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804168 - EPA 3510C

LCS (A804168-BS1)

Prepared: 04/19/2018 Analyzed: 04/24/2018 21:05

Propazine	0.840	0.50	ug/L	1.000		84.0	72-122			
Simazine	0.892	0.50	ug/L	1.000		89.2	72.8-113			
Terbufos	0.514	0.20	ug/L	1.000		51.4	38.6-115			
Triallate	0.622	0.50	ug/L	1.000		62.2	51.4-116			
Trifluralin	0.588	0.50	ug/L	1.000		58.8	46.1-134			
Surrogate: Atrazine-d5	0.451		ug/L	0.5000		90.2	65.1-122			
Surrogate: Parathion-d10	0.495		ug/L	0.5000		99.0	22.3-159			
Surrogate: Triphenyl phosphate	0.534		ug/L	0.5000		107	65.2-151			

Matrix Spike (A804168-MS1)

Source: A181612-06

Prepared: 04/19/2018 Analyzed: 04/24/2018 21:34

Acetochlor	1.09	0.50	ug/L	0.9346	0.0378	113	67.3-128			
Alachlor	2.58	0.50	ug/L	0.9346	1.50	116	58.2-150			
Atrazine	1.25	0.50	ug/L	0.9346	0.324	98.7	70.1-120			
Chlorpyrifos	1.26	0.50	ug/L	0.9346	0.121	122	73.3-118			M
Cyanazine	1.79	0.20	ug/L	0.9346	0.659	121	60.6-140			
Desethylatrazine	1.05	0.50	ug/L	0.9346	0.0617	106	69.7-122			
Deisopropylatrazine	0.867	0.50	ug/L	0.9346	0.246	66.4	48-121			
Dimethenamid	1.16	0.50	ug/L	0.9346	0.0699	117	63.7-123			
EPTC	0.734	0.50	ug/L	0.9346	0.100	67.8	58-109			
Ethalfuralin	0.652	0.50	ug/L	0.9346	ND	69.7	59.3-129			
Fonofos	0.605	0.50	ug/L	0.9346	0.0263	61.9	73.5-108			M
Metolachlor	65.6	0.50	ug/L	0.9346	67.5	NR	40.9-156			M1, E
Metribuzin	1.03	0.50	ug/L	0.9346	0.0606	104	70.9-136			
Pendimethalin	1.35	0.50	ug/L	0.9346	0.0391	141	55.4-155			
Phorate	0.563	0.30	ug/L	0.9346	0.112	48.2	60.2-108			M
Prometon	1.18	0.50	ug/L	0.9346	0.266	97.8	74.7-124			
Propachlor	0.724	0.50	ug/L	0.9346	ND	77.5	72.3-115			
Propazine	1.31	0.50	ug/L	0.9346	0.472	89.1	73.7-124			
Simazine	0.915	0.50	ug/L	0.9346	ND	97.9	74.8-114			
Terbufos	0.564	0.20	ug/L	0.9346	ND	60.4	56.1-114			
Triallate	0.620	0.50	ug/L	0.9346	ND	66.4	65.5-107			
Trifluralin	0.873	0.50	ug/L	0.9346	0.0370	89.5	58-149			
Surrogate: Atrazine-d5	0.443		ug/L	0.4673		94.7	65.1-122			
Surrogate: Parathion-d10	0.528		ug/L	0.4673		113	22.3-159			
Surrogate: Triphenyl phosphate	0.702		ug/L	0.4673		150	65.2-151			

Matrix Spike Dup (A804168-MSD1)

Source: A181612-06

Prepared: 04/19/2018 Analyzed: 04/24/2018 22:02

Acetochlor	1.10	0.50	ug/L	0.9434	0.0378	112	67.3-128	0.205	20	
Alachlor	2.49	0.50	ug/L	0.9434	1.50	106	58.2-150	3.47	20	
Atrazine	1.20	0.50	ug/L	0.9434	0.324	93.2	70.1-120	3.57	20	
Chlorpyrifos	1.25	0.50	ug/L	0.9434	0.121	119	73.3-118	1.32	20	M
Cyanazine	1.75	0.20	ug/L	0.9434	0.659	116	60.6-140	2.18	20	
Desethylatrazine	1.03	0.50	ug/L	0.9434	0.0617	102	69.7-122	2.35	20	
Deisopropylatrazine	0.790	0.50	ug/L	0.9434	0.246	57.7	48-121	9.23	20	



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Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10427276
 Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804168 - EPA 3510C

Matrix Spike Dup (A804168-MSD1)

Source: A181612-06

Prepared: 04/19/2018 Analyzed: 04/24/2018 22:02

Dimethenamid	1.14	0.50	ug/L	0.9434	0.0699	113	63.7-123	1.98	20	
EPTC	0.759	0.50	ug/L	0.9434	0.100	69.8	58-109	3.38	20	
Ethalfuralin	0.650	0.50	ug/L	0.9434	ND	68.9	59.3-129	0.280	20	
Fonofos	0.581	0.50	ug/L	0.9434	0.0263	58.8	73.5-108	4.15	20	M
Metolachlor	63.8	0.50	ug/L	0.9434	67.5	NR	40.9-156	2.74	20	M1, E
Metribuzin	1.01	0.50	ug/L	0.9434	0.0606	100	70.9-136	2.66	20	
Pendimethalin	1.34	0.50	ug/L	0.9434	0.0391	138	55.4-155	1.06	20	
Phorate	0.583	0.30	ug/L	0.9434	0.112	49.9	60.2-108	3.49	20	M
Prometon	1.15	0.50	ug/L	0.9434	0.266	93.9	74.7-124	2.45	20	
Propachlor	0.706	0.50	ug/L	0.9434	ND	74.8	72.3-115	2.52	20	
Propazine	1.29	0.50	ug/L	0.9434	0.472	86.8	73.7-124	1.08	20	
Simazine	0.862	0.50	ug/L	0.9434	ND	91.4	74.8-114	5.89	20	
Terbufos	0.553	0.20	ug/L	0.9434	ND	58.6	56.1-114	2.07	20	
Triallate	0.606	0.50	ug/L	0.9434	ND	64.2	65.5-107	2.43	20	M
Trifluralin	0.840	0.50	ug/L	0.9434	0.0370	85.1	58-149	3.90	20	
Surrogate: Atrazine-d5	0.431		ug/L	0.4717		91.4	65.1-122			
Surrogate: Parathion-d10	0.485		ug/L	0.4717		103	22.3-159			
Surrogate: Triphenyl phosphate	0.641		ug/L	0.4717		136	65.2-151			



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Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch A804156 - EPA 3510C

Blank (A804156-BLK1)

Prepared: 04/18/2018 Analyzed: 04/24/2018 19:26

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							

Surrogate: 2,4-D-d5

2.01 ug/L 2.016 99.7 44.2-121

LCS (A804156-BS1)

Prepared: 04/18/2018 Analyzed: 04/25/2018 03:47

2,4-D	1.74	0.50	ug/L	2.000		86.9	64.6-148			
2,4-DB	1.99	0.50	ug/L	2.000		99.5	66.7-143			
2,4,5-T	1.78	0.50	ug/L	2.000		88.9	63.4-133			
2,4,5-TP (Silvex)	1.77	0.50	ug/L	2.000		88.4	63-145			
Bentazon	1.06	0.50	ug/L	1.000		106	52.5-139			
Dicamba	1.67	0.50	ug/L	2.000		83.7	55.4-143			
MCPA	1.65	0.30	ug/L	2.000		82.7	33.5-143			
Picloram	0.830	0.50	ug/L	1.000		83.0	47.9-113			
Triclopyr	1.74	0.50	ug/L	2.000		87.0	65.1-141			

Surrogate: 2,4-D-d5

1.94 ug/L 2.016 96.2 44.2-121

LCS Dup (A804156-BSD1)

Prepared: 04/18/2018 Analyzed: 04/25/2018 04:22

2,4-D	1.74	0.50	ug/L	2.000		87.2	64.6-148	0.362	20	
2,4-DB	2.01	0.50	ug/L	2.000		100	66.7-143	0.905	20	
2,4,5-T	1.74	0.50	ug/L	2.000		87.0	63.4-133	2.10	20	
2,4,5-TP (Silvex)	1.85	0.50	ug/L	2.000		92.5	63-145	4.55	20	
Bentazon	0.953	0.50	ug/L	1.000		95.3	52.5-139	10.4	20	
Dicamba	1.79	0.50	ug/L	2.000		89.4	55.4-143	6.62	20	
MCPA	1.79	0.30	ug/L	2.000		89.4	33.5-143	7.77	20	
Picloram	0.822	0.50	ug/L	1.000		82.2	47.9-113	1.02	20	
Triclopyr	1.86	0.50	ug/L	2.000		93.1	65.1-141	6.76	20	

Surrogate: 2,4-D-d5

1.82 ug/L 2.016 90.5 44.2-121



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427276
Project Manager: Jennifer Anderson

Notes and Definitions

- M1 Spike recoveries were not evaluated because of elevated levels of the spiked analyte in the parent sample.
- M The matrix spike and/or matrix spike duplicate recovery was outside of the laboratory control limits.
- LC Results may be biased low because of low continuing calibration verification (CCV).
- E The concentration indicated is above the instrument calibration range. This value is an estimated concentration.
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

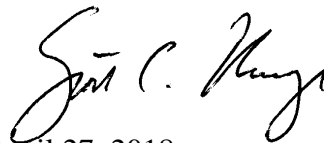
PaceProject#: 10427280
Sample Receipt Date: 04/13/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 27, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

April 27, 2018

DISCUSSION

This report presents the results from the analyses performed on five samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 45-64%. All of the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 104%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10427280

Appendix A

Sample Management

WO#: 10427280



Minnesota Pollution Control Agency

Chain-of-Custody Form

Work Order Number:

Turnaround Time:

COC ID:

LABORATORY

FOR LAB USE ONLY

Facility Code: MPCA-Freeway LF 50/16 Program Code (MDH Lab Only):

Lab Name:

Project Name: MPCA-Freeway LF 50/16 Project Task Code:

Address:

18-00383
EPIC Profile # 38716

Project Manager:

Phone No:

Potential Hazard? If yes, add information to Sampler Comments Section

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

S-Routine Sample
S-IVP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
NWP=Non-potable Water
SD=Soil/Solid
WP=Wipe

AR=Air
BL=Biological Material
OT=Other
TS=Tissue

FIELD MATRIX CODES

W-Ground=Groundwater
W-Surf=Surface Water
QC-BLANK=Artificial Blank Water
Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in / feet	End Depth, in / feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Lab Sample No.	#
FD-SB-F1 (10-14.5)	S	4/12/18	1015			C	SD				13	X	001	1
FD-SB-F1 (15-19.5)	S	4/12/18	1045			C	SD				13	X		2
FD-TT-05 (4-9 w/m)	S	4/12/18	0945			C	SD				13	X	002	3
FD-TT-06 (2-5 w/m)	S	4/12/18	1145			C	SD				13	X		4
FD-TT-07 (6-11 w/m)	S	4/12/18	1300			C	SD				13	X	003	5
FD-TT-08 (5-12 w/m)	S	4/12/18	1430			C	SD				13	X		6
FS-SB-01 (5-9 w/m)	S	4/12/18	1720			C	SD				13	X	004	7
FS-SB-02 (5-10 S)	S	4/12/18	1910			C	SD				13	X	005	8
FS-SB-03 (1.5-3.0 S)	S	4/12/18	1935			C	SD				13	X	005	9
														10

ANALYSIS
Sealed
for soils/water
(-Dioxins)
+Dioxins

4/13/18 JD
4/13/18 JD

Sampled By: David Anderson

Sampler's Signature: David Anderson

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
(Sampler) <u>David Anderson / Pace Analytical</u>	<u>4/13/18/0745</u>	<u>Don Payne</u>	<u>4/13/18 800</u>

T=3.1

Sample Condition Upon Receipt
 Client Name: MPCA
 Project #: _____
 Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____
 Tracking Number: _____

WO#: 10427280
 PM: SCU Due Date: 04/27/18
 CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No
 Seals Intact? Yes No
 Packing Material: Bubble Wrap Bubble Bags None Other: PB
 Temp Blank? Yes No
 Thermometer 151401163
 Used: G87A9155100842
 Type of Ice: Wet Blue None Dry Melted
 Cooler Temp Read (°C): 2.9 Cooler Temp Corrected (°C): 3.1
 Temp should be above freezing to 6°C Correction Factor: +0.2
 Biological Tissue Frozen? Yes No N/A
 Date and Initials of Person Examining Contents: RG 4/13/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	12. <u>No time on label</u>
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____
 Field Data Required? Yes No

Project Manager Review: [Signature] Date: 04/13/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10427280

Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-F1 (10-14.5 S)		
Lab Sample ID	10427280001		
Filename	U180422B_08		
Injected By	BAL		
Total Amount Extracted	15.0 g	Matrix	Solid
% Moisture	32.6	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	04/12/2018 10:15
ICAL ID	U180405	Received	04/13/2018 12:05
CCal Filename(s)	U180422A_16 & U180422B_15	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/22/2018 19:54

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	63

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-TT-05 (4-9 WM)		
Lab Sample ID	10427280002		
Filename	U180422B_09		
Injected By	BAL		
Total Amount Extracted	13.7 g	Matrix	Solid
% Moisture	28.0	Dilution	NA
Dry Weight Extracted	9.86 g	Collected	04/12/2018 09:45
ICAL ID	U180405	Received	04/13/2018 12:05
CCal Filename(s)	U180422A_16 & U180422B_15	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/22/2018 20:42

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	56
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	58

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-TT-07 (6-11 WM)		
Lab Sample ID	10427280003		
Filename	U180422B_10		
Injected By	BAL		
Total Amount Extracted	13.2 g	Matrix	Solid
% Moisture	28.0	Dilution	NA
Dry Weight Extracted	9.50 g	Collected	04/12/2018 13:00
ICAL ID	U180405	Received	04/13/2018 12:05
CCal Filename(s)	U180422A_16 & U180422B_15	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/22/2018 21:31

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	2.7	----	1.0	2,3,7,8-TCDD-13C	2.00	60
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	59

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	TS-SB-01 (5-8 WM)		
Lab Sample ID	10427280004		
Filename	U180422B_11		
Injected By	BAL		
Total Amount Extracted	11.4 g	Matrix	Solid
% Moisture	10.4	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	04/12/2018 17:20
ICAL ID	U180405	Received	04/13/2018 12:05
CCal Filename(s)	U180422A_16 & U180422B_15	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/22/2018 22:19

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	64
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	65

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	TS-SB-03 (1.5-3.0 S)		
Lab Sample ID	10427280005		
Filename	U180422B_12		
Injected By	BAL		
Total Amount Extracted	13.6 g	Matrix	Solid
% Moisture	12.1	Dilution	NA
Dry Weight Extracted	12.0 g	Collected	04/12/2018 19:55
ICAL ID	U180405	Received	04/13/2018 12:05
CCal Filename(s)	U180422A_16 & U180422B_15	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/22/2018 23:07

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	45
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	47

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61774	Matrix	Solid
Filename	Y180422A_04	Dilution	NA
Total Amount Extracted	79.7 g	Extracted	04/17/2018 15:45
ICAL ID	Y180204	Analyzed	04/22/2018 16:10
CCal Filename(s)	Y180421B_16 & Y180422A_12	Injected By	BAL

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	63

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61775	Matrix	Solid
Filename	Y180422A_01	Dilution	NA
Total Amount Extracted	75.1 g	Extracted	04/17/2018 15:45
ICAL ID	Y180204	Analyzed	04/22/2018 13:59
CCal Filename(s)	Y180421B_16 & Y180422A_12	Injected By	BAL
Method Blank ID	BLANK-61774		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.21	104	2,3,7,8-TCDD-13C	2.0	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	62

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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May 02, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 13, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Alaska Certification UST-107
California Certification #2973
California Certification #2973
Montana Certificate #CERT0103
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
Montana DHHS Certification #: CERT0102
Nevada DCNR Certification #: MN000372018-1

Minnesota Dept of Health Certification #: 1382680
Wisconsin DNR Certification #: 999446800
North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

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SAMPLE SUMMARY

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10427291001	FD-SB-F1 (10-14.5 S)	Solid	04/12/18 10:15	04/13/18 08:00
10427291002	FB-SB-G1 (5-10 S)	Solid	04/12/18 10:45	04/13/18 08:00
10427291003	FD-TT-05 (4-9 WM)	Solid	04/12/18 09:45	04/13/18 08:00
10427291004	FD-TT-06 (2-5 WM)	Solid	04/12/18 11:40	04/13/18 08:00
10427291005	FD-TT-07 (6-11 WM)	Solid	04/12/18 13:00	04/13/18 08:00
10427291006	FD-TT-08 (5-12 WM)	Solid	04/12/18 14:30	04/13/18 08:00
10427291007	TS-SB-01 (5-8 WM)	Solid	04/12/18 17:20	04/13/18 08:00
10427291008	TS-SB-02 (5-10 S)	Solid	04/12/18 19:10	04/13/18 08:00
10427291009	TS-SB-03 (1.5-3.0 S)	Solid	04/12/18 19:55	04/13/18 08:00

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10427291001	FD-SB-F1 (10-14.5 S)	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	JRH	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010C	DM, IP	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	TT3	10	PASI-M		
		EPA 7471	LMW	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	AT1	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10427291002	FB-SB-G1 (5-10 S)	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M
WI MOD DRO	JRH			2	PASI-M		
WI MOD GRO	AJR			2	PASI-M		
EPA 6010C	IP			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	TT3			10	PASI-M		
EPA 7471	LMW			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	AT1			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8260B	CD2			70	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
10427291003	FD-TT-05 (4-9 WM)			EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM, IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427291004	FD-TT-06 (2-5 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM, IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427291005	FD-TT-07 (6-11 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM, IP	11	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427291006	FD-TT-08 (5-12 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM, IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427291007	TS-SB-01 (5-8 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM, IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10427291008	TS-SB-02 (5-10 S)	ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	AT1	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	JRH	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010C	IP	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	TT3	10	PASI-M		
		EPA 7471	LMW	1	PASI-M		
		10427291009	TS-SB-03 (1.5-3.0 S)	ASTM D2974	JDL	1	PASI-M
				EPA 8270D	AT1	72	PASI-M
				EPA 8270D by SIM	STB	18	PASI-M
EPA 8260B	CD2			70	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
EPA 1630 (1998)	CPK			1	PASI-DUL		
EPA 8081B	XV1			24	PASI-M		
EPA 8082A	RAG			12	PASI-M		
WI MOD DRO	JRH			2	PASI-M		
WI MOD GRO	AJR			2	PASI-M		
EPA 6010C	IP			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	TT3			10	PASI-M		
EPA 7471	LMW			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	AT1			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-SB-F1 (10-14.5 S) **Lab ID: 10427291001** Collected: 04/12/18 10:15 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	13.7	1	04/25/18 10:56	04/27/18 16:00	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	309-00-2	
alpha-BHC	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	319-84-6	
beta-BHC	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	319-85-7	
delta-BHC	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	58-89-9	
Chlordane (Technical)	ND	ug/kg	24.7	1	04/16/18 10:57	04/20/18 02:15	57-74-9	
alpha-Chlordane	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	5103-71-9	
gamma-Chlordane	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	5103-74-2	
4,4'-DDD	ND	ug/kg	4.9	1	04/16/18 10:57	04/20/18 02:15	72-54-8	
4,4'-DDE	ND	ug/kg	4.9	1	04/16/18 10:57	04/20/18 02:15	72-55-9	
4,4'-DDT	ND	ug/kg	4.9	1	04/16/18 10:57	04/20/18 02:15	50-29-3	
Dieldrin	ND	ug/kg	4.9	1	04/16/18 10:57	04/20/18 02:15	60-57-1	
Endosulfan I	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	959-98-8	
Endosulfan II	ND	ug/kg	4.9	1	04/16/18 10:57	04/20/18 02:15	33213-65-9	
Endosulfan sulfate	ND	ug/kg	4.9	1	04/16/18 10:57	04/20/18 02:15	1031-07-8	
Endrin	ND	ug/kg	4.9	1	04/16/18 10:57	04/20/18 02:15	72-20-8	
Endrin aldehyde	ND	ug/kg	4.9	1	04/16/18 10:57	04/20/18 02:15	7421-93-4	
Endrin ketone	ND	ug/kg	4.9	1	04/16/18 10:57	04/20/18 02:15	53494-70-5	
Heptachlor	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	76-44-8	
Heptachlor epoxide	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	1024-57-3	
Methoxychlor	ND	ug/kg	24.7	1	04/16/18 10:57	04/20/18 02:15	72-43-5	
Toxaphene	ND	ug/kg	74.0	1	04/16/18 10:57	04/20/18 02:15	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	96	%	30-150	1	04/16/18 10:57	04/20/18 02:15	877-09-8	
Decachlorobiphenyl (S)	86	%	30-150	1	04/16/18 10:57	04/20/18 02:15	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	11100-14-4	
PCB, Total	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	64	%	48-125	1	04/13/18 19:35	04/16/18 18:55	877-09-8	
Decachlorobiphenyl (S)	76	%	30-134	1	04/13/18 19:35	04/16/18 18:55	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	ND	mg/kg	12.7	1	04/16/18 14:24	04/19/18 19:52		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-SB-F1 (10-14.5 S) **Lab ID: 10427291001** Collected: 04/12/18 10:15 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	76	%	50-150	1	04/16/18 14:24	04/19/18 19:52	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	14.8	1	04/24/18 13:27	04/25/18 00:21		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/24/18 13:27	04/25/18 00:21	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	10700	mg/kg	14.5	1	04/18/18 09:37	04/21/18 19:10	7429-90-5	P6
Barium	134	mg/kg	0.73	1	04/18/18 09:37	04/21/18 19:10	7440-39-3	M1
Boron	802	mg/kg	10.9	1	04/18/18 09:37	04/21/18 19:10	7440-42-8	P6
Copper	20.2	mg/kg	0.73	1	04/18/18 09:37	04/21/18 19:10	7440-50-8	
Iron	34200	mg/kg	18.2	5	04/18/18 09:37	04/23/18 18:02	7439-89-6	
Manganese	185	mg/kg	0.36	1	04/18/18 09:37	04/21/18 19:10	7439-96-5	
Nickel	22.5	mg/kg	1.5	1	04/18/18 09:37	04/21/18 19:10	7440-02-0	M1
Silver	ND	mg/kg	0.73	1	04/18/18 09:37	04/21/18 19:10	7440-22-4	
Tin	ND	mg/kg	5.5	1	04/18/18 09:37	04/21/18 19:10	7440-31-5	M1
Titanium	589	mg/kg	1.8	1	04/18/18 09:37	04/21/18 19:10	7440-32-6	P6
Zinc	180	mg/kg	1.5	1	04/18/18 09:37	04/21/18 19:10	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	53.4	mg/kg	1.3	5	04/20/18 09:20	04/21/18 01:16	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	2.1	mg/kg	0.70	20	04/16/18 08:41	04/16/18 16:23	7440-36-0	
Arsenic	22.5	mg/kg	0.70	20	04/16/18 08:41	04/16/18 16:23	7440-38-2	
Beryllium	3.2	mg/kg	0.28	20	04/16/18 08:41	04/16/18 16:23	7440-41-7	
Cadmium	2.4	mg/kg	0.11	20	04/16/18 08:41	04/16/18 16:23	7440-43-9	
Cobalt	6.9	mg/kg	0.70	20	04/16/18 08:41	04/16/18 16:23	7440-48-4	
Lead	30.4	mg/kg	0.14	20	04/16/18 08:41	04/16/18 16:23	7439-92-1	
Lithium	10.2	mg/kg	0.70	20	04/16/18 08:41	04/16/18 16:23	7439-93-2	
Selenium	5.7	mg/kg	0.70	20	04/16/18 08:41	04/16/18 16:23	7782-49-2	
Strontium	71.4	mg/kg	0.70	20	04/16/18 08:41	04/16/18 16:23	7440-24-6	
Vanadium	117	mg/kg	1.4	20	04/16/18 08:41	04/16/18 16:23	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.075	mg/kg	0.029	1	04/18/18 09:38	04/19/18 18:17	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	32.6	%	0.10	1		04/19/18 14:07		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	83-32-9	
Acenaphthylene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: **FD-SB-F1 (10-14.5 S)** Lab ID: **10427291001** Collected: 04/12/18 10:15 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	120-12-7	
Benzo(a)anthracene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	56-55-3	
Benzo(a)pyrene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	101-55-3	
Butylbenzylphthalate	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	85-68-7	
Carbazole	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	59-50-7	
4-Chloroaniline	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	108-60-1	
2-Chloronaphthalene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	91-58-7	
2-Chlorophenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	7005-72-3	
Chrysene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	53-70-3	
Dibenzofuran	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	120-83-2	
Diethylphthalate	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	105-67-9	
Dimethylphthalate	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	131-11-3	
Di-n-butylphthalate	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	4660	1	04/20/18 12:55	04/24/18 15:29	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	606-20-2	
Di-n-octylphthalate	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	117-81-7	
Fluoranthene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	206-44-0	
Fluorene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	87-68-3	
Hexachlorobenzene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	118-74-1	
Hexachloroethane	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	193-39-5	
Isophorone	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	78-59-1	
1-Methylnaphthalene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	90-12-0	
2-Methylnaphthalene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-SB-F1 (10-14.5 S) **Lab ID: 10427291001** Collected: 04/12/18 10:15 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1810	1	04/20/18 12:55	04/24/18 15:29		
Naphthalene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	91-20-3	
2-Nitroaniline	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	88-74-4	
3-Nitroaniline	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	99-09-2	
4-Nitroaniline	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	100-01-6	
Nitrobenzene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	98-95-3	
2-Nitrophenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	88-75-5	
4-Nitrophenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	86-30-6	
Pentachlorophenol	ND	ug/kg	1830	1	04/20/18 12:55	04/24/18 15:29	87-86-5	
Phenanthrene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	85-01-8	
Phenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	108-95-2	
Pyrene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	58	%.	43-125	1	04/20/18 12:55	04/24/18 15:29	4165-60-0	
2-Fluorobiphenyl (S)	61	%.	30-132	1	04/20/18 12:55	04/24/18 15:29	321-60-8	
p-Terphenyl-d14 (S)	82	%.	62-125	1	04/20/18 12:55	04/24/18 15:29	1718-51-0	
Phenol-d6 (S)	66	%.	48-125	1	04/20/18 12:55	04/24/18 15:29	13127-88-3	
2-Fluorophenol (S)	65	%.	40-125	1	04/20/18 12:55	04/24/18 15:29	367-12-4	
2,4,6-Tribromophenol (S)	70	%.	60-125	1	04/20/18 12:55	04/24/18 15:29	118-79-6	
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	83-32-9	
Acenaphthylene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	208-96-8	
Anthracene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	120-12-7	
Benzo(a)anthracene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	56-55-3	
Benzo(a)pyrene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	207-08-9	
Chrysene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	53-70-3	
Fluoranthene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	206-44-0	
Fluorene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	193-39-5	
Naphthalene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	91-20-3	
Phenanthrene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	85-01-8	
Pyrene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	66	%.	42-125	1	04/18/18 17:23	04/20/18 02:20	321-60-8	
p-Terphenyl-d14 (S)	99	%.	57-125	1	04/18/18 17:23	04/20/18 02:20	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-SB-F1 (10-14.5 S) **Lab ID: 10427291001** Collected: 04/12/18 10:15 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1520	1	04/24/18 10:23	04/24/18 18:50	67-64-1	
Allyl chloride	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	107-05-1	
Benzene	ND	ug/kg	30.4	1	04/24/18 10:23	04/24/18 18:50	71-43-2	
Bromobenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	108-86-1	
Bromochloromethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	74-97-5	
Bromodichloromethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	75-27-4	
Bromoform	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	75-25-2	
Bromomethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	74-83-9	
2-Butanone (MEK)	ND	ug/kg	380	1	04/24/18 10:23	04/24/18 18:50	78-93-3	
n-Butylbenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	104-51-8	
sec-Butylbenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	135-98-8	
tert-Butylbenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	98-06-6	
Carbon tetrachloride	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	56-23-5	
Chlorobenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	108-90-7	
Chloroethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	75-00-3	
Chloroform	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	67-66-3	
Chloromethane	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	74-87-3	
2-Chlorotoluene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	95-49-8	
4-Chlorotoluene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	96-12-8	
Dibromochloromethane	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	106-93-4	
Dibromomethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	75-71-8	
1,1-Dichloroethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	75-34-3	
1,2-Dichloroethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	107-06-2	
1,1-Dichloroethene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	156-60-5	
Dichlorofluoromethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	75-43-4	
1,2-Dichloropropane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	78-87-5	
1,3-Dichloropropane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	142-28-9	
2,2-Dichloropropane	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	594-20-7	
1,1-Dichloropropene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	60-29-7	
Ethylbenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	380	1	04/24/18 10:23	04/24/18 18:50	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	98-82-8	
p-Isopropyltoluene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	99-87-6	
Methylene Chloride	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	380	1	04/24/18 10:23	04/24/18 18:50	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-SB-F1 (10-14.5 S) **Lab ID: 10427291001** Collected: 04/12/18 10:15 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	1634-04-4	
Naphthalene	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	91-20-3	
n-Propylbenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	103-65-1	
Styrene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	79-34-5	
Tetrachloroethene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	127-18-4	
Tetrahydrofuran	ND	ug/kg	3040	1	04/24/18 10:23	04/24/18 18:50	109-99-9	
Toluene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	79-00-5	
Trichloroethene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	79-01-6	
Trichlorofluoromethane	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	108-67-8	
Vinyl chloride	ND	ug/kg	30.4	1	04/24/18 10:23	04/24/18 18:50	75-01-4	
Xylene (Total)	ND	ug/kg	228	1	04/24/18 10:23	04/24/18 18:50	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1	04/24/18 10:23	04/24/18 18:50	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1	04/24/18 10:23	04/24/18 18:50	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125	1	04/24/18 10:23	04/24/18 18:50	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	14.5	5	04/23/18 11:09	04/24/18 13:02	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	53.4	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.57	1	04/20/18 10:25	04/20/18 13:58	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	4.1	mg/kg	0.99	1	04/18/18 14:45	04/19/18 21:46	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FB-SB-G1 (5-10 S) **Lab ID: 10427291002** Collected: 04/12/18 10:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.0	1	04/25/18 10:56	04/27/18 16:14	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	309-00-2	
alpha-BHC	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	319-84-6	
beta-BHC	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	319-85-7	
delta-BHC	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	58-89-9	
Chlordane (Technical)	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	57-74-9	
alpha-Chlordane	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	5103-71-9	M6
gamma-Chlordane	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	5103-74-2	M6
4,4'-DDD	212	ug/kg	74.2	20	04/16/18 10:57	04/19/18 23:48	72-54-8	M6, R1
4,4'-DDE	87.8	ug/kg	74.2	20	04/16/18 10:57	04/19/18 23:48	72-55-9	M6
4,4'-DDT	ND	ug/kg	74.2	20	04/16/18 10:57	04/19/18 23:48	50-29-3	M6
Dieldrin	ND	ug/kg	74.2	20	04/16/18 10:57	04/19/18 23:48	60-57-1	
Endosulfan I	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	959-98-8	
Endosulfan II	ND	ug/kg	74.2	20	04/16/18 10:57	04/19/18 23:48	33213-65-9	
Endosulfan sulfate	ND	ug/kg	74.2	20	04/16/18 10:57	04/19/18 23:48	1031-07-8	
Endrin	ND	ug/kg	74.2	20	04/16/18 10:57	04/19/18 23:48	72-20-8	
Endrin aldehyde	ND	ug/kg	74.2	20	04/16/18 10:57	04/19/18 23:48	7421-93-4	
Endrin ketone	ND	ug/kg	74.2	20	04/16/18 10:57	04/19/18 23:48	53494-70-5	
Heptachlor	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	76-44-8	
Heptachlor epoxide	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	1024-57-3	M6
Methoxychlor	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	72-43-5	
Toxaphene	ND	ug/kg	1110	20	04/16/18 10:57	04/19/18 23:48	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	04/16/18 10:57	04/19/18 23:48	877-09-8	2M, D4, S4
Decachlorobiphenyl (S)	0	%	30-150	20	04/16/18 10:57	04/19/18 23:48	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	11100-14-4	
PCB, Total	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	85	%	48-125	1	04/13/18 19:35	04/16/18 21:01	877-09-8	
Decachlorobiphenyl (S)	80	%	30-134	1	04/13/18 19:35	04/16/18 21:01	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FB-SB-G1 (5-10 S) **Lab ID: 10427291002** Collected: 04/12/18 10:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	68.1	mg/kg	48.2	5	04/16/18 14:24	04/19/18 18:41		T6
Surrogates								
n-Triacontane (S)	100	%	50-150	5	04/16/18 14:24	04/19/18 18:41	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	11.5	1	04/24/18 13:27	04/25/18 00:45		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	04/24/18 13:27	04/25/18 00:45	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	4200	mg/kg	10.8	1	04/18/18 09:37	04/21/18 19:38	7429-90-5	
Barium	60.3	mg/kg	0.54	1	04/18/18 09:37	04/21/18 19:38	7440-39-3	
Boron	11.6	mg/kg	8.1	1	04/18/18 09:37	04/21/18 19:38	7440-42-8	
Copper	8.0	mg/kg	0.54	1	04/18/18 09:37	04/21/18 19:38	7440-50-8	
Iron	8290	mg/kg	2.7	1	04/18/18 09:37	04/21/18 19:38	7439-89-6	
Manganese	323	mg/kg	0.27	1	04/18/18 09:37	04/21/18 19:38	7439-96-5	
Nickel	10.2	mg/kg	1.1	1	04/18/18 09:37	04/21/18 19:38	7440-02-0	
Silver	ND	mg/kg	0.54	1	04/18/18 09:37	04/21/18 19:38	7440-22-4	
Tin	ND	mg/kg	4.0	1	04/18/18 09:37	04/21/18 19:38	7440-31-5	
Titanium	147	mg/kg	1.3	1	04/18/18 09:37	04/21/18 19:38	7440-32-6	
Zinc	33.1	mg/kg	1.1	1	04/18/18 09:37	04/21/18 19:38	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	11.4	mg/kg	1.0	5	04/20/18 09:20	04/21/18 01:48	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.53	20	04/16/18 08:41	04/16/18 16:26	7440-36-0	
Arsenic	13.3	mg/kg	0.53	20	04/16/18 08:41	04/16/18 16:26	7440-38-2	
Beryllium	0.30	mg/kg	0.21	20	04/16/18 08:41	04/16/18 16:26	7440-41-7	
Cadmium	0.18	mg/kg	0.084	20	04/16/18 08:41	04/16/18 16:26	7440-43-9	
Cobalt	5.2	mg/kg	0.53	20	04/16/18 08:41	04/16/18 16:26	7440-48-4	
Lead	19.2	mg/kg	0.11	20	04/16/18 08:41	04/16/18 16:26	7439-92-1	
Lithium	3.6	mg/kg	0.53	20	04/16/18 08:41	04/16/18 16:26	7439-93-2	
Selenium	ND	mg/kg	0.53	20	04/16/18 08:41	04/16/18 16:26	7782-49-2	
Strontium	15.7	mg/kg	0.53	20	04/16/18 08:41	04/16/18 16:26	7440-24-6	
Vanadium	17.6	mg/kg	1.1	20	04/16/18 08:41	04/16/18 16:26	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.042	mg/kg	0.020	1	04/18/18 09:38	04/19/18 18:19	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	10.6	%	0.10	1		04/19/18 14:07		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FB-SB-G1 (5-10 S) **Lab ID: 10427291002** Collected: 04/12/18 10:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	208-96-8	
Anthracene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	120-12-7	
Benzo(a)anthracene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	56-55-3	
Benzo(a)pyrene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	101-55-3	
Butylbenzylphthalate	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	85-68-7	
Carbazole	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	59-50-7	
4-Chloroaniline	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	108-60-1	
2-Chloronaphthalene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	91-58-7	
2-Chlorophenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	7005-72-3	
Chrysene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	53-70-3	
Dibenzofuran	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	120-83-2	
Diethylphthalate	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	105-67-9	
Dimethylphthalate	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	131-11-3	
Di-n-butylphthalate	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	1900	1	04/13/18 17:55	04/19/18 21:36	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	606-20-2	
Di-n-octylphthalate	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	117-81-7	
Fluoranthene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	206-44-0	
Fluorene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	87-68-3	
Hexachlorobenzene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	118-74-1	
Hexachloroethane	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	193-39-5	
Isophorone	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	78-59-1	
1-Methylnaphthalene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	90-12-0	
2-Methylnaphthalene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FB-SB-G1 (5-10 S) **Lab ID: 10427291002** Collected: 04/12/18 10:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

2-Methylphenol(o-Cresol)	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	737	1	04/13/18 17:55	04/19/18 21:36		
Naphthalene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	91-20-3	
2-Nitroaniline	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	88-74-4	
3-Nitroaniline	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	99-09-2	
4-Nitroaniline	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	100-01-6	
Nitrobenzene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	98-95-3	
2-Nitrophenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	88-75-5	
4-Nitrophenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	86-30-6	
Pentachlorophenol	ND	ug/kg	748	1	04/13/18 17:55	04/19/18 21:36	87-86-5	
Phenanthrene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	85-01-8	
Phenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	108-95-2	
Pyrene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	88-06-2	

Surrogates

Nitrobenzene-d5 (S)	62	%	43-125	1	04/13/18 17:55	04/19/18 21:36	4165-60-0	
2-Fluorobiphenyl (S)	70	%	30-132	1	04/13/18 17:55	04/19/18 21:36	321-60-8	
p-Terphenyl-d14 (S)	83	%	62-125	1	04/13/18 17:55	04/19/18 21:36	1718-51-0	
Phenol-d6 (S)	65	%	48-125	1	04/13/18 17:55	04/19/18 21:36	13127-88-3	
2-Fluorophenol (S)	63	%	40-125	1	04/13/18 17:55	04/19/18 21:36	367-12-4	
2,4,6-Tribromophenol (S)	73	%	60-125	1	04/13/18 17:55	04/19/18 21:36	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	83-32-9	
Acenaphthylene	ND	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	208-96-8	
Anthracene	ND	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	120-12-7	
Benzo(a)anthracene	84.8	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	56-55-3	
Benzo(a)pyrene	107	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	50-32-8	
Benzo(b)fluoranthene	147	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	205-99-2	
Benzo(g,h,i)perylene	79.7	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	191-24-2	
Benzo(k)fluoranthene	58.5	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	207-08-9	
Chrysene	131	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	218-01-9	
Dibenz(a,h)anthracene	29.8	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	53-70-3	
Fluoranthene	183	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	206-44-0	
Fluorene	ND	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	86-73-7	
Indeno(1,2,3-cd)pyrene	66.7	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	193-39-5	
Naphthalene	ND	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	91-20-3	
Phenanthrene	69.4	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	85-01-8	
Pyrene	183	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	91	%	42-125	2	04/13/18 17:54	04/17/18 15:39	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FB-SB-G1 (5-10 S) **Lab ID: 10427291002** Collected: 04/12/18 10:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	100	%	57-125	2	04/13/18 17:54	04/17/18 15:39	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1080	1	04/24/18 10:23	04/24/18 19:07	67-64-1	
Allyl chloride	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	107-05-1	
Benzene	ND	ug/kg	21.6	1	04/24/18 10:23	04/24/18 19:07	71-43-2	
Bromobenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	108-86-1	
Bromochloromethane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	74-97-5	
Bromodichloromethane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	75-27-4	
Bromoform	ND	ug/kg	540	1	04/24/18 10:23	04/24/18 19:07	75-25-2	
Bromomethane	ND	ug/kg	540	1	04/24/18 10:23	04/24/18 19:07	74-83-9	
2-Butanone (MEK)	ND	ug/kg	270	1	04/24/18 10:23	04/24/18 19:07	78-93-3	
n-Butylbenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	104-51-8	
sec-Butylbenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	135-98-8	
tert-Butylbenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	98-06-6	
Carbon tetrachloride	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	56-23-5	
Chlorobenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	108-90-7	
Chloroethane	ND	ug/kg	540	1	04/24/18 10:23	04/24/18 19:07	75-00-3	
Chloroform	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	67-66-3	
Chloromethane	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	74-87-3	
2-Chlorotoluene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	95-49-8	
4-Chlorotoluene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	540	1	04/24/18 10:23	04/24/18 19:07	96-12-8	
Dibromochloromethane	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	106-93-4	
Dibromomethane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	75-71-8	
1,1-Dichloroethane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	75-34-3	
1,2-Dichloroethane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	107-06-2	
1,1-Dichloroethene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	156-60-5	
Dichlorofluoromethane	ND	ug/kg	540	1	04/24/18 10:23	04/24/18 19:07	75-43-4	
1,2-Dichloropropane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	78-87-5	
1,3-Dichloropropane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	142-28-9	
2,2-Dichloropropane	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	594-20-7	
1,1-Dichloropropene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	60-29-7	
Ethylbenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	270	1	04/24/18 10:23	04/24/18 19:07	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FB-SB-G1 (5-10 S) **Lab ID: 10427291002** Collected: 04/12/18 10:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	98-82-8	
p-Isopropyltoluene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	99-87-6	
Methylene Chloride	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	270	1	04/24/18 10:23	04/24/18 19:07	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	1634-04-4	
Naphthalene	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	91-20-3	
n-Propylbenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	103-65-1	
Styrene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	79-34-5	
Tetrachloroethene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	127-18-4	
Tetrahydrofuran	ND	ug/kg	2160	1	04/24/18 10:23	04/24/18 19:07	109-99-9	
Toluene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	79-00-5	
Trichloroethene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	79-01-6	
Trichlorofluoromethane	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	108-67-8	
Vinyl chloride	ND	ug/kg	21.6	1	04/24/18 10:23	04/24/18 19:07	75-01-4	
Xylene (Total)	ND	ug/kg	162	1	04/24/18 10:23	04/24/18 19:07	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	95	%	75-125	1	04/24/18 10:23	04/24/18 19:07	17060-07-0	
Toluene-d8 (S)	95	%	75-125	1	04/24/18 10:23	04/24/18 19:07	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125	1	04/24/18 10:23	04/24/18 19:07	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	44.9	20	04/23/18 11:09	04/24/18 13:02	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	11.4	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.39	1	04/20/18 10:25	04/20/18 13:58	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	1.8	mg/kg	0.99	1	04/18/18 14:45	04/19/18 22:45	16984-48-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-05 (4-9 WM) **Lab ID: 10427291003** Collected: 04/12/18 09:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)

Methyl Mercury	ND	ng/g	12.2	1	04/25/18 10:56	04/27/18 16:07	7439-97-6	N3
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8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550

Aldrin	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	309-00-2	
alpha-BHC	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	319-84-6	
beta-BHC	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	319-85-7	
delta-BHC	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	58-89-9	
Chlordane (Technical)	ND	ug/kg	116	5	04/16/18 10:57	04/20/18 04:23	57-74-9	
alpha-Chlordane	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	5103-71-9	
gamma-Chlordane	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	5103-74-2	
4,4'-DDD	ND	ug/kg	23.1	5	04/16/18 10:57	04/20/18 04:23	72-54-8	
4,4'-DDE	ND	ug/kg	23.1	5	04/16/18 10:57	04/20/18 04:23	72-55-9	
4,4'-DDT	ND	ug/kg	23.1	5	04/16/18 10:57	04/20/18 04:23	50-29-3	
Dieldrin	ND	ug/kg	23.1	5	04/16/18 10:57	04/20/18 04:23	60-57-1	
Endosulfan I	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	959-98-8	
Endosulfan II	ND	ug/kg	23.1	5	04/16/18 10:57	04/20/18 04:23	33213-65-9	
Endosulfan sulfate	ND	ug/kg	23.1	5	04/16/18 10:57	04/20/18 04:23	1031-07-8	
Endrin	ND	ug/kg	23.1	5	04/16/18 10:57	04/20/18 04:23	72-20-8	
Endrin aldehyde	ND	ug/kg	23.1	5	04/16/18 10:57	04/20/18 04:23	7421-93-4	
Endrin ketone	ND	ug/kg	23.1	5	04/16/18 10:57	04/20/18 04:23	53494-70-5	
Heptachlor	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	76-44-8	
Heptachlor epoxide	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	1024-57-3	
Methoxychlor	ND	ug/kg	116	5	04/16/18 10:57	04/20/18 04:23	72-43-5	
Toxaphene	ND	ug/kg	347	5	04/16/18 10:57	04/20/18 04:23	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	94	%	30-150	5	04/16/18 10:57	04/20/18 04:23	877-09-8	4M, D3
Decachlorobiphenyl (S)	92	%	30-150	5	04/16/18 10:57	04/20/18 04:23	2051-24-3	

8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550

PCB-1016 (Aroclor 1016)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	11100-14-4	
PCB, Total	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	83	%	48-125	1	04/13/18 19:35	04/16/18 21:17	877-09-8	
Decachlorobiphenyl (S)	74	%	30-134	1	04/13/18 19:35	04/16/18 21:17	2051-24-3	

WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO

WDRO C10-C28	33.7	mg/kg	23.6	2	04/16/18 14:24	04/20/18 09:13		T6
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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Project No.: 10427291

Sample: FD-TT-05 (4-9 WM) **Lab ID: 10427291003** Collected: 04/12/18 09:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	94	%	50-150	2	04/16/18 14:24	04/20/18 09:13	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	15.4	1	04/24/18 13:27	04/25/18 01:09		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/24/18 13:27	04/25/18 01:09	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	7800	mg/kg	13.5	1	04/18/18 09:37	04/21/18 19:41	7429-90-5	
Barium	129	mg/kg	0.67	1	04/18/18 09:37	04/21/18 19:41	7440-39-3	
Boron	106	mg/kg	10.1	1	04/18/18 09:37	04/21/18 19:41	7440-42-8	
Copper	16.9	mg/kg	0.67	1	04/18/18 09:37	04/21/18 19:41	7440-50-8	
Iron	26400	mg/kg	16.8	5	04/18/18 09:37	04/24/18 18:42	7439-89-6	
Manganese	365	mg/kg	0.34	1	04/18/18 09:37	04/21/18 19:41	7439-96-5	
Nickel	18.4	mg/kg	1.3	1	04/18/18 09:37	04/21/18 19:41	7440-02-0	
Silver	ND	mg/kg	0.67	1	04/18/18 09:37	04/21/18 19:41	7440-22-4	
Tin	ND	mg/kg	5.1	1	04/18/18 09:37	04/21/18 19:41	7440-31-5	
Titanium	432	mg/kg	1.7	1	04/18/18 09:37	04/21/18 19:41	7440-32-6	
Zinc	117	mg/kg	1.3	1	04/18/18 09:37	04/21/18 19:41	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	42.6	mg/kg	1.3	5	04/20/18 09:20	04/21/18 01:53	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.0	mg/kg	0.68	20	04/16/18 08:41	04/16/18 16:29	7440-36-0	
Arsenic	14.8	mg/kg	0.68	20	04/16/18 08:41	04/16/18 16:29	7440-38-2	
Beryllium	1.8	mg/kg	0.27	20	04/16/18 08:41	04/16/18 16:29	7440-41-7	
Cadmium	1.4	mg/kg	0.11	20	04/16/18 08:41	04/16/18 16:29	7440-43-9	
Cobalt	5.2	mg/kg	0.68	20	04/16/18 08:41	04/16/18 16:29	7440-48-4	
Lead	18.2	mg/kg	0.14	20	04/16/18 08:41	04/16/18 16:29	7439-92-1	
Lithium	8.6	mg/kg	0.68	20	04/16/18 08:41	04/16/18 16:29	7439-93-2	
Selenium	2.0	mg/kg	0.68	20	04/16/18 08:41	04/16/18 16:29	7782-49-2	
Strontium	49.0	mg/kg	0.68	20	04/16/18 08:41	04/16/18 16:29	7440-24-6	
Vanadium	76.5	mg/kg	1.4	20	04/16/18 08:41	04/16/18 16:29	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.057	mg/kg	0.026	1	04/18/18 09:38	04/19/18 18:21	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	28.0	%	0.10	1		04/19/18 15:12		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	83-32-9	
Acenaphthylene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-05 (4-9 WM) Lab ID: 10427291003 Collected: 04/12/18 09:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Anthracene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	120-12-7	
Benzo(a)anthracene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	56-55-3	
Benzo(a)pyrene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	101-55-3	
Butylbenzylphthalate	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	85-68-7	
Carbazole	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	59-50-7	
4-Chloroaniline	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	108-60-1	
2-Chloronaphthalene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	91-58-7	
2-Chlorophenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	7005-72-3	
Chrysene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	53-70-3	
Dibenzofuran	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	120-83-2	
Diethylphthalate	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	105-67-9	
Dimethylphthalate	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	131-11-3	
Di-n-butylphthalate	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2350	1	04/13/18 17:55	04/19/18 17:49	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	606-20-2	
Di-n-octylphthalate	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	117-81-7	
Fluoranthene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	206-44-0	
Fluorene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	87-68-3	
Hexachlorobenzene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	118-74-1	
Hexachloroethane	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	193-39-5	
Isophorone	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	78-59-1	
1-Methylnaphthalene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	90-12-0	
2-Methylnaphthalene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-05 (4-9 WM) **Lab ID:** 10427291003 Collected: 04/12/18 09:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

3&4-Methylphenol(m&p Cresol)	ND	ug/kg	914	1	04/13/18 17:55	04/19/18 17:49		
Naphthalene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	91-20-3	
2-Nitroaniline	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	88-74-4	
3-Nitroaniline	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	99-09-2	
4-Nitroaniline	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	100-01-6	
Nitrobenzene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	98-95-3	
2-Nitrophenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	88-75-5	
4-Nitrophenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	86-30-6	
Pentachlorophenol	ND	ug/kg	928	1	04/13/18 17:55	04/19/18 17:49	87-86-5	
Phenanthrene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	85-01-8	
Phenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	108-95-2	
Pyrene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	88-06-2	

Surrogates

Nitrobenzene-d5 (S)	68	%.	43-125	1	04/13/18 17:55	04/19/18 17:49	4165-60-0	
2-Fluorobiphenyl (S)	70	%.	30-132	1	04/13/18 17:55	04/19/18 17:49	321-60-8	
p-Terphenyl-d14 (S)	83	%.	62-125	1	04/13/18 17:55	04/19/18 17:49	1718-51-0	
Phenol-d6 (S)	70	%.	48-125	1	04/13/18 17:55	04/19/18 17:49	13127-88-3	
2-Fluorophenol (S)	68	%.	40-125	1	04/13/18 17:55	04/19/18 17:49	367-12-4	
2,4,6-Tribromophenol (S)	70	%.	60-125	1	04/13/18 17:55	04/19/18 17:49	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	83-32-9	
Acenaphthylene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	208-96-8	
Anthracene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	120-12-7	
Benzo(a)anthracene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	56-55-3	
Benzo(a)pyrene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	50-32-8	
Benzo(b)fluoranthene	16.7	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	207-08-9	
Chrysene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	53-70-3	
Fluoranthene	19.2	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	206-44-0	
Fluorene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	193-39-5	
Naphthalene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	91-20-3	
Phenanthrene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	85-01-8	
Pyrene	16.7	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	129-00-0	

Surrogates

2-Fluorobiphenyl (S)	71	%.	42-125	1	04/13/18 17:54	04/17/18 14:58	321-60-8	
p-Terphenyl-d14 (S)	77	%.	57-125	1	04/13/18 17:54	04/17/18 14:58	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-05 (4-9 WM) **Lab ID: 10427291003** Collected: 04/12/18 09:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1440	1	04/24/18 10:23	04/24/18 19:24	67-64-1	
Allyl chloride	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	107-05-1	
Benzene	ND	ug/kg	28.7	1	04/24/18 10:23	04/24/18 19:24	71-43-2	
Bromobenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	108-86-1	
Bromochloromethane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	74-97-5	
Bromodichloromethane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	75-27-4	
Bromoform	ND	ug/kg	718	1	04/24/18 10:23	04/24/18 19:24	75-25-2	
Bromomethane	ND	ug/kg	718	1	04/24/18 10:23	04/24/18 19:24	74-83-9	
2-Butanone (MEK)	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:24	78-93-3	
n-Butylbenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	104-51-8	
sec-Butylbenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	135-98-8	
tert-Butylbenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	98-06-6	
Carbon tetrachloride	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	56-23-5	
Chlorobenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	108-90-7	
Chloroethane	ND	ug/kg	718	1	04/24/18 10:23	04/24/18 19:24	75-00-3	
Chloroform	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	67-66-3	
Chloromethane	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	74-87-3	
2-Chlorotoluene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	95-49-8	
4-Chlorotoluene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	718	1	04/24/18 10:23	04/24/18 19:24	96-12-8	
Dibromochloromethane	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	106-93-4	
Dibromomethane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	75-71-8	
1,1-Dichloroethane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	75-34-3	
1,2-Dichloroethane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	107-06-2	
1,1-Dichloroethene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	156-60-5	
Dichlorofluoromethane	ND	ug/kg	718	1	04/24/18 10:23	04/24/18 19:24	75-43-4	
1,2-Dichloropropane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	78-87-5	
1,3-Dichloropropane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	142-28-9	
2,2-Dichloropropane	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	594-20-7	
1,1-Dichloropropene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	60-29-7	
Ethylbenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:24	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	98-82-8	
p-Isopropyltoluene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	99-87-6	
Methylene Chloride	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:24	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-05 (4-9 WM) **Lab ID: 10427291003** Collected: 04/12/18 09:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	1634-04-4	
Naphthalene	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	91-20-3	
n-Propylbenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	103-65-1	
Styrene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	79-34-5	
Tetrachloroethene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	127-18-4	
Tetrahydrofuran	ND	ug/kg	2870	1	04/24/18 10:23	04/24/18 19:24	109-99-9	
Toluene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	79-00-5	
Trichloroethene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	79-01-6	
Trichlorofluoromethane	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	108-67-8	
Vinyl chloride	ND	ug/kg	28.7	1	04/24/18 10:23	04/24/18 19:24	75-01-4	
Xylene (Total)	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:24	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1	04/24/18 10:23	04/24/18 19:24	17060-07-0	
Toluene-d8 (S)	96	%.	75-125	1	04/24/18 10:23	04/24/18 19:24	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	75-125	1	04/24/18 10:23	04/24/18 19:24	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	14.0	5	04/23/18 11:09	04/24/18 13:02	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	42.6	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.47	1	04/20/18 10:25	04/20/18 14:01	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	4.3	mg/kg	0.98	1	04/18/18 14:45	04/19/18 23:44	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: **FD-TT-06 (2-5 WM)** Lab ID: **10427291004** Collected: 04/12/18 11:40 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	14.6	1	04/25/18 10:56	04/27/18 16:34	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	309-00-2	
alpha-BHC	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	319-84-6	
beta-BHC	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	319-85-7	
delta-BHC	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	58-89-9	
Chlordane (Technical)	ND	ug/kg	27.6	1	04/16/18 10:57	04/20/18 02:33	57-74-9	
alpha-Chlordane	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	5103-71-9	
gamma-Chlordane	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	5103-74-2	
4,4'-DDD	ND	ug/kg	5.5	1	04/16/18 10:57	04/20/18 02:33	72-54-8	
4,4'-DDE	ND	ug/kg	5.5	1	04/16/18 10:57	04/20/18 02:33	72-55-9	
4,4'-DDT	ND	ug/kg	5.5	1	04/16/18 10:57	04/20/18 02:33	50-29-3	
Dieldrin	ND	ug/kg	5.5	1	04/16/18 10:57	04/20/18 02:33	60-57-1	
Endosulfan I	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	959-98-8	
Endosulfan II	ND	ug/kg	5.5	1	04/16/18 10:57	04/20/18 02:33	33213-65-9	
Endosulfan sulfate	ND	ug/kg	5.5	1	04/16/18 10:57	04/20/18 02:33	1031-07-8	
Endrin	ND	ug/kg	5.5	1	04/16/18 10:57	04/20/18 02:33	72-20-8	
Endrin aldehyde	ND	ug/kg	5.5	1	04/16/18 10:57	04/20/18 02:33	7421-93-4	
Endrin ketone	ND	ug/kg	5.5	1	04/16/18 10:57	04/20/18 02:33	53494-70-5	
Heptachlor	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	76-44-8	
Heptachlor epoxide	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	1024-57-3	
Methoxychlor	ND	ug/kg	27.6	1	04/16/18 10:57	04/20/18 02:33	72-43-5	
Toxaphene	ND	ug/kg	82.7	1	04/16/18 10:57	04/20/18 02:33	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	96	%	30-150	1	04/16/18 10:57	04/20/18 02:33	877-09-8	
Decachlorobiphenyl (S)	86	%	30-150	1	04/16/18 10:57	04/20/18 02:33	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	11097-69-1	
PCB-1260 (Aroclor 1260)	118	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	11100-14-4	
PCB, Total	118	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	83	%	48-125	1	04/13/18 19:35	04/16/18 21:33	877-09-8	
Decachlorobiphenyl (S)	76	%	30-134	1	04/13/18 19:35	04/16/18 21:33	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	119	mg/kg	14.2	1	04/16/18 14:24	04/19/18 18:48		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-06 (2-5 WM) **Lab ID:** 10427291004 Collected: 04/12/18 11:40 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	94	%	50-150	1	04/16/18 14:24	04/19/18 18:48	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	17.4	1	04/24/18 13:27	04/25/18 01:33		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/24/18 13:27	04/25/18 01:33	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	29600	mg/kg	16.3	1	04/18/18 09:37	04/21/18 19:45	7429-90-5	
Barium	138	mg/kg	0.81	1	04/18/18 09:37	04/21/18 19:45	7440-39-3	
Boron	192	mg/kg	12.2	1	04/18/18 09:37	04/21/18 19:45	7440-42-8	
Copper	1660	mg/kg	0.81	1	04/18/18 09:37	04/21/18 19:45	7440-50-8	
Iron	31800	mg/kg	20.3	5	04/18/18 09:37	04/24/18 18:44	7439-89-6	
Manganese	251	mg/kg	0.41	1	04/18/18 09:37	04/21/18 19:45	7439-96-5	
Nickel	489	mg/kg	1.6	1	04/18/18 09:37	04/21/18 19:45	7440-02-0	
Silver	ND	mg/kg	0.81	1	04/18/18 09:37	04/21/18 19:45	7440-22-4	
Tin	29.9	mg/kg	6.1	1	04/18/18 09:37	04/21/18 19:45	7440-31-5	
Titanium	405	mg/kg	2.0	1	04/18/18 09:37	04/21/18 19:45	7440-32-6	
Zinc	320	mg/kg	1.6	1	04/18/18 09:37	04/21/18 19:45	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	38.5	mg/kg	1.5	5	04/20/18 09:20	04/21/18 01:57	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	0.99	mg/kg	0.81	20	04/16/18 08:41	04/16/18 15:41	7440-36-0	
Arsenic	18.3	mg/kg	0.81	20	04/16/18 08:41	04/16/18 15:41	7440-38-2	
Beryllium	2.4	mg/kg	0.33	20	04/16/18 08:41	04/16/18 15:41	7440-41-7	
Cadmium	2.1	mg/kg	0.13	20	04/16/18 08:41	04/16/18 15:41	7440-43-9	
Cobalt	7.2	mg/kg	0.81	20	04/16/18 08:41	04/16/18 15:41	7440-48-4	
Lead	75.8	mg/kg	0.16	20	04/16/18 08:41	04/16/18 15:41	7439-92-1	
Lithium	9.9	mg/kg	0.81	20	04/16/18 08:41	04/16/18 15:41	7439-93-2	
Selenium	3.7	mg/kg	0.81	20	04/16/18 08:41	04/16/18 15:41	7782-49-2	
Strontium	51.0	mg/kg	0.81	20	04/16/18 08:41	04/16/18 15:41	7440-24-6	
Vanadium	69.5	mg/kg	1.6	20	04/16/18 08:41	04/16/18 15:41	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	1.7	mg/kg	0.062	2	04/18/18 09:38	04/19/18 18:42	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	39.7	%	0.10	1		04/19/18 15:12		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	83-32-9	
Acenaphthylene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	208-96-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-06 (2-5 WM) Lab ID: 10427291004 Collected: 04/12/18 11:40 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	120-12-7	
Benzo(a)anthracene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	56-55-3	
Benzo(a)pyrene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	101-55-3	
Butylbenzylphthalate	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	85-68-7	
Carbazole	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	59-50-7	
4-Chloroaniline	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	108-60-1	
2-Chloronaphthalene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	91-58-7	
2-Chlorophenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	7005-72-3	
Chrysene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	53-70-3	
Dibenzofuran	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	120-83-2	
Diethylphthalate	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	105-67-9	
Dimethylphthalate	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	131-11-3	
Di-n-butylphthalate	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2810	1	04/20/18 12:55	04/24/18 15:57	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	606-20-2	
Di-n-octylphthalate	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	117-81-7	
Fluoranthene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	206-44-0	
Fluorene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	87-68-3	
Hexachlorobenzene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	118-74-1	
Hexachloroethane	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	193-39-5	
Isophorone	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	78-59-1	
1-Methylnaphthalene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	90-12-0	
2-Methylnaphthalene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: **FD-TT-06 (2-5 WM)** Lab ID: **10427291004** Collected: 04/12/18 11:40 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1090	1	04/20/18 12:55	04/24/18 15:57		
Naphthalene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	91-20-3	
2-Nitroaniline	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	88-74-4	
3-Nitroaniline	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	99-09-2	
4-Nitroaniline	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	100-01-6	
Nitrobenzene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	98-95-3	
2-Nitrophenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	88-75-5	
4-Nitrophenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	86-30-6	
Pentachlorophenol	ND	ug/kg	1110	1	04/20/18 12:55	04/24/18 15:57	87-86-5	
Phenanthrene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	85-01-8	
Phenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	108-95-2	
Pyrene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	51	%.	43-125	1	04/20/18 12:55	04/24/18 15:57	4165-60-0	
2-Fluorobiphenyl (S)	61	%.	30-132	1	04/20/18 12:55	04/24/18 15:57	321-60-8	
p-Terphenyl-d14 (S)	90	%.	62-125	1	04/20/18 12:55	04/24/18 15:57	1718-51-0	
Phenol-d6 (S)	54	%.	48-125	1	04/20/18 12:55	04/24/18 15:57	13127-88-3	
2-Fluorophenol (S)	52	%.	40-125	1	04/20/18 12:55	04/24/18 15:57	367-12-4	
2,4,6-Tribromophenol (S)	81	%.	60-125	1	04/20/18 12:55	04/24/18 15:57	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	83-32-9	
Acenaphthylene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	208-96-8	
Anthracene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	120-12-7	
Benzo(a)anthracene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	56-55-3	
Benzo(a)pyrene	17.9	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	50-32-8	
Benzo(b)fluoranthene	23.1	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	207-08-9	
Chrysene	21.9	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	53-70-3	
Fluoranthene	18.6	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	206-44-0	
Fluorene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	193-39-5	
Naphthalene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	91-20-3	
Phenanthrene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	85-01-8	
Pyrene	23.8	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	72	%.	42-125	1	04/13/18 17:54	04/16/18 20:27	321-60-8	
p-Terphenyl-d14 (S)	79	%.	57-125	1	04/13/18 17:54	04/16/18 20:27	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-06 (2-5 WM) **Lab ID: 10427291004** Collected: 04/12/18 11:40 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1800	1	04/24/18 10:23	04/24/18 19:41	67-64-1	
Allyl chloride	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	107-05-1	
Benzene	ND	ug/kg	35.9	1	04/24/18 10:23	04/24/18 19:41	71-43-2	
Bromobenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	108-86-1	
Bromochloromethane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	74-97-5	
Bromodichloromethane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	75-27-4	
Bromoform	ND	ug/kg	898	1	04/24/18 10:23	04/24/18 19:41	75-25-2	
Bromomethane	ND	ug/kg	898	1	04/24/18 10:23	04/24/18 19:41	74-83-9	
2-Butanone (MEK)	ND	ug/kg	449	1	04/24/18 10:23	04/24/18 19:41	78-93-3	
n-Butylbenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	104-51-8	
sec-Butylbenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	135-98-8	
tert-Butylbenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	98-06-6	
Carbon tetrachloride	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	56-23-5	
Chlorobenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	108-90-7	
Chloroethane	ND	ug/kg	898	1	04/24/18 10:23	04/24/18 19:41	75-00-3	
Chloroform	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	67-66-3	
Chloromethane	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	74-87-3	
2-Chlorotoluene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	95-49-8	
4-Chlorotoluene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	898	1	04/24/18 10:23	04/24/18 19:41	96-12-8	
Dibromochloromethane	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	106-93-4	
Dibromomethane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	75-71-8	
1,1-Dichloroethane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	75-34-3	
1,2-Dichloroethane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	107-06-2	
1,1-Dichloroethene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	156-60-5	
Dichlorofluoromethane	ND	ug/kg	898	1	04/24/18 10:23	04/24/18 19:41	75-43-4	
1,2-Dichloropropane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	78-87-5	
1,3-Dichloropropane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	142-28-9	
2,2-Dichloropropane	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	594-20-7	
1,1-Dichloropropene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	60-29-7	
Ethylbenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	449	1	04/24/18 10:23	04/24/18 19:41	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	98-82-8	
p-Isopropyltoluene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	99-87-6	
Methylene Chloride	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	449	1	04/24/18 10:23	04/24/18 19:41	108-10-1	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-06 (2-5 WM) **Lab ID: 10427291004** Collected: 04/12/18 11:40 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	1634-04-4	
Naphthalene	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	91-20-3	
n-Propylbenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	103-65-1	
Styrene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	79-34-5	
Tetrachloroethene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	127-18-4	
Tetrahydrofuran	ND	ug/kg	3590	1	04/24/18 10:23	04/24/18 19:41	109-99-9	
Toluene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	79-00-5	
Trichloroethene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	79-01-6	
Trichlorofluoromethane	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	108-67-8	
Vinyl chloride	ND	ug/kg	35.9	1	04/24/18 10:23	04/24/18 19:41	75-01-4	
Xylene (Total)	ND	ug/kg	269	1	04/24/18 10:23	04/24/18 19:41	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	93	%.	75-125	1	04/24/18 10:23	04/24/18 19:41	17060-07-0	
Toluene-d8 (S)	95	%.	75-125	1	04/24/18 10:23	04/24/18 19:41	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1	04/24/18 10:23	04/24/18 19:41	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	66.9	20	04/23/18 11:09	04/24/18 13:02	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	38.5	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.67	mg/kg	0.52	1	04/20/18 10:25	04/20/18 14:01	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	1.4	mg/kg	1.0	1	04/18/18 14:45	04/19/18 16:34	16984-48-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: **FD-TT-07 (6-11 WM)** Lab ID: **10427291005** Collected: 04/12/18 13:00 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	14.2	1	04/25/18 10:56	04/27/18 16:54	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	309-00-2	
alpha-BHC	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	319-84-6	
beta-BHC	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	319-85-7	
delta-BHC	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	58-89-9	
Chlordane (Technical)	ND	ug/kg	116	5	04/16/18 10:57	04/20/18 04:41	57-74-9	
alpha-Chlordane	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	5103-71-9	
gamma-Chlordane	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	5103-74-2	
4,4'-DDD	ND	ug/kg	23.0	5	04/16/18 10:57	04/20/18 04:41	72-54-8	
4,4'-DDE	ND	ug/kg	23.0	5	04/16/18 10:57	04/20/18 04:41	72-55-9	
4,4'-DDT	ND	ug/kg	23.0	5	04/16/18 10:57	04/20/18 04:41	50-29-3	
Dieldrin	ND	ug/kg	23.0	5	04/16/18 10:57	04/20/18 04:41	60-57-1	
Endosulfan I	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	959-98-8	
Endosulfan II	ND	ug/kg	23.0	5	04/16/18 10:57	04/20/18 04:41	33213-65-9	
Endosulfan sulfate	ND	ug/kg	23.0	5	04/16/18 10:57	04/20/18 04:41	1031-07-8	
Endrin	ND	ug/kg	23.0	5	04/16/18 10:57	04/20/18 04:41	72-20-8	
Endrin aldehyde	ND	ug/kg	23.0	5	04/16/18 10:57	04/20/18 04:41	7421-93-4	
Endrin ketone	ND	ug/kg	23.0	5	04/16/18 10:57	04/20/18 04:41	53494-70-5	
Heptachlor	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	76-44-8	
Heptachlor epoxide	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	1024-57-3	
Methoxychlor	ND	ug/kg	116	5	04/16/18 10:57	04/20/18 04:41	72-43-5	
Toxaphene	ND	ug/kg	346	5	04/16/18 10:57	04/20/18 04:41	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	96	%	30-150	5	04/16/18 10:57	04/20/18 04:41	877-09-8	4M, D3
Decachlorobiphenyl (S)	100	%	30-150	5	04/16/18 10:57	04/20/18 04:41	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 19:42	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 19:42	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 19:42	11141-16-5	
PCB-1242 (Aroclor 1242)	3430	ug/kg	229	5	04/13/18 19:35	04/17/18 09:17	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 19:42	12672-29-6	
PCB-1254 (Aroclor 1254)	355	ug/kg	45.8	1	04/13/18 19:35	04/16/18 19:42	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 19:42	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 19:42	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 19:42	11100-14-4	
PCB, Total	3780	ug/kg	229	5	04/13/18 19:35	04/17/18 09:17	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	79	%	48-125	1	04/13/18 19:35	04/16/18 19:42	877-09-8	
Decachlorobiphenyl (S)	71	%	30-134	1	04/13/18 19:35	04/16/18 19:42	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	497	mg/kg	54.9	5	04/16/18 14:24	04/20/18 09:20		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-07 (6-11 WM) Lab ID: 10427291005 Collected: 04/12/18 13:00 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS		Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO						
Surrogates								
n-Triacontane (S)	160	%	50-150	5	04/16/18 14:24	04/20/18 09:20	638-68-6	S5
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil						
Gasoline Range Organics	ND	mg/kg	14.3	1	04/24/18 13:27	04/25/18 01:57		
Surrogates								
a,a,a-Trifluorotoluene (S)	97	%	80-150	1	04/24/18 13:27	04/25/18 01:57	98-08-8	
6010C MET ICP		Analytical Method: EPA 6010C Preparation Method: EPA 3050						
Aluminum	7160	mg/kg	13.0	1	04/18/18 09:37	04/21/18 19:49	7429-90-5	
Barium	144	mg/kg	0.65	1	04/18/18 09:37	04/21/18 19:49	7440-39-3	
Boron	95.1	mg/kg	9.7	1	04/18/18 09:37	04/21/18 19:49	7440-42-8	
Copper	507	mg/kg	0.65	1	04/18/18 09:37	04/21/18 19:49	7440-50-8	
Iron	61000	mg/kg	32.4	10	04/18/18 09:37	04/24/18 18:47	7439-89-6	
Manganese	447	mg/kg	0.32	1	04/18/18 09:37	04/21/18 19:49	7439-96-5	
Nickel	45.5	mg/kg	1.3	1	04/18/18 09:37	04/21/18 19:49	7440-02-0	
Silver	1.0	mg/kg	0.65	1	04/18/18 09:37	04/21/18 19:49	7440-22-4	
Tin	83.4	mg/kg	4.9	1	04/18/18 09:37	04/21/18 19:49	7440-31-5	
Titanium	312	mg/kg	1.6	1	04/18/18 09:37	04/21/18 19:49	7440-32-6	
Zinc	553	mg/kg	1.3	1	04/18/18 09:37	04/21/18 19:49	7440-66-6	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3050B						
Chromium	54.4	mg/kg	1.3	5	04/20/18 09:20	04/21/18 02:02	7440-47-3	N2
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	3.9	mg/kg	0.66	20	04/16/18 08:41	04/16/18 15:53	7440-36-0	
Arsenic	12.6	mg/kg	0.66	20	04/16/18 08:41	04/16/18 15:53	7440-38-2	
Beryllium	1.3	mg/kg	0.26	20	04/16/18 08:41	04/16/18 15:53	7440-41-7	
Cadmium	2.7	mg/kg	0.11	20	04/16/18 08:41	04/16/18 15:53	7440-43-9	
Cobalt	8.4	mg/kg	0.66	20	04/16/18 08:41	04/16/18 15:53	7440-48-4	
Lead	338	mg/kg	0.13	20	04/16/18 08:41	04/16/18 15:53	7439-92-1	
Lithium	9.4	mg/kg	0.66	20	04/16/18 08:41	04/16/18 15:53	7439-93-2	
Selenium	2.4	mg/kg	0.66	20	04/16/18 08:41	04/16/18 15:53	7782-49-2	
Strontium	124	mg/kg	0.66	20	04/16/18 08:41	04/16/18 15:53	7440-24-6	
Vanadium	41.4	mg/kg	1.3	20	04/16/18 08:41	04/16/18 15:53	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	1.0	mg/kg	0.024	1	04/18/18 09:38	04/19/18 18:29	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	28.0	%	0.10	1		04/19/18 15:13		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	83-32-9	
Acenaphthylene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-07 (6-11 WM) **Lab ID: 10427291005** Collected: 04/12/18 13:00 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	120-12-7	
Benzo(a)anthracene	667	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	56-55-3	
Benzo(a)pyrene	667	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	50-32-8	
Benzo(b)fluoranthene	895	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	205-99-2	
Benzo(g,h,i)perylene	459	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	101-55-3	
Butylbenzylphthalate	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	85-68-7	
Carbazole	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	59-50-7	
4-Chloroaniline	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	108-60-1	
2-Chloronaphthalene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	91-58-7	
2-Chlorophenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	7005-72-3	
Chrysene	715	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	53-70-3	
Dibenzofuran	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	120-83-2	
Diethylphthalate	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	105-67-9	
Dimethylphthalate	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	131-11-3	
Di-n-butylphthalate	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2360	1	04/13/18 17:55	04/19/18 22:04	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	606-20-2	
Di-n-octylphthalate	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	122-66-7	
bis(2-Ethylhexyl)phthalate	5580	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	117-81-7	
Fluoranthene	996	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	206-44-0	
Fluorene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	87-68-3	
Hexachlorobenzene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	118-74-1	
Hexachloroethane	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	193-39-5	
Isophorone	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	78-59-1	
1-Methylnaphthalene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	90-12-0	
2-Methylnaphthalene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-07 (6-11 WM) **Lab ID: 10427291005** Collected: 04/12/18 13:00 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	916	1	04/13/18 17:55	04/19/18 22:04		
Naphthalene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	91-20-3	
2-Nitroaniline	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	88-74-4	
3-Nitroaniline	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	99-09-2	
4-Nitroaniline	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	100-01-6	
Nitrobenzene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	98-95-3	
2-Nitrophenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	88-75-5	
4-Nitrophenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	86-30-6	
Pentachlorophenol	ND	ug/kg	930	1	04/13/18 17:55	04/19/18 22:04	87-86-5	
Phenanthrene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	85-01-8	
Phenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	108-95-2	
Pyrene	955	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	58	%.	43-125	1	04/13/18 17:55	04/19/18 22:04	4165-60-0	
2-Fluorobiphenyl (S)	63	%.	30-132	1	04/13/18 17:55	04/19/18 22:04	321-60-8	
p-Terphenyl-d14 (S)	78	%.	62-125	1	04/13/18 17:55	04/19/18 22:04	1718-51-0	
Phenol-d6 (S)	61	%.	48-125	1	04/13/18 17:55	04/19/18 22:04	13127-88-3	
2-Fluorophenol (S)	60	%.	40-125	1	04/13/18 17:55	04/19/18 22:04	367-12-4	
2,4,6-Tribromophenol (S)	66	%.	60-125	1	04/13/18 17:55	04/19/18 22:04	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	55.3	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	83-32-9	
Acenaphthylene	ND	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	208-96-8	
Anthracene	274	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	120-12-7	
Benzo(a)anthracene	1150	ug/kg	139	10	04/13/18 17:54	04/18/18 13:15	56-55-3	
Benzo(a)pyrene	1150	ug/kg	139	10	04/13/18 17:54	04/18/18 13:15	50-32-8	
Benzo(b)fluoranthene	1540	ug/kg	139	10	04/13/18 17:54	04/18/18 13:15	205-99-2	
Benzo(g,h,i)perylene	561	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	191-24-2	
Benzo(k)fluoranthene	602	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	207-08-9	
Chrysene	1150	ug/kg	139	10	04/13/18 17:54	04/18/18 13:15	218-01-9	
Dibenz(a,h)anthracene	200	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	53-70-3	
Fluoranthene	2240	ug/kg	139	10	04/13/18 17:54	04/18/18 13:15	206-44-0	
Fluorene	65.4	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	86-73-7	
Indeno(1,2,3-cd)pyrene	620	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	193-39-5	
Naphthalene	ND	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	91-20-3	
Phenanthrene	790	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	85-01-8	
Pyrene	1810	ug/kg	139	10	04/13/18 17:54	04/18/18 13:15	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	87	%.	42-125	2	04/13/18 17:54	04/17/18 15:59	321-60-8	D3
p-Terphenyl-d14 (S)	96	%.	57-125	2	04/13/18 17:54	04/17/18 15:59	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-07 (6-11 WM) **Lab ID: 10427291005** Collected: 04/12/18 13:00 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1750	1	04/24/18 10:23	04/24/18 19:58	67-64-1	
Allyl chloride	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	107-05-1	
Benzene	ND	ug/kg	35.0	1	04/24/18 10:23	04/24/18 19:58	71-43-2	
Bromobenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	108-86-1	
Bromochloromethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	74-97-5	
Bromodichloromethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	75-27-4	
Bromoform	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	75-25-2	
Bromomethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	74-83-9	
2-Butanone (MEK)	ND	ug/kg	437	1	04/24/18 10:23	04/24/18 19:58	78-93-3	
n-Butylbenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	104-51-8	
sec-Butylbenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	135-98-8	
tert-Butylbenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	98-06-6	
Carbon tetrachloride	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	56-23-5	
Chlorobenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	108-90-7	
Chloroethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	75-00-3	
Chloroform	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	67-66-3	
Chloromethane	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	74-87-3	
2-Chlorotoluene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	95-49-8	
4-Chlorotoluene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	96-12-8	
Dibromochloromethane	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	106-93-4	
Dibromomethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	75-71-8	
1,1-Dichloroethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	75-34-3	
1,2-Dichloroethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	107-06-2	
1,1-Dichloroethene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	156-60-5	
Dichlorofluoromethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	75-43-4	
1,2-Dichloropropane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	78-87-5	
1,3-Dichloropropane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	142-28-9	
2,2-Dichloropropane	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	594-20-7	
1,1-Dichloropropene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	60-29-7	
Ethylbenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	437	1	04/24/18 10:23	04/24/18 19:58	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	98-82-8	
p-Isopropyltoluene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	99-87-6	
Methylene Chloride	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	437	1	04/24/18 10:23	04/24/18 19:58	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-07 (6-11 WM) **Lab ID: 10427291005** Collected: 04/12/18 13:00 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	1634-04-4	
Naphthalene	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	91-20-3	
n-Propylbenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	103-65-1	
Styrene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	79-34-5	
Tetrachloroethene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	127-18-4	
Tetrahydrofuran	ND	ug/kg	3500	1	04/24/18 10:23	04/24/18 19:58	109-99-9	
Toluene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	79-00-5	
Trichloroethene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	79-01-6	
Trichlorofluoromethane	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	108-67-8	
Vinyl chloride	ND	ug/kg	35.0	1	04/24/18 10:23	04/24/18 19:58	75-01-4	
Xylene (Total)	ND	ug/kg	262	1	04/24/18 10:23	04/24/18 19:58	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1	04/24/18 10:23	04/24/18 19:58	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1	04/24/18 10:23	04/24/18 19:58	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	75-125	1	04/24/18 10:23	04/24/18 19:58	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	54.0	20	04/23/18 11:09	04/24/18 13:03	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	54.4	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.85	mg/kg	0.45	1	04/25/18 11:00	04/25/18 13:19	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	04/18/18 14:45	04/19/18 22:26	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-08 (5-12 WM) **Lab ID: 10427291006** Collected: 04/12/18 14:30 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.5	1	04/25/18 10:56	04/27/18 17:00	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	309-00-2	
alpha-BHC	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	319-84-6	
beta-BHC	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	319-85-7	
delta-BHC	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	58-89-9	
Chlordane (Technical)	ND	ug/kg	107	5	04/16/18 10:57	04/20/18 04:59	57-74-9	
alpha-Chlordane	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	5103-71-9	
gamma-Chlordane	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	5103-74-2	
4,4'-DDD	ND	ug/kg	21.3	5	04/16/18 10:57	04/20/18 04:59	72-54-8	
4,4'-DDE	ND	ug/kg	21.3	5	04/16/18 10:57	04/20/18 04:59	72-55-9	
4,4'-DDT	22.9	ug/kg	21.3	5	04/16/18 10:57	04/20/18 04:59	50-29-3	
Dieldrin	29.7	ug/kg	21.3	5	04/16/18 10:57	04/20/18 04:59	60-57-1	
Endosulfan I	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	959-98-8	
Endosulfan II	ND	ug/kg	21.3	5	04/16/18 10:57	04/20/18 04:59	33213-65-9	
Endosulfan sulfate	ND	ug/kg	21.3	5	04/16/18 10:57	04/20/18 04:59	1031-07-8	
Endrin	ND	ug/kg	21.3	5	04/16/18 10:57	04/20/18 04:59	72-20-8	
Endrin aldehyde	ND	ug/kg	21.3	5	04/16/18 10:57	04/20/18 04:59	7421-93-4	
Endrin ketone	ND	ug/kg	21.3	5	04/16/18 10:57	04/20/18 04:59	53494-70-5	
Heptachlor	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	76-44-8	
Heptachlor epoxide	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	1024-57-3	
Methoxychlor	ND	ug/kg	107	5	04/16/18 10:57	04/20/18 04:59	72-43-5	
Toxaphene	ND	ug/kg	319	5	04/16/18 10:57	04/20/18 04:59	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	89	%	30-150	5	04/16/18 10:57	04/20/18 04:59	877-09-8	4M, D4
Decachlorobiphenyl (S)	84	%	30-150	5	04/16/18 10:57	04/20/18 04:59	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	42.2	1	04/13/18 19:35	04/16/18 19:58	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	42.2	1	04/13/18 19:35	04/16/18 19:58	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	42.2	1	04/13/18 19:35	04/16/18 19:58	11141-16-5	
PCB-1242 (Aroclor 1242)	2380	ug/kg	84.4	2	04/13/18 19:35	04/17/18 09:32	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	42.2	1	04/13/18 19:35	04/16/18 19:58	12672-29-6	
PCB-1254 (Aroclor 1254)	504	ug/kg	42.2	1	04/13/18 19:35	04/16/18 19:58	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	42.2	1	04/13/18 19:35	04/16/18 19:58	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	42.2	1	04/13/18 19:35	04/16/18 19:58	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	42.2	1	04/13/18 19:35	04/16/18 19:58	11100-14-4	
PCB, Total	2880	ug/kg	84.4	2	04/13/18 19:35	04/17/18 09:32	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	74	%	48-125	1	04/13/18 19:35	04/16/18 19:58	877-09-8	
Decachlorobiphenyl (S)	74	%	30-134	1	04/13/18 19:35	04/16/18 19:58	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	825	mg/kg	136	10	04/16/18 14:24	04/20/18 09:27		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-08 (5-12 WM) **Lab ID: 10427291006** Collected: 04/12/18 14:30 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	0	%	50-150	10	04/16/18 14:24	04/20/18 09:27	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	15.6	1	04/24/18 13:27	04/25/18 02:21		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/24/18 13:27	04/25/18 02:21	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	9940	mg/kg	12.4	1	04/18/18 09:37	04/21/18 19:53	7429-90-5	
Barium	156	mg/kg	0.62	1	04/18/18 09:37	04/21/18 19:53	7440-39-3	
Boron	138	mg/kg	9.3	1	04/18/18 09:37	04/21/18 19:53	7440-42-8	
Copper	193	mg/kg	0.62	1	04/18/18 09:37	04/21/18 19:53	7440-50-8	
Iron	53400	mg/kg	31.0	10	04/18/18 09:37	04/24/18 18:50	7439-89-6	
Manganese	382	mg/kg	0.31	1	04/18/18 09:37	04/21/18 19:53	7439-96-5	
Nickel	41.1	mg/kg	1.2	1	04/18/18 09:37	04/21/18 19:53	7440-02-0	
Silver	ND	mg/kg	0.62	1	04/18/18 09:37	04/21/18 19:53	7440-22-4	
Tin	50.1	mg/kg	4.7	1	04/18/18 09:37	04/21/18 19:53	7440-31-5	
Titanium	327	mg/kg	1.6	1	04/18/18 09:37	04/21/18 19:53	7440-32-6	
Zinc	365	mg/kg	1.2	1	04/18/18 09:37	04/21/18 19:53	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	109	mg/kg	1.3	5	04/20/18 09:20	04/21/18 02:07	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	3.6	mg/kg	0.61	20	04/16/18 08:41	04/16/18 15:46	7440-36-0	
Arsenic	37.0	mg/kg	0.61	20	04/16/18 08:41	04/16/18 15:46	7440-38-2	
Beryllium	1.6	mg/kg	0.24	20	04/16/18 08:41	04/16/18 15:46	7440-41-7	
Cadmium	13.7	mg/kg	0.097	20	04/16/18 08:41	04/16/18 15:46	7440-43-9	
Cobalt	8.5	mg/kg	0.61	20	04/16/18 08:41	04/16/18 15:46	7440-48-4	
Lead	558	mg/kg	0.61	100	04/16/18 08:41	04/17/18 12:38	7439-92-1	
Lithium	7.8	mg/kg	0.61	20	04/16/18 08:41	04/16/18 15:46	7439-93-2	
Selenium	4.5	mg/kg	0.61	20	04/16/18 08:41	04/16/18 15:46	7782-49-2	
Strontium	69.9	mg/kg	0.61	20	04/16/18 08:41	04/16/18 15:46	7440-24-6	
Vanadium	96.5	mg/kg	1.2	20	04/16/18 08:41	04/16/18 15:46	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.26	mg/kg	0.024	1	04/18/18 09:38	04/19/18 18:31	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	21.8	%	0.10	1		04/19/18 15:13		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	83-32-9	
Acenaphthylene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-08 (5-12 WM) **Lab ID: 10427291006** Collected: 04/12/18 14:30 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	120-12-7	
Benzo(a)anthracene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	56-55-3	
Benzo(a)pyrene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	101-55-3	
Butylbenzylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	85-68-7	
Carbazole	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	59-50-7	
4-Chloroaniline	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	108-60-1	
2-Chloronaphthalene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	91-58-7	
2-Chlorophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	7005-72-3	
Chrysene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	53-70-3	
Dibenzofuran	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	120-83-2	
Diethylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	105-67-9	
Dimethylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	131-11-3	
Di-n-butylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2170	1	04/13/18 17:55	04/19/18 18:46	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	606-20-2	
Di-n-octylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	122-66-7	
bis(2-Ethylhexyl)phthalate	1020	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	117-81-7	
Fluoranthene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	206-44-0	
Fluorene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	87-68-3	
Hexachlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	118-74-1	
Hexachloroethane	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	193-39-5	
Isophorone	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	78-59-1	
1-Methylnaphthalene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	90-12-0	
2-Methylnaphthalene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-08 (5-12 WM) **Lab ID: 10427291006** Collected: 04/12/18 14:30 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	841	1	04/13/18 17:55	04/19/18 18:46		
Naphthalene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	91-20-3	
2-Nitroaniline	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	88-74-4	
3-Nitroaniline	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	99-09-2	
4-Nitroaniline	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	100-01-6	
Nitrobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	98-95-3	
2-Nitrophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	88-75-5	
4-Nitrophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	86-30-6	
Pentachlorophenol	ND	ug/kg	853	1	04/13/18 17:55	04/19/18 18:46	87-86-5	
Phenanthrene	479	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	85-01-8	
Phenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	108-95-2	
Pyrene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	56	%.	43-125	1	04/13/18 17:55	04/19/18 18:46	4165-60-0	
2-Fluorobiphenyl (S)	74	%.	30-132	1	04/13/18 17:55	04/19/18 18:46	321-60-8	
p-Terphenyl-d14 (S)	85	%.	62-125	1	04/13/18 17:55	04/19/18 18:46	1718-51-0	
Phenol-d6 (S)	64	%.	48-125	1	04/13/18 17:55	04/19/18 18:46	13127-88-3	
2-Fluorophenol (S)	54	%.	40-125	1	04/13/18 17:55	04/19/18 18:46	367-12-4	
2,4,6-Tribromophenol (S)	83	%.	60-125	1	04/13/18 17:55	04/19/18 18:46	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	83-32-9	
Acenaphthylene	ND	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	208-96-8	
Anthracene	65.2	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	120-12-7	
Benzo(a)anthracene	220	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	56-55-3	
Benzo(a)pyrene	185	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	50-32-8	
Benzo(b)fluoranthene	297	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	205-99-2	
Benzo(g,h,i)perylene	123	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	191-24-2	
Benzo(k)fluoranthene	98.6	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	207-08-9	
Chrysene	352	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	53-70-3	
Fluoranthene	365	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	206-44-0	
Fluorene	118	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	86-73-7	
Indeno(1,2,3-cd)pyrene	89.4	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	193-39-5	
Naphthalene	76.3	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	91-20-3	
Phenanthrene	506	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	85-01-8	
Pyrene	399	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	84	%.	42-125	5	04/18/18 17:23	04/20/18 15:23	321-60-8	
p-Terphenyl-d14 (S)	100	%.	57-125	5	04/18/18 17:23	04/20/18 15:23	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: **FD-TT-08 (5-12 WM)** Lab ID: **10427291006** Collected: 04/12/18 14:30 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1730	1	04/24/18 10:23	04/24/18 20:15	67-64-1	
Allyl chloride	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	107-05-1	
Benzene	818	ug/kg	34.5	1	04/24/18 10:23	04/24/18 20:15	71-43-2	
Bromobenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	108-86-1	
Bromochloromethane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	74-97-5	
Bromodichloromethane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	75-27-4	
Bromoform	ND	ug/kg	863	1	04/24/18 10:23	04/24/18 20:15	75-25-2	
Bromomethane	ND	ug/kg	863	1	04/24/18 10:23	04/24/18 20:15	74-83-9	
2-Butanone (MEK)	ND	ug/kg	432	1	04/24/18 10:23	04/24/18 20:15	78-93-3	
n-Butylbenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	104-51-8	
sec-Butylbenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	135-98-8	
tert-Butylbenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	98-06-6	
Carbon tetrachloride	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	56-23-5	
Chlorobenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	108-90-7	
Chloroethane	ND	ug/kg	863	1	04/24/18 10:23	04/24/18 20:15	75-00-3	
Chloroform	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	67-66-3	
Chloromethane	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	74-87-3	
2-Chlorotoluene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	95-49-8	
4-Chlorotoluene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	863	1	04/24/18 10:23	04/24/18 20:15	96-12-8	
Dibromochloromethane	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	106-93-4	
Dibromomethane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	75-71-8	
1,1-Dichloroethane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	75-34-3	
1,2-Dichloroethane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	107-06-2	
1,1-Dichloroethene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	156-60-5	
Dichlorofluoromethane	ND	ug/kg	863	1	04/24/18 10:23	04/24/18 20:15	75-43-4	
1,2-Dichloropropane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	78-87-5	
1,3-Dichloropropane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	142-28-9	
2,2-Dichloropropane	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	594-20-7	
1,1-Dichloropropene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	60-29-7	
Ethylbenzene	510	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	432	1	04/24/18 10:23	04/24/18 20:15	87-68-3	
Isopropylbenzene (Cumene)	114	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	98-82-8	
p-Isopropyltoluene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	99-87-6	
Methylene Chloride	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	432	1	04/24/18 10:23	04/24/18 20:15	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-08 (5-12 WM) **Lab ID: 10427291006** Collected: 04/12/18 14:30 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	1634-04-4	
Naphthalene	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	91-20-3	
n-Propylbenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	103-65-1	
Styrene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	79-34-5	
Tetrachloroethene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	127-18-4	
Tetrahydrofuran	ND	ug/kg	3450	1	04/24/18 10:23	04/24/18 20:15	109-99-9	
Toluene	717	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	79-00-5	
Trichloroethene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	79-01-6	
Trichlorofluoromethane	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	108-67-8	
Vinyl chloride	ND	ug/kg	34.5	1	04/24/18 10:23	04/24/18 20:15	75-01-4	
Xylene (Total)	386	ug/kg	259	1	04/24/18 10:23	04/24/18 20:15	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%	75-125	1	04/24/18 10:23	04/24/18 20:15	17060-07-0	
Toluene-d8 (S)	96	%	75-125	1	04/24/18 10:23	04/24/18 20:15	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125	1	04/24/18 10:23	04/24/18 20:15	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	50.4	20	04/23/18 11:09	04/24/18 13:03	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	109	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.39	1	04/25/18 11:00	04/25/18 13:20	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	1.3	mg/kg	1.0	1	04/18/18 14:45	04/19/18 21:27	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-01 (5-8 WM) **Lab ID: 10427291007** Collected: 04/12/18 17:20 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.6	1	04/25/18 10:56	04/27/18 17:07	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	309-00-2	
alpha-BHC	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	319-84-6	
beta-BHC	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	319-85-7	
delta-BHC	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	58-89-9	
Chlordane (Technical)	ND	ug/kg	1860	100	04/16/18 10:57	04/20/18 09:52	57-74-9	
alpha-Chlordane	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	5103-71-9	
gamma-Chlordane	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	5103-74-2	
4,4'-DDD	ND	ug/kg	371	100	04/16/18 10:57	04/20/18 09:52	72-54-8	
4,4'-DDE	ND	ug/kg	371	100	04/16/18 10:57	04/20/18 09:52	72-55-9	
4,4'-DDT	ND	ug/kg	371	100	04/16/18 10:57	04/20/18 09:52	50-29-3	
Dieldrin	ND	ug/kg	371	100	04/16/18 10:57	04/20/18 09:52	60-57-1	
Endosulfan I	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	959-98-8	
Endosulfan II	ND	ug/kg	371	100	04/16/18 10:57	04/20/18 09:52	33213-65-9	
Endosulfan sulfate	ND	ug/kg	371	100	04/16/18 10:57	04/20/18 09:52	1031-07-8	
Endrin	ND	ug/kg	371	100	04/16/18 10:57	04/20/18 09:52	72-20-8	
Endrin aldehyde	ND	ug/kg	371	100	04/16/18 10:57	04/20/18 09:52	7421-93-4	
Endrin ketone	ND	ug/kg	371	100	04/16/18 10:57	04/20/18 09:52	53494-70-5	
Heptachlor	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	76-44-8	
Heptachlor epoxide	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	1024-57-3	
Methoxychlor	ND	ug/kg	1860	100	04/16/18 10:57	04/20/18 09:52	72-43-5	
Toxaphene	ND	ug/kg	5570	100	04/16/18 10:57	04/20/18 09:52	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	100	04/16/18 10:57	04/20/18 09:52	877-09-8	1M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	100	04/16/18 10:57	04/20/18 09:52	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	11100-14-4	
PCB, Total	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	67	%	48-125	1	04/13/18 19:35	04/16/18 20:14	877-09-8	
Decachlorobiphenyl (S)	67	%	30-134	1	04/13/18 19:35	04/16/18 20:14	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-01 (5-8 WM) Lab ID: 10427291007 Collected: 04/12/18 17:20 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	1480	mg/kg	930	20	04/16/18 14:24	04/19/18 17:51		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	20	04/16/18 14:24	04/19/18 17:51	638-68-6	P3,S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	53.6	mg/kg	13.0	1	04/24/18 13:27	04/25/18 02:45		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%.	80-150	1	04/24/18 13:27	04/25/18 02:45	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	3840	mg/kg	10.6	1	04/18/18 09:37	04/21/18 19:57	7429-90-5	
Barium	75.4	mg/kg	0.53	1	04/18/18 09:37	04/21/18 19:57	7440-39-3	
Boron	12.2	mg/kg	8.0	1	04/18/18 09:37	04/21/18 19:57	7440-42-8	
Copper	11.3	mg/kg	0.53	1	04/18/18 09:37	04/21/18 19:57	7440-50-8	
Iron	12500	mg/kg	13.3	5	04/18/18 09:37	04/24/18 18:53	7439-89-6	
Manganese	455	mg/kg	0.27	1	04/18/18 09:37	04/21/18 19:57	7439-96-5	
Nickel	10.8	mg/kg	1.1	1	04/18/18 09:37	04/21/18 19:57	7440-02-0	
Silver	ND	mg/kg	0.53	1	04/18/18 09:37	04/21/18 19:57	7440-22-4	
Tin	ND	mg/kg	4.0	1	04/18/18 09:37	04/21/18 19:57	7440-31-5	
Titanium	186	mg/kg	1.3	1	04/18/18 09:37	04/21/18 19:57	7440-32-6	
Zinc	65.9	mg/kg	1.1	1	04/18/18 09:37	04/21/18 19:57	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	14.0	mg/kg	1.0	5	04/20/18 09:20	04/21/18 02:20	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.52	20	04/16/18 08:41	04/16/18 15:50	7440-36-0	
Arsenic	2.7	mg/kg	0.52	20	04/16/18 08:41	04/16/18 15:50	7440-38-2	
Beryllium	0.25	mg/kg	0.21	20	04/16/18 08:41	04/16/18 15:50	7440-41-7	
Cadmium	0.26	mg/kg	0.083	20	04/16/18 08:41	04/16/18 15:50	7440-43-9	
Cobalt	4.3	mg/kg	0.52	20	04/16/18 08:41	04/16/18 15:50	7440-48-4	
Lead	43.4	mg/kg	0.10	20	04/16/18 08:41	04/16/18 15:50	7439-92-1	
Lithium	4.4	mg/kg	0.52	20	04/16/18 08:41	04/16/18 15:50	7439-93-2	
Selenium	ND	mg/kg	0.52	20	04/16/18 08:41	04/16/18 15:50	7782-49-2	
Strontium	19.8	mg/kg	0.52	20	04/16/18 08:41	04/16/18 15:50	7440-24-6	
Vanadium	19.1	mg/kg	1.0	20	04/16/18 08:41	04/16/18 15:50	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.044	mg/kg	0.020	1	04/18/18 09:38	04/19/18 18:35	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	10.4	%	0.10	1		04/19/18 15:13		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-01 (5-8 WM) **Lab ID: 10427291007** Collected: 04/12/18 17:20 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	208-96-8	
Anthracene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	120-12-7	
Benzo(a)anthracene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	56-55-3	
Benzo(a)pyrene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	101-55-3	
Butylbenzylphthalate	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	85-68-7	
Carbazole	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	59-50-7	
4-Chloroaniline	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	108-60-1	
2-Chloronaphthalene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	91-58-7	
2-Chlorophenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	7005-72-3	
Chrysene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	53-70-3	
Dibenzofuran	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	120-83-2	
Diethylphthalate	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	105-67-9	
Dimethylphthalate	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	131-11-3	
Di-n-butylphthalate	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	18900	1	04/13/18 17:55	04/19/18 22:32	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	606-20-2	
Di-n-octylphthalate	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	117-81-7	
Fluoranthene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	206-44-0	
Fluorene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	87-68-3	
Hexachlorobenzene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	118-74-1	
Hexachloroethane	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	193-39-5	
Isophorone	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	78-59-1	
1-Methylnaphthalene	5860	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	90-12-0	
2-Methylnaphthalene	8050	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-01 (5-8 WM) **Lab ID: 10427291007** Collected: 04/12/18 17:20 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	7340	1	04/13/18 17:55	04/19/18 22:32		
Naphthalene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	91-20-3	
2-Nitroaniline	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	88-74-4	
3-Nitroaniline	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	99-09-2	
4-Nitroaniline	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	100-01-6	
Nitrobenzene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	98-95-3	
2-Nitrophenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	88-75-5	
4-Nitrophenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	86-30-6	
Pentachlorophenol	ND	ug/kg	7450	1	04/13/18 17:55	04/19/18 22:32	87-86-5	
Phenanthrene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	85-01-8	
Phenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	108-95-2	
Pyrene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%	43-125	1	04/13/18 17:55	04/19/18 22:32	4165-60-0	P3,S5
2-Fluorobiphenyl (S)	0	%	30-132	1	04/13/18 17:55	04/19/18 22:32	321-60-8	S5
p-Terphenyl-d14 (S)	0	%	62-125	1	04/13/18 17:55	04/19/18 22:32	1718-51-0	S5
Phenol-d6 (S)	0	%	48-125	1	04/13/18 17:55	04/19/18 22:32	13127-88-3	S5
2-Fluorophenol (S)	0	%	40-125	1	04/13/18 17:55	04/19/18 22:32	367-12-4	S5
2,4,6-Tribromophenol (S)	0	%	60-125	1	04/13/18 17:55	04/19/18 22:32	118-79-6	S5
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	83-32-9	
Acenaphthylene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	208-96-8	
Anthracene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	120-12-7	
Benzo(a)anthracene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	56-55-3	
Benzo(a)pyrene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	207-08-9	
Chrysene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	53-70-3	
Fluoranthene	714	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	206-44-0	
Fluorene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	193-39-5	
Naphthalene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	91-20-3	
Phenanthrene	1340	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	85-01-8	
Pyrene	1310	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	129-00-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-01 (5-8 WM) **Lab ID: 10427291007** Collected: 04/12/18 17:20 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
2-Fluorobiphenyl (S)	0	%	42-125	5	04/13/18 17:54	04/16/18 23:00	321-60-8	D3,P3, S4
p-Terphenyl-d14 (S)	0	%	57-125	5	04/13/18 17:54	04/16/18 23:00	1718-51-0	S4
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1150	1	04/24/18 10:23	04/24/18 20:32	67-64-1	
Allyl chloride	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	107-05-1	
Benzene	ND	ug/kg	22.9	1	04/24/18 10:23	04/24/18 20:32	71-43-2	
Bromobenzene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	108-86-1	
Bromochloromethane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	74-97-5	
Bromodichloromethane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	75-27-4	
Bromoform	ND	ug/kg	573	1	04/24/18 10:23	04/24/18 20:32	75-25-2	
Bromomethane	ND	ug/kg	573	1	04/24/18 10:23	04/24/18 20:32	74-83-9	
2-Butanone (MEK)	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 20:32	78-93-3	
n-Butylbenzene	76.6	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	104-51-8	
sec-Butylbenzene	60.0	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	135-98-8	
tert-Butylbenzene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	98-06-6	
Carbon tetrachloride	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	56-23-5	
Chlorobenzene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	108-90-7	
Chloroethane	ND	ug/kg	573	1	04/24/18 10:23	04/24/18 20:32	75-00-3	
Chloroform	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	67-66-3	
Chloromethane	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	74-87-3	
2-Chlorotoluene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	95-49-8	
4-Chlorotoluene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	573	1	04/24/18 10:23	04/24/18 20:32	96-12-8	
Dibromochloromethane	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	106-93-4	
Dibromomethane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	75-71-8	
1,1-Dichloroethane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	75-34-3	
1,2-Dichloroethane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	107-06-2	
1,1-Dichloroethene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	156-60-5	
Dichlorofluoromethane	ND	ug/kg	573	1	04/24/18 10:23	04/24/18 20:32	75-43-4	
1,2-Dichloropropane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	78-87-5	
1,3-Dichloropropane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	142-28-9	
2,2-Dichloropropane	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	594-20-7	
1,1-Dichloropropene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	60-29-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-01 (5-8 WM) **Lab ID: 10427291007** Collected: 04/12/18 17:20 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Ethylbenzene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 20:32	87-68-3	
Isopropylbenzene (Cumene)	72.1	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	98-82-8	
p-Isopropyltoluene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	99-87-6	
Methylene Chloride	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 20:32	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	1634-04-4	
Naphthalene	1320	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	91-20-3	
n-Propylbenzene	134	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	103-65-1	
Styrene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	79-34-5	
Tetrachloroethene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	127-18-4	
Tetrahydrofuran	ND	ug/kg	2290	1	04/24/18 10:23	04/24/18 20:32	109-99-9	
Toluene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	79-00-5	
Trichloroethene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	79-01-6	
Trichlorofluoromethane	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	76-13-1	
1,2,4-Trimethylbenzene	327	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	95-63-6	
1,3,5-Trimethylbenzene	137	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	108-67-8	
Vinyl chloride	ND	ug/kg	22.9	1	04/24/18 10:23	04/24/18 20:32	75-01-4	
Xylene (Total)	208	ug/kg	172	1	04/24/18 10:23	04/24/18 20:32	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%	75-125	1	04/24/18 10:23	04/24/18 20:32	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	04/24/18 10:23	04/24/18 20:32	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125	1	04/24/18 10:23	04/24/18 20:32	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	44.5	20	04/23/18 11:09	04/24/18 13:03	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	14.0	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.24	1	04/25/18 11:00	04/25/18 13:21	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	1.1	mg/kg	1.0	1	04/18/18 14:45	04/19/18 18:50	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: **TS-SB-02 (5-10 S)** Lab ID: **10427291008** Collected: 04/12/18 19:10 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	8.81	1	04/25/18 10:56	04/27/18 17:14	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	309-00-2	
alpha-BHC	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	319-84-6	
beta-BHC	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	319-85-7	
delta-BHC	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	58-89-9	
Chlordane (Technical)	ND	ug/kg	36.0	2	04/16/18 10:57	04/20/18 01:38	57-74-9	
alpha-Chlordane	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	5103-71-9	
gamma-Chlordane	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	5103-74-2	
4,4'-DDD	ND	ug/kg	7.2	2	04/16/18 10:57	04/20/18 01:38	72-54-8	
4,4'-DDE	ND	ug/kg	7.2	2	04/16/18 10:57	04/20/18 01:38	72-55-9	
4,4'-DDT	ND	ug/kg	7.2	2	04/16/18 10:57	04/20/18 01:38	50-29-3	
Dieldrin	ND	ug/kg	7.2	2	04/16/18 10:57	04/20/18 01:38	60-57-1	
Endosulfan I	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	959-98-8	
Endosulfan II	ND	ug/kg	7.2	2	04/16/18 10:57	04/20/18 01:38	33213-65-9	
Endosulfan sulfate	ND	ug/kg	7.2	2	04/16/18 10:57	04/20/18 01:38	1031-07-8	
Endrin	ND	ug/kg	7.2	2	04/16/18 10:57	04/20/18 01:38	72-20-8	
Endrin aldehyde	ND	ug/kg	7.2	2	04/16/18 10:57	04/20/18 01:38	7421-93-4	
Endrin ketone	ND	ug/kg	7.2	2	04/16/18 10:57	04/20/18 01:38	53494-70-5	
Heptachlor	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	76-44-8	
Heptachlor epoxide	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	1024-57-3	
Methoxychlor	ND	ug/kg	36.0	2	04/16/18 10:57	04/20/18 01:38	72-43-5	
Toxaphene	ND	ug/kg	108	2	04/16/18 10:57	04/20/18 01:38	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	87	%	30-150	2	04/16/18 10:57	04/20/18 01:38	877-09-8	5M, D3
Decachlorobiphenyl (S)	85	%	30-150	2	04/16/18 10:57	04/20/18 01:38	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	11100-14-4	
PCB, Total	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	91	%	48-125	1	04/13/18 19:35	04/16/18 20:30	877-09-8	
Decachlorobiphenyl (S)	79	%	30-134	1	04/13/18 19:35	04/16/18 20:30	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	12.4	mg/kg	9.3	1	04/16/18 14:24	04/19/18 19:38		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Project No.: 10427291

Sample: TS-SB-02 (5-10 S) **Lab ID: 10427291008** Collected: 04/12/18 19:10 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	87	%	50-150	1	04/16/18 14:24	04/19/18 19:38	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	11.9	1	04/24/18 13:27	04/25/18 03:08		
Surrogates								
a,a,a-Trifluorotoluene (S)	100	%	80-150	1	04/24/18 13:27	04/25/18 03:08	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	2940	mg/kg	10.7	1	04/18/18 09:37	04/21/18 20:01	7429-90-5	
Barium	49.5	mg/kg	0.54	1	04/18/18 09:37	04/21/18 20:01	7440-39-3	
Boron	ND	mg/kg	8.0	1	04/18/18 09:37	04/21/18 20:01	7440-42-8	
Copper	6.5	mg/kg	0.54	1	04/18/18 09:37	04/21/18 20:01	7440-50-8	
Iron	7500	mg/kg	2.7	1	04/18/18 09:37	04/21/18 20:01	7439-89-6	
Manganese	258	mg/kg	0.27	1	04/18/18 09:37	04/21/18 20:01	7439-96-5	
Nickel	8.7	mg/kg	1.1	1	04/18/18 09:37	04/21/18 20:01	7440-02-0	
Silver	ND	mg/kg	0.54	1	04/18/18 09:37	04/21/18 20:01	7440-22-4	
Tin	ND	mg/kg	4.0	1	04/18/18 09:37	04/21/18 20:01	7440-31-5	
Titanium	204	mg/kg	1.3	1	04/18/18 09:37	04/21/18 20:01	7440-32-6	
Zinc	26.9	mg/kg	1.1	1	04/18/18 09:37	04/21/18 20:01	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	8.8	mg/kg	0.98	5	04/20/18 09:20	04/21/18 02:25	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.54	20	04/16/18 08:41	04/16/18 14:33	7440-36-0	
Arsenic	2.9	mg/kg	0.54	20	04/16/18 08:41	04/16/18 14:33	7440-38-2	
Beryllium	ND	mg/kg	0.21	20	04/16/18 08:41	04/16/18 14:33	7440-41-7	
Cadmium	0.10	mg/kg	0.086	20	04/16/18 08:41	04/16/18 14:33	7440-43-9	
Cobalt	3.3	mg/kg	0.54	20	04/16/18 08:41	04/16/18 14:33	7440-48-4	
Lead	4.5	mg/kg	0.11	20	04/16/18 08:41	04/16/18 14:33	7439-92-1	
Lithium	4.4	mg/kg	0.54	20	04/16/18 08:41	04/16/18 14:33	7439-93-2	
Selenium	ND	mg/kg	0.54	20	04/16/18 08:41	04/16/18 14:33	7782-49-2	
Strontium	25.0	mg/kg	0.54	20	04/16/18 08:41	04/16/18 14:33	7440-24-6	
Vanadium	16.3	mg/kg	1.1	20	04/16/18 08:41	04/16/18 14:33	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	ND	mg/kg	0.021	1	04/18/18 09:38	04/19/18 18:38	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	7.6	%	0.10	1		04/19/18 15:14		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	83-32-9	
Acenaphthylene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-02 (5-10 S) **Lab ID: 10427291008** Collected: 04/12/18 19:10 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	120-12-7	
Benzo(a)anthracene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	56-55-3	
Benzo(a)pyrene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	101-55-3	
Butylbenzylphthalate	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	85-68-7	
Carbazole	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	59-50-7	
4-Chloroaniline	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	108-60-1	
2-Chloronaphthalene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	91-58-7	
2-Chlorophenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	7005-72-3	
Chrysene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	53-70-3	
Dibenzofuran	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	120-83-2	
Diethylphthalate	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	105-67-9	
Dimethylphthalate	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	131-11-3	
Di-n-butylphthalate	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	1840	1	04/20/18 12:55	04/24/18 16:26	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	606-20-2	
Di-n-octylphthalate	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	117-81-7	
Fluoranthene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	206-44-0	
Fluorene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	87-68-3	
Hexachlorobenzene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	118-74-1	
Hexachloroethane	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	193-39-5	
Isophorone	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	78-59-1	
1-Methylnaphthalene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	90-12-0	
2-Methylnaphthalene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: **TS-SB-02 (5-10 S)** Lab ID: **10427291008** Collected: 04/12/18 19:10 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	714	1	04/20/18 12:55	04/24/18 16:26		
Naphthalene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	91-20-3	
2-Nitroaniline	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	88-74-4	
3-Nitroaniline	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	99-09-2	
4-Nitroaniline	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	100-01-6	
Nitrobenzene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	98-95-3	
2-Nitrophenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	88-75-5	
4-Nitrophenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	86-30-6	
Pentachlorophenol	ND	ug/kg	725	1	04/20/18 12:55	04/24/18 16:26	87-86-5	
Phenanthrene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	85-01-8	
Phenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	108-95-2	
Pyrene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	49	%.	43-125	1	04/20/18 12:55	04/24/18 16:26	4165-60-0	
2-Fluorobiphenyl (S)	63	%.	30-132	1	04/20/18 12:55	04/24/18 16:26	321-60-8	
p-Terphenyl-d14 (S)	89	%.	62-125	1	04/20/18 12:55	04/24/18 16:26	1718-51-0	
Phenol-d6 (S)	53	%.	48-125	1	04/20/18 12:55	04/24/18 16:26	13127-88-3	
2-Fluorophenol (S)	50	%.	40-125	1	04/20/18 12:55	04/24/18 16:26	367-12-4	
2,4,6-Tribromophenol (S)	78	%.	60-125	1	04/20/18 12:55	04/24/18 16:26	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	11.9	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	83-32-9	
Acenaphthylene	ND	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	208-96-8	
Anthracene	17.8	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	120-12-7	
Benzo(a)anthracene	37.9	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	56-55-3	
Benzo(a)pyrene	36.5	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	50-32-8	
Benzo(b)fluoranthene	46.4	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	205-99-2	
Benzo(g,h,i)perylene	19.0	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	191-24-2	
Benzo(k)fluoranthene	20.5	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	207-08-9	
Chrysene	40.1	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	53-70-3	
Fluoranthene	86.0	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	206-44-0	
Fluorene	ND	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	86-73-7	
Indeno(1,2,3-cd)pyrene	14.7	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	193-39-5	
Naphthalene	ND	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	91-20-3	
Phenanthrene	58.1	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	85-01-8	
Pyrene	67.7	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	54	%.	42-125	1	04/13/18 17:54	04/16/18 20:49	321-60-8	
p-Terphenyl-d14 (S)	71	%.	57-125	1	04/13/18 17:54	04/16/18 20:49	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-02 (5-10 S) **Lab ID: 10427291008** Collected: 04/12/18 19:10 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1130	1	04/24/18 10:23	04/24/18 20:49	67-64-1	
Allyl chloride	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	107-05-1	
Benzene	ND	ug/kg	22.5	1	04/24/18 10:23	04/24/18 20:49	71-43-2	
Bromobenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	108-86-1	
Bromochloromethane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	74-97-5	
Bromodichloromethane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	75-27-4	
Bromoform	ND	ug/kg	563	1	04/24/18 10:23	04/24/18 20:49	75-25-2	
Bromomethane	ND	ug/kg	563	1	04/24/18 10:23	04/24/18 20:49	74-83-9	
2-Butanone (MEK)	ND	ug/kg	281	1	04/24/18 10:23	04/24/18 20:49	78-93-3	
n-Butylbenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	104-51-8	
sec-Butylbenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	135-98-8	
tert-Butylbenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	98-06-6	
Carbon tetrachloride	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	56-23-5	
Chlorobenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	108-90-7	
Chloroethane	ND	ug/kg	563	1	04/24/18 10:23	04/24/18 20:49	75-00-3	
Chloroform	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	67-66-3	
Chloromethane	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	74-87-3	
2-Chlorotoluene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	95-49-8	
4-Chlorotoluene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	563	1	04/24/18 10:23	04/24/18 20:49	96-12-8	
Dibromochloromethane	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	106-93-4	
Dibromomethane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	75-71-8	
1,1-Dichloroethane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	75-34-3	
1,2-Dichloroethane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	107-06-2	
1,1-Dichloroethene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	156-60-5	
Dichlorofluoromethane	ND	ug/kg	563	1	04/24/18 10:23	04/24/18 20:49	75-43-4	
1,2-Dichloropropane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	78-87-5	
1,3-Dichloropropane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	142-28-9	
2,2-Dichloropropane	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	594-20-7	
1,1-Dichloropropene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	60-29-7	
Ethylbenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	281	1	04/24/18 10:23	04/24/18 20:49	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	98-82-8	
p-Isopropyltoluene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	99-87-6	
Methylene Chloride	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	281	1	04/24/18 10:23	04/24/18 20:49	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-02 (5-10 S) **Lab ID: 10427291008** Collected: 04/12/18 19:10 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	1634-04-4	
Naphthalene	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	91-20-3	
n-Propylbenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	103-65-1	
Styrene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	79-34-5	
Tetrachloroethene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	127-18-4	
Tetrahydrofuran	ND	ug/kg	2250	1	04/24/18 10:23	04/24/18 20:49	109-99-9	
Toluene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	79-00-5	
Trichloroethene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	79-01-6	
Trichlorofluoromethane	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	108-67-8	
Vinyl chloride	ND	ug/kg	22.5	1	04/24/18 10:23	04/24/18 20:49	75-01-4	
Xylene (Total)	ND	ug/kg	169	1	04/24/18 10:23	04/24/18 20:49	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1	04/24/18 10:23	04/24/18 20:49	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1	04/24/18 10:23	04/24/18 20:49	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1	04/24/18 10:23	04/24/18 20:49	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	10.6	5	04/23/18 11:09	04/24/18 13:03	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	8.8	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.37	1	04/25/18 11:00	04/25/18 13:25	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.99	1	04/18/18 14:45	04/19/18 20:28	16984-48-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-03 (1.5-3.0 S) **Lab ID: 10427291009** Collected: 04/12/18 19:55 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	9.41	1	04/25/18 10:56	04/27/18 17:20	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	309-00-2	
alpha-BHC	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	319-84-6	
beta-BHC	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	319-85-7	
delta-BHC	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	58-89-9	
Chlordane (Technical)	ND	ug/kg	190	10	04/16/18 10:57	04/20/18 04:04	57-74-9	
alpha-Chlordane	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	5103-71-9	
gamma-Chlordane	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	5103-74-2	
4,4'-DDD	ND	ug/kg	37.8	10	04/16/18 10:57	04/20/18 04:04	72-54-8	
4,4'-DDE	ND	ug/kg	37.8	10	04/16/18 10:57	04/20/18 04:04	72-55-9	
4,4'-DDT	ND	ug/kg	37.8	10	04/16/18 10:57	04/20/18 04:04	50-29-3	
Dieldrin	ND	ug/kg	37.8	10	04/16/18 10:57	04/20/18 04:04	60-57-1	
Endosulfan I	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	959-98-8	
Endosulfan II	ND	ug/kg	37.8	10	04/16/18 10:57	04/20/18 04:04	33213-65-9	
Endosulfan sulfate	ND	ug/kg	37.8	10	04/16/18 10:57	04/20/18 04:04	1031-07-8	
Endrin	ND	ug/kg	37.8	10	04/16/18 10:57	04/20/18 04:04	72-20-8	
Endrin aldehyde	ND	ug/kg	37.8	10	04/16/18 10:57	04/20/18 04:04	7421-93-4	
Endrin ketone	ND	ug/kg	37.8	10	04/16/18 10:57	04/20/18 04:04	53494-70-5	
Heptachlor	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	76-44-8	
Heptachlor epoxide	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	1024-57-3	
Methoxychlor	ND	ug/kg	190	10	04/16/18 10:57	04/20/18 04:04	72-43-5	
Toxaphene	ND	ug/kg	568	10	04/16/18 10:57	04/20/18 04:04	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	10	04/16/18 10:57	04/20/18 04:04	877-09-8	3M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	10	04/16/18 10:57	04/20/18 04:04	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	53469-21-9	
PCB-1248 (Aroclor 1248)	56.3	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	11100-14-4	
PCB, Total	56.3	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	73	%	48-125	1	04/13/18 19:35	04/16/18 20:45	877-09-8	
Decachlorobiphenyl (S)	77	%	30-134	1	04/13/18 19:35	04/16/18 20:45	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-03 (1.5-3.0 S) **Lab ID: 10427291009** Collected: 04/12/18 19:55 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	674	mg/kg	95.8	10	04/16/18 14:24	04/19/18 18:12		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	10	04/16/18 14:24	04/19/18 18:12	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	11.7	1	04/24/18 13:27	04/25/18 03:32		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	04/24/18 13:27	04/25/18 03:32	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	3290	mg/kg	10.5	1	04/18/18 09:37	04/21/18 20:05	7429-90-5	
Barium	47.1	mg/kg	0.53	1	04/18/18 09:37	04/21/18 20:05	7440-39-3	
Boron	ND	mg/kg	7.9	1	04/18/18 09:37	04/21/18 20:05	7440-42-8	
Copper	9.1	mg/kg	0.53	1	04/18/18 09:37	04/21/18 20:05	7440-50-8	
Iron	7440	mg/kg	2.6	1	04/18/18 09:37	04/21/18 20:05	7439-89-6	
Manganese	282	mg/kg	0.26	1	04/18/18 09:37	04/21/18 20:05	7439-96-5	
Nickel	9.0	mg/kg	1.1	1	04/18/18 09:37	04/21/18 20:05	7440-02-0	
Silver	ND	mg/kg	0.53	1	04/18/18 09:37	04/21/18 20:05	7440-22-4	
Tin	ND	mg/kg	3.9	1	04/18/18 09:37	04/21/18 20:05	7440-31-5	
Titanium	148	mg/kg	1.3	1	04/18/18 09:37	04/21/18 20:05	7440-32-6	
Zinc	38.6	mg/kg	1.1	1	04/18/18 09:37	04/21/18 20:05	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	9.4	mg/kg	1.1	5	04/20/18 09:20	04/21/18 02:29	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.55	20	04/16/18 08:41	04/16/18 14:36	7440-36-0	
Arsenic	2.3	mg/kg	0.55	20	04/16/18 08:41	04/16/18 14:36	7440-38-2	
Beryllium	0.28	mg/kg	0.22	20	04/16/18 08:41	04/16/18 14:36	7440-41-7	
Cadmium	0.21	mg/kg	0.087	20	04/16/18 08:41	04/16/18 14:36	7440-43-9	
Cobalt	3.7	mg/kg	0.55	20	04/16/18 08:41	04/16/18 14:36	7440-48-4	
Lead	199	mg/kg	0.11	20	04/16/18 08:41	04/16/18 14:36	7439-92-1	
Lithium	5.0	mg/kg	0.55	20	04/16/18 08:41	04/16/18 14:36	7439-93-2	
Selenium	ND	mg/kg	0.55	20	04/16/18 08:41	04/16/18 14:36	7782-49-2	
Strontium	22.7	mg/kg	0.55	20	04/16/18 08:41	04/16/18 14:36	7440-24-6	
Vanadium	18.3	mg/kg	1.1	20	04/16/18 08:41	04/16/18 14:36	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.034	mg/kg	0.022	1	04/18/18 09:38	04/19/18 18:40	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	12.1	%	0.10	1		04/19/18 15:14		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	1010	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-03 (1.5-3.0 S) **Lab ID: 10427291009** Collected: 04/12/18 19:55 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	208-96-8	
Anthracene	2220	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	120-12-7	
Benzo(a)anthracene	2580	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	56-55-3	
Benzo(a)pyrene	2040	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	50-32-8	
Benzo(b)fluoranthene	2440	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	205-99-2	
Benzo(g,h,i)perylene	1160	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	191-24-2	
Benzo(k)fluoranthene	1240	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	101-55-3	
Butylbenzylphthalate	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	85-68-7	
Carbazole	550	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	59-50-7	
4-Chloroaniline	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	108-60-1	
2-Chloronaphthalene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	91-58-7	
2-Chlorophenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	7005-72-3	
Chrysene	2430	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	53-70-3	
Dibenzofuran	1300	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	120-83-2	
Diethylphthalate	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	105-67-9	
Dimethylphthalate	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	131-11-3	
Di-n-butylphthalate	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	1930	1	04/13/18 17:55	04/19/18 23:01	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	606-20-2	
Di-n-octylphthalate	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	117-81-7	
Fluoranthene	5120	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	206-44-0	
Fluorene	2040	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	87-68-3	
Hexachlorobenzene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	118-74-1	
Hexachloroethane	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	67-72-1	
Indeno(1,2,3-cd)pyrene	1040	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	193-39-5	
Isophorone	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	78-59-1	
1-Methylnaphthalene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	90-12-0	
2-Methylnaphthalene	427	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-03 (1.5-3.0 S) **Lab ID: 10427291009** Collected: 04/12/18 19:55 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

2-Methylphenol(o-Cresol)	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	749	1	04/13/18 17:55	04/19/18 23:01		
Naphthalene	632	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	91-20-3	
2-Nitroaniline	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	88-74-4	
3-Nitroaniline	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	99-09-2	
4-Nitroaniline	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	100-01-6	
Nitrobenzene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	98-95-3	
2-Nitrophenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	88-75-5	
4-Nitrophenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	86-30-6	
Pentachlorophenol	ND	ug/kg	760	1	04/13/18 17:55	04/19/18 23:01	87-86-5	
Phenanthrene	4900	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	85-01-8	
Phenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	108-95-2	
Pyrene	4820	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	56	%	43-125	1	04/13/18 17:55	04/19/18 23:01	4165-60-0	
2-Fluorobiphenyl (S)	59	%	30-132	1	04/13/18 17:55	04/19/18 23:01	321-60-8	
p-Terphenyl-d14 (S)	70	%	62-125	1	04/13/18 17:55	04/19/18 23:01	1718-51-0	
Phenol-d6 (S)	56	%	48-125	1	04/13/18 17:55	04/19/18 23:01	13127-88-3	
2-Fluorophenol (S)	57	%	40-125	1	04/13/18 17:55	04/19/18 23:01	367-12-4	
2,4,6-Tribromophenol (S)	59	%	60-125	1	04/13/18 17:55	04/19/18 23:01	118-79-6	S5

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	1030	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	83-32-9	
Acenaphthylene	ND	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	208-96-8	
Anthracene	2200	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	120-12-7	
Benzo(a)anthracene	2360	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	56-55-3	
Benzo(a)pyrene	2040	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	50-32-8	
Benzo(b)fluoranthene	2540	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	205-99-2	
Benzo(g,h,i)perylene	963	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	191-24-2	
Benzo(k)fluoranthene	950	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	207-08-9	
Chrysene	2040	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	218-01-9	
Dibenz(a,h)anthracene	357	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	53-70-3	
Fluoranthene	5260	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	206-44-0	
Fluorene	2030	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	86-73-7	
Indeno(1,2,3-cd)pyrene	1020	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	193-39-5	
Naphthalene	735	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	91-20-3	
Phenanthrene	5160	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	85-01-8	
Pyrene	4170	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%	42-125	25	04/13/18 17:54	04/17/18 16:40	321-60-8	D4,S4

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-03 (1.5-3.0 S) Lab ID: 10427291009 Collected: 04/12/18 19:55 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	0	%	57-125	25	04/13/18 17:54	04/17/18 16:40	1718-51-0	S4
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1170	1	04/24/18 10:23	04/24/18 21:05	67-64-1	
Allyl chloride	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	107-05-1	
Benzene	ND	ug/kg	23.4	1	04/24/18 10:23	04/24/18 21:05	71-43-2	
Bromobenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	108-86-1	
Bromochloromethane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	74-97-5	
Bromodichloromethane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	75-27-4	
Bromoform	ND	ug/kg	584	1	04/24/18 10:23	04/24/18 21:05	75-25-2	
Bromomethane	ND	ug/kg	584	1	04/24/18 10:23	04/24/18 21:05	74-83-9	
2-Butanone (MEK)	ND	ug/kg	292	1	04/24/18 10:23	04/24/18 21:05	78-93-3	
n-Butylbenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	104-51-8	
sec-Butylbenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	135-98-8	
tert-Butylbenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	98-06-6	
Carbon tetrachloride	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	56-23-5	
Chlorobenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	108-90-7	
Chloroethane	ND	ug/kg	584	1	04/24/18 10:23	04/24/18 21:05	75-00-3	
Chloroform	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	67-66-3	
Chloromethane	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	74-87-3	
2-Chlorotoluene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	95-49-8	
4-Chlorotoluene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	584	1	04/24/18 10:23	04/24/18 21:05	96-12-8	
Dibromochloromethane	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	106-93-4	
Dibromomethane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	75-71-8	
1,1-Dichloroethane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	75-34-3	
1,2-Dichloroethane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	107-06-2	
1,1-Dichloroethene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	156-60-5	
Dichlorofluoromethane	ND	ug/kg	584	1	04/24/18 10:23	04/24/18 21:05	75-43-4	
1,2-Dichloropropane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	78-87-5	
1,3-Dichloropropane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	142-28-9	
2,2-Dichloropropane	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	594-20-7	
1,1-Dichloropropene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	60-29-7	
Ethylbenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	292	1	04/24/18 10:23	04/24/18 21:05	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-03 (1.5-3.0 S) **Lab ID: 10427291009** Collected: 04/12/18 19:55 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	98-82-8	
p-Isopropyltoluene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	99-87-6	
Methylene Chloride	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	292	1	04/24/18 10:23	04/24/18 21:05	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	1634-04-4	
Naphthalene	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	91-20-3	
n-Propylbenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	103-65-1	
Styrene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	79-34-5	
Tetrachloroethene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	127-18-4	
Tetrahydrofuran	ND	ug/kg	2340	1	04/24/18 10:23	04/24/18 21:05	109-99-9	
Toluene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	79-00-5	
Trichloroethene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	79-01-6	
Trichlorofluoromethane	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	108-67-8	
Vinyl chloride	ND	ug/kg	23.4	1	04/24/18 10:23	04/24/18 21:05	75-01-4	
Xylene (Total)	ND	ug/kg	175	1	04/24/18 10:23	04/24/18 21:05	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	95	%	75-125	1	04/24/18 10:23	04/24/18 21:05	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	04/24/18 10:23	04/24/18 21:05	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125	1	04/24/18 10:23	04/24/18 21:05	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	11.3	5	04/23/18 11:09	04/24/18 13:26	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	9.4	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.42	1	04/25/18 11:00	04/25/18 13:25	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	6.1	mg/kg	0.97	1	04/18/18 14:45	04/19/18 20:09	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 141622 Analysis Method: EPA 1630 (1998)
 QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 559956 Matrix: Solid
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.16	04/27/18 14:14	N3

METHOD BLANK: 559957 Matrix: Solid
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.05	04/27/18 14:20	N3

METHOD BLANK: 559958 Matrix: Solid
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.14	04/27/18 14:27	N3

LABORATORY CONTROL SAMPLE: 559959

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	99.7	116	117	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559960 559961

Parameter	Units	10427018004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	374	387	412	449	110	116	65-135	9	35	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559962 559963

Parameter	Units	10427291002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	344	356	391	403	114	113	65-135	3	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 533955 Analysis Method: WI MOD GRO
 QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2900195 Matrix: Solid
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	04/24/18 16:15	
a,a,a-Trifluorotoluene (S)	%.	98	80-150	04/24/18 16:15	

LABORATORY CONTROL SAMPLE & LCSD: 2900196 2900197

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	43.1	43.6	86	87	80-120	1	20	
a,a,a-Trifluorotoluene (S)	%.				99	99	80-150			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2901282 2901283

Parameter	Units	10428008010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Gasoline Range Organics	mg/kg	ND	54.1	53.3	51.3	51.0	95	96	80-120	1	20	
a,a,a-Trifluorotoluene (S)	%.						98	99	80-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 532422

Analysis Method: EPA 7471

QC Batch Method: EPA 7471

Analysis Description: 7471 Mercury

Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2891608

Matrix: Solid

Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.018	04/19/18 18:07	

LABORATORY CONTROL SAMPLE: 2891609

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.48	0.52	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891610 2891611

Parameter	Units	10427084001 Result	MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Mercury	mg/kg	0.60	.65	.62	1.2	1.5	100	137	80-120	16	20	E,M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

QC Batch: 532423 Analysis Method: EPA 6010C
QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2891612 Matrix: Solid
Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.9	04/21/18 19:02	
Barium	mg/kg	ND	0.50	04/21/18 19:02	
Boron	mg/kg	ND	7.4	04/21/18 19:02	
Copper	mg/kg	ND	0.50	04/21/18 19:02	
Iron	mg/kg	ND	2.5	04/21/18 19:02	
Manganese	mg/kg	ND	0.25	04/21/18 19:02	
Nickel	mg/kg	ND	0.99	04/21/18 19:02	
Silver	mg/kg	ND	0.50	04/21/18 19:02	
Tin	mg/kg	ND	3.7	04/21/18 19:02	
Titanium	mg/kg	ND	1.2	04/21/18 19:02	
Zinc	mg/kg	ND	0.99	04/21/18 19:02	

LABORATORY CONTROL SAMPLE: 2891613

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	952	864	91	80-120	
Barium	mg/kg	47.6	47.5	100	80-120	
Boron	mg/kg	47.6	43.8	92	80-120	
Copper	mg/kg	47.6	45.2	95	80-120	
Iron	mg/kg	952	927	97	80-120	
Manganese	mg/kg	47.6	47.9	101	80-120	
Nickel	mg/kg	47.6	46.5	98	80-120	
Silver	mg/kg	23.8	21.5	90	80-120	
Tin	mg/kg	47.6	44.9	94	80-120	
Titanium	mg/kg	47.6	45.8	96	80-120	
Zinc	mg/kg	47.6	45.2	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891614 2891615

Parameter	Units	2891614		2891615		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Aluminum	mg/kg	10700	1400	1370	12800	12900	148	161	75-125	1	20	P6
Barium	mg/kg	134	70	68.7	183	185	70	75	75-125	1	20	M1
Boron	mg/kg	802	70	68.7	962	1030	228	335	75-125	7	20	P6
Copper	mg/kg	20.2	70	68.7	74.2	73.4	77	77	75-125	1	20	
Iron	mg/kg	34200	1400	1370	35600	35400	99	89	75-125	0	20	
Manganese	mg/kg	185	70	68.7	241	239	79	78	75-125	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Parameter	Units	2891614		2891615		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10427291001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Nickel	mg/kg	22.5	70	68.7	74.6	73.8	74	75	75-125	1	20	M1	
Silver	mg/kg	ND	35	34.3	26.2	25.8	75	75	75-125	2	20		
Tin	mg/kg	ND	70	68.7	49.7	49.0	67	67	75-125	1	20	M1	
Titanium	mg/kg	589	70	68.7	624	626	50	55	75-125	0	20	P6	
Zinc	mg/kg	180	70	68.7	240	238	85	85	75-125	1	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 437531 Analysis Method: EPA 6020
 QC Batch Method: EPA 3050B Analysis Description: 6020 MET
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2021107 Matrix: Solid
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.18	04/21/18 01:07	N2

LABORATORY CONTROL SAMPLE: 2021108

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.8	3.7	99	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2021109 2021110

Parameter	Units	10427291001 Result	MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result	% Rec	% Rec					
Chromium	mg/kg	53.4	5.64	61.8	5.49	58.5	152	94	75-125	6	20	N2,P6	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 532416 Analysis Method: EPA 6020A
 QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2891584 Matrix: Solid
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.50	04/16/18 16:04	
Arsenic	mg/kg	ND	0.50	04/16/18 16:04	
Beryllium	mg/kg	ND	0.20	04/16/18 16:04	
Cadmium	mg/kg	ND	0.080	04/16/18 16:04	
Cobalt	mg/kg	ND	0.50	04/16/18 16:04	
Lead	mg/kg	ND	0.10	04/16/18 16:04	
Lithium	mg/kg	ND	0.50	04/16/18 16:04	
Selenium	mg/kg	ND	0.50	04/16/18 16:04	
Strontium	mg/kg	ND	0.50	04/16/18 16:04	
Vanadium	mg/kg	ND	1.0	04/16/18 16:04	

LABORATORY CONTROL SAMPLE: 2891585

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	49	48.4	99	80-120	
Arsenic	mg/kg	49	47.0	96	80-120	
Beryllium	mg/kg	49	46.7	95	80-120	
Cadmium	mg/kg	49	47.9	98	80-120	
Cobalt	mg/kg	49	48.1	98	80-120	
Lead	mg/kg	49	48.5	99	80-120	
Lithium	mg/kg	49	47.0	96	80-120	
Selenium	mg/kg	49	46.8	96	80-120	
Strontium	mg/kg	49	47.3	96	80-120	
Vanadium	mg/kg	49	47.7	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891586 2891587

Parameter	Units	10427286001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result						
Antimony	mg/kg	ND	50.9	50.9	36.3	36.1	71	71	75-125	0	20	M6
Arsenic	mg/kg	1.5	50.9	50.9	46.8	47.2	89	90	75-125	1	20	
Beryllium	mg/kg	ND	50.9	50.9	46.4	49.9	91	98	75-125	7	20	
Cadmium	mg/kg	0.18	50.9	50.9	46.7	47.0	91	92	75-125	0	20	
Cobalt	mg/kg	2.7	50.9	50.9	48.1	48.6	89	90	75-125	1	20	
Lead	mg/kg	1.7	50.9	50.9	48.3	48.2	92	91	75-125	0	20	
Lithium	mg/kg	3.0	50.9	50.9	48.7	52.0	90	96	75-125	6	20	
Selenium	mg/kg	ND	50.9	50.9	46.6	48.7	91	96	75-125	5	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Parameter	Units	2891586		2891587		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result								
Strontium	mg/kg	11.5	50.9	50.9	56.2	57.0	88	90	75-125	1	20		
Vanadium	mg/kg	12.9	50.9	50.9	60.9	60.4	94	93	75-125	1	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 533208

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10427291001, 10427291002

SAMPLE DUPLICATE: 2897020

Parameter	Units	10427291002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.6	11.4	8	30	

SAMPLE DUPLICATE: 2897108

Parameter	Units	10427829003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	6.5	6.7	2	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch:	533359	Analysis Method:	ASTM D2974
QC Batch Method:	ASTM D2974	Analysis Description:	Dry Weight / %M by ASTM D2974
Associated Lab Samples:	10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009		

SAMPLE DUPLICATE: 2897274

Parameter	Units	10427291006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.8	21.5	1	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 533981 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2900460 Matrix: Solid
Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	04/24/18 14:55	
1,1,1-Trichloroethane	ug/kg	ND	50.0	04/24/18 14:55	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	04/24/18 14:55	
1,1,2-Trichloroethane	ug/kg	ND	50.0	04/24/18 14:55	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	04/24/18 14:55	
1,1-Dichloroethane	ug/kg	ND	50.0	04/24/18 14:55	
1,1-Dichloroethene	ug/kg	ND	50.0	04/24/18 14:55	
1,1-Dichloropropene	ug/kg	ND	50.0	04/24/18 14:55	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	04/24/18 14:55	
1,2,3-Trichloropropane	ug/kg	ND	200	04/24/18 14:55	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	04/24/18 14:55	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	04/24/18 14:55	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	04/24/18 14:55	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	04/24/18 14:55	
1,2-Dichlorobenzene	ug/kg	ND	50.0	04/24/18 14:55	
1,2-Dichloroethane	ug/kg	ND	50.0	04/24/18 14:55	
1,2-Dichloropropane	ug/kg	ND	50.0	04/24/18 14:55	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	04/24/18 14:55	
1,3-Dichlorobenzene	ug/kg	ND	50.0	04/24/18 14:55	
1,3-Dichloropropane	ug/kg	ND	50.0	04/24/18 14:55	
1,4-Dichlorobenzene	ug/kg	ND	50.0	04/24/18 14:55	
2,2-Dichloropropane	ug/kg	ND	200	04/24/18 14:55	
2-Butanone (MEK)	ug/kg	ND	250	04/24/18 14:55	
2-Chlorotoluene	ug/kg	ND	50.0	04/24/18 14:55	
4-Chlorotoluene	ug/kg	ND	50.0	04/24/18 14:55	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	04/24/18 14:55	
Acetone	ug/kg	ND	1000	04/24/18 14:55	
Allyl chloride	ug/kg	ND	200	04/24/18 14:55	
Benzene	ug/kg	ND	20.0	04/24/18 14:55	
Bromobenzene	ug/kg	ND	50.0	04/24/18 14:55	
Bromochloromethane	ug/kg	ND	50.0	04/24/18 14:55	
Bromodichloromethane	ug/kg	ND	50.0	04/24/18 14:55	
Bromoform	ug/kg	ND	500	04/24/18 14:55	MN
Bromomethane	ug/kg	ND	500	04/24/18 14:55	
Carbon tetrachloride	ug/kg	ND	50.0	04/24/18 14:55	
Chlorobenzene	ug/kg	ND	50.0	04/24/18 14:55	
Chloroethane	ug/kg	ND	500	04/24/18 14:55	
Chloroform	ug/kg	ND	50.0	04/24/18 14:55	
Chloromethane	ug/kg	ND	200	04/24/18 14:55	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	04/24/18 14:55	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

METHOD BLANK: 2900460

Matrix: Solid

Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
cis-1,3-Dichloropropene	ug/kg	ND	50.0	04/24/18 14:55	
Dibromochloromethane	ug/kg	ND	200	04/24/18 14:55	
Dibromomethane	ug/kg	ND	50.0	04/24/18 14:55	
Dichlorodifluoromethane	ug/kg	ND	200	04/24/18 14:55	
Dichlorofluoromethane	ug/kg	ND	500	04/24/18 14:55	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	04/24/18 14:55	
Ethylbenzene	ug/kg	ND	50.0	04/24/18 14:55	
Hexachloro-1,3-butadiene	ug/kg	ND	250	04/24/18 14:55	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	04/24/18 14:55	
Methyl-tert-butyl ether	ug/kg	ND	50.0	04/24/18 14:55	
Methylene Chloride	ug/kg	ND	200	04/24/18 14:55	
n-Butylbenzene	ug/kg	ND	50.0	04/24/18 14:55	
n-Propylbenzene	ug/kg	ND	50.0	04/24/18 14:55	
Naphthalene	ug/kg	ND	200	04/24/18 14:55	
p-Isopropyltoluene	ug/kg	ND	50.0	04/24/18 14:55	
sec-Butylbenzene	ug/kg	ND	50.0	04/24/18 14:55	
Styrene	ug/kg	ND	50.0	04/24/18 14:55	
tert-Butylbenzene	ug/kg	ND	50.0	04/24/18 14:55	
Tetrachloroethene	ug/kg	ND	50.0	04/24/18 14:55	
Tetrahydrofuran	ug/kg	ND	2000	04/24/18 14:55	
Toluene	ug/kg	ND	50.0	04/24/18 14:55	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	04/24/18 14:55	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	04/24/18 14:55	
Trichloroethene	ug/kg	ND	50.0	04/24/18 14:55	
Trichlorofluoromethane	ug/kg	ND	200	04/24/18 14:55	
Vinyl chloride	ug/kg	ND	20.0	04/24/18 14:55	
Xylene (Total)	ug/kg	ND	150	04/24/18 14:55	
1,2-Dichloroethane-d4 (S)	%	96	75-125	04/24/18 14:55	
4-Bromofluorobenzene (S)	%	99	75-125	04/24/18 14:55	
Toluene-d8 (S)	%	96	75-125	04/24/18 14:55	

LABORATORY CONTROL SAMPLE & LCSD: 2900461

2900462

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	873	843	87	84	59-125	3	20	
1,1,1-Trichloroethane	ug/kg	1000	981	967	98	97	59-125	1	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	854	774	85	77	58-125	10	20	
1,1,2-Trichloroethane	ug/kg	1000	824	795	82	79	64-125	4	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	833	853	83	85	65-125	2	20	
1,1-Dichloroethane	ug/kg	1000	864	866	86	87	63-125	0	20	
1,1-Dichloroethene	ug/kg	1000	862	857	86	86	59-125	1	20	
1,1-Dichloropropene	ug/kg	1000	984	952	98	95	64-125	3	20	
1,2,3-Trichlorobenzene	ug/kg	1000	841	801	84	80	55-126	5	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

LABORATORY CONTROL SAMPLE & LCSD: 2900461

2900462

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,3-Trichloropropane	ug/kg	1000	821	781	82	78	62-125	5	20	
1,2,4-Trichlorobenzene	ug/kg	1000	866	799	87	80	62-125	8	20	
1,2,4-Trimethylbenzene	ug/kg	1000	857	780	86	78	59-125	9	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	2120	1960	85	78	54-125	8	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	885	829	89	83	64-125	6	20	
1,2-Dichlorobenzene	ug/kg	1000	838	807	84	81	63-125	4	20	
1,2-Dichloroethane	ug/kg	1000	786	759	79	76	57-125	3	20	
1,2-Dichloropropane	ug/kg	1000	813	790	81	79	67-125	3	20	
1,3,5-Trimethylbenzene	ug/kg	1000	852	801	85	80	59-125	6	20	
1,3-Dichlorobenzene	ug/kg	1000	851	790	85	79	64-125	7	20	
1,3-Dichloropropane	ug/kg	1000	809	768	81	77	64-125	5	20	
1,4-Dichlorobenzene	ug/kg	1000	772	743	77	74	63-125	4	20	
2,2-Dichloropropane	ug/kg	1000	926	889	93	89	37-126	4	20	
2-Butanone (MEK)	ug/kg	5000	4220	4240	84	85	48-125	0	20	
2-Chlorotoluene	ug/kg	1000	853	794	85	79	62-125	7	20	
4-Chlorotoluene	ug/kg	1000	831	789	83	79	63-125	5	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4010	3890	80	78	52-135	3	20	
Acetone	ug/kg	5000	5120	4760	102	95	65-125	7	20	
Allyl chloride	ug/kg	1000	834	837	83	84	52-125	0	20	
Benzene	ug/kg	1000	842	832	84	83	61-125	1	20	
Bromobenzene	ug/kg	1000	880	827	88	83	64-125	6	20	
Bromochloromethane	ug/kg	1000	932	869	93	87	65-125	7	20	
Bromodichloromethane	ug/kg	1000	886	831	89	83	57-125	6	20	
Bromoform	ug/kg	1000	827	788	83	79	57-125	5	20	
Bromomethane	ug/kg	1000	831	750	83	75	60-125	10	20	
Carbon tetrachloride	ug/kg	1000	1010	963	101	96	58-125	5	20	
Chlorobenzene	ug/kg	1000	801	787	80	79	66-125	2	20	
Chloroethane	ug/kg	1000	901	853	90	85	62-125	5	20	
Chloroform	ug/kg	1000	872	837	87	84	59-125	4	20	
Chloromethane	ug/kg	1000	826	748	83	75	50-125	10	20	
cis-1,2-Dichloroethene	ug/kg	1000	913	880	91	88	61-125	4	20	
cis-1,3-Dichloropropene	ug/kg	1000	879	848	88	85	61-125	3	20	
Dibromochloromethane	ug/kg	1000	812	762	81	76	60-125	6	20	
Dibromomethane	ug/kg	1000	860	816	86	82	69-125	5	20	
Dichlorodifluoromethane	ug/kg	1000	786	715	79	72	38-125	9	20	
Dichlorofluoromethane	ug/kg	1000	951	846	95	85	67-125	12	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	1640	1750	164	175	60-125	7	20	L3,SS
Ethylbenzene	ug/kg	1000	861	829	86	83	62-125	4	20	
Hexachloro-1,3-butadiene	ug/kg	1000	862	789	86	79	56-125	9	20	
Isopropylbenzene (Cumene)	ug/kg	1000	882	856	88	86	65-125	3	20	
Methyl-tert-butyl ether	ug/kg	1000	788	793	79	79	59-125	1	20	
Methylene Chloride	ug/kg	1000	782	787	78	79	64-125	1	20	
n-Butylbenzene	ug/kg	1000	891	848	89	85	59-125	5	20	
n-Propylbenzene	ug/kg	1000	897	795	90	80	61-125	12	20	
Naphthalene	ug/kg	1000	871	803	87	80	53-125	8	20	
p-Isopropyltoluene	ug/kg	1000	883	840	88	84	63-125	5	20	
sec-Butylbenzene	ug/kg	1000	830	821	83	82	62-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

LABORATORY CONTROL SAMPLE & LCSD: 2900461		2900462								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Styrene	ug/kg	1000	826	796	83	80	66-125	4	20	
tert-Butylbenzene	ug/kg	1000	865	807	87	81	64-125	7	20	
Tetrachloroethene	ug/kg	1000	907	867	91	87	67-125	5	20	
Tetrahydrofuran	ug/kg	10000	9540	8450	95	84	62-125	12	20	
Toluene	ug/kg	1000	792	766	79	77	61-125	3	20	
trans-1,2-Dichloroethene	ug/kg	1000	872	879	87	88	64-125	1	20	
trans-1,3-Dichloropropene	ug/kg	1000	872	830	87	83	56-125	5	20	
Trichloroethene	ug/kg	1000	878	815	88	81	67-125	7	20	
Trichlorofluoromethane	ug/kg	1000	985	917	99	92	65-125	7	20	
Vinyl chloride	ug/kg	1000	916	820	92	82	57-125	11	20	
Xylene (Total)	ug/kg	3000	2470	2420	82	81	62-125	2	20	
1,2-Dichloroethane-d4 (S)	%				95	99	75-125			
4-Bromofluorobenzene (S)	%				100	99	75-125			
Toluene-d8 (S)	%				99	100	75-125			

MATRIX SPIKE SAMPLE: 2900463		10428008001	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	1080	1190	110	64-146	
1,1,1-Trichloroethane	ug/kg	ND	1080	1220	113	56-148	
1,1,2,2-Tetrachloroethane	ug/kg	ND	1080	1140	105	36-150	
1,1,2-Trichloroethane	ug/kg	ND	1080	1130	104	67-148	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	1080	1140	105	60-142	
1,1-Dichloroethane	ug/kg	ND	1080	1170	108	57-140	
1,1-Dichloroethene	ug/kg	ND	1080	1140	105	59-139	
1,1-Dichloropropene	ug/kg	ND	1080	1230	113	61-142	
1,2,3-Trichlorobenzene	ug/kg	ND	1080	1100	101	69-150	
1,2,3-Trichloropropane	ug/kg	ND	1080	1140	105	64-150	
1,2,4-Trichlorobenzene	ug/kg	ND	1080	1120	103	71-149	
1,2,4-Trimethylbenzene	ug/kg	ND	1080	1100	101	67-149	
1,2-Dibromo-3-chloropropane	ug/kg	ND	2710	2890	107	61-150	
1,2-Dibromoethane (EDB)	ug/kg	ND	1080	1220	113	67-147	
1,2-Dichlorobenzene	ug/kg	ND	1080	1130	104	70-142	
1,2-Dichloroethane	ug/kg	ND	1080	1080	99	58-132	
1,2-Dichloropropane	ug/kg	ND	1080	1120	104	64-144	
1,3,5-Trimethylbenzene	ug/kg	ND	1080	1140	105	71-146	
1,3-Dichlorobenzene	ug/kg	ND	1080	1100	102	71-142	
1,3-Dichloropropane	ug/kg	ND	1080	1130	104	68-140	
1,4-Dichlorobenzene	ug/kg	ND	1080	1070	99	68-142	
2,2-Dichloropropane	ug/kg	ND	1080	1150	107	34-150	
2-Butanone (MEK)	ug/kg	ND	5420	5620	104	51-150	
2-Chlorotoluene	ug/kg	ND	1080	1090	100	66-144	
4-Chlorotoluene	ug/kg	ND	1080	1110	102	66-140	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	5420	5480	101	63-150	
Acetone	ug/kg	ND	5420	6520	120	54-150	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

MATRIX SPIKE SAMPLE: 2900463		10428008001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Allyl chloride	ug/kg	ND	1080	1170	108	53-135	
Benzene	ug/kg	ND	1080	1150	107	65-135	
Bromobenzene	ug/kg	ND	1080	1150	106	71-141	
Bromochloromethane	ug/kg	ND	1080	1130	104	62-145	
Bromodichloromethane	ug/kg	ND	1080	1170	108	59-148	
Bromoform	ug/kg	ND	1080	1160	108	57-145	
Bromomethane	ug/kg	ND	1080	1040	96	51-129	
Carbon tetrachloride	ug/kg	ND	1080	1240	114	55-144	
Chlorobenzene	ug/kg	ND	1080	1110	102	70-142	
Chloroethane	ug/kg	ND	1080	1090	101	61-135	
Chloroform	ug/kg	ND	1080	1080	99	58-135	
Chloromethane	ug/kg	ND	1080	971	90	37-125	
cis-1,2-Dichloroethene	ug/kg	ND	1080	1130	105	60-138	
cis-1,3-Dichloropropene	ug/kg	ND	1080	1210	112	62-142	
Dibromochloromethane	ug/kg	ND	1080	1100	102	65-141	
Dibromomethane	ug/kg	ND	1080	1190	110	72-150	
Dichlorodifluoromethane	ug/kg	ND	1080	862	80	30-125	
Dichlorofluoromethane	ug/kg	ND	1080	1090	101	62-148	
Diethyl ether (Ethyl ether)	ug/kg	ND	1080	2460	227	62-135	M0,SS
Ethylbenzene	ug/kg	ND	1080	1140	105	72-138	
Hexachloro-1,3-butadiene	ug/kg	ND	1080	1150	106	38-150	
Isopropylbenzene (Cumene)	ug/kg	ND	1080	1210	111	75-148	
Methyl-tert-butyl ether	ug/kg	ND	1080	1070	99	63-139	
Methylene Chloride	ug/kg	ND	1080	1070	98	58-135	
n-Butylbenzene	ug/kg	ND	1080	1140	105	63-150	
n-Propylbenzene	ug/kg	ND	1080	1130	103	70-146	
Naphthalene	ug/kg	ND	1080	1100	101	63-150	
p-Isopropyltoluene	ug/kg	ND	1080	1130	104	72-150	
sec-Butylbenzene	ug/kg	ND	1080	1130	104	66-150	
Styrene	ug/kg	ND	1080	1160	107	72-146	
tert-Butylbenzene	ug/kg	ND	1080	1110	102	71-148	
Tetrachloroethene	ug/kg	ND	1080	1230	114	70-150	
Tetrahydrofuran	ug/kg	ND	10800	11500	106	62-150	
Toluene	ug/kg	ND	1080	1070	99	65-142	
trans-1,2-Dichloroethene	ug/kg	ND	1080	1210	112	55-141	
trans-1,3-Dichloropropene	ug/kg	ND	1080	1150	107	57-147	
Trichloroethene	ug/kg	ND	1080	1170	108	62-150	
Trichlorofluoromethane	ug/kg	ND	1080	1190	110	51-150	
Vinyl chloride	ug/kg	ND	1080	1060	98	45-132	
Xylene (Total)	ug/kg	ND	3250	3330	103	75-140	
1,2-Dichloroethane-d4 (S)	%				97	75-125	
4-Bromofluorobenzene (S)	%				98	75-125	
Toluene-d8 (S)	%				98	75-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

SAMPLE DUPLICATE: 2900464

Parameter	Units	10428008002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,1-Trichloroethane	ug/kg	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,2-Trichloroethane	ug/kg	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	ND		30	
1,1-Dichloroethane	ug/kg	ND	ND		30	
1,1-Dichloroethene	ug/kg	ND	ND		30	
1,1-Dichloropropene	ug/kg	ND	ND		30	
1,2,3-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,3-Trichloropropane	ug/kg	ND	ND		30	
1,2,4-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,4-Trimethylbenzene	ug/kg	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/kg	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	ND		30	
1,2-Dichlorobenzene	ug/kg	ND	ND		30	
1,2-Dichloroethane	ug/kg	ND	ND		30	
1,2-Dichloropropane	ug/kg	ND	ND		30	
1,3,5-Trimethylbenzene	ug/kg	ND	ND		30	
1,3-Dichlorobenzene	ug/kg	ND	ND		30	
1,3-Dichloropropane	ug/kg	ND	ND		30	
1,4-Dichlorobenzene	ug/kg	ND	ND		30	
2,2-Dichloropropane	ug/kg	ND	ND		30	
2-Butanone (MEK)	ug/kg	ND	ND		30	
2-Chlorotoluene	ug/kg	ND	ND		30	
4-Chlorotoluene	ug/kg	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND		30	
Acetone	ug/kg	ND	ND		30	
Allyl chloride	ug/kg	ND	ND		30	
Benzene	ug/kg	ND	ND		30	
Bromobenzene	ug/kg	ND	ND		30	
Bromochloromethane	ug/kg	ND	ND		30	
Bromodichloromethane	ug/kg	ND	ND		30	
Bromoform	ug/kg	ND	ND		30	
Bromomethane	ug/kg	ND	ND		30	
Carbon tetrachloride	ug/kg	ND	ND		30	
Chlorobenzene	ug/kg	ND	ND		30	
Chloroethane	ug/kg	ND	ND		30	
Chloroform	ug/kg	ND	ND		30	
Chloromethane	ug/kg	ND	ND		30	
cis-1,2-Dichloroethene	ug/kg	ND	ND		30	
cis-1,3-Dichloropropene	ug/kg	ND	ND		30	
Dibromochloromethane	ug/kg	ND	ND		30	
Dibromomethane	ug/kg	ND	ND		30	
Dichlorodifluoromethane	ug/kg	ND	ND		30	
Dichlorofluoromethane	ug/kg	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/kg	ND	ND		30	
Ethylbenzene	ug/kg	ND	ND		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

SAMPLE DUPLICATE: 2900464

Parameter	Units	10428008002 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	ND	ND		30	
Isopropylbenzene (Cumene)	ug/kg	ND	ND		30	
Methyl-tert-butyl ether	ug/kg	ND	ND		30	
Methylene Chloride	ug/kg	ND	ND		30	
n-Butylbenzene	ug/kg	ND	ND		30	
n-Propylbenzene	ug/kg	ND	ND		30	
Naphthalene	ug/kg	ND	ND		30	
p-Isopropyltoluene	ug/kg	ND	ND		30	
sec-Butylbenzene	ug/kg	ND	ND		30	
Styrene	ug/kg	ND	ND		30	
tert-Butylbenzene	ug/kg	ND	ND		30	
Tetrachloroethene	ug/kg	ND	ND		30	
Tetrahydrofuran	ug/kg	ND	ND		30	
Toluene	ug/kg	ND	ND		30	
trans-1,2-Dichloroethene	ug/kg	ND	ND		30	
trans-1,3-Dichloropropene	ug/kg	ND	ND		30	
Trichloroethene	ug/kg	ND	ND		30	
Trichlorofluoromethane	ug/kg	ND	ND		30	
Vinyl chloride	ug/kg	ND	ND		30	
Xylene (Total)	ug/kg	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	97	95	5		
4-Bromofluorobenzene (S)	%.	93	100	14		
Toluene-d8 (S)	%.	97	99	10		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 532516 Analysis Method: EPA 8081B
 QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2891965 Matrix: Solid
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/19/18 23:12	
4,4'-DDE	ug/kg	ND	3.3	04/19/18 23:12	
4,4'-DDT	ug/kg	ND	3.3	04/19/18 23:12	
Aldrin	ug/kg	ND	1.7	04/19/18 23:12	
alpha-BHC	ug/kg	ND	1.7	04/19/18 23:12	
alpha-Chlordane	ug/kg	ND	1.7	04/19/18 23:12	
beta-BHC	ug/kg	ND	1.7	04/19/18 23:12	
Chlordane (Technical)	ug/kg	ND	16.7	04/19/18 23:12	
delta-BHC	ug/kg	ND	1.7	04/19/18 23:12	
Dieldrin	ug/kg	ND	3.3	04/19/18 23:12	
Endosulfan I	ug/kg	ND	1.7	04/19/18 23:12	
Endosulfan II	ug/kg	ND	3.3	04/19/18 23:12	
Endosulfan sulfate	ug/kg	ND	3.3	04/19/18 23:12	
Endrin	ug/kg	ND	3.3	04/19/18 23:12	
Endrin aldehyde	ug/kg	ND	3.3	04/19/18 23:12	
Endrin ketone	ug/kg	ND	3.3	04/19/18 23:12	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/19/18 23:12	
gamma-Chlordane	ug/kg	ND	1.7	04/19/18 23:12	
Heptachlor	ug/kg	ND	1.7	04/19/18 23:12	
Heptachlor epoxide	ug/kg	ND	1.7	04/19/18 23:12	
Methoxychlor	ug/kg	ND	16.7	04/19/18 23:12	
Toxaphene	ug/kg	ND	50.0	04/19/18 23:12	
Decachlorobiphenyl (S)	%	93	30-150	04/19/18 23:12	
Tetrachloro-m-xylene (S)	%	98	30-150	04/19/18 23:12	

LABORATORY CONTROL SAMPLE: 2891966

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	32.6	98	62-127	
4,4'-DDE	ug/kg	33.3	31.8	95	66-125	
4,4'-DDT	ug/kg	33.3	31.9	96	67-128	
Aldrin	ug/kg	16.7	15.0	90	66-125	
alpha-BHC	ug/kg	16.7	16.0	96	64-125	
alpha-Chlordane	ug/kg	16.7	15.5	93	68-125	
beta-BHC	ug/kg	16.7	15.8	95	69-125	
delta-BHC	ug/kg	16.7	13.2	79	42-133	
Dieldrin	ug/kg	33.3	34.3	103	69-126	
Endosulfan I	ug/kg	16.7	14.8	89	63-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

LABORATORY CONTROL SAMPLE: 2891966

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endosulfan II	ug/kg	33.3	33.3	100	69-125	
Endosulfan sulfate	ug/kg	33.3	29.6	89	56-137	
Endrin	ug/kg	33.3	31.7	95	69-125	
Endrin aldehyde	ug/kg	33.3	31.6	95	65-125	
Endrin ketone	ug/kg	33.3	33.9	102	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	16.0	96	67-125	
gamma-Chlordane	ug/kg	16.7	14.1	85	63-125	
Heptachlor	ug/kg	16.7	16.5	99	69-125	
Heptachlor epoxide	ug/kg	16.7	15.7	94	68-125	
Methoxychlor	ug/kg	167	163	98	65-134	
Decachlorobiphenyl (S)	%			91	30-150	
Tetrachloro-m-xylene (S)	%			94	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891992 2891993

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427291002 Result	Spike Conc.	Spike Conc.	MS Result						
4,4'-DDD	ug/kg	212	37.2	37.1	174	220	-103	21	56-125	23	20 M6, R1
4,4'-DDE	ug/kg	87.8	37.2	37.1	89.4	109	4	58	32-150	20	20 M6
4,4'-DDT	ug/kg	ND	37.2	37.1	63.9J	63.3J	172	170	60-132		20 M6
Aldrin	ug/kg	ND	18.7	18.6	18.6J	17.7J	100	95	56-125		20
alpha-BHC	ug/kg	ND	18.7	18.6	16.8J	18.5J	90	99	54-136		20
alpha-Chlordane	ug/kg	ND	18.7	18.6	35.2J	41.6	189	224	54-133		20 M6
beta-BHC	ug/kg	ND	18.7	18.6	20.2J	21.1J	109	113	30-150		20
delta-BHC	ug/kg	ND	18.7	18.6	14.3J	14.6J	77	78	45-145		20
Dieldrin	ug/kg	ND	37.2	37.1	38.3J	39.4J	103	106	47-150		20
Endosulfan I	ug/kg	ND	18.7	18.6	18.9J	19.1J	101	103	35-145		20
Endosulfan II	ug/kg	ND	37.2	37.1	38.6J	39.6J	104	107	50-147		20
Endosulfan sulfate	ug/kg	ND	37.2	37.1	35.5J	35.6J	95	96	54-132		20
Endrin	ug/kg	ND	37.2	37.1	34.7J	35.4J	93	95	62-125		20
Endrin aldehyde	ug/kg	ND	37.2	37.1	38.9J	39.6J	105	106	33-150		20
Endrin ketone	ug/kg	ND	37.2	37.1	37.7J	37.9J	101	102	56-144		20
gamma-BHC (Lindane)	ug/kg	ND	18.7	18.6	17.1J	18J	92	97	63-125		20
gamma-Chlordane	ug/kg	ND	18.7	18.6	26.5J	30.4J	143	164	45-132		20 M6
Heptachlor	ug/kg	ND	18.7	18.6	18.9J	19.3J	101	104	51-142		20
Heptachlor epoxide	ug/kg	ND	18.7	18.6	24.4J	27.6J	131	148	50-142		20 M6
Methoxychlor	ug/kg	ND	187	186	155J	168J	83	90	58-139		20
Decachlorobiphenyl (S)	%						0	0	30-150		S4
Tetrachloro-m-xylene (S)	%						0	0	30-150		2M, D4, S4

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 532316

Analysis Method: EPA 8082A

QC Batch Method: EPA 3550

Analysis Description: 8082A GCS PCB

Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2890749

Matrix: Solid

Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/16/18 15:30	
Decachlorobiphenyl (S)	%.	90	30-134	04/16/18 15:30	
Tetrachloro-m-xylene (S)	%.	89	48-125	04/16/18 15:30	

LABORATORY CONTROL SAMPLE: 2890750

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	578	87	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	588	88	62-125	
Decachlorobiphenyl (S)	%.			97	30-134	
Tetrachloro-m-xylene (S)	%.			97	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2890820 2890821

Parameter	Units	10427018004 Result	MSD		MS		MSD		% Rec Limits	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec		RPD	RPD	
PCB-1016 (Aroclor 1016)	ug/kg	ND	779	782	625	654	80	84	30-150	5	30	
PCB-1260 (Aroclor 1260)	ug/kg	ND	779	782	650	643	83	82	30-138	1	30	
Decachlorobiphenyl (S)	%.						80	76	30-134			
Tetrachloro-m-xylene (S)	%.						80	80	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 532275 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10427291002, 10427291003, 10427291005, 10427291006, 10427291007, 10427291009

METHOD BLANK: 2890574 Matrix: Solid
Associated Lab Samples: 10427291002, 10427291003, 10427291005, 10427291006, 10427291007, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/18/18 16:57	
1,2-Dichlorobenzene	ug/kg	ND	330	04/18/18 16:57	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/18/18 16:57	
1,3-Dichlorobenzene	ug/kg	ND	330	04/18/18 16:57	
1,4-Dichlorobenzene	ug/kg	ND	330	04/18/18 16:57	
1-Methylnaphthalene	ug/kg	ND	330	04/18/18 16:57	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/18/18 16:57	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/18/18 16:57	
2,4-Dichlorophenol	ug/kg	ND	330	04/18/18 16:57	
2,4-Dimethylphenol	ug/kg	ND	330	04/18/18 16:57	
2,4-Dinitrophenol	ug/kg	ND	330	04/18/18 16:57	
2,4-Dinitrotoluene	ug/kg	ND	330	04/18/18 16:57	
2,6-Dinitrotoluene	ug/kg	ND	330	04/18/18 16:57	
2-Chloronaphthalene	ug/kg	ND	330	04/18/18 16:57	
2-Chlorophenol	ug/kg	ND	330	04/18/18 16:57	
2-Methylnaphthalene	ug/kg	ND	330	04/18/18 16:57	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/18/18 16:57	
2-Nitroaniline	ug/kg	ND	330	04/18/18 16:57	
2-Nitrophenol	ug/kg	ND	330	04/18/18 16:57	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/18/18 16:57	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/18/18 16:57	
3-Nitroaniline	ug/kg	ND	330	04/18/18 16:57	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/18/18 16:57	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/18/18 16:57	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/18/18 16:57	
4-Chloroaniline	ug/kg	ND	330	04/18/18 16:57	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/18/18 16:57	
4-Nitroaniline	ug/kg	ND	330	04/18/18 16:57	
4-Nitrophenol	ug/kg	ND	330	04/18/18 16:57	
Acenaphthene	ug/kg	ND	330	04/18/18 16:57	
Acenaphthylene	ug/kg	ND	330	04/18/18 16:57	
Anthracene	ug/kg	ND	330	04/18/18 16:57	
Benzo(a)anthracene	ug/kg	ND	330	04/18/18 16:57	
Benzo(a)pyrene	ug/kg	ND	330	04/18/18 16:57	
Benzo(b)fluoranthene	ug/kg	ND	330	04/18/18 16:57	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/18/18 16:57	
Benzo(k)fluoranthene	ug/kg	ND	330	04/18/18 16:57	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/18/18 16:57	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/18/18 16:57	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/18/18 16:57	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/18/18 16:57	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

METHOD BLANK: 2890574

Matrix: Solid

Associated Lab Samples: 10427291002, 10427291003, 10427291005, 10427291006, 10427291007, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/18/18 16:57	
Carbazole	ug/kg	ND	330	04/18/18 16:57	
Chrysene	ug/kg	ND	330	04/18/18 16:57	
Di-n-butylphthalate	ug/kg	ND	330	04/18/18 16:57	
Di-n-octylphthalate	ug/kg	ND	330	04/18/18 16:57	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/18/18 16:57	
Dibenzofuran	ug/kg	ND	330	04/18/18 16:57	
Diethylphthalate	ug/kg	ND	330	04/18/18 16:57	
Dimethylphthalate	ug/kg	ND	330	04/18/18 16:57	
Fluoranthene	ug/kg	ND	330	04/18/18 16:57	
Fluorene	ug/kg	ND	330	04/18/18 16:57	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/18/18 16:57	
Hexachlorobenzene	ug/kg	ND	330	04/18/18 16:57	
Hexachloroethane	ug/kg	ND	330	04/18/18 16:57	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/18/18 16:57	
Isophorone	ug/kg	ND	330	04/18/18 16:57	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/18/18 16:57	
N-Nitrosodimethylamine	ug/kg	ND	330	04/18/18 16:57	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/18/18 16:57	
Naphthalene	ug/kg	ND	330	04/18/18 16:57	
Nitrobenzene	ug/kg	ND	330	04/18/18 16:57	
Pentachlorophenol	ug/kg	ND	670	04/18/18 16:57	
Phenanthrene	ug/kg	ND	330	04/18/18 16:57	
Phenol	ug/kg	ND	330	04/18/18 16:57	
Pyrene	ug/kg	ND	330	04/18/18 16:57	
2,4,6-Tribromophenol (S)	%	77	60-125	04/18/18 16:57	
2-Fluorobiphenyl (S)	%	79	30-132	04/18/18 16:57	
2-Fluorophenol (S)	%	72	40-125	04/18/18 16:57	
Nitrobenzene-d5 (S)	%	71	43-125	04/18/18 16:57	
p-Terphenyl-d14 (S)	%	86	62-125	04/18/18 16:57	
Phenol-d6 (S)	%	72	48-125	04/18/18 16:57	

LABORATORY CONTROL SAMPLE: 2890575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	983	59	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1010	61	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1320	79	63-125	
1,3-Dichlorobenzene	ug/kg	1670	980	59	38-125	
1,4-Dichlorobenzene	ug/kg	1670	984	59	39-125	
1-Methylnaphthalene	ug/kg	1670	1190	72	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1340	81	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1340	80	61-125	
2,4-Dichlorophenol	ug/kg	1670	1230	74	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

LABORATORY CONTROL SAMPLE: 2890575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1140	69	51-125	
2,4-Dinitrophenol	ug/kg	1670	1290	78	30-132	6M
2,4-Dinitrotoluene	ug/kg	1670	1580	95	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1490	89	63-125	
2-Chloronaphthalene	ug/kg	1670	1310	79	61-125	
2-Chlorophenol	ug/kg	1670	987	59	46-125	
2-Methylnaphthalene	ug/kg	1670	1160	70	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1070	64	50-125	
2-Nitroaniline	ug/kg	1670	1330	80	61-125	
2-Nitrophenol	ug/kg	1670	1110	66	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1150	69	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1260	75	47-125	
3-Nitroaniline	ug/kg	1670	1270	76	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1540J	93	30-141	6M
4-Bromophenylphenyl ether	ug/kg	1670	1380	83	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1360	82	64-125	
4-Chloroaniline	ug/kg	1670	853	51	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1390	83	64-125	
4-Nitroaniline	ug/kg	1670	1290	77	59-125	
4-Nitrophenol	ug/kg	1670	1300	78	54-125	
Acenaphthene	ug/kg	1670	1320	79	62-125	
Acenaphthylene	ug/kg	1670	1320	79	61-125	
Anthracene	ug/kg	1670	1360	81	66-125	
Benzo(a)anthracene	ug/kg	1670	1410	84	69-125	
Benzo(a)pyrene	ug/kg	1670	1410	85	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1410	85	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1470	88	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1440	87	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1070	64	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	914	55	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	773	46	37-125	6M
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1530	92	69-131	
Butylbenzylphthalate	ug/kg	1670	1500	90	69-129	
Carbazole	ug/kg	1670	1430	86	66-125	
Chrysene	ug/kg	1670	1430	86	68-125	
Di-n-butylphthalate	ug/kg	1670	1510	90	69-125	
Di-n-octylphthalate	ug/kg	1670	1580	95	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1510	91	64-125	
Dibenzofuran	ug/kg	1670	1410	84	65-125	
Diethylphthalate	ug/kg	1670	1450	87	67-125	
Dimethylphthalate	ug/kg	1670	1440	86	67-125	
Fluoranthene	ug/kg	1670	1430	86	66-125	
Fluorene	ug/kg	1670	1390	83	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	951	57	40-125	
Hexachlorobenzene	ug/kg	1670	1400	84	62-125	
Hexachloroethane	ug/kg	1670	939	56	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1490	90	64-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

LABORATORY CONTROL SAMPLE: 2890575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1170	70	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1090	65	50-125	
N-Nitrosodimethylamine	ug/kg	1670	956	57	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1390	84	65-125	
Naphthalene	ug/kg	1670	1040	62	48-125	
Nitrobenzene	ug/kg	1670	984	59	48-125	
Pentachlorophenol	ug/kg	1670	1300	78	41-125	
Phenanthrene	ug/kg	1670	1350	81	66-125	
Phenol	ug/kg	1670	1000	60	46-125	
Pyrene	ug/kg	1670	1420	85	69-125	
2,4,6-Tribromophenol (S)	%			84	60-125	
2-Fluorobiphenyl (S)	%			69	30-132	
2-Fluorophenol (S)	%			52	40-125	
Nitrobenzene-d5 (S)	%			53	43-125	
p-Terphenyl-d14 (S)	%			85	62-125	
Phenol-d6 (S)	%			57	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2890607 2890608

Parameter	Units	10427018008		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
1,2,4-Trichlorobenzene	ug/kg	ND	1940	1950	1400J	1390J	73	71	30-127		30		
1,2-Dichlorobenzene	ug/kg	ND	1940	1950	1330J	1150J	69	59	30-125		30		
1,2-Diphenylhydrazine	ug/kg	ND	1940	1950	1410J	1360J	73	70	30-150		30		
1,3-Dichlorobenzene	ug/kg	ND	1940	1950	1270J	1060J	66	54	30-125		30		
1,4-Dichlorobenzene	ug/kg	ND	1940	1950	1280J	1100J	66	57	30-125		30		
1-Methylnaphthalene	ug/kg	ND	1940	1950	1560J	1520J	79	76	42-125		30		
2,4,5-Trichlorophenol	ug/kg	ND	1940	1950	1400J	1400J	73	72	30-150		30		
2,4,6-Trichlorophenol	ug/kg	ND	1940	1950	1450J	1420J	75	73	30-150		30		
2,4-Dichlorophenol	ug/kg	ND	1940	1950	1490J	1420J	77	73	30-135		30		
2,4-Dimethylphenol	ug/kg	ND	1940	1950	1540J	1470J	79	76	30-148		30		
2,4-Dinitrophenol	ug/kg	ND	1940	1950	ND	ND	0	0	30-125		30	M1	
2,4-Dinitrotoluene	ug/kg	ND	1940	1950	1030J	818J	53	42	30-150		30		
2,6-Dinitrotoluene	ug/kg	ND	1940	1950	1150J	1010J	60	52	30-150		30		
2-Chloronaphthalene	ug/kg	ND	1940	1950	1460J	1430J	76	74	30-138		30		
2-Chlorophenol	ug/kg	ND	1940	1950	1480J	1380J	76	71	30-130		30		
2-Methylnaphthalene	ug/kg	ND	1940	1950	1570J	1510J	79	76	46-125		30		
2-Methylphenol(o-Cresol)	ug/kg	ND	1940	1950	1440J	1440J	75	74	30-133		30		
2-Nitroaniline	ug/kg	ND	1940	1950	1610J	1580J	83	81	30-150		30		
2-Nitrophenol	ug/kg	ND	1940	1950	813J	ND	42	31	30-134		30		
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	1940	1950	1460J	1380J	75	71	30-138		30		
3,3'-Dichlorobenzidine	ug/kg	ND	1940	1950	ND	ND	32	41	30-149		30		
3-Nitroaniline	ug/kg	ND	1940	1950	1780J	1750J	92	90	30-150		30		
4,6-Dinitro-2-methylphenol	ug/kg	ND	1940	1950	ND	ND	0	0	30-133		30	M1	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2890607			2890608								
Parameter	Units	10427018008 Result	MS	MSD	MS	MSD	MS	MSD	% Rec Limits	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec			
4-Bromophenylphenyl ether	ug/kg	ND	1940	1950	1520J	1460J	79	75	44-125	30	
4-Chloro-3-methylphenol	ug/kg	ND	1940	1950	1490J	1440J	77	74	30-150	30	
4-Chloroaniline	ug/kg	ND	1940	1950	ND	ND	49	46	30-125	30	
4-Chlorophenylphenyl ether	ug/kg	ND	1940	1950	1530J	1440J	79	74	44-125	30	
4-Nitroaniline	ug/kg	ND	1940	1950	1670J	1750J	86	90	30-150	30	
4-Nitrophenol	ug/kg	ND	1940	1950	ND	1280J	47	66	30-150	30	
Acenaphthene	ug/kg	ND	1940	1950	1540J	1790J	80	92	40-125	30	
Acenaphthylene	ug/kg	ND	1940	1950	1560J	1460J	81	75	30-150	30	
Anthracene	ug/kg	ND	1940	1950	1650J	2080J	77	99	30-150	30	
Benzo(a)anthracene	ug/kg	ND	1940	1950	1910J	3050J	78	136	30-150	30	
Benzo(a)pyrene	ug/kg	ND	1940	1950	1810J	2600J	94	134	30-150	30	
Benzo(b)fluoranthene	ug/kg	ND	1940	1950	1910J	2960J	99	152	30-150	30	M1
Benzo(g,h,i)perylene	ug/kg	ND	1940	1950	1930J	2310J	99	119	30-150	30	
Benzo(k)fluoranthene	ug/kg	ND	1940	1950	1630J	2200J	84	113	30-150	30	
bis(2-Chloroethoxy)methane	ug/kg	ND	1940	1950	1420J	1370J	73	70	30-134	30	
bis(2-Chloroethyl) ether	ug/kg	ND	1940	1950	1210J	1180J	62	61	30-125	30	
bis(2-Chloroisopropyl) ether	ug/kg	ND	1940	1950	1150J	1050J	59	54	30-125	30	6M
bis(2-Ethylhexyl)phthalate	ug/kg	ND	1940	1950	3800J	2960J	76	33	30-150	30	
Butylbenzylphthalate	ug/kg	ND	1940	1950	1790J	1760J	93	91	30-150	30	
Carbazole	ug/kg	ND	1940	1950	1650J	1960J	82	98	41-125	30	
Chrysene	ug/kg	ND	1940	1950	2000J	3120J	82	139	30-150	30	
Di-n-butylphthalate	ug/kg	ND	1940	1950	2730J	1930J	141	99	30-150	30	
Di-n-octylphthalate	ug/kg	ND	1940	1950	1870J	1770J	96	91	30-150	30	
Dibenz(a,h)anthracene	ug/kg	ND	1940	1950	1570J	1660J	81	85	30-150	30	
Dibenzofuran	ug/kg	ND	1940	1950	1620J	1590J	84	82	45-125	30	
Diethylphthalate	ug/kg	ND	1940	1950	1530J	1530J	79	79	30-150	30	
Dimethylphthalate	ug/kg	ND	1940	1950	1600J	1500J	82	77	30-150	30	
Fluoranthene	ug/kg	ND	1940	1950	2260J	5090	76	221	30-150	30	M1
Fluorene	ug/kg	ND	1940	1950	1660J	1740J	77	81	30-150	30	
Hexachloro-1,3-butadiene	ug/kg	ND	1940	1950	1420J	1230J	73	63	30-128	30	
Hexachlorobenzene	ug/kg	ND	1940	1950	1570J	1500J	81	77	30-150	30	
Hexachloroethane	ug/kg	ND	1940	1950	ND	ND	41	26	30-125	30	M1
Indeno(1,2,3-cd)pyrene	ug/kg	ND	1940	1950	1690J	2080J	88	107	30-150	30	
Isophorone	ug/kg	ND	1940	1950	1440J	1380J	74	71	30-140	30	
N-Nitroso-di-n-propylamine	ug/kg	ND	1940	1950	1410J	1300J	73	67	30-147	30	
N-Nitrosodimethylamine	ug/kg	ND	1940	1950	ND	ND	52	45	30-125	30	
N-Nitrosodiphenylamine	ug/kg	ND	1940	1950	1760J	1700J	91	87	30-150	30	
Naphthalene	ug/kg	ND	1940	1950	1470J	1460J	76	75	44-125	30	
Nitrobenzene	ug/kg	ND	1940	1950	1290J	1270J	67	65	30-136	30	
Pentachlorophenol	ug/kg	ND	1940	1950	ND	ND	56	48	30-150	30	
Phenanthrene	ug/kg	ND	1940	1950	2210J	4090	53	150	30-150	30	
Phenol	ug/kg	ND	1940	1950	1380J	1340J	71	69	30-129	30	
Pyrene	ug/kg	ND	1940	1950	2560J	5020	76	203	30-150	30	M1
2,4,6-Tribromophenol (S)	%						64	68	60-125		
2-Fluorobiphenyl (S)	%						61	64	30-132		
2-Fluorophenol (S)	%						54	56	40-125		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Parameter	Units	2890607		2890608		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					
Nitrobenzene-d5 (S)	%.					50	52	43-125		P3
p-Terphenyl-d14 (S)	%.					79	78	62-125		
Phenol-d6 (S)	%.					59	57	48-125		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

QC Batch: 533467 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10427291001, 10427291004, 10427291008

METHOD BLANK: 2897876 Matrix: Solid
Associated Lab Samples: 10427291001, 10427291004, 10427291008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/24/18 14:01	
1,2-Dichlorobenzene	ug/kg	ND	330	04/24/18 14:01	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/24/18 14:01	
1,3-Dichlorobenzene	ug/kg	ND	330	04/24/18 14:01	
1,4-Dichlorobenzene	ug/kg	ND	330	04/24/18 14:01	
1-Methylnaphthalene	ug/kg	ND	330	04/24/18 14:01	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/24/18 14:01	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/24/18 14:01	
2,4-Dichlorophenol	ug/kg	ND	330	04/24/18 14:01	
2,4-Dimethylphenol	ug/kg	ND	330	04/24/18 14:01	
2,4-Dinitrophenol	ug/kg	ND	330	04/24/18 14:01	
2,4-Dinitrotoluene	ug/kg	ND	330	04/24/18 14:01	
2,6-Dinitrotoluene	ug/kg	ND	330	04/24/18 14:01	
2-Chloronaphthalene	ug/kg	ND	330	04/24/18 14:01	
2-Chlorophenol	ug/kg	ND	330	04/24/18 14:01	
2-Methylnaphthalene	ug/kg	ND	330	04/24/18 14:01	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/24/18 14:01	
2-Nitroaniline	ug/kg	ND	330	04/24/18 14:01	
2-Nitrophenol	ug/kg	ND	330	04/24/18 14:01	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/24/18 14:01	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/24/18 14:01	
3-Nitroaniline	ug/kg	ND	330	04/24/18 14:01	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/24/18 14:01	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/24/18 14:01	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/24/18 14:01	
4-Chloroaniline	ug/kg	ND	330	04/24/18 14:01	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/24/18 14:01	
4-Nitroaniline	ug/kg	ND	330	04/24/18 14:01	
4-Nitrophenol	ug/kg	ND	330	04/24/18 14:01	
Acenaphthene	ug/kg	ND	330	04/24/18 14:01	
Acenaphthylene	ug/kg	ND	330	04/24/18 14:01	
Anthracene	ug/kg	ND	330	04/24/18 14:01	
Benzo(a)anthracene	ug/kg	ND	330	04/24/18 14:01	
Benzo(a)pyrene	ug/kg	ND	330	04/24/18 14:01	
Benzo(b)fluoranthene	ug/kg	ND	330	04/24/18 14:01	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/24/18 14:01	
Benzo(k)fluoranthene	ug/kg	ND	330	04/24/18 14:01	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/24/18 14:01	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/24/18 14:01	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/24/18 14:01	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/24/18 14:01	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Project No.: 10427291

METHOD BLANK: 2897876

Matrix: Solid

Associated Lab Samples: 10427291001, 10427291004, 10427291008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/24/18 14:01	
Carbazole	ug/kg	ND	330	04/24/18 14:01	
Chrysene	ug/kg	ND	330	04/24/18 14:01	
Di-n-butylphthalate	ug/kg	ND	330	04/24/18 14:01	
Di-n-octylphthalate	ug/kg	ND	330	04/24/18 14:01	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/24/18 14:01	
Dibenzofuran	ug/kg	ND	330	04/24/18 14:01	
Diethylphthalate	ug/kg	ND	330	04/24/18 14:01	
Dimethylphthalate	ug/kg	ND	330	04/24/18 14:01	
Fluoranthene	ug/kg	ND	330	04/24/18 14:01	
Fluorene	ug/kg	ND	330	04/24/18 14:01	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/24/18 14:01	
Hexachlorobenzene	ug/kg	ND	330	04/24/18 14:01	
Hexachloroethane	ug/kg	ND	330	04/24/18 14:01	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/24/18 14:01	
Isophorone	ug/kg	ND	330	04/24/18 14:01	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/24/18 14:01	
N-Nitrosodimethylamine	ug/kg	ND	330	04/24/18 14:01	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/24/18 14:01	
Naphthalene	ug/kg	ND	330	04/24/18 14:01	
Nitrobenzene	ug/kg	ND	330	04/24/18 14:01	
Pentachlorophenol	ug/kg	ND	670	04/24/18 14:01	
Phenanthrene	ug/kg	ND	330	04/24/18 14:01	
Phenol	ug/kg	ND	330	04/24/18 14:01	
Pyrene	ug/kg	ND	330	04/24/18 14:01	
2,4,6-Tribromophenol (S)	%	93	60-125	04/24/18 14:01	
2-Fluorobiphenyl (S)	%	90	30-132	04/24/18 14:01	
2-Fluorophenol (S)	%	85	40-125	04/24/18 14:01	
Nitrobenzene-d5 (S)	%	85	43-125	04/24/18 14:01	
p-Terphenyl-d14 (S)	%	108	62-125	04/24/18 14:01	
Phenol-d6 (S)	%	85	48-125	04/24/18 14:01	

LABORATORY CONTROL SAMPLE: 2897877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1270	76	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1260	75	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1430	86	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1220	73	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1230	74	39-125	
1-Methylnaphthalene	ug/kg	1670	1360	82	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1490	89	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1470	88	61-125	
2,4-Dichlorophenol	ug/kg	1670	1440	86	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

LABORATORY CONTROL SAMPLE: 2897877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1350	81	51-125	
2,4-Dinitrophenol	ug/kg	1670	1200	72	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1740	104	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1630	98	63-125	
2-Chloronaphthalene	ug/kg	1670	1430	86	61-125	
2-Chlorophenol	ug/kg	1670	1270	76	46-125	
2-Methylnaphthalene	ug/kg	1670	1340	81	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1290	77	50-125	
2-Nitroaniline	ug/kg	1670	1510	91	61-125	
2-Nitrophenol	ug/kg	1670	1350	81	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1360	81	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1450	87	47-125	
3-Nitroaniline	ug/kg	1670	1460	88	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1530J	92	30-141	
4-Bromophenylphenyl ether	ug/kg	1670	1520	91	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1560	93	64-125	
4-Chloroaniline	ug/kg	1670	1050	63	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1500	90	64-125	
4-Nitroaniline	ug/kg	1670	1510	91	59-125	
4-Nitrophenol	ug/kg	1670	1430	86	54-125	
Acenaphthene	ug/kg	1670	1440	87	62-125	
Acenaphthylene	ug/kg	1670	1450	87	61-125	
Anthracene	ug/kg	1670	1490	89	66-125	
Benzo(a)anthracene	ug/kg	1670	1580	95	69-125	
Benzo(a)pyrene	ug/kg	1670	1560	94	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1540	92	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1650	99	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1590	96	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1310	79	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1200	72	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1030	62	37-125 6M	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1800	108	69-131	
Butylbenzylphthalate	ug/kg	1670	1740	104	69-129	
Carbazole	ug/kg	1670	1580	95	66-125	
Chrysene	ug/kg	1670	1580	95	68-125	
Di-n-butylphthalate	ug/kg	1670	1700	102	69-125	
Di-n-octylphthalate	ug/kg	1670	1830	110	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1680	101	64-125	
Dibenzofuran	ug/kg	1670	1500	90	65-125	
Diethylphthalate	ug/kg	1670	1600	96	67-125	
Dimethylphthalate	ug/kg	1670	1590	95	67-125	
Fluoranthene	ug/kg	1670	1560	94	66-125	
Fluorene	ug/kg	1670	1490	89	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1210	72	40-125	
Hexachlorobenzene	ug/kg	1670	1550	93	62-125	
Hexachloroethane	ug/kg	1670	1230	74	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1650	99	64-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

LABORATORY CONTROL SAMPLE: 2897877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1350	81	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1260	75	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1170	70	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1570	94	65-125	
Naphthalene	ug/kg	1670	1270	76	48-125	
Nitrobenzene	ug/kg	1670	1250	75	48-125	
Pentachlorophenol	ug/kg	1670	1220	73	41-125	
Phenanthrene	ug/kg	1670	1490	89	66-125	
Phenol	ug/kg	1670	1250	75	46-125	
Pyrene	ug/kg	1670	1600	96	69-125	
2,4,6-Tribromophenol (S)	%			97	60-125	
2-Fluorobiphenyl (S)	%			81	30-132	
2-Fluorophenol (S)	%			74	40-125	
Nitrobenzene-d5 (S)	%			72	43-125	
p-Terphenyl-d14 (S)	%			99	62-125	
Phenol-d6 (S)	%			74	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897878 2897879

Parameter	Units	10427906003		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
1,2,4-Trichlorobenzene	ug/kg	<70.8	1850	1840	1210	1310	66	71	30-127	8	30		
1,2-Dichlorobenzene	ug/kg	<68.9	1850	1840	1250	1250	68	68	30-125	0	30		
1,2-Diphenylhydrazine	ug/kg	<66.0	1850	1840	1010	1080	55	59	30-150	7	30		
1,3-Dichlorobenzene	ug/kg	<68.1	1850	1840	1220	1220	66	66	30-125	0	30		
1,4-Dichlorobenzene	ug/kg	<66.5	1850	1840	1230	1210	67	66	30-125	2	30		
1-Methylnaphthalene	ug/kg	<57.3	1850	1840	1270	1360	69	74	42-125	7	30		
2,4,5-Trichlorophenol	ug/kg	<71.3	1850	1840	1160	1250	63	68	30-150	8	30		
2,4,6-Trichlorophenol	ug/kg	<51.8	1850	1840	1240	1360	67	74	30-150	9	30		
2,4-Dichlorophenol	ug/kg	<68.8	1850	1840	1290	1390	70	75	30-135	8	30		
2,4-Dimethylphenol	ug/kg	<137	1850	1840	1290	1430	70	78	30-148	10	30		
2,4-Dinitrophenol	ug/kg	<82.1	1850	1840	ND	ND	0	0	30-125		30	M1	
2,4-Dinitrotoluene	ug/kg	<49.4	1850	1840	555	642	30	35	30-150	14	30		
2,6-Dinitrotoluene	ug/kg	<50.9	1850	1840	710	771	39	42	30-150	8	30		
2-Chloronaphthalene	ug/kg	<51.8	1850	1840	1250	1330	68	72	30-138	6	30		
2-Chlorophenol	ug/kg	<72.6	1850	1840	1320	1350	72	74	30-130	2	30		
2-Methylnaphthalene	ug/kg	<56.6	1850	1840	1260	1350	68	73	46-125	7	30		
2-Methylphenol(o-Cresol)	ug/kg	<91.9	1850	1840	1310	1370	71	74	30-133	4	30		
2-Nitroaniline	ug/kg	<80.6	1850	1840	1610	1730	87	94	30-150	7	30		
2-Nitrophenol	ug/kg	<68.7	1850	1840	562	610	30	33	30-134	8	30		
3&4-Methylphenol(m&p Cresol)	ug/kg	<82.3	1850	1840	1330	1390	72	75	30-138	5	30		
3,3'-Dichlorobenzidine	ug/kg	<87.3	1850	1840	1460	1420	79	77	30-149	2	30		
3-Nitroaniline	ug/kg	<89.4	1850	1840	1860	1890	101	102	30-150	1	30		
4,6-Dinitro-2-methylphenol	ug/kg	<147	1850	1840	ND	ND	0	0	30-133		30	M1	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897878												2897879											
Parameter	Units	10427906003		MS	MSD	MS		MSD		% Rec		Max		Qual									
		Result	Spike Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD											
4-Bromophenylphenyl ether	ug/kg	<61.5	1850	1840	1260	1390	68	76	44-125	10	30												
4-Chloro-3-methylphenol	ug/kg	<50.6	1850	1840	1280	1420	70	77	30-150	10	30												
4-Chloroaniline	ug/kg	<102	1850	1840	1060	953	57	52	30-125	11	30												
4-Chlorophenylphenyl ether	ug/kg	<49.9	1850	1840	1280	1360	69	74	44-125	6	30												
4-Nitroaniline	ug/kg	<65.1	1850	1840	1800	1850	97	100	30-150	3	30												
4-Nitrophenol	ug/kg	<105	1850	1840	1100	1160	60	63	30-150	6	30												
Acenaphthene	ug/kg	<59.8	1850	1840	1150	1250	63	68	40-125	8	30												
Acenaphthylene	ug/kg	<50.0	1850	1840	1220	1320	66	72	30-150	8	30												
Anthracene	ug/kg	<52.6	1850	1840	1220	1340	66	73	30-150	9	30												
Benzo(a)anthracene	ug/kg	<42.4	1850	1840	1220	1340	66	73	30-150	10	30												
Benzo(a)pyrene	ug/kg	<41.3	1850	1840	1120	1270	61	69	30-150	13	30												
Benzo(b)fluoranthene	ug/kg	<44.2	1850	1840	1200	1290	65	70	30-150	7	30												
Benzo(g,h,i)perylene	ug/kg	<31.6	1850	1840	967	1090	53	59	30-150	12	30												
Benzo(k)fluoranthene	ug/kg	<44.2	1850	1840	1160	1300	63	71	30-150	12	30												
bis(2-Chloroethoxy)methane	ug/kg	<70.8	1850	1840	1300	1370	71	74	30-134	5	30												
bis(2-Chloroethyl) ether	ug/kg	<80.0	1850	1840	1200	1280	65	70	30-125	7	30												
bis(2-Chloroisopropyl) ether	ug/kg	<84.7	1850	1840	1050	1060	57	57	30-125	1	30	6M											
bis(2-Ethylhexyl)phthalate	ug/kg	104J	1850	1840	1490	1660	75	84	30-150	11	30												
Butylbenzylphthalate	ug/kg	140J	1850	1840	1560	1660	77	83	30-150	7	30												
Carbazole	ug/kg	<49.1	1850	1840	1360	1450	74	79	41-125	7	30												
Chrysene	ug/kg	<36.7	1850	1840	1210	1350	66	73	30-150	11	30												
Di-n-butylphthalate	ug/kg	<49.9	1850	1840	1430	1550	78	84	30-150	8	30												
Di-n-octylphthalate	ug/kg	<112	1850	1840	1450	1570	79	85	30-150	7	30												
Dibenz(a,h)anthracene	ug/kg	<37.7	1850	1840	1150	1260	63	69	30-150	9	30												
Dibenzofuran	ug/kg	<53.0	1850	1840	1270	1370	69	74	45-125	7	30												
Diethylphthalate	ug/kg	<43.3	1850	1840	1380	1480	75	81	30-150	7	30												
Dimethylphthalate	ug/kg	<56.2	1850	1840	1400	1470	76	80	30-150	5	30												
Fluoranthene	ug/kg	<39.0	1850	1840	1210	1340	65	72	30-150	10	30												
Fluorene	ug/kg	<50.9	1850	1840	1260	1340	68	73	30-150	6	30												
Hexachloro-1,3-butadiene	ug/kg	<84.2	1850	1840	1150	1270	62	69	30-128	9	30												
Hexachlorobenzene	ug/kg	<47.2	1850	1840	1060	1220	58	66	30-150	14	30												
Hexachloroethane	ug/kg	<74.7	1850	1840	303J	252J	16	14	30-125		30	M1											
Indeno(1,2,3-cd)pyrene	ug/kg	<42.5	1850	1840	1070	1180	58	64	30-150	9	30												
Isophorone	ug/kg	<83.7	1850	1840	1230	1350	67	73	30-140	9	30												
N-Nitroso-di-n-propylamine	ug/kg	<112	1850	1840	1300	1290	70	70	30-147	0	30												
N-Nitrosodimethylamine	ug/kg	<95.6	1850	1840	1240	1190	67	65	30-125	4	30												
N-Nitrosodiphenylamine	ug/kg	<44.9	1850	1840	1360	1470	74	80	30-150	8	30												
Naphthalene	ug/kg	<69.5	1850	1840	1240	1320	67	72	44-125	6	30												
Nitrobenzene	ug/kg	<73.4	1850	1840	1180	1230	64	67	30-136	4	30												
Pentachlorophenol	ug/kg	<108	1850	1840	528J	591J	29	32	30-150		30	M1											
Phenanthrene	ug/kg	<50.0	1850	1840	1240	1330	66	71	30-150	8	30												
Phenol	ug/kg	<70.6	1850	1840	1250	1290	68	70	30-129	3	30												
Pyrene	ug/kg	<38.4	1850	1840	1270	1400	67	74	30-150	10	30												
2,4,6-Tribromophenol (S)	%						62	67	60-125														
2-Fluorobiphenyl (S)	%						67	71	30-132														
2-Fluorophenol (S)	%						68	69	40-125														

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Parameter	Units	2897878		2897879		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Nitrobenzene-d5 (S)	%.	10427906003				61	65	43-125			
p-Terphenyl-d14 (S)	%.					72	78	62-125			
Phenol-d6 (S)	%.					66	70	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 532273 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
Associated Lab Samples: 10427291002, 10427291003, 10427291004, 10427291005, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2890569 Matrix: Solid
Associated Lab Samples: 10427291002, 10427291003, 10427291004, 10427291005, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/16/18 16:05	
Acenaphthylene	ug/kg	ND	10.0	04/16/18 16:05	
Anthracene	ug/kg	ND	10.0	04/16/18 16:05	
Benzo(a)anthracene	ug/kg	ND	10.0	04/16/18 16:05	
Benzo(a)pyrene	ug/kg	ND	10.0	04/16/18 16:05	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/16/18 16:05	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/16/18 16:05	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/16/18 16:05	
Chrysene	ug/kg	ND	10.0	04/16/18 16:05	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/16/18 16:05	
Fluoranthene	ug/kg	ND	10.0	04/16/18 16:05	
Fluorene	ug/kg	ND	10.0	04/16/18 16:05	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/16/18 16:05	
Naphthalene	ug/kg	ND	10.0	04/16/18 16:05	
Phenanthrene	ug/kg	ND	10.0	04/16/18 16:05	
Pyrene	ug/kg	ND	10.0	04/16/18 16:05	
2-Fluorobiphenyl (S)	%	82	42-125	04/16/18 16:05	
p-Terphenyl-d14 (S)	%	104	57-125	04/16/18 16:05	

LABORATORY CONTROL SAMPLE: 2890570

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	24.5	73	52-125	
Acenaphthylene	ug/kg	33.3	27.4	82	50-125	
Anthracene	ug/kg	33.3	30.9	93	65-125	
Benzo(a)anthracene	ug/kg	33.3	32.2	97	60-125	
Benzo(a)pyrene	ug/kg	33.3	31.9	96	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	31.4	94	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	25.5	77	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	28.1	84	67-125	
Chrysene	ug/kg	33.3	29.3	88	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	23.6	71	63-125	
Fluoranthene	ug/kg	33.3	30.9	93	75-125	
Fluorene	ug/kg	33.3	26.4	79	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	24.7	74	63-125	
Naphthalene	ug/kg	33.3	27.2	82	49-125	
Phenanthrene	ug/kg	33.3	26.3	79	65-125	
Pyrene	ug/kg	33.3	30.2	91	64-125	
2-Fluorobiphenyl (S)	%			79	42-125	
p-Terphenyl-d14 (S)	%			108	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Parameter	Units	2890571		2890572		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10427186001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Acenaphthene	ug/kg	ND	34.1	34.1	29.8	28.6	87	84	30-125	4	30		
Acenaphthylene	ug/kg	ND	34.1	34.1	29.8	30.2	87	88	30-133	1	30		
Anthracene	ug/kg	ND	34.1	34.1	41.5	41.5	122	122	30-150	0	30		
Benzo(a)anthracene	ug/kg	0.012	34.1	34.1	64.1	57.8	153	134	30-150	10	30	M1	
Benzo(a)pyrene	ug/kg	0.013	34.1	34.1	60.0	53.0	137	116	30-150	12	30		
Benzo(b)fluoranthene	ug/kg	0.015	34.1	34.1	66.9	58.5	152	127	30-150	13	30	M1	
Benzo(g,h,i)perylene	ug/kg	ND	34.1	34.1	40.8	36.9	120	108	30-150	10	30		
Benzo(k)fluoranthene	ug/kg	ND	34.1	34.1	43.9	40.5	129	119	30-150	8	30		
Chrysene	ug/kg	0.012	34.1	34.1	55.1	51.3	126	114	30-150	7	30		
Dibenz(a,h)anthracene	ug/kg	ND	34.1	34.1	25.2	25.0	74	73	30-131	1	30		
Fluoranthene	ug/kg	0.022	34.1	34.1	92.3	82.7	206	177	30-150	11	30	M1	
Fluorene	ug/kg	ND	34.1	34.1	28.3	30.7	83	90	30-147	8	30		
Indeno(1,2,3-cd)pyrene	ug/kg	ND	34.1	34.1	36.0	34.8	105	102	30-150	3	30		
Naphthalene	ug/kg	ND	34.1	34.1	26.6	27.4	78	80	30-131	3	30		
Phenanthrene	ug/kg	ND	34.1	34.1	58.5	57.4	171	168	30-150	2	30	M1	
Pyrene	ug/kg	0.018	34.1	34.1	78.5	70.6	176	153	30-150	11	30	M1	
2-Fluorobiphenyl (S)	%.						78	79	42-125				
p-Terphenyl-d14 (S)	%.						106	104	57-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

QC Batch: 532984 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
Associated Lab Samples: 10427291001, 10427291006

METHOD BLANK: 2894424 Matrix: Solid
Associated Lab Samples: 10427291001, 10427291006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/19/18 19:46	
Acenaphthylene	ug/kg	ND	10.0	04/19/18 19:46	
Anthracene	ug/kg	ND	10.0	04/19/18 19:46	
Benzo(a)anthracene	ug/kg	ND	10.0	04/19/18 19:46	
Benzo(a)pyrene	ug/kg	ND	10.0	04/19/18 19:46	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/19/18 19:46	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/19/18 19:46	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/19/18 19:46	
Chrysene	ug/kg	ND	10.0	04/19/18 19:46	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/19/18 19:46	
Fluoranthene	ug/kg	ND	10.0	04/19/18 19:46	
Fluorene	ug/kg	ND	10.0	04/19/18 19:46	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/19/18 19:46	
Naphthalene	ug/kg	ND	10.0	04/19/18 19:46	
Phenanthrene	ug/kg	ND	10.0	04/19/18 19:46	
Pyrene	ug/kg	ND	10.0	04/19/18 19:46	
2-Fluorobiphenyl (S)	%	79	42-125	04/19/18 19:46	
p-Terphenyl-d14 (S)	%	94	57-125	04/19/18 19:46	

LABORATORY CONTROL SAMPLE: 2894425

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	22.0	66	52-125	
Acenaphthylene	ug/kg	33.3	21.2	64	50-125	
Anthracene	ug/kg	33.3	31.2	94	65-125	
Benzo(a)anthracene	ug/kg	33.3	27.4	82	60-125	
Benzo(a)pyrene	ug/kg	33.3	30.3	91	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	33.2	100	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	30.0	90	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	28.7	86	67-125	
Chrysene	ug/kg	33.3	30.5	91	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	30.0	90	63-125	
Fluoranthene	ug/kg	33.3	29.1	87	75-125	
Fluorene	ug/kg	33.3	24.1	72	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	30.1	90	63-125	
Naphthalene	ug/kg	33.3	21.6	65	49-125	
Phenanthrene	ug/kg	33.3	27.9	84	65-125	
Pyrene	ug/kg	33.3	28.3	85	64-125	
2-Fluorobiphenyl (S)	%			71	42-125	
p-Terphenyl-d14 (S)	%			102	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2894426		2894427									
Parameter	Units	10427632001	MS	MSD	MS	MSD	MS	MSD	% Rec	Max			
		Result	Spike	Spike	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual	
Acenaphthene	ug/kg	ND	37.4	37.3	32.7	32.5	88	87	30-125	1	30		
Acenaphthylene	ug/kg	ND	37.4	37.3	47.8	41.6	128	112	30-133	14	30		
Anthracene	ug/kg	ND	37.4	37.3	43.8	42.9	117	115	30-150	2	30		
Benzo(a)anthracene	ug/kg	0.023	37.4	37.3	104	85.5	215	167	30-150	19	30	M1	
Benzo(a)pyrene	ug/kg	0.035	37.4	37.3	141	110	283	201	30-150	24	30	M1	
Benzo(b)fluoranthene	ug/kg	0.051	37.4	37.3	184	147	356	255	30-150	23	30	M1	
Benzo(g,h,i)perylene	ug/kg	0.033	37.4	37.3	120	97.0	233	172	30-150	21	30	M1	
Benzo(k)fluoranthene	ug/kg	0.018	37.4	37.3	79.2	61.6	164	117	30-150	25	30	M1	
Chrysene	ug/kg	0.032	37.4	37.3	127	101	254	184	30-150	23	30	M1	
Dibenz(a,h)anthracene	ug/kg	ND	37.4	37.3	52.3	46.5	140	125	30-131	12	30	M1	
Fluoranthene	ug/kg	0.054	37.4	37.3	211	162	419	288	30-150	26	30	M1	
Fluorene	ug/kg	ND	37.4	37.3	35.4	34.9	95	94	30-147	1	30		
Indeno(1,2,3-cd)pyrene	ug/kg	0.025	37.4	37.3	96.8	78.2	192	143	30-150	21	30	M1	
Naphthalene	ug/kg	ND	37.4	37.3	29.9	29.5	80	79	30-131	2	30		
Phenanthrene	ug/kg	0.028	37.4	37.3	124	113	256	227	30-150	9	30	M1	
Pyrene	ug/kg	0.057	37.4	37.3	223	167	443	295	30-150	29	30	M1	
2-Fluorobiphenyl (S)	%.						85	85	42-125				
p-Terphenyl-d14 (S)	%.						96	98	57-125				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

QC Batch: 532497 Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS
Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2891856 Matrix: Solid
Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	04/19/18 17:29	
n-Triacontane (S)	%	110	50-150	04/19/18 17:29	

LABORATORY CONTROL SAMPLE & LCSD: 2891857 2891858

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	77.3	77.6	97	97	70-120	0	20	
n-Triacontane (S)	%				104	99	50-150			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 438492 Analysis Method: EPA 7196A
 QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2026403 Matrix: Solid
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/24/18 13:00	

LABORATORY CONTROL SAMPLE: 2026404

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1010	924	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026421 2026422

Parameter	Units	10427291008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	1080	1150	839	962	77	84	75-125	14	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026423 2026424

Parameter	Units	10427291008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	42.9	42.7	28.6	29.2	67	68	75-125	2	20	M3

SAMPLE DUPLICATE: 2026425

Parameter	Units	10427354004 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

QC Batch: 286553 Analysis Method: EPA 9012
QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004

METHOD BLANK: 1676305 Matrix: Solid
Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/20/18 13:32	

LABORATORY CONTROL SAMPLE: 1676306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.0	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1676307 1676308

Parameter	Units	40167646001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.10J	2.22	2.34	2.3	2.4	98	99	80-120	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1676309 1676310

Parameter	Units	10427291004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.67	3.98	3.65	4.2	3.7	88	82	80-120	12	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 286937 Analysis Method: EPA 9012
 QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
 Associated Lab Samples: 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 1678360 Matrix: Solid
 Associated Lab Samples: 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/25/18 13:16	

LABORATORY CONTROL SAMPLE: 1678361

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.1	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1678362 1678363

Parameter	Units	10427642001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Cyanide	mg/kg	0.52	3.72	3.72	4.0	4.1	93	97	80-120	4	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1678364 1678365

Parameter	Units	10428096003		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Cyanide	mg/kg	0.45	2.7	2.6	3.5	2.7	112	87	80-120	25	20	M0,R1	

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
 ND - Not Detected at or above adjusted reporting limit.
 TNTC - Too Numerous To Count
 J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
 MDL - Adjusted Method Detection Limit.
 PQL - Practical Quantitation Limit.
 RL - Reporting Limit.
 S - Surrogate
 1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
 Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
 LCS(D) - Laboratory Control Sample (Duplicate)
 MS(D) - Matrix Spike (Duplicate)
 DUP - Sample Duplicate
 RPD - Relative Percent Difference
 NC - Not Calculable.
 SG - Silica Gel - Clean-Up
 U - Indicates the compound was analyzed for, but not detected.
 N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
 Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
 TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth
 PASI-G Pace Analytical Services - Green Bay
 PASI-I Pace Analytical Services - Indianapolis
 PASI-M Pace Analytical Services - Minneapolis
 PASI-V Pace Analytical Services - Virginia

ANALYTE QUALIFIERS

1M Sample was black in color and viscous. Sample was centrifuged and decanted prior to analysis.
 2M Sample was black in color.
 3M Sample was dark brown in color.
 4M Sample was light brown in color.
 5M Sample was yellow in color.
 6M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
 D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
 D4 Sample was diluted due to the presence of high levels of target analytes.
 E Analyte concentration exceeded the calibration range. The reported result is estimated.
 L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
 M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
 M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

ANALYTE QUALIFIERS

M3	Matrix spike recovery was outside laboratory control limits due to matrix interferences.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
MN	The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.
N2	The lab does not hold NELAC/TNI accreditation for this parameter.
N3	Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
P3	Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
R1	RPD value was outside control limits.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
SS	This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.
T6	High boiling point hydrocarbons are present in the sample.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427291001	FD-SB-F1 (10-14.5 S)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427291002	FB-SB-G1 (5-10 S)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427291003	FD-TT-05 (4-9 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427291004	FD-TT-06 (2-5 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427291005	FD-TT-07 (6-11 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427291006	FD-TT-08 (5-12 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427291007	TS-SB-01 (5-8 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427291008	TS-SB-02 (5-10 S)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427291001	FD-SB-F1 (10-14.5 S)	EPA 3550	532516	EPA 8081B	533098
10427291002	FB-SB-G1 (5-10 S)	EPA 3550	532516	EPA 8081B	533098
10427291003	FD-TT-05 (4-9 WM)	EPA 3550	532516	EPA 8081B	533098
10427291004	FD-TT-06 (2-5 WM)	EPA 3550	532516	EPA 8081B	533098
10427291005	FD-TT-07 (6-11 WM)	EPA 3550	532516	EPA 8081B	533098
10427291006	FD-TT-08 (5-12 WM)	EPA 3550	532516	EPA 8081B	533098
10427291007	TS-SB-01 (5-8 WM)	EPA 3550	532516	EPA 8081B	533098
10427291008	TS-SB-02 (5-10 S)	EPA 3550	532516	EPA 8081B	533098
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 3550	532516	EPA 8081B	533098
10427291001	FD-SB-F1 (10-14.5 S)	EPA 3550	532316	EPA 8082A	532613
10427291002	FB-SB-G1 (5-10 S)	EPA 3550	532316	EPA 8082A	532613
10427291003	FD-TT-05 (4-9 WM)	EPA 3550	532316	EPA 8082A	532613
10427291004	FD-TT-06 (2-5 WM)	EPA 3550	532316	EPA 8082A	532613
10427291005	FD-TT-07 (6-11 WM)	EPA 3550	532316	EPA 8082A	532613
10427291006	FD-TT-08 (5-12 WM)	EPA 3550	532316	EPA 8082A	532613
10427291007	TS-SB-01 (5-8 WM)	EPA 3550	532316	EPA 8082A	532613
10427291008	TS-SB-02 (5-10 S)	EPA 3550	532316	EPA 8082A	532613
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 3550	532316	EPA 8082A	532613
10427291001	FD-SB-F1 (10-14.5 S)	WI MOD DRO	532497	WI MOD DRO	532700
10427291002	FB-SB-G1 (5-10 S)	WI MOD DRO	532497	WI MOD DRO	532700
10427291003	FD-TT-05 (4-9 WM)	WI MOD DRO	532497	WI MOD DRO	532700
10427291004	FD-TT-06 (2-5 WM)	WI MOD DRO	532497	WI MOD DRO	532700
10427291005	FD-TT-07 (6-11 WM)	WI MOD DRO	532497	WI MOD DRO	532700
10427291006	FD-TT-08 (5-12 WM)	WI MOD DRO	532497	WI MOD DRO	532700
10427291007	TS-SB-01 (5-8 WM)	WI MOD DRO	532497	WI MOD DRO	532700
10427291008	TS-SB-02 (5-10 S)	WI MOD DRO	532497	WI MOD DRO	532700
10427291009	TS-SB-03 (1.5-3.0 S)	WI MOD DRO	532497	WI MOD DRO	532700
10427291001	FD-SB-F1 (10-14.5 S)	EPA 5030 Medium Soil	533955	WI MOD GRO	534062
10427291002	FB-SB-G1 (5-10 S)	EPA 5030 Medium Soil	533955	WI MOD GRO	534062
10427291003	FD-TT-05 (4-9 WM)	EPA 5030 Medium Soil	533955	WI MOD GRO	534062
10427291004	FD-TT-06 (2-5 WM)	EPA 5030 Medium Soil	533955	WI MOD GRO	534062
10427291005	FD-TT-07 (6-11 WM)	EPA 5030 Medium Soil	533955	WI MOD GRO	534062
10427291006	FD-TT-08 (5-12 WM)	EPA 5030 Medium Soil	533955	WI MOD GRO	534062
10427291007	TS-SB-01 (5-8 WM)	EPA 5030 Medium Soil	533955	WI MOD GRO	534062
10427291008	TS-SB-02 (5-10 S)	EPA 5030 Medium Soil	533955	WI MOD GRO	534062
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 5030 Medium Soil	533955	WI MOD GRO	534062
10427291001	FD-SB-F1 (10-14.5 S)	EPA 3050	532423	EPA 6010C	533058

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427291002	FB-SB-G1 (5-10 S)	EPA 3050	532423	EPA 6010C	533058
10427291003	FD-TT-05 (4-9 WM)	EPA 3050	532423	EPA 6010C	533058
10427291004	FD-TT-06 (2-5 WM)	EPA 3050	532423	EPA 6010C	533058
10427291005	FD-TT-07 (6-11 WM)	EPA 3050	532423	EPA 6010C	533058
10427291006	FD-TT-08 (5-12 WM)	EPA 3050	532423	EPA 6010C	533058
10427291007	TS-SB-01 (5-8 WM)	EPA 3050	532423	EPA 6010C	533058
10427291008	TS-SB-02 (5-10 S)	EPA 3050	532423	EPA 6010C	533058
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 3050	532423	EPA 6010C	533058
10427291001	FD-SB-F1 (10-14.5 S)	EPA 3050B	437531	EPA 6020	438359
10427291002	FB-SB-G1 (5-10 S)	EPA 3050B	437531	EPA 6020	438359
10427291003	FD-TT-05 (4-9 WM)	EPA 3050B	437531	EPA 6020	438359
10427291004	FD-TT-06 (2-5 WM)	EPA 3050B	437531	EPA 6020	438359
10427291005	FD-TT-07 (6-11 WM)	EPA 3050B	437531	EPA 6020	438359
10427291006	FD-TT-08 (5-12 WM)	EPA 3050B	437531	EPA 6020	438359
10427291007	TS-SB-01 (5-8 WM)	EPA 3050B	437531	EPA 6020	438359
10427291008	TS-SB-02 (5-10 S)	EPA 3050B	437531	EPA 6020	438359
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 3050B	437531	EPA 6020	438359
10427291001	FD-SB-F1 (10-14.5 S)	EPA 3050	532416	EPA 6020A	532552
10427291002	FB-SB-G1 (5-10 S)	EPA 3050	532416	EPA 6020A	532552
10427291003	FD-TT-05 (4-9 WM)	EPA 3050	532416	EPA 6020A	532552
10427291004	FD-TT-06 (2-5 WM)	EPA 3050	532416	EPA 6020A	532552
10427291005	FD-TT-07 (6-11 WM)	EPA 3050	532416	EPA 6020A	532552
10427291006	FD-TT-08 (5-12 WM)	EPA 3050	532416	EPA 6020A	532552
10427291007	TS-SB-01 (5-8 WM)	EPA 3050	532416	EPA 6020A	532552
10427291008	TS-SB-02 (5-10 S)	EPA 3050	532416	EPA 6020A	532552
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 3050	532416	EPA 6020A	532552
10427291001	FD-SB-F1 (10-14.5 S)	EPA 7471	532422	EPA 7471	533051
10427291002	FB-SB-G1 (5-10 S)	EPA 7471	532422	EPA 7471	533051
10427291003	FD-TT-05 (4-9 WM)	EPA 7471	532422	EPA 7471	533051
10427291004	FD-TT-06 (2-5 WM)	EPA 7471	532422	EPA 7471	533051
10427291005	FD-TT-07 (6-11 WM)	EPA 7471	532422	EPA 7471	533051
10427291006	FD-TT-08 (5-12 WM)	EPA 7471	532422	EPA 7471	533051
10427291007	TS-SB-01 (5-8 WM)	EPA 7471	532422	EPA 7471	533051
10427291008	TS-SB-02 (5-10 S)	EPA 7471	532422	EPA 7471	533051
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 7471	532422	EPA 7471	533051
10427291001	FD-SB-F1 (10-14.5 S)	ASTM D2974	533208		
10427291002	FB-SB-G1 (5-10 S)	ASTM D2974	533208		
10427291003	FD-TT-05 (4-9 WM)	ASTM D2974	533359		
10427291004	FD-TT-06 (2-5 WM)	ASTM D2974	533359		
10427291005	FD-TT-07 (6-11 WM)	ASTM D2974	533359		
10427291006	FD-TT-08 (5-12 WM)	ASTM D2974	533359		
10427291007	TS-SB-01 (5-8 WM)	ASTM D2974	533359		
10427291008	TS-SB-02 (5-10 S)	ASTM D2974	533359		
10427291009	TS-SB-03 (1.5-3.0 S)	ASTM D2974	533359		
10427291001	FD-SB-F1 (10-14.5 S)	EPA 3550	533467	EPA 8270D	533832

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427291002	FB-SB-G1 (5-10 S)	EPA 3550	532275	EPA 8270D	532657
10427291003	FD-TT-05 (4-9 WM)	EPA 3550	532275	EPA 8270D	532657
10427291004	FD-TT-06 (2-5 WM)	EPA 3550	533467	EPA 8270D	533832
10427291005	FD-TT-07 (6-11 WM)	EPA 3550	532275	EPA 8270D	532657
10427291006	FD-TT-08 (5-12 WM)	EPA 3550	532275	EPA 8270D	532657
10427291007	TS-SB-01 (5-8 WM)	EPA 3550	532275	EPA 8270D	532657
10427291008	TS-SB-02 (5-10 S)	EPA 3550	533467	EPA 8270D	533832
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 3550	532275	EPA 8270D	532657
10427291001	FD-SB-F1 (10-14.5 S)	EPA 3550	532984	EPA 8270D by SIM	533391
10427291002	FB-SB-G1 (5-10 S)	EPA 3550	532273	EPA 8270D by SIM	532620
10427291003	FD-TT-05 (4-9 WM)	EPA 3550	532273	EPA 8270D by SIM	532620
10427291004	FD-TT-06 (2-5 WM)	EPA 3550	532273	EPA 8270D by SIM	532620
10427291005	FD-TT-07 (6-11 WM)	EPA 3550	532273	EPA 8270D by SIM	532620
10427291006	FD-TT-08 (5-12 WM)	EPA 3550	532984	EPA 8270D by SIM	533391
10427291007	TS-SB-01 (5-8 WM)	EPA 3550	532273	EPA 8270D by SIM	532620
10427291008	TS-SB-02 (5-10 S)	EPA 3550	532273	EPA 8270D by SIM	532620
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 3550	532273	EPA 8270D by SIM	532620
10427291001	FD-SB-F1 (10-14.5 S)	EPA 5035/5030B	533981	EPA 8260B	533996
10427291002	FB-SB-G1 (5-10 S)	EPA 5035/5030B	533981	EPA 8260B	533996
10427291003	FD-TT-05 (4-9 WM)	EPA 5035/5030B	533981	EPA 8260B	533996
10427291004	FD-TT-06 (2-5 WM)	EPA 5035/5030B	533981	EPA 8260B	533996
10427291005	FD-TT-07 (6-11 WM)	EPA 5035/5030B	533981	EPA 8260B	533996
10427291006	FD-TT-08 (5-12 WM)	EPA 5035/5030B	533981	EPA 8260B	533996
10427291007	TS-SB-01 (5-8 WM)	EPA 5035/5030B	533981	EPA 8260B	533996
10427291008	TS-SB-02 (5-10 S)	EPA 5035/5030B	533981	EPA 8260B	533996
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 5035/5030B	533981	EPA 8260B	533996
10427291001	FD-SB-F1 (10-14.5 S)	EPA 3060A	438492	EPA 7196A	438766
10427291002	FB-SB-G1 (5-10 S)	EPA 3060A	438492	EPA 7196A	438766
10427291003	FD-TT-05 (4-9 WM)	EPA 3060A	438492	EPA 7196A	438766
10427291004	FD-TT-06 (2-5 WM)	EPA 3060A	438492	EPA 7196A	438766
10427291005	FD-TT-07 (6-11 WM)	EPA 3060A	438492	EPA 7196A	438766
10427291006	FD-TT-08 (5-12 WM)	EPA 3060A	438492	EPA 7196A	438766
10427291007	TS-SB-01 (5-8 WM)	EPA 3060A	438492	EPA 7196A	438766
10427291008	TS-SB-02 (5-10 S)	EPA 3060A	438492	EPA 7196A	438766
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 3060A	438492	EPA 7196A	438766
10427291001	FD-SB-F1 (10-14.5 S)	Trivalent Chromium Calculation	439198		
10427291002	FB-SB-G1 (5-10 S)	Trivalent Chromium Calculation	439198		
10427291003	FD-TT-05 (4-9 WM)	Trivalent Chromium Calculation	439198		
10427291004	FD-TT-06 (2-5 WM)	Trivalent Chromium Calculation	439198		
10427291005	FD-TT-07 (6-11 WM)	Trivalent Chromium Calculation	439198		

REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427291006	FD-TT-08 (5-12 WM)	Trivalent Chromium Calculation	439198		
10427291007	TS-SB-01 (5-8 WM)	Trivalent Chromium Calculation	439198		
10427291008	TS-SB-02 (5-10 S)	Trivalent Chromium Calculation	439198		
10427291009	TS-SB-03 (1.5-3.0 S)	Trivalent Chromium Calculation	439198		
10427291001	FD-SB-F1 (10-14.5 S)	EPA 9012A	286553	EPA 9012	286614
10427291002	FB-SB-G1 (5-10 S)	EPA 9012A	286553	EPA 9012	286614
10427291003	FD-TT-05 (4-9 WM)	EPA 9012A	286553	EPA 9012	286614
10427291004	FD-TT-06 (2-5 WM)	EPA 9012A	286553	EPA 9012	286614
10427291005	FD-TT-07 (6-11 WM)	EPA 9012A	286937	EPA 9012	286958
10427291006	FD-TT-08 (5-12 WM)	EPA 9012A	286937	EPA 9012	286958
10427291007	TS-SB-01 (5-8 WM)	EPA 9012A	286937	EPA 9012	286958
10427291008	TS-SB-02 (5-10 S)	EPA 9012A	286937	EPA 9012	286958
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 9012A	286937	EPA 9012	286958
10427291001	FD-SB-F1 (10-14.5 S)	EPA 300.0	140842	EPA 9056A	140851
10427291002	FB-SB-G1 (5-10 S)	EPA 300.0	140842	EPA 9056A	140851
10427291003	FD-TT-05 (4-9 WM)	EPA 300.0	140842	EPA 9056A	140851
10427291004	FD-TT-06 (2-5 WM)	EPA 300.0	140842	EPA 9056A	140851
10427291005	FD-TT-07 (6-11 WM)	EPA 300.0	140842	EPA 9056A	140851
10427291006	FD-TT-08 (5-12 WM)	EPA 300.0	140842	EPA 9056A	140851
10427291007	TS-SB-01 (5-8 WM)	EPA 300.0	140842	EPA 9056A	140851
10427291008	TS-SB-02 (5-10 S)	EPA 300.0	140842	EPA 9056A	140851
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 300.0	140842	EPA 9056A	140851

REPORT OF LABORATORY ANALYSIS

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WO#: 10427291



Page: 1 of 1

	Chain-of-Custody Form		Work Order N Turnaround
	PROJECT/CLIENT INFO		LABORATORY
Facility Code:	MPEA-Freeway LF 50/16		Program Code (MDH Lab Only):
Project Name:	MPCA-Freeway LF 50/16		Project Task Code:
Project Manager:			Address: 18-00383 EPIC Profile # 38716
Potential Hazard?	If yes, add information to Sampler Comments Section		Phone No:

FOR LAB USE ONLY

Lab Work Order Sticker

SAMPLE DETAILS											ANALYSIS REQUESTED																			
SAMPLE TYPE CODES		QC-FB=Field Blank Sample		QC-FR=Field Replicate Sample		QC-TB=Trip Blank Sample		LAB MATRIX CODES		AR=Air		SL=Biological Material		OT=Other		TS=Tissue		FIELD MATRIX CODES		Wt-Ground=Groundwater		Wt-Surf=Surface Water		QC-BLANK=Artificial Blank Water		Leachate=Leachate Sample				
Location Identifier	Sample Type	Date	Time	Start Depth, in / cm	End Depth, in / cm	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Coats	ANALYSIS REQUESTED																Lab Sample No.	#	
FD-SB-F1 (10-14.5)	S	4/12/18	1015			C	SD				13																	001	1	
FD-SB-S1 (3-10.5)	S	4/12/18	1045			C	SD				13																	002	2	
FD-T1-05 (4-9 w/m)	S	4/12/18	0945			C	SD				13																	003	3	
FD-T1-06 (2-3 w/m)	S	4/12/18	1140			C	SD				13																	004	4	
FD-T1-07 (6-11 w/m)	S	4/12/18	1300			C	SD				13																	005	5	
FD-T1-08 (5-12 w/m)	S	4/12/18	1430			C	SD				13																	006	6	
TS-SB-01 (5-8 w/m)	S	4/12/18	1720			C	SD				13																	007	7	
TS-SB-02 (5-10.5)	S	4/12/18	1910			C	SD				13																	008	8	
TS-SB-03 (1.5-3.0.5)	S	4/12/18	1935			C	SD				13																	009	9	
																													010	10

Sampled By: David Anderson Sampler's Signature: David Anderson Phone #:

Receiving Comments:

Retinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) David Anderson / Pace Analytical	4/13/18/0745	Don Pare	4/13/18 800

T=3.1

Sample Condition Upon Receipt

Client Name: MPCA

Project #: _____

WO#: 10427291

PM: JMA

Due Date: 04/27/18

CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: PB Temp Blank? Yes No

Thermometer 151401163 Type of Ice: Wet Blue None Dry Melted
 Used: G87A9155100842

Cooler Temp Read (°C): 2.9 Cooler Temp Corrected (°C): 3.1 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: PGY/13/18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12. <u>NO time on label</u>
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____

Date/Time: _____

Comments/Resolution: _____

Project Manager Review: _____

Date: 04/13/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigaiton Plon

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Litium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

WO#: 12107161



Page 114 of 140

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427291 Workorder Name: 18-00383 MPCA-Freeway LF Solid Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To		Subcontract To				Requested Analysis												
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042				Fluoride by method 9056												
						Preserved Containers												
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved												LAB USE ONLY
1	FD-SB-F1 (10-14.5 S)	PS	4/12/2018 10:15	10427291001	Solid	1												
2	FB-SB-G1 (5-10 S)	PS	4/12/2018 10:45	10427291002	Solid	1												
3	FD-TT-05 (4-9 WM)	PS	4/12/2018 09:45	10427291003	Solid	1												
4	FD-TT-06 (2-5 WM)	PS	4/12/2018 11:40	10427291004	Solid	1												
5	FD-TT-07 (6-11 WM)	PS	4/12/2018 13:00	10427291005	Solid	1												
6	FD-TT-08 (5-12 WM)	PS	4/12/2018 14:30	10427291006	Solid	1												
7	TS-SB-01 (5-8 WM)	PS	4/12/2018 17:20	10427291007	Solid	1												
8	TS-SB-02 (5-10 S)	PS	4/12/2018 19:10	10427291008	Solid	1												
9	TS-SB-03 (1.5-3.0 S)	PS	4/12/2018 19:55	10427291009	Solid	1												

Transfers					Comments				
Released By	Date/Time	Received By	Date/Time						
1	<i>Angela Pace</i>	<i>4/16/18 12:15</i>	<i>CB</i>	<i>4/16/18 12:15</i>					
2	<i>CB</i>	<i>4/16/18 21:30</i>	<i>B Mathews</i>	<i>4/17/18 07:00</i>					
3									

Cooler Temperature on Receipt 5.6 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace - MPLS

Project #:

WO#: 12107161
 PM: HRZ Due Date: 04/27/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Optional: Proj Due Date: _____ Proj Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 5.3 Cooler Temp Corrected °C: 5.0 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 4.3 Date and Initials of Person Examining Contents: 4/10/18 CR

Comments: BM 4/17/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review:

Angela Loisel

Date: 4/17/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427291 Workorder Name: 18-00383 MPCA-Freeway LF Solid Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To		Subcontract To				Requested Analysis																		
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Duluth 4730 Oneota St. Duluth, MN 55807 Phone (218)727-6380																						
						Preserved Containers					Methyl Mercury by 1630					LAB USE ONLY								
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved																		
1	FD-SB-F1 (10-14.5 S)	PS	4/12/2018 10:15	10427291001	Solid	1																		
2	FB-SB-G1 (5-10 S)	PS	4/12/2018 10:45	10427291002	Solid	1																		
3	FD-TT-05 (4-9 WM)	PS	4/12/2018 09:45	10427291003	Solid	1																		
4	FD-TT-06 (2-5 WM)	PS	4/12/2018 11:40	10427291004	Solid	1																		
5	FD-TT-07 (6-11 WM)	PS	4/12/2018 13:00	10427291005	Solid	1																		
6	FD-TT-08 (5-12 WM)	PS	4/12/2018 14:30	10427291006	Solid	1																		
7	TS-SB-01 (5-8 WM)	PS	4/12/2018 17:20	10427291007	Solid	1																		
8	TS-SB-02 (5-10 S)	PS	4/12/2018 19:10	10427291008	Solid	1																		
9	TS-SB-03 (1.5-3.0 S)	PS	4/12/2018 19:55	10427291009	Solid	1																		

Transfers					Comments				
Released By	Date/Time	Received By	Date/Time						
<i>[Signature]</i>	4/16/18 17:00	<i>CB</i>	4/16/18 17:45						
<i>CB</i>	4/17/18 15:15	<i>John [Signature]</i>	4/17/18 15:15						

Cooler Temperature on Receipt _____ °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: PACE MPLS Project #: _____

WO#: 12107161



12107161

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 01339252/1710 IR-1 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 5.9 Cooler Temp Corrected °C: 5.9 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6°C Correction Factor: 0.0 Date and Initials of Person Examining Contents: 4/17/18 [Signature]

If temperature is ≤0°C, is there evidence of ice formation? Yes No NA

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____ Date: _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Client Name: Pace MN

Sample Preservation Receipt Form

Project # 20167542

All containers needing preservation have been checked and noted below: Yes No N/A

Lab Lot# of pH paper:

Lab Std #ID of preservation (if pH adjusted):

Initial when completed:

Date/Time:


Pace Lab #	Glass							Plastic						Vials					Jars			General			VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)									
	AG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP2N	BP2Z	BP3U	BP3C	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU	WPFU	SP5T								ZPLC	GN							
001																																								
002																																								2.5 / 5 / 10
003																																								2.5 / 5 / 10
004																																								2.5 / 5 / 10
005																																								2.5 / 5 / 10
006																																								2.5 / 5 / 10
007																																								2.5 / 5 / 10
008																																								2.5 / 5 / 10
009																																								2.5 / 5 / 10
010																																								2.5 / 5 / 10
011																																								2.5 / 5 / 10
012																																								2.5 / 5 / 10
013																																								2.5 / 5 / 10
014																																								2.5 / 5 / 10
015																																								2.5 / 5 / 10
016																																								2.5 / 5 / 10
017																																								2.5 / 5 / 10
018																																								2.5 / 5 / 10
019																																								2.5 / 5 / 10
020																																								2.5 / 5 / 10

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm) : Yes No N/A *If yes look in headspace column

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	DG9A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO3	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL		
AG5U	100 mL amber glass unpres	BP3C	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres	BP3S	250 mL plastic H2SO4			GN:	

Sample Condition Upon Receipt Form (SCUR)

Client Name: PRM MN

Project #: **WO# : 40167542**

40167542

Courier: CS Logistics Fed Ex Speedee UPS Waltco
 Client Pace Other: _____

Tracking #: 1693529-1

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Custody Seal on Samples Present: yes no Seals intact: yes no

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR - 75 Type of Ice: Wet Blue Dry None

Cooler Temperature Uncorr: 2 / Corr: 2 Samples on ice, cooling process has begun

Temp Blank Present: yes no

Biological Tissue is Frozen: yes no

Person examining contents:
Date: 4/17/18
Initials: SSM

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>IRVO</u> <u>SSM 4/17/18</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	MS/MSD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>client + labels have no collect time</u>
-Includes date/time/ID/Analysis Matrix:	<u>6</u>	<u>SSM 4/17/18</u>
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Person Contacted: _____ Date/Time: _____ If checked, see attached form for additional comments
Comments/ Resolution: _____

Project Manager Review: CW Date: 4/17/18

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427291

Workorder Name: 18-00383 MPCA-Freeway LF Solid

Owner Received Date: 4/13/2018

Results Requested By: 4/27/2018

Report To		Subcontract To					Requested Analysis																
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Indianapolis 7726 Moller Road Indianapolis, IN 46268 Phone (317)228-3100																					
						Preserved Containers					Chromium III	Chromium VI	Total Cr by 6020										
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unreserved																	
1	FD-SB-F1 (10-14.5 S)	PS	4/12/2018 10:15	10427291001	Solid	1						X	X	X									
2	FB-SB-G1 (5-10 S)	PS	4/12/2018 10:45	10427291002	Solid	1						X	X	X									
3	FD-TT-05 (4-9 WM)	PS	4/12/2018 09:45	10427291003	Solid	1						X	X	X									
4	FD-TT-06 (2-5 WM)	PS	4/12/2018 11:40	10427291004	Solid	1						X	X	X									
5	FD-TT-07 (6-11 WM)	PS	4/12/2018 13:00	10427291005	Solid	1						X	X	X									
6	FD-TT-08 (5-12 WM)	PS	4/12/2018 14:30	10427291006	Solid	1						X	X	X									
7	TS-SB-01 (5-8 WM)	PS	4/12/2018 17:20	10427291007	Solid	1						X	X	X									
8	TS-SB-02 (5-10 S)	PS	4/12/2018 19:10	10427291008	Solid	1						X	X	X									
9	TS-SB-03 (1.5-3.0 S)	PS	4/12/2018 19:55	10427291009	Solid	1						X	X	X									
											Comments												
Transfers	Released By	Date/Time	Received By	Date/Time																			
1	<i>[Signature]</i>	4/16/18 1630	<i>[Signature]</i>	4/17/2018																			
2																							
3																							
Cooler Temperature on Receipt		23 °C	Custody Seal		<input checked="" type="checkbox"/> or N	Received on Ice		<input checked="" type="checkbox"/> or N	Samples Intact														<input checked="" type="checkbox"/> or N

50194564
LAB USE ONLY

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50194564

Date/Time and Initials of

person examining contents: Joe 4/12/18 JF45

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 7632 1990

Custody Seal on Cooler/Box Present: Yes No

Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: A 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N

Cooler Temperature: 2.1/2.3 Ice Visible in Sample Containers?: Yes No N

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia?			All containers needing acid/base pres. Have been checked? exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
Document any containers out of temp.		/		All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.		
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		/	Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Present:	/		Dissolved Metals field filtered?:			/
Chain of Custody Filled Out:	/		Headspace Wisconsin Sulfide			/
Short Hold Time Analysis (<72hr)?:		/	Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
Analysis:				Residual Chlorine Check (Total/Amenable/Free Cyanide)		
Time 5035A TC placed in Freezer or Short Holds To Lab:			Headspace in VOA Vials (>6mm):			/
Rush TAT Requested:		/	Trip Blank Present?:		/	
Containers Intact?:	/		Trip Blank Custody Seals?:		/	
Sample Labels Match COC?:	/					
Except TCs, which only require sample ID						

Comments: _____

Sample Container Count

WO#: 50194564



50194564

SBS Bulk Kit

Matrix SIM (Soil/Water Aqueous L

pH <2 pH >9 pH >12

CLIENT: PAAG MW

COC PAGE 1 of 1

COC ID# _____

Project # 50194564

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	Matrix SIM (Soil/Water Aqueous L	pH <2	pH >9	pH >12	
1																							
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
VGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				

Page 12 of 140



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 25, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Solid - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/17/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List

			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427291
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-SB-F1 (10-14.5 S) (10427291001)	A181607-01	Solid	04/12/2018	04/17/2018
FB-SB-G1 (5-10 S) (10427291002)	A181607-02	Solid	04/12/2018	04/17/2018
FD-TT-05 (4-9 WM) (10427291003)	A181607-03	Solid	04/12/2018	04/17/2018
FD-TT-06 (2-5 WM) (10427291004)	A181607-04	Solid	04/12/2018	04/17/2018
FD-TT-07 (6-11 WM) (10427291005)	A181607-05	Solid	04/12/2018	04/17/2018
FD-TT-08 (5-12 WM) (10427291006)	A181607-06	Solid	04/12/2018	04/17/2018
TS-SB-01 (5-8 WM) (10427291007)	A181607-07	Solid	04/12/2018	04/17/2018
TS-SB-02 (5-10 S) (10427291008)	A181607-08	Solid	04/12/2018	04/17/2018
TS-SB-03 (1.5-3.0 S) (10427291009)	A181607-09	Solid	04/12/2018	04/17/2018

CASE NARRATIVE

Sample Receipt Information:

9 samples were received on 04/17/2018. Samples were received at 4.4 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.



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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427291
Project Manager: Jennifer Anderson

FD-SB-F1 (10-14.5 S) (10427291001)

A181607-01 (Solid)

Date Sampled
04/12/2018 10:15

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 05:32	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 05:04	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 05:32	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 05:32	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 05:04	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 05:32	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 05:32	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 05:32	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 05:04	EPA 8321B	
<i>Surrogate: DCAA</i>		66.2 %		70.8-116	04/20/2018	04/21/2018 05:32	EPA 8321B	S

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	67.4	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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2525 Advance Road
 Madison, WI 53718
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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427291
 Project Manager: Jennifer Anderson

FB-SB-G1 (5-10 S) (10427291002)
A181607-02 (Solid)

Date Sampled
 04/12/2018 10:45

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 06:39	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 06:39	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 06:39	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 06:39	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 06:39	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 06:39	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 06:39	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 06:39	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 06:39	EPA 8321B	
Surrogate: DCAA		96.1 %		70.8-116	04/20/2018	04/21/2018 06:39	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	89.4	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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2525 Advance Road
 Madison, WI 53718
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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427291
 Project Manager: Jennifer Anderson

FD-TT-05 (4-9 WM) (10427291003)
A181607-03 (Solid)

Date Sampled
04/12/2018 09:45

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 07:46	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 07:46	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 07:46	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 07:46	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 07:16	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 07:46	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 07:46	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 07:46	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 07:46	EPA 8321B	
Surrogate: DCAA		82.7 %		70.8-116	04/20/2018	04/21/2018 07:46	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	75.5	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427291
 Project Manager: Jennifer Anderson

FD-TT-06 (2-5 WM) (10427291004)
A181607-04 (Solid)

Date Sampled
 04/12/2018 11:40

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 08:22	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 08:53	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 08:53	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 08:53	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 08:22	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 08:53	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 08:53	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 08:53	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 08:53	EPA 8321B	
Surrogate: DCAA		77.4 %	70.8-116		04/20/2018	04/21/2018 08:53	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	64.4	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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2525 Advance Road
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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427291
 Project Manager: Jennifer Anderson

FD-TT-08 (5-12 WM) (10427291006)

A181607-06 (Solid)

Date Sampled
04/12/2018 14:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 10:34	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 10:34	EPA 8321B	
2,4,5-T	0.16	0.10	mg/kg dry	1	04/20/2018	04/21/2018 11:08	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 10:34	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 11:08	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 11:08	EPA 8321B	
MCPA	0.13	0.10	mg/kg dry	1	04/20/2018	04/21/2018 11:08	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 11:08	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 10:34	EPA 8321B	
<i>Surrogate: DCAA</i>		<i>80.7 %</i>	<i>70.8-116</i>		<i>04/20/2018</i>	<i>04/21/2018 11:08</i>	<i>EPA 8321B</i>	

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	79.0	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427291
 Project Manager: Jennifer Anderson

TS-SB-01 (5-8 WM) (10427291007)
A181607-07 (Solid)

Date Sampled
04/12/2018 17:20

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 19:28	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 19:28	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 19:28	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 19:28	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 19:11	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 19:28	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 19:28	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 19:28	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 19:28	EPA 8321B	
<i>Surrogate: DCAA</i>		<i>93.0 %</i>	<i>70.8-116</i>		<i>04/20/2018</i>	<i>04/20/2018 19:28</i>	<i>EPA 8321B</i>	

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	86.4	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Solid - MN Project Number: 10427291 Project Manager: Jennifer Anderson
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TS-SB-02 (5-10 S) (10427291008)

Date Sampled
 04/12/2018 19:10

A181607-08 (Solid)

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 21:43	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 21:43	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 21:43	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 21:43	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 21:23	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 21:43	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 21:43	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 21:43	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 21:43	EPA 8321B	

Surrogate: DCAA

102 % 70.8-116 04/20/2018 04/20/2018 21:43 EPA 8321B

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	92.8	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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Pace Analytical
 1700 Elm Street, Suite 200
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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427291
 Project Manager: Jennifer Anderson

TS-SB-03 (1.5-3.0 S) (10427291009)
A181607-09 (Solid)

Date Sampled
 04/12/2018 19:55

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 20:36	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 20:36	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 20:36	EPA 8321B	
2,4,5-TP	0.15	0.10	mg/kg dry	1	04/20/2018	04/20/2018 20:36	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 20:17	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 20:36	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 20:36	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 20:36	EPA 8321B	
Triclopyr	0.11	0.10	mg/kg dry	1	04/20/2018	04/20/2018 20:17	EPA 8321B	
Surrogate: DCAA		100 %	70.8-116		04/20/2018	04/20/2018 20:36	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	90.3	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427291
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804171 - EPA 3570

Blank (A804171-BLK1)		Prepared: 04/20/2018 Analyzed: 04/20/2018 18:21								
2,4-D	ND	0.10	mg/kg wet							
2,4-D [2C]	ND	0.10	mg/kg wet							
2,4-DB	ND	0.10	mg/kg wet							
2,4-DB [2C]	ND	0.10	mg/kg wet							
2,4,5-T	ND	0.10	mg/kg wet							
2,4,5-T [2C]	ND	0.10	mg/kg wet							
2,4,5-TP	ND	0.10	mg/kg wet							
2,4,5-TP [2C]	ND	0.10	mg/kg wet							
Bentazon	ND	0.10	mg/kg wet							
Bentazon [2C]	ND	0.10	mg/kg wet							
Dicamba	ND	0.10	mg/kg wet							
Dicamba [2C]	ND	0.10	mg/kg wet							
MCPA	ND	0.10	mg/kg wet							
MCPA [2C]	ND	0.10	mg/kg wet							
Picloram	ND	0.10	mg/kg wet							
Picloram [2C]	ND	0.10	mg/kg wet							
Triclopyr	ND	0.10	mg/kg wet							
Triclopyr [2C]	ND	0.10	mg/kg wet							
Surrogate: DCAA	21.2		mg/kg wet	20.00		106	70.8-116			
Surrogate: DCAA [2C]	19.0		mg/kg wet	20.00		95.3	62.3-114			

LCS (A804171-BS1)		Prepared: 04/20/2018 Analyzed: 04/20/2018 17:14								
2,4-D	1.92	0.10	mg/kg wet	2.000		96.2	81.6-107			
2,4-D [2C]	1.66	0.10	mg/kg wet	2.000		83.2	71.8-120			
2,4-DB	1.77	0.10	mg/kg wet	2.000		88.7	76.4-107			
2,4-DB [2C]	1.69	0.10	mg/kg wet	2.000		84.5	62.2-129			
2,4,5-T	1.93	0.10	mg/kg wet	2.000		96.6	81.2-110			
2,4,5-T [2C]	1.88	0.10	mg/kg wet	2.000		93.8	70.6-125			
2,4,5-TP	1.87	0.10	mg/kg wet	2.000		93.5	79.1-106			
2,4,5-TP [2C]	1.69	0.10	mg/kg wet	2.000		84.4	68.2-118			
Bentazon	1.07	0.10	mg/kg wet	1.000		107	82.5-119			
Bentazon [2C]	0.806	0.10	mg/kg wet	1.000		80.6	73.3-125			
Dicamba	1.98	0.10	mg/kg wet	2.000		98.8	85.1-108			
Dicamba [2C]	1.85	0.10	mg/kg wet	2.000		92.4	71.4-115			
Picloram	0.991	0.10	mg/kg wet	1.000		99.1	86.1-106			
Picloram [2C]	0.878	0.10	mg/kg wet	1.000		87.8	74.5-114			
Triclopyr	1.89	0.10	mg/kg wet	2.000		94.4	78.6-106			
Triclopyr [2C]	1.67	0.10	mg/kg wet	2.000		83.4	69.4-118			
Surrogate: DCAA	20.9		mg/kg wet	20.00		105	70.8-116			
Surrogate: DCAA [2C]	18.7		mg/kg wet	20.00		93.5	62.3-114			

LCS (A804171-BS2)		Prepared: 04/20/2018 Analyzed: 04/20/2018 16:07								
MCPA	2.15	0.10	mg/kg wet	2.000		107	79.4-116			
MCPA [2C]	1.92	0.10	mg/kg wet	2.000		96.2	77-123			



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Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427291
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804171 - EPA 3570

LCS (A804171-BS2)

Prepared: 04/20/2018 Analyzed: 04/20/2018 16:07

Surrogate: DCAA	21.1		mg/kg wet	20.00		106	70.8-116			
Surrogate: DCAA [2C]	21.1		mg/kg wet	20.00		105	62.3-114			

Matrix Spike (A804171-MS1)

Source: A181607-08

Prepared: 04/20/2018 Analyzed: 04/20/2018 22:50

2,4-D	1.92	0.10	mg/kg dry	2.156	ND	89.2	71.4-105			
2,4-D [2C]	1.82	0.10	mg/kg dry	2.156	0.0525	81.8	50.5-123			
2,4-DB	1.86	0.10	mg/kg dry	2.156	ND	86.1	46.4-117			
2,4-DB [2C]	1.72	0.10	mg/kg dry	2.156	ND	79.7	44.5-121			
2,4,5-T	2.03	0.10	mg/kg dry	2.156	ND	94.1	66.2-110			
2,4,5-T [2C]	1.94	0.10	mg/kg dry	2.156	ND	90.0	43.6-126			
2,4,5-TP	1.97	0.10	mg/kg dry	2.156	ND	91.3	52.4-114			
2,4,5-TP [2C]	1.83	0.10	mg/kg dry	2.156	ND	85.0	47.6-117			
Bentazon	1.02	0.10	mg/kg dry	1.078	0.0456	90.9	61.5-117			
Bentazon [2C]	0.920	0.10	mg/kg dry	1.078	ND	85.3	50.7-127			
Dicamba	1.59	0.10	mg/kg dry	2.156	ND	73.9	48.4-111			
Dicamba [2C]	1.56	0.10	mg/kg dry	2.156	ND	72.3	43.3-108			
Picloram	0.633	0.10	mg/kg dry	1.078	ND	58.7	26.7-110			
Picloram [2C]	0.389	0.10	mg/kg dry	1.078	0.0164	34.6	10.8-110			
Triclopyr	1.95	0.10	mg/kg dry	2.156	ND	90.7	56-113			
Triclopyr [2C]	1.78	0.10	mg/kg dry	2.156	0.0278	81.2	47.9-120			
Surrogate: DCAA	21.4		mg/kg dry	21.56		99.2	70.8-116			
Surrogate: DCAA [2C]	19.1		mg/kg dry	21.56		88.6	62.3-114			

Matrix Spike (A804171-MS2)

Source: A181607-08

Prepared: 04/20/2018 Analyzed: 04/21/2018 01:04

MCPA	2.22	0.10	mg/kg dry	2.156	ND	103	74.2-114			
MCPA [2C]	2.11	0.10	mg/kg dry	2.156	ND	97.8	60.9-122			
Surrogate: DCAA	21.5		mg/kg dry	21.56		99.6	70.8-116			
Surrogate: DCAA [2C]	21.8		mg/kg dry	21.56		101	62.3-114			

Matrix Spike Dup (A804171-MSD1)

Source: A181607-08

Prepared: 04/20/2018 Analyzed: 04/20/2018 23:57

2,4-D	1.96	0.10	mg/kg dry	2.156	ND	90.7	71.4-105	1.67	20	
2,4-D [2C]	1.88	0.10	mg/kg dry	2.156	0.0525	84.8	50.5-123	3.52	20	
2,4-DB	1.86	0.10	mg/kg dry	2.156	ND	86.1	46.4-117	0.0708	20	
2,4-DB [2C]	1.81	0.10	mg/kg dry	2.156	ND	84.1	44.5-121	5.40	20	
2,4,5-T	2.01	0.10	mg/kg dry	2.156	ND	93.3	66.2-110	0.865	20	
2,4,5-T [2C]	1.92	0.10	mg/kg dry	2.156	ND	89.0	43.6-126	1.06	20	
2,4,5-TP	1.95	0.10	mg/kg dry	2.156	ND	90.3	52.4-114	1.05	20	
2,4,5-TP [2C]	1.83	0.10	mg/kg dry	2.156	ND	84.9	47.6-117	0.106	20	
Bentazon	1.04	0.10	mg/kg dry	1.078	0.0456	92.2	61.5-117	1.44	20	
Bentazon [2C]	0.960	0.10	mg/kg dry	1.078	ND	89.1	50.7-127	4.28	20	
Dicamba	1.62	0.10	mg/kg dry	2.156	ND	74.9	48.4-111	1.41	20	
Dicamba [2C]	1.60	0.10	mg/kg dry	2.156	ND	74.1	43.3-108	2.52	20	
Picloram	0.641	0.10	mg/kg dry	1.078	ND	59.5	26.7-110	1.30	20	
Picloram [2C]	0.387	0.10	mg/kg dry	1.078	0.0164	34.4	10.8-110	0.574	20	



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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427291
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804171 - EPA 3570

Matrix Spike Dup (A804171-MSD1)		Source: A181607-08			Prepared: 04/20/2018 Analyzed: 04/20/2018 23:57					
Triclopyr	1.97	0.10	mg/kg dry	2.156	ND	91.4	56-113	0.809	20	
Triclopyr [2C]	1.78	0.10	mg/kg dry	2.156	0.0278	81.1	47.9-120	0.221	20	
Surrogate: DCAA	21.2		mg/kg dry	21.56		98.4	70.8-116			
Surrogate: DCAA [2C]	18.9		mg/kg dry	21.56		87.9	62.3-114			
Matrix Spike Dup (A804171-MSD2)		Source: A181607-08			Prepared: 04/20/2018 Analyzed: 04/21/2018 02:11					
MCPA	2.21	0.10	mg/kg dry	2.156	ND	103	74.2-114	0.307	20	
MCPA [2C]	2.08	0.10	mg/kg dry	2.156	ND	96.5	60.9-122	1.37	20	
Surrogate: DCAA	21.6		mg/kg dry	21.56		100	70.8-116			
Surrogate: DCAA [2C]	21.9		mg/kg dry	21.56		102	62.3-114			



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Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Solid - MN Project Number: 10427291 Project Manager: Jennifer Anderson
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Classical Chemistry Parameters - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804163 - % Solids

Duplicate (A804163-DUP1)	Source: A181607-09		Prepared: 04/18/2018 Analyzed: 04/19/2018 11:20							
% Solids	90.0	0.00	% by Weight		90.3			0.390	20	



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1700 Elm Street, Suite 200
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Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427291
Project Manager: Jennifer Anderson

Notes and Definitions

- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- P The difference in the concentrations between the primary and confirmation column was > 40%.
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

May 10, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 13, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
 A2LA Certification #: 2926.01
 Alabama Certification #: 40770
 Alaska Contaminated Sites Certification #: 17-009
 Alaska DW Certification #: MN00064
 Arizona Certification #: AZ0014
 Arkansas Certification #: 88-0680
 California Certification #: 2929
 CNMI Saipan Certification #: MP0003
 Colorado Certification #: MN00064
 Connecticut Certification #: PH-0256
 EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
 Florida Certification #: E87605
 Georgia Certification #: 959
 Guam EPA Certification #: MN00064
 Hawaii Certification #: MN00064
 Idaho Certification #: MN00064
 Illinois Certification #: 200011
 Indiana Certification #: C-MN-01
 Iowa Certification #: 368
 Kansas Certification #: E-10167
 Kentucky DW Certification #: 90062
 Kentucky WW Certification #: 90062
 Louisiana DEQ Certification #: 03086
 Louisiana DW Certification #: MN00064
 Maine Certification #: MN00064
 Maryland Certification #: 322
 Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
 Minnesota Certification #: 027-053-137
 Mississippi Certification #: MN00064
 Montana Certification #: CERT0092
 Nebraska Certification #: NE-OS-18-06
 Nevada Certification #: MN00064
 New Hampshire Certification #: 2081
 New Jersey Certification #: MN002
 New York Certification #: 11647
 North Carolina DW Certification #: 27700
 North Carolina WW Certification #: 530
 North Dakota Certification #: R-036
 Ohio DW Certification #: 41244
 Ohio VAP Certification #: CL101
 Oklahoma Certification #: 9507
 Oregon NwTPH Certification #: MN300001
 Oregon Secondary Certification #: MN200001
 Pennsylvania Certification #: 68-00563
 Puerto Rico Certification #: MN00064
 South Carolina Certification #: 74003001
 Tennessee Certification #: TN02818
 Texas Certification #: T104704192
 Utah Certification #: MN00064
 Virginia Certification #: 460163
 Washington Certification #: C486
 West Virginia DW Certification #: 9952 C
 West Virginia DEP Certification #: 382
 Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
 Alaska Certification UST-107
 Alaska Certification UST-107
 California Certification #2973
 California Certification #2973
 Montana Certificate #CERT0103
 Alaska Certification #MN01084
 Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
 North Dakota Certification: # R-203
 Wisconsin DNR Certification #: 998027470
 WA Department of Ecology Lab ID# C1007
 Nevada DNR #MN010842018-1
 Oklahoma Department of Environmental Quality
 California Certification #2973

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
 ANAB DOD-ELAP Rad Accreditation #: L2417
 Alabama Certification #: 41590
 Arizona Certification #: AZ0734
 Arkansas Certification
 California Certification #: 04222CA
 Colorado Certification #: PA01547
 Connecticut Certification #: PH-0694
 Delaware Certification
 EPA Region 4 DW Rad

Florida/TNI Certification #: E87683
 Georgia Certification #: C040
 Guam Certification
 Hawaii Certification
 Idaho Certification
 Illinois Certification
 Indiana Certification
 Iowa Certification #: 391
 Kansas/TNI Certification #: E-10358
 Kentucky Certification #: KY90133

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

Pennsylvania Certification IDs

KY WW Permit #: KY0098221	Ohio EPA Rad Approval: #41249
KY WW Permit #: KY0000221	Oregon/TNI Certification #: PA200002-010
Louisiana DHH/TNI Certification #: LA180012	Pennsylvania/TNI Certification #: 65-00282
Louisiana DEQ/TNI Certification #: 4086	Puerto Rico Certification #: PA01457
Maine Certification #: 2017020	Rhode Island Certification #: 65-00282
Maryland Certification #: 308	South Dakota Certification
Massachusetts Certification #: M-PA1457	Tennessee Certification #: 02867
Michigan/PADEP Certification #: 9991	Texas/TNI Certification #: T104704188-17-3
Missouri Certification #: 235	Utah/TNI Certification #: PA014572017-9
Montana Certification #: Cert0082	USDA Soil Permit #: P330-17-00091
Nebraska Certification #: NE-OS-29-14	Vermont Dept. of Health: ID# VT-0282
Nevada Certification #: PA014572018-1	Virgin Island/PADEP Certification
New Hampshire/TNI Certification #: 297617	Virginia/VELAP Certification #: 9526
New Jersey/TNI Certification #: PA051	Washington Certification #: C868
New Mexico Certification #: PA01457	West Virginia DEP Certification #: 143
New York/TNI Certification #: 10888	West Virginia DHHR Certification #: 9964C
North Carolina Certification #: 42706	Wisconsin Approve List for Rad
North Dakota Certification #: R-190	Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174	Nebraska Certification: NE-OS-28-14
Alabama Certification #: 41320	Nevada Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216	New Hampshire Certification #: 2958
Delaware Certification: FL NELAC Reciprocity	New Jersey Certification #: FL022
Florida Certification #: E83079	New York Certification #: 11608
Georgia Certification #: 955	North Carolina Environmental Certificate #: 667
Guam Certification: FL NELAC Reciprocity	North Carolina Certification #: 12710
Hawaii Certification: FL NELAC Reciprocity	Oklahoma Certification #: D9947
Illinois Certification #: 200068	Pennsylvania Certification #: 68-00547
Indiana Certification: FL NELAC Reciprocity	Puerto Rico Certification #: FL01264
Kansas Certification #: E-10383	South Carolina Certification: #96042001
Kentucky Certification #: 90050	Tennessee Certification #: TN02974
Louisiana Certification #: FL NELAC Reciprocity	Texas Certification: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007	US Virgin Islands Certification: FL NELAC Reciprocity
Maryland Certification: #346	Virginia Environmental Certification #: 460165
Michigan Certification #: 9911	Wyoming Certification: FL NELAC Reciprocity
Mississippi Certification: FL NELAC Reciprocity	West Virginia Certification #: 9962C
Missouri Certification #: 236	Wisconsin Certification #: 399079670
Montana Certification #: Cert 0074	Wyoming (EPA Region 8): FL NELAC Reciprocity

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512	New York State Department of Health, Serial #57971 and 57972
Minnesota Department of Health, Certificate #1385941	North Carolina Division of Water Resources, Certificate #659
Arkansas Department of Environmental Quality, Certificate #17-046-0	Virginia Department of General Services, Certificate #9028
Georgia Environmental Protection Division, Stipulation	Wisconsin Department of Natural Resources, Laboratory #999472650
Illinois Environmental Protection Agency, Certificate #004325	U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278
Michigan Department of Environmental Quality, Laboratory #0034	

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10427352001	TS-SB-05	Water	04/13/18 11:20	04/13/18 16:35
10427352002	TS-SB-07	Water	04/13/18 13:30	04/13/18 16:35
10427352003	TS-SB-08	Water	04/13/18 15:20	04/13/18 16:35

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10427352001	TS-SB-05	EPA 200.7	DM	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 8270D	AT1	38	PASI-M
10427352002	TS-SB-07	EPA 200.7	DM	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 8270D	AT1	38	PASI-M
10427352003	TS-SB-08	EPA 531.1	AC1	3	PASI-O
		EPA 547	AC1	1	PASI-O
		EPA 549.2	AC1	2	PASI-O
		EPA 552.3	MMB	7	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 548.1	LAJ	1	PASI-O
		EPA 8270D	AT1	38	PASI-M
		EPA 524.2	AEZ	4	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NJV	2	PASI-PA
EPA 903.1	KAC	1	PASI-PA		
EPA 904.0	JLW	1	PASI-PA		
Total Radium Calculation	CMC	1	PASI-PA		
Hach 10360 Rev 1.1	AJS	1	PASI-M		
EPA 1664A OG	AR3	1	PASI-M		
EPA 180.1	JFP	1	PASI-M		
SM 2540D	NAS	1	PASI-M		

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 4500-CIO2	AGS	1	PASI-O
		SM 4500-H+B	AR3	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	AR3	2	PASI-M
		EPA 300.1	CMB	1	PASI-O
		EPA 300.1	CMB	1	PASI-O
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1	DMB	1	PASI-V
		EPA 353.2	JFP	3	PASI-M
		EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Sample: TS-SB-05	Lab ID: 10427352001	Collected: 04/13/18 11:20	Received: 04/13/18 16:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	3810	ug/L	200	1	04/17/18 11:11	04/19/18 17:06	7429-90-5	
Barium, Dissolved	2750	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:06	7440-39-3	
Copper, Dissolved	11.9	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:06	7440-50-8	
Manganese, Dissolved	2440	ug/L	5.0	1	04/17/18 11:11	04/19/18 17:06	7439-96-5	
Nickel, Dissolved	22.4	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:06	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:06	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/17/18 11:11	04/19/18 17:06	7440-31-5	
Zinc, Dissolved	77.6	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:06	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	594	ug/L	2.5	5	04/18/18 09:40	04/19/18 12:46	7440-47-3	
Total Hardness by 2340B	2230000	ug/L	14100	100	04/18/18 09:40	04/19/18 12:48		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	1.4	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:52	7440-36-0	
Arsenic, Dissolved	4.4	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:52	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/23/18 14:28	04/25/18 08:52	7440-41-7	
Boron, Dissolved	859	ug/L	100	20	04/23/18 14:28	04/24/18 19:33	7440-42-8	
Cadmium, Dissolved	0.27	ug/L	0.080	1	04/23/18 14:28	04/25/18 08:52	7440-43-9	
Chromium, Dissolved	14.0	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:52	7440-47-3	
Cobalt, Dissolved	4.8	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:52	7440-48-4	
Lead, Dissolved	24.3	ug/L	0.10	1	04/23/18 14:28	04/25/18 08:52	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:52	7782-49-2	
Thallium, Dissolved	0.21	ug/L	0.10	1	04/23/18 14:28	04/25/18 08:52	7440-28-0	
Uranium-238, Dissolved	1.8	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:52	7440-61-1	
Vanadium, Dissolved	12.0	ug/L	1.0	1	04/23/18 14:28	04/25/18 08:52	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:00	7439-97-6	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	83-32-9	
Anthracene	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	50-32-8	
Benzoic acid	ND	ug/L	521	10	04/19/18 14:59	04/23/18 20:06	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	111-44-4	
2-Chlorophenol	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	52.1	1	04/19/18 14:59	04/23/18 17:38	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	120-83-2	
Diethylphthalate	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	84-66-2	
2,4-Dimethylphenol	ND	ug/L	52.1	1	04/19/18 14:59	04/23/18 17:38	105-67-9	
Dimethylphthalate	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	51-28-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

Sample: TS-SB-05		Lab ID: 10427352001	Collected: 04/13/18 11:20	Received: 04/13/18 16:35	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Di-n-octylphthalate	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	117-81-7	
Fluoranthene	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	206-44-0	
Fluorene	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	86-73-7	
Hexachlorobenzene	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	52.1	1	04/19/18 14:59	04/23/18 17:38	77-47-4	
Hexachloroethane	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	67-72-1	
Isophorone	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	95-48-7	
3&4-Methylphenol(m&p Cresol)	232	ug/L	208	10	04/19/18 14:59	04/23/18 20:06		
N-Nitrosodiphenylamine	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	86-30-6	
Pentachlorophenol	ND	ug/L	20.8	1	04/19/18 14:59	04/23/18 17:38	87-86-5	
Phenanthrene	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	85-01-8	
Phenol	12.3	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	108-95-2	
Pyrene	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	75	%	60-125	1	04/19/18 14:59	04/23/18 17:38	4165-60-0	
2-Fluorobiphenyl (S)	78	%	56-125	1	04/19/18 14:59	04/23/18 17:38	321-60-8	
p-Terphenyl-d14 (S)	66	%	58-125	1	04/19/18 14:59	04/23/18 17:38	1718-51-0	
Phenol-d6 (S)	72	%	58-125	1	04/19/18 14:59	04/23/18 17:38	13127-88-3	
2-Fluorophenol (S)	76	%	55-125	1	04/19/18 14:59	04/23/18 17:38	367-12-4	
2,4,6-Tribromophenol (S)	98	%	65-125	1	04/19/18 14:59	04/23/18 17:38	118-79-6	

Sample: TS-SB-07		Lab ID: 10427352002	Collected: 04/13/18 13:30	Received: 04/13/18 16:35	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	92800	ug/L	200	1	04/17/18 11:11	04/19/18 17:09	7429-90-5	
Barium, Dissolved	2810	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:09	7440-39-3	
Copper, Dissolved	313	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:09	7440-50-8	
Manganese, Dissolved	9940	ug/L	5.0	1	04/17/18 11:11	04/19/18 17:09	7439-96-5	
Nickel, Dissolved	215	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:09	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:09	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/17/18 11:11	04/19/18 17:09	7440-31-5	
Zinc, Dissolved	492	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:09	7440-66-6	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Chromium	713	ug/L	2.5	5	04/18/18 09:40	04/19/18 12:50	7440-47-3	
Total Hardness by 2340B	9500000	ug/L	70500	500	04/18/18 09:40	04/19/18 13:01		
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	1.1	ug/L	0.50	1	04/23/18 14:28	04/26/18 09:14	7440-36-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Sample: TS-SB-07	Lab ID: 10427352002	Collected: 04/13/18 13:30	Received: 04/13/18 16:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Arsenic, Dissolved	71.2	ug/L	0.50	1	04/23/18 14:28	04/26/18 09:14	7440-38-2	
Beryllium, Dissolved	2.8	ug/L	0.20	1	04/23/18 14:28	04/26/18 09:14	7440-41-7	
Boron, Dissolved	889	ug/L	250	50	04/23/18 14:28	04/25/18 08:55	7440-42-8	
Cadmium, Dissolved	3.8	ug/L	0.080	1	04/23/18 14:28	04/26/18 09:14	7440-43-9	
Chromium, Dissolved	165	ug/L	0.50	1	04/23/18 14:28	04/26/18 09:14	7440-47-3	
Cobalt, Dissolved	105	ug/L	0.50	1	04/23/18 14:28	04/26/18 09:14	7440-48-4	
Lead, Dissolved	113	ug/L	0.10	1	04/23/18 14:28	04/26/18 09:14	7439-92-1	
Selenium, Dissolved	3.8	ug/L	0.50	1	04/23/18 14:28	04/26/18 09:14	7782-49-2	
Thallium, Dissolved	2.9	ug/L	0.10	1	04/23/18 14:28	04/26/18 09:14	7440-28-0	
Uranium-238, Dissolved	8.5	ug/L	0.50	1	04/23/18 14:28	04/26/18 09:14	7440-61-1	
Vanadium, Dissolved	205	ug/L	1.0	1	04/23/18 14:28	04/26/18 09:14	7440-62-2	
245.1 Mercury, Dissolved		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	0.35	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:03	7439-97-6	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	83-32-9	
Anthracene	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	50-32-8	
Benzoic acid	ND	ug/L	52.6	1	04/19/18 14:59	04/23/18 18:07	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	111-44-4	
2-Chlorophenol	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	52.6	1	04/19/18 14:59	04/23/18 18:07	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	120-83-2	
Diethylphthalate	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	84-66-2	
2,4-Dimethylphenol	ND	ug/L	52.6	1	04/19/18 14:59	04/23/18 18:07	105-67-9	
Dimethylphthalate	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	117-81-7	
Fluoranthene	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	206-44-0	
Fluorene	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	86-73-7	
Hexachlorobenzene	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	52.6	1	04/19/18 14:59	04/23/18 18:07	77-47-4	
Hexachloroethane	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	67-72-1	
Isophorone	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	21.1	1	04/19/18 14:59	04/23/18 18:07		
N-Nitrosodiphenylamine	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	86-30-6	
Pentachlorophenol	ND	ug/L	21.1	1	04/19/18 14:59	04/23/18 18:07	87-86-5	
Phenanthrene	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	85-01-8	
Phenol	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	108-95-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Sample: TS-SB-07	Lab ID: 10427352002	Collected: 04/13/18 13:30	Received: 04/13/18 16:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Pyrene	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	71	%	60-125	1	04/19/18 14:59	04/23/18 18:07	4165-60-0	
2-Fluorobiphenyl (S)	73	%	56-125	1	04/19/18 14:59	04/23/18 18:07	321-60-8	
p-Terphenyl-d14 (S)	55	%	58-125	1	04/19/18 14:59	04/23/18 18:07	1718-51-0	S0
Phenol-d6 (S)	76	%	58-125	1	04/19/18 14:59	04/23/18 18:07	13127-88-3	
2-Fluorophenol (S)	72	%	55-125	1	04/19/18 14:59	04/23/18 18:07	367-12-4	
2,4,6-Tribromophenol (S)	92	%	65-125	1	04/19/18 14:59	04/23/18 18:07	118-79-6	
Sample: TS-SB-08		Lab ID: 10427352003 Collected: 04/13/18 15:20 Received: 04/13/18 16:35 Matrix: Water						
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Field pH	7.0	Std. Units	0.10	1		04/13/18 15:20		
Field Temperature	10.5	deg C	0.50	1		04/13/18 15:20		
531.1 HPLC Carbamates		Analytical Method: EPA 531.1						
Aldicarb	ND	ug/L	2.0	1		05/04/18 08:25	116-06-3	
Carbofuran	ND	ug/L	2.0	1		05/04/18 08:25	1563-66-2	
Surrogates								
BDMC (S)	117	%	80-120	1		05/04/18 08:25		
547 HPLC Glyphosate		Analytical Method: EPA 547						
Glyphosate	ND	ug/L	6.0	1		04/27/18 02:20		
549.2 HPLC Paraquat Diquat		Analytical Method: EPA 549.2 Preparation Method: EPA 549.2						
Diquat	ND	ug/L	0.40	1	04/18/18 23:22	04/19/18 19:47	85-00-7	
Paraquat	ND	ug/L	0.40	1	04/18/18 23:22	04/19/18 19:47	1910-42-5	
552.3 Haloacetic Acids		Analytical Method: EPA 552.3 Preparation Method: EPA 552.3						
Dibromoacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 19:12	631-64-1	
Dichloroacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 19:12	79-43-6	
Haloacetic Acids (Total)	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 19:12		
Monobromoacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 19:12	79-08-3	
Monochloroacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 19:12	79-11-8	
Trichloroacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 19:12	76-03-9	
Surrogates								
2,3-Dibromopropanoic Acid (S)	183	%	70-130	1	04/21/18 00:13	04/25/18 19:12	600-05-5	S3
8011 GCS EDB and DBCP		Analytical Method: EPA 8011 Preparation Method: EPA 8011						
1,2-Dibromo-3-chloropropane	ND	ug/L	0.0099	1	04/24/18 14:16	04/25/18 00:39	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.0099	1	04/24/18 14:16	04/25/18 00:39	106-93-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Sample: TS-SB-08	Lab ID: 10427352003	Collected: 04/13/18 15:20	Received: 04/13/18 16:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8011 GCS EDB and DBCP Analytical Method: EPA 8011 Preparation Method: EPA 8011								
<i>Surrogates</i>								
4-Bromofluorobenzene (S)	128	%	30-150	1	04/24/18 14:16	04/25/18 00:39	460-00-4	
8015M Alcohols in water Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	ug/L	5000	1		04/25/18 15:50	67-56-1	
8015M Glycols in water Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/23/18 15:53	107-21-1	
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	309-00-2	
alpha-BHC	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	319-84-6	
beta-BHC	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	319-85-7	
delta-BHC	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	58-89-9	
Chlordane (Technical)	ND	ug/L	5.3	10	04/17/18 09:44	04/19/18 22:35	57-74-9	
alpha-Chlordane	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	5103-71-9	
gamma-Chlordane	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	5103-74-2	
4,4'-DDD	ND	ug/L	1.1	10	04/17/18 09:44	04/19/18 22:35	72-54-8	
4,4'-DDE	ND	ug/L	1.1	10	04/17/18 09:44	04/19/18 22:35	72-55-9	
4,4'-DDT	ND	ug/L	1.1	10	04/17/18 09:44	04/19/18 22:35	50-29-3	
Dieldrin	ND	ug/L	1.1	10	04/17/18 09:44	04/19/18 22:35	60-57-1	
Endosulfan I	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	959-98-8	
Endosulfan II	ND	ug/L	1.1	10	04/17/18 09:44	04/19/18 22:35	33213-65-9	
Endosulfan sulfate	ND	ug/L	1.1	10	04/17/18 09:44	04/19/18 22:35	1031-07-8	
Endrin	ND	ug/L	1.1	10	04/17/18 09:44	04/19/18 22:35	72-20-8	
Endrin aldehyde	ND	ug/L	1.1	10	04/17/18 09:44	04/19/18 22:35	7421-93-4	
Endrin ketone	ND	ug/L	1.1	10	04/17/18 09:44	04/19/18 22:35	53494-70-5	
Heptachlor	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	76-44-8	
Heptachlor epoxide	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	1024-57-3	
Methoxychlor	ND	ug/L	5.3	10	04/17/18 09:44	04/19/18 22:35	72-43-5	
Toxaphene	ND	ug/L	15.8	10	04/17/18 09:44	04/19/18 22:35	8001-35-2	
<i>Surrogates</i>								
Tetrachloro-m-xylene (S)	0	%	62-125	10	04/17/18 09:44	04/19/18 22:35	877-09-8	2M, D3, S4
Decachlorobiphenyl (S)	0	%	30-143	10	04/17/18 09:44	04/19/18 22:35	2051-24-3	S4
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.11	1	04/17/18 09:43	04/18/18 13:47	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.11	1	04/17/18 09:43	04/18/18 13:47	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.11	1	04/17/18 09:43	04/18/18 13:47	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.11	1	04/17/18 09:43	04/18/18 13:47	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.11	1	04/17/18 09:43	04/18/18 13:47	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.11	1	04/17/18 09:43	04/18/18 13:47	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.11	1	04/17/18 09:43	04/18/18 13:47	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.11	1	04/17/18 09:43	04/18/18 13:47	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.11	1	04/17/18 09:43	04/18/18 13:47	11100-14-4	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Project No.: 10427352

Sample: TS-SB-08	Lab ID: 10427352003	Collected: 04/13/18 15:20	Received: 04/13/18 16:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
Surrogates								
Tetrachloro-m-xylene (S)	70	%	30-125	1	04/17/18 09:43	04/18/18 13:47	877-09-8	
Decachlorobiphenyl (S)	31	%	30-125	1	04/17/18 09:43	04/18/18 13:47	2051-24-3	
8315A GCSV Aldehydes								
Analytical Method: EPA 8315A Preparation Method: EPA 8315A								
Formaldehyde	ND	ug/L	100	1	04/19/18 09:11	04/19/18 16:12	50-00-0	H3
8316 W GCSV Acrylamide								
Analytical Method: EPA 8316								
Acrylamide	ND	ug/L	20.0	1		04/18/18 17:24	79-06-1	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	04/17/18 11:11	04/19/18 17:11	7429-90-5	
Barium, Dissolved	1080	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:11	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:11	7440-50-8	
Manganese, Dissolved	226	ug/L	5.0	1	04/17/18 11:11	04/19/18 17:11	7439-96-5	
Nickel, Dissolved	30.9	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:11	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:11	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/17/18 11:11	04/19/18 17:11	7440-31-5	
Zinc, Dissolved	43.0	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:11	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	21.6	ug/L	2.5	5	04/18/18 09:40	04/19/18 12:54	7440-47-3	
Total Hardness by 2340B	1410000	ug/L	14100	100	04/18/18 09:40	04/19/18 12:56		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	0.57	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:58	7440-36-0	
Arsenic, Dissolved	6.6	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:58	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/23/18 14:28	04/25/18 08:58	7440-41-7	
Boron, Dissolved	6960	ug/L	250	50	04/23/18 14:28	04/24/18 19:39	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/23/18 14:28	04/25/18 08:58	7440-43-9	
Chromium, Dissolved	7.1	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:58	7440-47-3	
Cobalt, Dissolved	5.0	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:58	7440-48-4	
Lead, Dissolved	4.9	ug/L	0.10	1	04/23/18 14:28	04/25/18 08:58	7439-92-1	
Selenium, Dissolved	1.1	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:58	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/23/18 14:28	04/25/18 08:58	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:58	7440-61-1	
Vanadium, Dissolved	1.9	ug/L	1.0	1	04/23/18 14:28	04/25/18 08:58	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:05	7439-97-6	
548.1 GCS Endothall								
Analytical Method: EPA 548.1 Preparation Method: EPA 548.1								
Endothall	ND	ug/L	9.0	1	04/19/18 08:10	04/19/18 23:08		IO

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Sample: TS-SB-08	Lab ID: 10427352003	Collected: 04/13/18 15:20	Received: 04/13/18 16:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	83-32-9	
Anthracene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	50-32-8	
Benzoic acid	ND	ug/L	52.1	1	04/16/18 17:28	04/20/18 18:13	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	111-44-4	
2-Chlorophenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	52.1	1	04/16/18 17:28	04/20/18 18:13	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	120-83-2	
Diethylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	84-66-2	
2,4-Dimethylphenol	ND	ug/L	52.1	1	04/16/18 17:28	04/20/18 18:13	105-67-9	
Dimethylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	117-81-7	
Fluoranthene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	206-44-0	
Fluorene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	86-73-7	
Hexachlorobenzene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	52.1	1	04/16/18 17:28	04/20/18 18:13	77-47-4	
Hexachloroethane	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	67-72-1	
Isophorone	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.8	1	04/16/18 17:28	04/20/18 18:13		
N-Nitrosodiphenylamine	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	86-30-6	
Pentachlorophenol	ND	ug/L	20.8	1	04/16/18 17:28	04/20/18 18:13	87-86-5	
Phenanthrene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	85-01-8	
Phenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	108-95-2	
Pyrene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	74	%	60-125	1	04/16/18 17:28	04/20/18 18:13	4165-60-0	
2-Fluorobiphenyl (S)	76	%	56-125	1	04/16/18 17:28	04/20/18 18:13	321-60-8	
p-Terphenyl-d14 (S)	74	%	58-125	1	04/16/18 17:28	04/20/18 18:13	1718-51-0	
Phenol-d6 (S)	75	%	58-125	1	04/16/18 17:28	04/20/18 18:13	13127-88-3	
2-Fluorophenol (S)	71	%	55-125	1	04/16/18 17:28	04/20/18 18:13	367-12-4	
2,4,6-Tribromophenol (S)	92	%	65-125	1	04/16/18 17:28	04/20/18 18:13	118-79-6	
524.2 MSV								
Analytical Method: EPA 524.2								
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/17/18 14:31		
Surrogates								
4-Bromofluorobenzene (S)	96	%	75-125	1		04/17/18 14:31	460-00-4	
Toluene-d8 (S)	94	%	75-125	1		04/17/18 14:31	2037-26-5	
1,2-Dichloroethane-d4 (S)	104	%	75-125	1		04/17/18 14:31	17060-07-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Sample: TS-SB-08	Lab ID: 10427352003	Collected: 04/13/18 15:20	Received: 04/13/18 16:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:							
Field pH	7.0	Std. Units		1		04/13/18 15:20		
Field Temperature	10.5	deg C		1		04/13/18 15:20		
Hach 10360 Rev 1.1 BOD	Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360							
BOD, 5 day	ND	mg/L	20.0	10	04/13/18 17:23	04/18/18 16:40		
1664 HEM, Oil and Grease	Analytical Method: EPA 1664A OG							
Oil and Grease	ND	mg/L	5.0	1		04/25/18 12:19		1M
180.1 Turbidity	Analytical Method: EPA 180.1							
Turbidity	260	NTU	15.0	50		04/14/18 14:47		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	109	mg/L	10.0	1		04/20/18 11:12		
4500ClO2 Chlorine Dioxide	Analytical Method: SM 4500-ClO2							
Chlorine Dioxide	0.11	mg/L	0.10	1		04/25/18 13:31		H6
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	6.9	Std. Units	0.10	1		04/24/18 14:43		H6
Trivalent Chromium Calculation	Analytical Method: Trivalent Chromium Calculation							
Chromium, Trivalent	0.022	mg/L	0.010	1		04/24/18 15:01		
300.0 IC Anions	Analytical Method: EPA 300.0							
Chloride	820	mg/L	24.0	20		04/18/18 16:47	16887-00-6	
Fluoride	ND	mg/L	0.050	1		04/17/18 18:25	16984-48-8	
300.1 Oxihalide IC Anions 14d	Analytical Method: EPA 300.1							
Chlorite	ND	ug/L	500	100		04/21/18 02:03		D3
300.1 Oxihalide IC Anions 28d	Analytical Method: EPA 300.1							
Bromate	ND	ug/L	10.0	10		04/22/18 15:11	15541-45-4	D3
Chromium, Hexavalent	Analytical Method: SM 3500-Cr B Modified							
Chromium, Hexavalent	ND	mg/L	0.010	1		04/13/18 17:21		FS
350.1 Ammonia, Unionized	Analytical Method: EPA 350.1							
Nitrogen, Ammonia (Unionized)	0.18	mg/L	0.010	1		05/02/18 09:45		
350.1 Ammonia, Undistilled	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	95.2	mg/L	4.0	40		04/24/18 11:19	7664-41-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Sample: TS-SB-08		Lab ID: 10427352003		Collected: 04/13/18 15:20	Received: 04/13/18 16:35	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
353.2 Nitrate + Nitrite		Analytical Method: EPA 353.2						
Nitrate as N	ND	mg/L	0.020	1		04/13/18 17:21	14797-55-8	FS
Nitrite as N	ND	mg/L	0.020	1		04/13/18 17:21	14797-65-0	FS
Nitrogen, NO ₂ plus NO ₃	ND	mg/L	0.020	1		04/13/18 17:21		FS
9016 Cyanide, Free		Analytical Method: EPA 9016 Preparation Method: EPA 9016						
Cyanide, Free	ND	ug/L	5.0	1	04/24/18 16:40	04/24/18 17:32		
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	41.3	ug/L	10.0	1	04/23/18 09:55	04/23/18 12:31	57-12-5	
SM4500P-E, Total Phosphorus		Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B						
Phosphorus	0.096	mg/L	0.050	1	04/26/18 09:33	04/27/18 12:00	7723-14-0	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 444328	Analysis Method: EPA 531.1
QC Batch Method: EPA 531.1	Analysis Description: 531.1 HPLC Carbamate
Associated Lab Samples: 10427352003	

METHOD BLANK: 2409903 Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aldicarb	ug/L	ND	2.0	05/03/18 15:06	
Carbofuran	ug/L	ND	2.0	05/03/18 15:06	
BDMC (S)	%	103	80-120	05/03/18 15:06	

LABORATORY CONTROL SAMPLE: 2409904

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aldicarb	ug/L	10	10.4	104	80-120	
Carbofuran	ug/L	10	8.8	88	80-120	
BDMC (S)	%			94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2409905 2409906

Parameter	Units	35385680001 Result	MS		MSD		MS		MSD		% Rec Limits	Max		Qual
			Spike Conc.	MS Result	MSD Result	% Rec	% Rec	RPD	RPD					
Aldicarb	ug/L	0.64U	10	7.9	9.3	79	93	80-120	16	20	M1			
Carbofuran	ug/L	0.32U	10	7.7	8.7	77	87	80-120	12	20	M1			
BDMC (S)	%					47	94	80-120			S0			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 441208

Analysis Method: EPA 547

QC Batch Method: EPA 547

Analysis Description: 547 HPLC Glyphosate

Associated Lab Samples: 10427352003

METHOD BLANK: 2394537

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Glyphosate	ug/L	ND	6.0	04/26/18 20:22	

LABORATORY CONTROL SAMPLE: 2394538

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Glyphosate	ug/L	50	50.3	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2394539 2394540

Parameter	Units	92380797002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	ND	50	50	51.6	48.4	103	97	80-120	7	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2394541 2394542

Parameter	Units	35385315001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	<4.2	50	50	52.2	52.2	104	104	80-120	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 438905 Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10427352003

METHOD BLANK: 2027992 Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methanol	ug/L	ND	5000	04/25/18 14:17	

LABORATORY CONTROL SAMPLE: 2027993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methanol	ug/L	50000	46800	94	79-111	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027994 2027995

Parameter	Units	2027994		2027995		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10428032001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Methanol	ug/L	ND	50000	50000	47100	51900	91	101	43-138	10	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 438205	Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol	Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10427352003	

METHOD BLANK: 2024704 Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylene glycol	mg/L	ND	5.0	04/23/18 14:09	

LABORATORY CONTROL SAMPLE: 2024705

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylene glycol	mg/L	25	29.3	117	55-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026734 2026735

Parameter	Units	50194690001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result						
Ethylene glycol	mg/L	ND	25	25	21.9	24.7	87	99	38-154	12	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

QC Batch: 20643 Analysis Method: EPA 8316
QC Batch Method: EPA 8316 Analysis Description: 8316 W GCSV Acrylamide
Associated Lab Samples: 10427352003

METHOD BLANK: 82388 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acrylamide	ug/L	ND	20.0	04/18/18 17:05	

LABORATORY CONTROL SAMPLE: 82389

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acrylamide	ug/L	1000	989	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 82390 82391

Parameter	Units	10427276001		82391		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					
Acrylamide	ug/L	ND	1000	1000	944	963	94	96	78-135	2 16

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 532437 Analysis Method: EPA 200.7
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
 Associated Lab Samples: 10427352001, 10427352002, 10427352003

METHOD BLANK: 2891672 Matrix: Water

Associated Lab Samples: 10427352001, 10427352002, 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/19/18 16:13	
Barium, Dissolved	ug/L	ND	10.0	04/19/18 16:13	
Copper, Dissolved	ug/L	ND	10.0	04/19/18 16:13	
Manganese, Dissolved	ug/L	ND	5.0	04/19/18 16:13	
Nickel, Dissolved	ug/L	ND	20.0	04/19/18 16:13	
Silver, Dissolved	ug/L	ND	10.0	04/19/18 16:13	
Tin, Dissolved	ug/L	ND	75.0	04/19/18 16:13	
Zinc, Dissolved	ug/L	ND	20.0	04/19/18 16:13	

LABORATORY CONTROL SAMPLE: 2891673

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21400	107	85-115	
Barium, Dissolved	ug/L	1000	1040	104	85-115	
Copper, Dissolved	ug/L	1000	1020	102	85-115	
Manganese, Dissolved	ug/L	1000	1040	104	85-115	
Nickel, Dissolved	ug/L	1000	1030	103	85-115	
Silver, Dissolved	ug/L	500	506	101	85-115	
Tin, Dissolved	ug/L	1000	1020	102	85-115	
Zinc, Dissolved	ug/L	1000	1040	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891674 2891675

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427032001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	21600	21800	108	109	70-130	1	30
Barium, Dissolved	ug/L	ND	1000	1000	1010	1020	100	101	70-130	1	30
Copper, Dissolved	ug/L	ND	1000	1000	1050	1050	105	105	70-130	1	30
Manganese, Dissolved	ug/L	8.5	1000	1000	1010	1020	100	101	70-130	1	30
Nickel, Dissolved	ug/L	ND	1000	1000	993	997	99	100	70-130	0	30
Silver, Dissolved	ug/L	ND	500	500	506	508	101	102	70-130	0	30
Tin, Dissolved	ug/L	ND	1000	1000	1030	1020	103	101	70-130	1	30
Zinc, Dissolved	ug/L	ND	1000	1000	1030	1030	102	102	70-130	0	30

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

MATRIX SPIKE SAMPLE: 2893024		10427135002	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Aluminum, Dissolved	ug/L	ND	20000	23000	115	70-130	
Barium, Dissolved	ug/L	22.2	1000	1080	106	70-130	
Copper, Dissolved	ug/L	ND	1000	1080	108	70-130	
Manganese, Dissolved	ug/L	118	1000	1170	105	70-130	
Nickel, Dissolved	ug/L	ND	1000	1010	100	70-130	
Silver, Dissolved	ug/L	ND	500	532	106	70-130	
Tin, Dissolved	ug/L	ND	1000	1030	103	70-130	
Zinc, Dissolved	ug/L	ND	1000	1010	100	70-130	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 532878 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
 Associated Lab Samples: 10427352001, 10427352002, 10427352003

METHOD BLANK: 2894019 Matrix: Water

Associated Lab Samples: 10427352001, 10427352002, 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	0.50	04/19/18 12:18	

LABORATORY CONTROL SAMPLE: 2894020

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	100	108	108	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2894021 2894022

Parameter	Units	10427405001		MS		MSD		% Rec		Limits		Max		Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	RPD	RPD			
Chromium	ug/L	0.85	100	100	100	111	121	111	120	70-130	8	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 533428 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
 Associated Lab Samples: 10427352001, 10427352002, 10427352003

METHOD BLANK: 2897737 Matrix: Water

Associated Lab Samples: 10427352001, 10427352002, 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Arsenic, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Beryllium, Dissolved	ug/L	ND	0.20	04/25/18 08:49	
Boron, Dissolved	ug/L	ND	5.0	04/25/18 08:49	
Cadmium, Dissolved	ug/L	ND	0.080	04/25/18 08:49	
Chromium, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Cobalt, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Lead, Dissolved	ug/L	ND	0.10	04/25/18 08:49	
Selenium, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Thallium, Dissolved	ug/L	ND	0.10	04/25/18 08:49	
Uranium-238, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Vanadium, Dissolved	ug/L	ND	1.0	04/25/18 08:49	

LABORATORY CONTROL SAMPLE: 2897738

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	99.4	99	85-115	
Arsenic, Dissolved	ug/L	100	99.4	99	85-115	
Beryllium, Dissolved	ug/L	100	107	107	85-115	
Boron, Dissolved	ug/L	100	104	104	85-115	
Cadmium, Dissolved	ug/L	100	99.0	99	85-115	
Chromium, Dissolved	ug/L	100	101	101	85-115	
Cobalt, Dissolved	ug/L	100	102	102	85-115	
Lead, Dissolved	ug/L	100	105	105	85-115	
Selenium, Dissolved	ug/L	100	103	103	85-115	
Thallium, Dissolved	ug/L	100	103	103	85-115	
Uranium-238, Dissolved	ug/L	100	101	101	85-115	
Vanadium, Dissolved	ug/L	100	99.6	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897739 2897740

Parameter	Units	10427867001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Spike Conc.						
Antimony, Dissolved	ug/L	0.0029 mg/L	100	110	108	107	105	70-130	2	20		
Arsenic, Dissolved	ug/L	ND	100	112	109	111	109	70-130	2	20		
Beryllium, Dissolved	ug/L	ND	100	107	104	107	104	70-130	3	20		
Boron, Dissolved	ug/L	32.5	100	137	133	104	101	70-130	2	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897739												2897740	
Parameter	Units	10427867001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual		
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD			
Cadmium, Dissolved	ug/L	ND	100	100	102	101	102	101	70-130	2	20		
Chromium, Dissolved	ug/L	ND	100	100	109	107	109	107	70-130	2	20		
Cobalt, Dissolved	ug/L	3.7	100	100	108	106	104	103	70-130	1	20		
Lead, Dissolved	ug/L	ND	100	100	105	103	105	103	70-130	3	20		
Selenium, Dissolved	ug/L	0.00058 mg/L	100	100	114	111	113	110	70-130	2	20		
Thallium, Dissolved	ug/L	ND	100	100	104	100	104	100	70-130	4	20		
Uranium-238, Dissolved	ug/L	10.3	100	100	118	116	108	106	70-130	2	20		
Vanadium, Dissolved	ug/L	ND	100	100	110	108	110	108	70-130	2	20		

MATRIX SPIKE SAMPLE: 2897741									
Parameter	Units	10427767003	Spike	MS	MS	% Rec	Qualifiers		
		Result	Conc.	Result	% Rec	Limits			
Antimony, Dissolved	ug/L	ND	100	105	105	70-130			
Arsenic, Dissolved	ug/L	ND	100	106	106	70-130			
Beryllium, Dissolved	ug/L	ND	100	115	115	70-130			
Boron, Dissolved	ug/L	11.5	100	124	113	70-130			
Cadmium, Dissolved	ug/L	ND	100	104	104	70-130			
Chromium, Dissolved	ug/L	ND	100	109	109	70-130			
Cobalt, Dissolved	ug/L	ND	100	110	110	70-130			
Lead, Dissolved	ug/L	ND	100	110	110	70-130			
Selenium, Dissolved	ug/L	ND	100	109	109	70-130			
Thallium, Dissolved	ug/L	ND	100	109	109	70-130			
Uranium-238, Dissolved	ug/L	ND	100	108	108	70-130			
Vanadium, Dissolved	ug/L	ND	100	107	107	70-130			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

QC Batch: 532754 Analysis Method: EPA 524.2
QC Batch Method: EPA 524.2 Analysis Description: 524.2 MSV
Associated Lab Samples: 10427352003

METHOD BLANK: 2893227 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	ND	4.0	04/17/18 11:21	
1,2-Dichloroethane-d4 (S)	%.	102	75-125	04/17/18 11:21	
4-Bromofluorobenzene (S)	%.	97	75-125	04/17/18 11:21	
Toluene-d8 (S)	%.	96	75-125	04/17/18 11:21	

LABORATORY CONTROL SAMPLE: 2893228

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	80	77.9	97	70-130	
1,2-Dichloroethane-d4 (S)	%.			103	75-125	
4-Bromofluorobenzene (S)	%.			95	75-125	
Toluene-d8 (S)	%.			97	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897401 2897402

Parameter	Units	10427958001		2897402		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Total Trihalomethanes (Calc.)	ug/L	ND	80	80	73.3	82.0	92	103	70-130	11	20
1,2-Dichloroethane-d4 (S)	%.						104	104	75-125		
4-Bromofluorobenzene (S)	%.						97	96	75-125		
Toluene-d8 (S)	%.						96	95	75-125		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 441140 Analysis Method: EPA 548.1
 QC Batch Method: EPA 548.1 Analysis Description: 548 GCS Endothall
 Associated Lab Samples: 10427352003

METHOD BLANK: 2394100 Matrix: Water
 Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Endothall	ug/L	ND	9.0	04/19/18 21:45	

LABORATORY CONTROL SAMPLE: 2394101

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	50	45.7	91	64-137	

LABORATORY CONTROL SAMPLE: 2394102

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	9	7.4J	82	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2395124 2395125

Parameter	Units	35386626001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endothall	ug/L	4.3U	50	50	49.5	48.1	99	96	64-137	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2395126 2395127

Parameter	Units	35386626002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endothall	ug/L	4.3U	50	50	20.6	22.1	41	44	64-137	7	30 M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

QC Batch: 440817 Analysis Method: EPA 549.2
QC Batch Method: EPA 549.2 Analysis Description: 549 HPLC Paraquat Diquat
Associated Lab Samples: 10427352003

METHOD BLANK: 2392537 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diquat	ug/L	ND	0.40	04/18/18 19:40	
Paraquat	ug/L	ND	0.40	04/18/18 19:40	

LABORATORY CONTROL SAMPLE: 2392538

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	2	2.1	103	70-130	
Paraquat	ug/L	2	1.7	85	70-130	

LABORATORY CONTROL SAMPLE: 2392539

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	.4	0.58	144	50-150	
Paraquat	ug/L	.4	ND	75	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2393245 2393246

Parameter	Units	35386136002 Result	MS Spike Conc.	MSD Spike Conc.	2393245		2393246		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Diquat	ug/L	0.30U	2	2	ND	ND	0	0	70-130		30	M1
Paraquat	ug/L	0.30U	2	2	ND	ND	0	0	70-130		30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2393247 2393248

Parameter	Units	35386336001 Result	MS Spike Conc.	MSD Spike Conc.	2393247		2393248		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Diquat	ug/L	0.30U	2	2	1.9	2.1	96	103	70-130	7	30	
Paraquat	ug/L	0.30U	2	2	1.9	1.9	95	94	70-130	1	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

QC Batch: 441812 Analysis Method: EPA 552.3
QC Batch Method: EPA 552.3 Analysis Description: 5523 Haloacetic Acids
Associated Lab Samples: 10427352003

METHOD BLANK: 2397907 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromoacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Dichloroacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Haloacetic Acids (Total)	ug/L	ND	1.0	04/25/18 15:02	
Monobromoacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Monochloroacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Trichloroacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
2,3-Dibromopropanoic Acid (S)	%	115	70-130	04/25/18 15:02	

LABORATORY CONTROL SAMPLE: 2397908

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromoacetic Acid	ug/L	10	12.4	124	70-130	
Dichloroacetic Acid	ug/L	10	10.5	105	70-130	
Haloacetic Acids (Total)	ug/L	50	55.7	111	70-130	
Monobromoacetic Acid	ug/L	10	10.8	108	70-130	
Monochloroacetic Acid	ug/L	10	10.9	109	70-130	
Trichloroacetic Acid	ug/L	10	11.1	111	70-130	
2,3-Dibromopropanoic Acid (S)	%			123	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398523 2398524

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		35386593001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Dibromoacetic Acid	ug/L	0.75J	10	10	13.2	12.5	125	117	70-130	6	30	
Dichloroacetic Acid	ug/L	28.5	10	10	40.3	37.2	119	87	70-130	8	30	
Haloacetic Acids (Total)	ug/L	33.1	50	50	93.8	88.0	121	110	70-130	6	30	
Monobromoacetic Acid	ug/L	0.29U	10	10	11.0	11.5	110	115	70-130	5	30	
Monochloroacetic Acid	ug/L	0.90U	10	10	13.7	12.1	137	121	70-130	12	30	M1
Trichloroacetic Acid	ug/L	3.9	10	10	15.6	14.7	117	109	70-130	5	30	
2,3-Dibromopropanoic Acid (S)	%						136	114	70-130		30	S0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398525 2398526

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		35386593002 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Dibromoacetic Acid	ug/L	0.76J	10	10	12.5	12.9	117	122	70-130	4	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Parameter	Units	2398525		2398526		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Dichloroacetic Acid	ug/L	28.5	10	10	36.8	36.9	83	84	70-130	0	30	
Haloacetic Acids (Total)	ug/L	33.2	50	50	85.7	87.0	105	108	70-130	2	30	
Monobromoacetic Acid	ug/L	0.29U	10	10	10.9	10.5	109	105	70-130	4	30	
Monochloroacetic Acid	ug/L	0.90U	10	10	11.5	12.0	115	120	70-130	4	30	
Trichloroacetic Acid	ug/L	3.9	10	10	14.0	14.7	101	108	70-130	5	30	
2,3-Dibromopropanoic Acid (S)	%						110	116	70-130		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 534073	Analysis Method: EPA 8011
QC Batch Method: EPA 8011	Analysis Description: GCS 8011 EDB DBCP
Associated Lab Samples: 10427352003	

METHOD BLANK: 2901365 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	ND	0.010	04/24/18 22:05	
1,2-Dibromoethane (EDB)	ug/L	ND	0.010	04/24/18 22:05	
4-Bromofluorobenzene (S)	%	102	30-150	04/24/18 22:05	

LABORATORY CONTROL SAMPLE & LCSD: 2901366

Parameter	Units	2901367								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	.11	0.10	0.097	95	89	60-140	7	20	
1,2-Dibromoethane (EDB)	ug/L	.11	0.11	0.10	100	94	60-140	6	20	
4-Bromofluorobenzene (S)	%				107	106	30-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

QC Batch: 532721 Analysis Method: EPA 8081B
QC Batch Method: EPA Mod. 3510C Analysis Description: 8081B GCS Pesticides
Associated Lab Samples: 10427352003

METHOD BLANK: 2893117 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/19/18 21:40	
4,4'-DDE	ug/L	ND	0.10	04/19/18 21:40	
4,4'-DDT	ug/L	ND	0.10	04/19/18 21:40	
Aldrin	ug/L	ND	0.050	04/19/18 21:40	
alpha-BHC	ug/L	ND	0.050	04/19/18 21:40	
alpha-Chlordane	ug/L	ND	0.050	04/19/18 21:40	
beta-BHC	ug/L	ND	0.050	04/19/18 21:40	
Chlordane (Technical)	ug/L	ND	0.50	04/19/18 21:40	
delta-BHC	ug/L	ND	0.050	04/19/18 21:40	
Dieldrin	ug/L	ND	0.10	04/19/18 21:40	
Endosulfan I	ug/L	ND	0.050	04/19/18 21:40	
Endosulfan II	ug/L	ND	0.10	04/19/18 21:40	
Endosulfan sulfate	ug/L	ND	0.10	04/19/18 21:40	
Endrin	ug/L	ND	0.10	04/19/18 21:40	
Endrin aldehyde	ug/L	ND	0.10	04/19/18 21:40	
Endrin ketone	ug/L	ND	0.10	04/19/18 21:40	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/19/18 21:40	
gamma-Chlordane	ug/L	ND	0.050	04/19/18 21:40	
Heptachlor	ug/L	ND	0.050	04/19/18 21:40	
Heptachlor epoxide	ug/L	ND	0.050	04/19/18 21:40	
Methoxychlor	ug/L	ND	0.50	04/19/18 21:40	
Toxaphene	ug/L	ND	1.5	04/19/18 21:40	
Decachlorobiphenyl (S)	%	79	30-143	04/19/18 21:40	
Tetrachloro-m-xylene (S)	%	91	62-125	04/19/18 21:40	

LABORATORY CONTROL SAMPLE & LCSD: 2893118

Parameter	Units	2893119							RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits				
4,4'-DDD	ug/L	1	0.99	0.96	99	96	67-125	3	20		
4,4'-DDE	ug/L	1	0.97	0.93	97	93	68-125	4	20		
4,4'-DDT	ug/L	1	0.92	0.89	92	89	66-125	3	20		
Aldrin	ug/L	.5	0.44	0.39	87	79	46-125	10	20		
alpha-BHC	ug/L	.5	0.49	0.48	98	95	66-125	3	20		
alpha-Chlordane	ug/L	.5	0.48	0.46	96	92	72-125	4	20		
beta-BHC	ug/L	.5	0.49	0.47	97	94	72-125	3	20		
delta-BHC	ug/L	.5	0.40	0.39	81	78	37-141	4	20		
Dieldrin	ug/L	1	1.1	1.0	106	103	71-125	3	20		
Endosulfan I	ug/L	.5	0.47	0.45	94	91	69-125	3	20		
Endosulfan II	ug/L	1	1.0	0.99	102	99	73-125	3	20		
Endosulfan sulfate	ug/L	1	0.90	0.88	90	88	63-127	2	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Parameter	Units	2893118		2893119			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Endrin	ug/L	1	0.97	0.95	97	95	72-125	2	20	
Endrin aldehyde	ug/L	1	0.97	0.95	97	95	70-125	2	20	
Endrin ketone	ug/L	1	1.0	1.0	103	101	72-127	2	20	
gamma-BHC (Lindane)	ug/L	.5	0.49	0.48	98	95	69-125	3	20	
gamma-Chlordane	ug/L	.5	0.43	0.41	86	83	64-125	4	20	
Heptachlor	ug/L	.5	0.48	0.45	96	90	54-125	7	20	
Heptachlor epoxide	ug/L	.5	0.49	0.47	97	94	72-125	3	20	
Methoxychlor	ug/L	5	4.7	4.6	94	92	67-127	2	20	
Decachlorobiphenyl (S)	%.				82	74	30-143			
Tetrachloro-m-xylene (S)	%.				95	91	62-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 532722

Analysis Method: EPA 8082A

QC Batch Method: EPA Mod. 3510C

Analysis Description: 8082A GCS PCB

Associated Lab Samples: 10427352003

METHOD BLANK: 2893120

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/18/18 13:15	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/18/18 13:15	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/18/18 13:15	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/18/18 13:15	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/18/18 13:15	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/18/18 13:15	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/18/18 13:15	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/18/18 13:15	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/18/18 13:15	
Decachlorobiphenyl (S)	%	72	30-125	04/18/18 13:15	
Tetrachloro-m-xylene (S)	%	63	30-125	04/18/18 13:15	

LABORATORY CONTROL SAMPLE & LCSD: 2893121

2893122

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.6	1.6	78	79	47-125	1	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.7	1.7	83	85	54-125	3	20	
Decachlorobiphenyl (S)	%				82	83	30-125			
Tetrachloro-m-xylene (S)	%				66	67	30-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 532581

Analysis Method: EPA 8270D

QC Batch Method: EPA 3520

Analysis Description: 8270D Water MSSV

Associated Lab Samples: 10427352003

METHOD BLANK: 2892635

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/20/18 13:29	
2,4-Dichlorophenol	ug/L	ND	10.0	04/20/18 13:29	
2,4-Dimethylphenol	ug/L	ND	50.0	04/20/18 13:29	
2,4-Dinitrophenol	ug/L	ND	10.0	04/20/18 13:29	
2-Chlorophenol	ug/L	ND	10.0	04/20/18 13:29	
2-Methylnaphthalene	ug/L	ND	10.0	04/20/18 13:29	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/20/18 13:29	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/20/18 13:29	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/20/18 13:29	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/20/18 13:29	
Acenaphthene	ug/L	ND	10.0	04/20/18 13:29	
Anthracene	ug/L	ND	10.0	04/20/18 13:29	
Benzo(a)pyrene	ug/L	ND	10.0	04/20/18 13:29	
Benzoic acid	ug/L	ND	50.0	04/20/18 13:29	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/20/18 13:29	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/20/18 13:29	
Butylbenzylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Di-n-butylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Di-n-octylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Diethylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Dimethylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Fluoranthene	ug/L	ND	10.0	04/20/18 13:29	
Fluorene	ug/L	ND	10.0	04/20/18 13:29	
Hexachlorobenzene	ug/L	ND	10.0	04/20/18 13:29	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/20/18 13:29	
Hexachloroethane	ug/L	ND	10.0	04/20/18 13:29	
Isophorone	ug/L	ND	10.0	04/20/18 13:29	
N-Nitrosodiphenylamine	ug/L	ND	10.0	04/20/18 13:29	
Pentachlorophenol	ug/L	ND	20.0	04/20/18 13:29	
Phenanthrene	ug/L	ND	10.0	04/20/18 13:29	
Phenol	ug/L	ND	10.0	04/20/18 13:29	
Pyrene	ug/L	ND	10.0	04/20/18 13:29	
2,4,6-Tribromophenol (S)	%	86	65-125	04/20/18 13:29	
2-Fluorobiphenyl (S)	%	72	56-125	04/20/18 13:29	
2-Fluorophenol (S)	%	71	55-125	04/20/18 13:29	
Nitrobenzene-d5 (S)	%	71	60-125	04/20/18 13:29	
p-Terphenyl-d14 (S)	%	92	58-125	04/20/18 13:29	
Phenol-d6 (S)	%	72	58-125	04/20/18 13:29	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

LABORATORY CONTROL SAMPLE & LCSD: 2892636			2892637								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
2,4,6-Trichlorophenol	ug/L	50	45.9	45.1	92	90	74-125	2	20		
2,4-Dichlorophenol	ug/L	50	46.6	43.2	93	86	68-125	8	20		
2,4-Dimethylphenol	ug/L	50	40.9J	35.4J	82	71	33-125		20		
2,4-Dinitrophenol	ug/L	50	41.2	42.6	82	85	30-127	3	20		
2-Chlorophenol	ug/L	50	44.4	40.1	89	80	61-125	10	20		
2-Methylnaphthalene	ug/L	50	44.6	41.2	89	82	67-125	8	20		
2-Methylphenol(o-Cresol)	ug/L	50	43.3	39.6	87	79	63-125	9	20		
3&4-Methylphenol(m&p Cresol)	ug/L	50	44.7	40.9	89	82	67-125	9	20		
3,3'-Dichlorobenzidine	ug/L	50	54.7	50.0	109	100	60-125	9	20		
4-Bromophenylphenyl ether	ug/L	50	45.6	45.8	91	92	75-125	0	20		
Acenaphthene	ug/L	50	43.7	43.7	87	87	74-125	0	20		
Anthracene	ug/L	50	44.4	44.9	89	90	75-125	1	20		
Benzo(a)pyrene	ug/L	50	46.8	47.3	94	95	75-125	1	20		
Benzoic acid	ug/L	50	19.8J	30.9J	40	62	30-125		20		
bis(2-Chloroethyl) ether	ug/L	50	40.2	36.8	80	74	55-125	9	20		
bis(2-Ethylhexyl)phthalate	ug/L	50	55.5	52.7	111	105	72-129	5	20		
Butylbenzylphthalate	ug/L	50	52.7	51.2	105	102	69-127	3	20		
Di-n-butylphthalate	ug/L	50	49.3	49.3	99	99	75-125	0	20		
Di-n-octylphthalate	ug/L	50	56.2	54.2	112	108	69-131	4	20		
Diethylphthalate	ug/L	50	47.4	47.7	95	95	75-125	1	20		
Dimethylphthalate	ug/L	50	47.5	47.6	95	95	75-125	0	20		
Fluoranthene	ug/L	50	45.8	46.9	92	94	75-125	2	20		
Fluorene	ug/L	50	45.1	45.6	90	91	75-125	1	20		
Hexachlorobenzene	ug/L	50	46.9	47.3	94	95	74-125	1	20		
Hexachlorocyclopentadiene	ug/L	50	23.4J	19J	47	38	30-125		20		
Hexachloroethane	ug/L	50	38.5	35.5	77	71	30-125	8	20		
Isophorone	ug/L	50	44.5	40.9	89	82	72-125	8	20		
N-Nitrosodiphenylamine	ug/L	50	46.1	46.3	92	93	75-125	0	20		
Pentachlorophenol	ug/L	50	40.0	40.3	80	81	52-125	1	20		
Phenanthrene	ug/L	50	44.0	45.0	88	90	75-125	2	20		
Phenol	ug/L	50	41.9	38.1	84	76	59-125	9	20		
Pyrene	ug/L	50	49.5	49.1	99	98	75-125	1	20		
2,4,6-Tribromophenol (S)	%				94	93	65-125				
2-Fluorobiphenyl (S)	%				80	77	56-125				
2-Fluorophenol (S)	%				79	72	55-125				
Nitrobenzene-d5 (S)	%				79	72	60-125				
p-Terphenyl-d14 (S)	%				97	95	58-125				
Phenol-d6 (S)	%				79	72	58-125				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

QC Batch: 533322 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10427352001, 10427352002

METHOD BLANK: 2897016 Matrix: Water
Associated Lab Samples: 10427352001, 10427352002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4-Dichlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4-Dimethylphenol	ug/L	ND	50.0	04/23/18 13:12	
2,4-Dinitrophenol	ug/L	ND	10.0	04/23/18 13:12	
2-Chlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2-Methylnaphthalene	ug/L	ND	10.0	04/23/18 13:12	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/23/18 13:12	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/23/18 13:12	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/23/18 13:12	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/23/18 13:12	
Acenaphthene	ug/L	ND	10.0	04/23/18 13:12	
Anthracene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(a)pyrene	ug/L	ND	10.0	04/23/18 13:12	
Benzoic acid	ug/L	ND	50.0	04/23/18 13:12	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/23/18 13:12	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/23/18 13:12	
Butylbenzylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Di-n-butylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Di-n-octylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Diethylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Dimethylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Fluoranthene	ug/L	ND	10.0	04/23/18 13:12	
Fluorene	ug/L	ND	10.0	04/23/18 13:12	
Hexachlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/23/18 13:12	
Hexachloroethane	ug/L	ND	10.0	04/23/18 13:12	
Isophorone	ug/L	ND	10.0	04/23/18 13:12	
N-Nitrosodiphenylamine	ug/L	ND	10.0	04/23/18 13:12	
Pentachlorophenol	ug/L	ND	20.0	04/23/18 13:12	
Phenanthrene	ug/L	ND	10.0	04/23/18 13:12	
Phenol	ug/L	ND	10.0	04/23/18 13:12	
Pyrene	ug/L	ND	10.0	04/23/18 13:12	
2,4,6-Tribromophenol (S)	%	100	65-125	04/23/18 13:12	
2-Fluorobiphenyl (S)	%	85	56-125	04/23/18 13:12	
2-Fluorophenol (S)	%	90	55-125	04/23/18 13:12	
Nitrobenzene-d5 (S)	%	87	60-125	04/23/18 13:12	
p-Terphenyl-d14 (S)	%	105	58-125	04/23/18 13:12	
Phenol-d6 (S)	%	91	58-125	04/23/18 13:12	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

LABORATORY CONTROL SAMPLE & LCSD: 2897017			2897018							
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	47.6	46.1	95	92	74-125	3	20	
2,4-Dichlorophenol	ug/L	50	46.2	45.8	92	92	68-125	1	20	
2,4-Dimethylphenol	ug/L	50	36.7J	33.2J	73	66	33-125		20	
2,4-Dinitrophenol	ug/L	50	44.2	49.6	88	99	30-127	12	20	
2-Chlorophenol	ug/L	50	42.5	40.8	85	82	61-125	4	20	
2-Methylnaphthalene	ug/L	50	45.8	43.0	92	86	67-125	6	20	
2-Methylphenol(o-Cresol)	ug/L	50	43.3	40.4	87	81	63-125	7	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	43.9	42.1	88	84	67-125	4	20	
3,3'-Dichlorobenzidine	ug/L	50	55.6	52.5	111	105	60-125	6	20	
4-Bromophenylphenyl ether	ug/L	50	48.0	46.6	96	93	75-125	3	20	
Acenaphthene	ug/L	50	47.1	45.3	94	91	74-125	4	20	
Anthracene	ug/L	50	48.4	46.0	97	92	75-125	5	20	
Benzo(a)pyrene	ug/L	50	48.6	47.8	97	96	75-125	2	20	
Benzoic acid	ug/L	50	28.6J	32.3J	57	65	30-125		20	
bis(2-Chloroethyl) ether	ug/L	50	39.9	37.8	80	76	55-125	5	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	55.2	54.2	110	108	72-129	2	20	
Butylbenzylphthalate	ug/L	50	54.4	51.4	109	103	69-127	6	20	
Di-n-butylphthalate	ug/L	50	53.2	50.5	106	101	75-125	5	20	
Di-n-octylphthalate	ug/L	50	56.1	54.8	112	110	69-131	2	20	
Diethylphthalate	ug/L	50	50.4	49.0	101	98	75-125	3	20	
Dimethylphthalate	ug/L	50	50.6	49.1	101	98	75-125	3	20	
Fluoranthene	ug/L	50	50.0	48.2	100	96	75-125	4	20	
Fluorene	ug/L	50	47.8	46.5	96	93	75-125	3	20	
Hexachlorobenzene	ug/L	50	49.3	47.2	99	94	74-125	4	20	
Hexachlorocyclopentadiene	ug/L	50	19.6J	ND	39	33	30-125		20	
Hexachloroethane	ug/L	50	42.8	40.0	86	80	30-125	7	20	
Isophorone	ug/L	50	45.7	42.8	91	86	72-125	7	20	
N-Nitrosodiphenylamine	ug/L	50	49.5	47.5	99	95	75-125	4	20	
Pentachlorophenol	ug/L	50	42.8	40.6	86	81	52-125	5	20	
Phenanthrene	ug/L	50	47.3	45.6	95	91	75-125	4	20	
Phenol	ug/L	50	41.4	40.1	83	80	59-125	3	20	
Pyrene	ug/L	50	50.4	49.0	101	98	75-125	3	20	
2,4,6-Tribromophenol (S)	%				95	91	65-125			
2-Fluorobiphenyl (S)	%				80	74	56-125			
2-Fluorophenol (S)	%				76	72	55-125			
Nitrobenzene-d5 (S)	%				77	72	60-125			
p-Terphenyl-d14 (S)	%				95	92	58-125			
Phenol-d6 (S)	%				76	73	58-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch:	20633	Analysis Method:	EPA 8315A
QC Batch Method:	EPA 8315A	Analysis Description:	8315 GCSV Aldehydes
Associated Lab Samples:	10427352003		

METHOD BLANK: 82358 Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Formaldehyde	ug/L	ND	100	04/19/18 15:47	

LABORATORY CONTROL SAMPLE: 82359

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	400	380	95	44-176	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 82485 82486

Parameter	Units	10427276001		82486		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Formaldehyde	ug/L	ND	400	400	527	399	130	98	35-167	28	20 H3,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 532263

Analysis Method: Hach 10360 Rev 1.1

QC Batch Method: Hach 10360

Analysis Description: Hach 10360 Rev 1.1, BOD

Associated Lab Samples: 10427352003

METHOD BLANK: 2890529

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	04/18/18 15:52	

LABORATORY CONTROL SAMPLE: 2890531

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	205	104	85-115	

SAMPLE DUPLICATE: 2890532

Parameter	Units	10427086001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	120 U	ND		20	B2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 534191	Analysis Method: EPA 1664A OG
QC Batch Method: EPA 1664A OG	Analysis Description: 1664 HEM, Oil and Grease
Associated Lab Samples: 10427352003	

METHOD BLANK: 2902447 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	04/25/18 09:37	

LABORATORY CONTROL SAMPLE: 2902448

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	37.9	95	78-114	

MATRIX SPIKE SAMPLE: 2902449

Parameter	Units	10427228001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	<1.1	40	27.7	67	78-114	M1

SAMPLE DUPLICATE: 2902450

Parameter	Units	10428140001 Result	Dup Result	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	4.8	3.6J		18	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 532382

Analysis Method: EPA 180.1

QC Batch Method: EPA 180.1

Analysis Description: 180.1 Turbidity

Associated Lab Samples: 10427352003

METHOD BLANK: 2891524

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	04/14/18 14:46	

LABORATORY CONTROL SAMPLE: 2891525

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.4	102	90-110	

SAMPLE DUPLICATE: 2891526

Parameter	Units	10427352003 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	260	259	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 533468	Analysis Method: SM 2540D
QC Batch Method: SM 2540D	Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10427352003	

METHOD BLANK: 2897880 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	04/20/18 11:12	

LABORATORY CONTROL SAMPLE: 2897881

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	88.0	88	80-120	

SAMPLE DUPLICATE: 2897882

Parameter	Units	10427360001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	419	381	10	10	

SAMPLE DUPLICATE: 2897883

Parameter	Units	10427457001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	212	206	3	10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 442752

Analysis Method: SM 4500-CIO2

QC Batch Method: SM 4500-CIO2

Analysis Description: 4500CIO2 Chlorine Dioxide

Associated Lab Samples: 10427352003

METHOD BLANK: 2402049

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorine Dioxide	mg/L	ND	0.10	04/25/18 13:30	H6

LABORATORY CONTROL SAMPLE: 2402050

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorine Dioxide	mg/L	2.5	2.3	95	90-110	H6

SAMPLE DUPLICATE: 2402051

Parameter	Units	10427276001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	1.6	1.6	1	20	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 534050 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 10427352003

LABORATORY CONTROL SAMPLE: 2901275

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	99	98-102	H6

SAMPLE DUPLICATE: 2901276

Parameter	Units	10427998001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.6	6.6	0	3	H6

SAMPLE DUPLICATE: 2901277

Parameter	Units	10428020002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	12.0	12.0	0	3	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

QC Batch: 532702 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10427352003

METHOD BLANK: 2893078 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	04/17/18 09:44	
Fluoride	mg/L	ND	0.050	04/17/18 09:44	

LABORATORY CONTROL SAMPLE: 2893079

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.3	98	90-110	
Fluoride	mg/L	1	1.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2893080 2893081

Parameter	Units	10427348003 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Chloride	mg/L	4.3	12.5	12.5	15.8	16.1	92	94	90-110	2	20	
Fluoride	mg/L	0.32	1	1	1.1	1.1	75	77	90-110	2	20 M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2893082 2893083

Parameter	Units	10427276001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Chloride	mg/L	56.5	12.5	12.5	58.2	59.0	13	20	90-110	1	20 M1	
Fluoride	mg/L	0.14	1	1	0.99	1.0	86	87	90-110	1	20 M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 441891	Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1	Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10427352003	

METHOD BLANK: 2398224 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorite	ug/L	ND	5.0	04/20/18 16:36	

LABORATORY CONTROL SAMPLE: 2398225

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	40	38.9	97	85-115	

MATRIX SPIKE SAMPLE: 2398227

Parameter	Units	35387332001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	128U	2000	1910	96	75-125	

SAMPLE DUPLICATE: 2398226

Parameter	Units	35387332001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorite	ug/L	128U	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 442024	Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1	Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10427352003	

METHOD BLANK: 2399130 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromate	ug/L	ND	1.0	04/22/18 13:44	

LABORATORY CONTROL SAMPLE: 2399131

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	8	8.1	101	85-115	

MATRIX SPIKE SAMPLE: 2399133

Parameter	Units	10427644001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	ND	80	77.2	97	75-125	

SAMPLE DUPLICATE: 2399132

Parameter	Units	10427644001 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromate	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 532346

Analysis Method: SM 3500-Cr B Modified

QC Batch Method: SM 3500-Cr B Modified

Analysis Description: Chromium, Hexavalent by 3500

Associated Lab Samples: 10427352003

METHOD BLANK: 2891044

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	04/13/18 16:43	FS

LABORATORY CONTROL SAMPLE: 2891045

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.20	98	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891046 2891047

Parameter	Units	10427276001		2891046		2891047		% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Chromium, Hexavalent	mg/L	0.011	.2	.2	0.012	0.012	1	1	85-115	0	20	FS,H1, M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

QC Batch: 141155 Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 Analysis Description: 350.1 Ammonia Undistilled
Associated Lab Samples: 10427352003

METHOD BLANK: 558427 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	04/24/18 09:49	

LABORATORY CONTROL SAMPLE: 558428

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	2	2.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 558429 558430

Parameter	Units	12107084001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Nitrogen, Ammonia	mg/L	ND	2	2.0	2	2.0	98	100	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 558431 558432

Parameter	Units	12107225001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Nitrogen, Ammonia	mg/L	ND	2	2.0	2	2.0	99	102	90-110	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

QC Batch: 532358 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 10427352003

METHOD BLANK: 2891118 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	04/13/18 17:20	FS
Nitrite as N	mg/L	ND	0.020	04/13/18 17:20	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	04/13/18 17:20	FS

LABORATORY CONTROL SAMPLE: 2891119

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	1.0	102	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	1.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891120 2891121

Parameter	Units	10427206001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Nitrite as N	mg/L	0.020 U	1	0.97	1.0	97	101	90-110	4	20		
Nitrogen, NO2 plus NO3	mg/L	4.5	5	9.9	9.7	109	105	90-110	2	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891122 2891123

Parameter	Units	10427206006 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Nitrite as N	mg/L	0.020 U	1	0.97	1.0	96	102	90-110	6	20		
Nitrogen, NO2 plus NO3	mg/L	30.2	20	49.2	50.0	95	99	90-110	2	20 E		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch:	21104	Analysis Method:	EPA 9016
QC Batch Method:	EPA 9016	Analysis Description:	9016 Free Cyanide
Associated Lab Samples:	10427352003		

METHOD BLANK: 84163 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/24/18 17:31	

LABORATORY CONTROL SAMPLE: 84164

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	148	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 84165 84166

Parameter	Units	10427352003		MS		MSD		% Rec		Limits	RPD	Max RPD	Qual
		Result	ND	Spike Conc.	MS Conc.	Spike Conc.	MS Result	MSD Result	% Rec				
Cyanide, Free	ug/L	ND	ND	150	150	142	143	95	95	80-120	1	11	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 533717 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10427352003

METHOD BLANK: 2899085 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/23/18 12:02	

LABORATORY CONTROL SAMPLE: 2899086

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	246	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2899087 2899088

Parameter	Units	10427113002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	ug/L	ND	250	250	226	235	88	91	80-120	4	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2899089 2899090

Parameter	Units	10427114001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	ug/L	10.5	250	250	242	240	92	92	80-120	1	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

QC Batch: 534444 Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10427352003

METHOD BLANK: 2903593 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	04/27/18 12:18	

LABORATORY CONTROL SAMPLE: 2903594

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	1.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903595 2903596

Parameter	Units	10428297001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Phosphorus	mg/L	0.068	1	1	1.0	1.1	98	101	80-120	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903597 2903598

Parameter	Units	10428298001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Phosphorus	mg/L	0.098	1	1	1.1	1.1	99	100	80-120	1	30	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Sample: TS-SB-08 **Lab ID: 10427352003** Collected: 04/13/18 15:20 Received: 04/13/18 16:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	13.3 ± 9.42 (15.4) C:NA T:NA	pCi/L	05/02/18 18:41	12587-46-1	
Gross Beta	EPA 900.0	98.0 ± 19.5 (9.43) C:NA T:NA	pCi/L	05/02/18 18:41	12587-47-2	
Radium-226	EPA 903.1	0.119 ± 0.403 (0.779) C:NA T:91%	pCi/L	05/01/18 19:18	13982-63-3	
Radium-228	EPA 904.0	0.991 ± 0.456 (0.764) C:82% T:72%	pCi/L	05/03/18 11:04	15262-20-1	
Total Radium	Total Radium Calculation	1.11 ± 0.859 (1.54)	pCi/L	05/07/18 12:58	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 295481

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 10427352003

METHOD BLANK: 1446558

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.261 ± 0.405 (0.702) C:NA T:87%	pCi/L	05/01/18 18:48	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 295494

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 10427352003

METHOD BLANK: 1446590

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.378 ± 0.342 (0.697) C:82% T:92%	pCi/L	05/03/18 11:03	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 296415

Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0

Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 10427352003

METHOD BLANK: 1451259

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.056 ± 0.549 (1.49) C:NA T:NA	pCi/L	05/03/18 08:27	
Gross Beta	0.198 ± 0.729 (1.74) C:NA T:NA	pCi/L	05/03/18 08:27	

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-O Pace Analytical Services - Ormond Beach

PASI-PA Pace Analytical Services - Greensburg

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10427352

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 532999

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

BATCH QUALIFIERS

Batch: 533100

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 533817

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 533882

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 534191

[BE] Batch extracted by solid phase extraction (SPE).

Batch: 534336

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

- 1M Sample pH adjusted using 6mL 6N HCl.
- 2M Sample was yellow in color. Emulsion was also present during extraction.
- B2 Oxygen usage is less than 2.0 for all dilutions set. The reported value is an estimated less than value and is calculated for the dilution using the most amount of sample.
- D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
- E Analyte concentration exceeded the calibration range. The reported result is estimated.
- FS The sample was filtered in the laboratory prior to analysis.
- H1 Analysis conducted outside the recognized method holding time.
- H3 Sample was received or analysis requested beyond the recognized method holding time.
- H6 Analysis initiated outside of the 15 minute EPA required holding time.
- IO The internal standard response was outside the laboratory acceptance limits confirmed by reanalysis. The results reported are from the most QC compliant analysis.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- R1 RPD value was outside control limits.
- S0 Surrogate recovery outside laboratory control limits.
- S3 Surrogate recovery exceeded laboratory control limits. Analyte presence below reporting limits in associated samples.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427352003	TS-SB-08				
10427352003	TS-SB-08	EPA 531.1	444328		
10427352003	TS-SB-08	EPA 547	441208		
10427352003	TS-SB-08	EPA 549.2	440817	EPA 549.2	441186
10427352003	TS-SB-08	EPA 552.3	441812	EPA 552.3	442081
10427352003	TS-SB-08	EPA 8011	534073	EPA 8011	534336
10427352003	TS-SB-08	EPA 8015 Alcohol-Glycol	438905		
10427352003	TS-SB-08	EPA 8015 Alcohol-Glycol	438205		
10427352003	TS-SB-08	EPA Mod. 3510C	532721	EPA 8081B	533100
10427352003	TS-SB-08	EPA Mod. 3510C	532722	EPA 8082A	532999
10427352003	TS-SB-08	EPA 8315A	20633	EPA 8315A	20789
10427352003	TS-SB-08	EPA 8316	20643		
10427352001	TS-SB-05	EPA 200.7	532437	EPA 200.7	532779
10427352002	TS-SB-07	EPA 200.7	532437	EPA 200.7	532779
10427352003	TS-SB-08	EPA 200.7	532437	EPA 200.7	532779
10427352001	TS-SB-05	EPA 200.8	532878	EPA 200.8	533104
10427352002	TS-SB-07	EPA 200.8	532878	EPA 200.8	533104
10427352003	TS-SB-08	EPA 200.8	532878	EPA 200.8	533104
10427352001	TS-SB-05	EPA 200.8	533428	EPA 200.8	533889
10427352002	TS-SB-07	EPA 200.8	533428	EPA 200.8	533889
10427352003	TS-SB-08	EPA 200.8	533428	EPA 200.8	533889
10427352001	TS-SB-05	EPA 245.1	533449	EPA 245.1	533882
10427352002	TS-SB-07	EPA 245.1	533449	EPA 245.1	533882
10427352003	TS-SB-08	EPA 245.1	533449	EPA 245.1	533882
10427352003	TS-SB-08	EPA 548.1	441140	EPA 548.1	441552
10427352001	TS-SB-05	EPA 3520	533322	EPA 8270D	533817
10427352002	TS-SB-07	EPA 3520	533322	EPA 8270D	533817
10427352003	TS-SB-08	EPA 3520	532581	EPA 8270D	532989
10427352003	TS-SB-08	EPA 524.2	532754		
10427352003	TS-SB-08				
10427352003	TS-SB-08	EPA 900.0	296415		
10427352003	TS-SB-08	EPA 903.1	295481		
10427352003	TS-SB-08	EPA 904.0	295494		
10427352003	TS-SB-08	Total Radium Calculation	297265		
10427352003	TS-SB-08	Hach 10360	532263	Hach 10360 Rev 1.1	532509
10427352003	TS-SB-08	EPA 1664A OG	534191		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427352003	TS-SB-08	EPA 180.1	532382		
10427352003	TS-SB-08	SM 2540D	533468		
10427352003	TS-SB-08	SM 4500-CIO2	442752		
10427352003	TS-SB-08	SM 4500-H+B	534050		
10427352003	TS-SB-08	Trivalent Chromium Calculation	534084		
10427352003	TS-SB-08	EPA 300.0	532702		
10427352003	TS-SB-08	EPA 300.1	441891		
10427352003	TS-SB-08	EPA 300.1	442023		
10427352003	TS-SB-08	EPA 300.1	441890		
10427352003	TS-SB-08	EPA 300.1	442024		
10427352003	TS-SB-08	SM 3500-Cr B Modified	532346		
10427352003	TS-SB-08	EPA 350.1			
10427352003	TS-SB-08	EPA 350.1	141155		
10427352003	TS-SB-08	EPA 353.2	532358		
10427352003	TS-SB-08	EPA 9016	21104	EPA 9016	21181
10427352003	TS-SB-08	SM 4500-CN-E	533717	SM 4500-CN-E	533784
10427352003	TS-SB-08	SM 4500-P B	534444	SM 4500-P E	534526

REPORT OF LABORATORY ANALYSIS

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WO#: 10427352



10427352

Minnesota Pollution Control Agency		Work Order Number:		COC Type:		Page: 1 of													
PROJECT/CLIENT INFO				Turnaround Time:		COC ID:													
Facility Code: MPCA Freeway LE Waters		Program Code (MDH Lab Only):		LABORATORY		FOR LAB USE ONLY													
Project Name: MPCA Freeway LE Waters		Project Task Code:		Lab Name:															
Project Manager:				Address: 18-00383															
Potential Hazard? If yes, add information to Sampler Comments Section				EPIC Profile # 38716															
				Phone No:		Lab Work Order Sticker													
SAMPLE DETAILS				ANALYSIS REQUESTED															
SAMPLE TYPE CODES S=Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample		LAB MATRIX CODES DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe		AR=Air BL=Biological Material OT=Other TS=Tissue		FIELD MATRIX CODES Ww-Ground=Groundwater Ww-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample													
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Coats	ANALYSIS	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	Lab Sample No.	#
TS-SB-05	S	4/13/18	1120			G	NW	WTF - Ground			3	X						001	1
TS-SB-07	S	4/13/18	1330			G	NW	WTF - Ground			3	X						002	2
TS-SB-08	S	4/13/18	1520			G	NW	WTF - Ground			41		X					003	3
																			4
																			5
																			6
																			7
																			8
																			9
																			10
Sampled By: David Anderson / David Anderson		Sampler's Signature: David Anderson		Phone #:															
Receiving Comments:																			
Relinquished By/Affiliation				Date/Time				Accepted By/Affiliation				Date/Time							
(Sampler) David Anderson / Pace Analytical				4/13/18 / 1630 David Anderson				PACE				4-13-18 1635							

TS-SB-05 collected only 250 HNO3 filtered / 250 HNO3 unfiltered / (1) glass liter
 TS-SB-07 collected only 250 HNO3 filtered / 250 HNO3 unfiltered / (1) glass liter

T = 9.6
 3.8
 9.1

Sample Condition Upon Receipt **Client Name:** MN Pollution Agency **Project #:** _____

Courier: Fed Ex UPS USPS Client 4/13/18

Commercial Pace SpeeDee Other: _____

Tracking Number: _____

WO# : 10427352

PM: JMA **Due Date: 04/27/18**

CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer 151401163 **Type of Ice:** Wet Blue None Dry Melted

Used: G87A9155100842 **Biological Tissue Frozen?** Yes No N/A

Cooler Temp Read (°C): 9.4, 3.6, 8.9 **Cooler Temp Corrected (°C):** 9.6, 3.8, 9.1 **Correction Factor:** +0.2 **Date and Initials of Person Examining Contents:** 4/13/18

USDA Regulated Soil: N/A, water sample

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. <u>SEE EXCEPTIONS</u>
-Includes Date/Time/ID/Analysis Matrix: <u>not</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and <u>dioxin</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>SEE EXCEPTIONS</u>
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: Brad Jacobson **Date/Time:** _____

Comments/Resolution: Confirmed that 8270 SVOC should be analyzed on AGIU containers received for samples TS-SB-05 10427352-001) and TS-SB-07 (10427352-002). Extra sample received is a vial from the Cyanide kit for sample TS-SB-08 (10427352-003)

Project Manager Review: [Signature] **Date:** 04/17/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	EPA 8270C
PCBs	EPA 8082
PFCs	EPA 537
VOCs	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

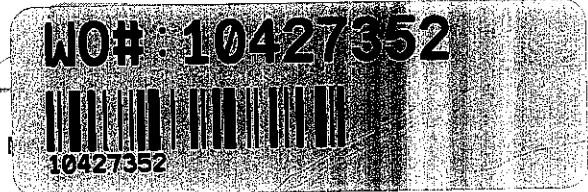
** ADD to Parameter List A:

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Harness determination)

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 801.1
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace



Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin:

Workorder: 10427352 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To		Subcontract To				Requested Analysis															
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042				Nitrogen, unionized ammonia, as N															
						LAB USE ONLY															
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				H2SO4	Nitrogen, unionized ammonia, as N										
1	TS-SB-08	PS	4/13/2018 15:20	10427352003	Water	1					X										
2																					
3																					
4																					
5																					
Transfers											Comments										
Released By	Date/Time	Received By	Date/Time																		
<i>Pract</i>	4/16/18 1745	<i>CB</i>	4/16/18 1745	returning volume to																	
<i>CB</i>	4/16/18 2130	<i>B. Matthews</i>	4/17/18 0900	MPLS																	
<i>R. Clapp</i>	4-25-18 1830	<i>Mark Lane</i>	4/25/18 1830																		
Cooler Temperature on Receipt 5.6 °C		Custody Seal <input checked="" type="checkbox"/> or N		Received on Ice <input checked="" type="checkbox"/> or N		Samples Intact <input checked="" type="checkbox"/> or N															

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

T = 3.4

WO# : 10427352
 PM: JMA Due Date: 04/27/18
 CLIENT: PAST-MNFLD

Client Name: Pace MPIS Project #:
 Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other:
 Tracking Number:

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: Temp Blank? Yes No

Thermometer: 151401163 687A9155100842
 Used: Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 3.6 Cooler Temp Corrected (°C): 3.6 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: none Date and Initials of Person Examining Contents: ms 4/25/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7. <u>Return Samples</u>
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>Wt</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Head space in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):	

CLIENT NOTIFICATION/RESOLUTION
 Person Contacted: Date/Time: Field Data Required? Yes No
 Comments/Resolution:

Project Manager Review: [Signature] Date: 04/26/2018
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Sample Condition Upon Receipt

Client Name: Pace - MPLS

Project #: **WO# : 12107159**
 PM: HRZ Due Date: 04/27/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 5.3 Cooler Temp Corrected °C: 5.0 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 1.3 Date and Initials of Person Examining Contents: 4/17/18 CJB

Comments: BIM 4/17/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____

Angela Loisel

Date: 4/17/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: Pace MN

Project # 30249749

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 1967

Label <u>DB</u>
LIMS Login <u>hmm</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used NA Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot# <u>1021071</u>			Date and Initials of person examining contents: <u>DS 4-17-18</u>
	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:	/			4.
Sample Labels match COC:	/			5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):	/			7.
Rush Turn Around Time Requested:	/			8.
Sufficient Volume:	/			9.
Correct Containers Used:	/			10.
-Pace Containers Used:	/			
Containers Intact:	/			11.
Orthophosphate field filtered	/			12.
Hex Cr Aqueous Compliance/NPDES sample field filtered	/			13.
Organic Samples checked for dechlorination:	/			14.
Filtered volume received for Dissolved tests	/			15.
All containers have been checked for preservation.	/			16.
All containers needing preservation are found to be in compliance with EPA recommendation.	/			<u>phc2</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed <u>DS</u> Date/time of preservation _____
				Lot # of added preservative _____
Headspace in VOA Vials (>6mm):	/			17.
Trip Blank Present:	/			18.
Trip Blank Custody Seals Present	/			
Rad Aqueous Samples Screened > 0.5 mrem/hr	/			Initial when completed <u>DS</u> Date: <u>4-17-18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Pace Analytical®

Client Pace Mon
 Receipt Record Page/Line # 9-2

Work Order #: 4610917

Recorded by (initials/date)

PS 4/17/18

Cooler
 Box
 Other _____

Qty Received 1

IR Gun (#202)
 Thermometer Used Digital Thermometer (#54)
 IR Gun (#402)

Cooler #	Time	Cooler #	Time	Cooler #	Time	Cooler #	Time	
<u>Ble</u>	<u>0950</u>							
Custody Seals: <input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		
Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		
Coolant Location: <input checked="" type="checkbox"/> Dispersed / Top / Middle / Bottom		Coolant Location: <input type="checkbox"/> Dispersed / Top / Middle / Bottom		Coolant Location: <input type="checkbox"/> Dispersed / Top / Middle / Bottom		Coolant Location: <input type="checkbox"/> Dispersed / Top / Middle / Bottom		
Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		
If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		
Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C	Actual °C
Temp Blank:			Temp Blank:			Temp Blank:		
Sample 1:	<u>1.7</u>	<u>1.7</u>	Sample 1:			Sample 1:		
Sample 2:	<u>1.0</u>	<u>1.0</u>	Sample 2:			Sample 2:		
Sample 3:	<u>1.1</u>	<u>1.1</u>	Sample 3:			Sample 3:		
When above 6 °C take a 3 Sample Average °C: _____			When above 6 °C take a 3 Sample Average °C: _____			When above 6 °C take a 3 Sample Average °C: _____		
<input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> VOC Trip Blank received?		

If any shaded areas checked, complete Sample Receiving Non-Conformance

Paperwork Received

- Yes No
- Chain of Custody record(s)? If No, Initiated By _____
 - Received for Lab Signed/Date/Time?
 - USDA Soil Documents?
 - Sampling / Field Forms?
 - Other _____

COC Information

- Pace COC Other _____
- COC ID Numbers: _____

Check COC for Accuracy

- Yes No
- Analysis Requested?
 - Sample ID matches COC?
 - Sample Date and Time matches COC?
 - All containers indicated are received?

Sample Condition Summary

- N/A Yes No
- Broken containers/lids?
 - Missing or incomplete labels?
 - Illegible information on labels?
 - Low volume received?
 - Inappropriate or non-Pace containers received?
 - VOC vials have headspace?
 - Extra sample locations?
 - Containers not listed on COC?

Check Sample Preservation

- N/A Yes No
- Temperature Blank OR average sample temperature, ≥6° C?
 - If "Yes" was thermal preservation required?
 - If "Yes" were ALL samples collected the same day as receipt?
 - Completed Sample Preservation Verification Form?
 - Samples chemically preserved correctly?
 - If "No", add wire tag and fill out Non-Conformance Form?
 - Received unpreserved Terracore kit?
 - If "Yes" unpreserved vials must be frozen

Work Order Not Logged In with Short Hold / Rush

- Copies of COC To Lab Areas

Notes

- Yes No
- Were all samples logged into Epic?
 - Were all samples labelled?
 - Were samples placed on scan locations?

Initial / Date :

AQUEOUS SAMPLE PRESERVATION VERIFICATION

Client: <u>Pace minn</u>	Work Order #: <u>4610917</u>
Receipt Log #: <u>9-2</u>	Project Manager: _____
Completed By (initials/date): <u>PS 4/17/18</u>	

COC ID # <u>WO# 10427276</u>												Adjusted by: _____	
												Date: _____	
Container Type	5 / 23		4		13		6		15				
	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1	✓												
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

pH Strip Reagent or Lot #
<input checked="" type="checkbox"/> HC727135
<input type="checkbox"/> Other

Place a check mark in the Received box if pH is acceptable. If pH is not acceptable, document the Received and Adjusted pH values in the appropriate columns (all adjustments must be reviewed by the project manager). Never add more than 2x the default preservation volume (see table below for default volumes). Complete and attach an orange preservation tag to all adjusted samples. A Sample Receiving Non-Conformance Report must be completed if a pH adjustment was required.

Comments: _____

COC ID # <u>WO # 10427352</u>												Adjusted by: _____	
												Date: _____	
Container Type	5 / 23		4		13		6		15				
	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1	✓												
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

Container Size (mL)	Default Preservative Volume (mL)
Container Types 5 / 23	NaOH
250	1.3
Container Type 4	H ₂ SO ₄
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H ₂ SO ₄
500	2.5
Container Types 6 / 15	HNO ₃
125	0.7
250	1.25
500	2.5
1000	5.0

Comments: _____

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427276 Workorder Name: 18-00383 MPCA-Freeway LF Water Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To		Subcontract To					Requested Analysis													
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Indianapolis 7726 Moller Road Indianapolis, IN 46268 Phone (317)228-3100					<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Methyl alcohol/Ethylene glycol/EPA</div> <div style="border: 1px solid black; width: 100%; height: 100%;"></div> </div>													
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved											Preserved Containers			
1	FD-TT-06	PS	4/12/2018 12:30	10427276001	Water	3														
2																				
3																				
4																				
5																				

56194585
LAB USE ONLY
001

						Comments									
Transfers	Released By	Date/Time	Received By	Date/Time											
1	<i>[Signature]</i>	4/16/18 1630	<i>[Signature]</i>												
2	<i>[Signature]</i>		<i>[Signature]</i>	4/17/18 0830											
3															

Cooler Temperature on Receipt 23 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50194585

Date/Time and Initials of person examining contents: TRW 4/17/18 0945

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9232 1940

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: A 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 2.1/2.3 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		/	All containers needing acid/base pres. Have been checked? exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		/	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			/
Chain of Custody Present:	/		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	/		Dissolved Metals field filtered?:			/
Short Hold Time Analysis (<72hr)?: Analysis:		/	Headspace Wisconsin Sulfide			/
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			/
Rush TAT Requested:		/	Headspace in VOA Vials (>6mm):			/
Containers Intact?:	/		Trip Blank Present?:		/	
Sample Labels Match COC?: Except TCs, which only require sample ID	/		Trip Blank Custody Seals?:		/	

Comments: _____

Sample Container Count

WO#: 50194585



CLIENT: Pace MW

COC PAGE 1 of 1

COC ID# _____

Project # 50194585

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	Bu Kit	R	Matrix (Soil/W Aqueol)	pH <2	pH >9	pH >	
	1																		1614					
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
WGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

WO#: 35386559

Project #
Project Manager:
Client:

PM: ADC Due Date: 04/27/18
CLIENT: PACMIN

Date and Initials of person:
Examining contents: PLD
Label: _____
Deliver: _____
pH: _____

Thermometer Used: T-338 Date: 4-17-18 Time: 11:00 Initials: NMP

State of Origin: _____

Cooler #1 Temp. °C 3.4 (Visual) +0 (Correction Factor) 3.4 (Actual)
Cooler #2 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #3 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #4 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #5 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #6 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)

- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____
Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9832 2036

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No Ice: Wet Blue Dry None
Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (If Yes, complete) Shorted Date: _____ Shorted Time: _____ Qty: _____

Comments:

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Preservation Information: Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	

Client Notification/ Resolution:
Person Contacted: _____ Date/Time: _____

Comments/ Resolution (use back for additional comments):



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 27, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414

RE: 18-00383 MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/17/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List

			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
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608.221.8700 Phone
608.221.4889 Fax

Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Water - MN Project Number: 10427352 Project Manager: Jennifer Anderson
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ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TS-SB-08 (10427352003)	A181605-01	Water	04/13/2018	04/17/2018

CASE NARRATIVE

Sample Receipt Information:

1 sample was received on 04/17/2018. Sample was received at 4.8 degrees Celsius. Sample was received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.



2525 Advance Road
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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427352
Project Manager: Jennifer Anderson

TS-SB-08 (10427352003)

Date Sampled

A181605-01 (Water)

04/13/2018 15:20

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804168

Acetochlor	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	

Surrogate: Atrazine-d5		120 %		65.1-122	04/19/2018	04/24/2018 15:01	EPA 8270D	
Surrogate: Parathion-d10		141 %		22.3-159	04/19/2018	04/24/2018 15:01	EPA 8270D	
Surrogate: Triphenyl phosphate		163 %		65.2-151	04/19/2018	04/24/2018 15:01	EPA 8270D	S

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804156

2,4-D	ND	0.50	ug/L	1	04/18/2018	04/24/2018 22:25	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/18/2018	04/24/2018 22:25	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/18/2018	04/24/2018 22:25	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/18/2018	04/24/2018 22:25	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/18/2018	04/24/2018 22:25	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/18/2018	04/24/2018 22:25	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/18/2018	04/24/2018 22:25	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/18/2018	04/24/2018 22:25	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/18/2018	04/24/2018 22:25	EPA 8151A	

Surrogate: 2,4-D-d5		71.4 %		44.2-121	04/18/2018	04/24/2018 22:25	EPA 8151A	
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2525 Advance Road
Madison, WI 53718
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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427352
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804168 - EPA 3510C

Blank (A804168-BLK1)

Prepared: 04/19/2018 Analyzed: 04/24/2018 19:13

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>83.6</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>85.3</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.529</i>		<i>ug/L</i>	<i>0.5000</i>		<i>106</i>	<i>65.2-151</i>			

LCS (A804168-BS1)

Prepared: 04/19/2018 Analyzed: 04/24/2018 21:05

Acetochlor	0.954	0.50	ug/L	1.000		95.4	67.5-120			
Alachlor	0.959	0.50	ug/L	1.000		95.9	71.7-120			
Atrazine	0.891	0.50	ug/L	1.000		89.1	72.8-113			
Chlorpyrifos	0.817	0.50	ug/L	1.000		81.7	65.3-119			
Cyanazine	1.01	0.20	ug/L	1.000		101	49.5-140			
Desethylatrazine	0.951	0.50	ug/L	1.000		95.1	66.9-116			
Deisopropylatrazine	0.729	0.50	ug/L	1.000		72.9	44.3-110			
Dimethenamid	0.964	0.50	ug/L	1.000		96.4	63.8-116			
EPTC	0.559	0.50	ug/L	1.000		55.9	41.7-102			
Ethalfuralin	0.538	0.50	ug/L	1.000		53.8	41-127			
Fonofos	0.709	0.50	ug/L	1.000		70.9	59.7-118			
Metolachlor	0.984	0.50	ug/L	1.000		98.4	71.7-122			
Metribuzin	0.911	0.50	ug/L	1.000		91.1	66.6-128			
Pendimethalin	0.946	0.50	ug/L	1.000		94.6	55.5-137			
Phorate	0.577	0.30	ug/L	1.000		57.7	41.2-114			
Prometon	0.958	0.50	ug/L	1.000		95.8	66.3-120			
Propachlor	0.933	0.50	ug/L	1.000		93.3	65.8-119			



2525 Advance Road
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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427352
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804168 - EPA 3510C

LCS (A804168-BS1)

Prepared: 04/19/2018 Analyzed: 04/24/2018 21:05

Propazine	0.840	0.50	ug/L	1.000		84.0	72-122			
Simazine	0.892	0.50	ug/L	1.000		89.2	72.8-113			
Terbufos	0.514	0.20	ug/L	1.000		51.4	38.6-115			
Triallate	0.622	0.50	ug/L	1.000		62.2	51.4-116			
Trifluralin	0.588	0.50	ug/L	1.000		58.8	46.1-134			
Surrogate: Atrazine-d5	0.451		ug/L	0.5000		90.2	65.1-122			
Surrogate: Parathion-d10	0.495		ug/L	0.5000		99.0	22.3-159			
Surrogate: Triphenyl phosphate	0.534		ug/L	0.5000		107	65.2-151			

Matrix Spike (A804168-MS1)

Source: A181612-06

Prepared: 04/19/2018 Analyzed: 04/24/2018 21:34

Acetochlor	1.09	0.50	ug/L	0.9346	0.0378	113	67.3-128			
Alachlor	2.58	0.50	ug/L	0.9346	1.50	116	58.2-150			
Atrazine	1.25	0.50	ug/L	0.9346	0.324	98.7	70.1-120			
Chlorpyrifos	1.26	0.50	ug/L	0.9346	0.121	122	73.3-118			M
Cyanazine	1.79	0.20	ug/L	0.9346	0.659	121	60.6-140			
Desethylatrazine	1.05	0.50	ug/L	0.9346	0.0617	106	69.7-122			
Deisopropylatrazine	0.867	0.50	ug/L	0.9346	0.246	66.4	48-121			
Dimethenamid	1.16	0.50	ug/L	0.9346	0.0699	117	63.7-123			
EPTC	0.734	0.50	ug/L	0.9346	0.100	67.8	58-109			
Ethalfuralin	0.652	0.50	ug/L	0.9346	ND	69.7	59.3-129			
Fonofos	0.605	0.50	ug/L	0.9346	0.0263	61.9	73.5-108			M
Metolachlor	65.6	0.50	ug/L	0.9346	67.5	NR	40.9-156			M1, E
Metribuzin	1.03	0.50	ug/L	0.9346	0.0606	104	70.9-136			
Pendimethalin	1.35	0.50	ug/L	0.9346	0.0391	141	55.4-155			
Phorate	0.563	0.30	ug/L	0.9346	0.112	48.2	60.2-108			M
Prometon	1.18	0.50	ug/L	0.9346	0.266	97.8	74.7-124			
Propachlor	0.724	0.50	ug/L	0.9346	ND	77.5	72.3-115			
Propazine	1.31	0.50	ug/L	0.9346	0.472	89.1	73.7-124			
Simazine	0.915	0.50	ug/L	0.9346	ND	97.9	74.8-114			
Terbufos	0.564	0.20	ug/L	0.9346	ND	60.4	56.1-114			
Triallate	0.620	0.50	ug/L	0.9346	ND	66.4	65.5-107			
Trifluralin	0.873	0.50	ug/L	0.9346	0.0370	89.5	58-149			
Surrogate: Atrazine-d5	0.443		ug/L	0.4673		94.7	65.1-122			
Surrogate: Parathion-d10	0.528		ug/L	0.4673		113	22.3-159			
Surrogate: Triphenyl phosphate	0.702		ug/L	0.4673		150	65.2-151			

Matrix Spike Dup (A804168-MSD1)

Source: A181612-06

Prepared: 04/19/2018 Analyzed: 04/24/2018 22:02

Acetochlor	1.10	0.50	ug/L	0.9434	0.0378	112	67.3-128	0.205	20	
Alachlor	2.49	0.50	ug/L	0.9434	1.50	106	58.2-150	3.47	20	
Atrazine	1.20	0.50	ug/L	0.9434	0.324	93.2	70.1-120	3.57	20	
Chlorpyrifos	1.25	0.50	ug/L	0.9434	0.121	119	73.3-118	1.32	20	M
Cyanazine	1.75	0.20	ug/L	0.9434	0.659	116	60.6-140	2.18	20	
Desethylatrazine	1.03	0.50	ug/L	0.9434	0.0617	102	69.7-122	2.35	20	
Deisopropylatrazine	0.790	0.50	ug/L	0.9434	0.246	57.7	48-121	9.23	20	



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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10427352
 Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804168 - EPA 3510C

Matrix Spike Dup (A804168-MSD1)	Source: A181612-06			Prepared: 04/19/2018 Analyzed: 04/24/2018 22:02						
Dimethenamid	1.14	0.50	ug/L	0.9434	0.0699	113	63.7-123	1.98	20	
EPTC	0.759	0.50	ug/L	0.9434	0.100	69.8	58-109	3.38	20	
Ethalfuralin	0.650	0.50	ug/L	0.9434	ND	68.9	59.3-129	0.280	20	
Fonofos	0.581	0.50	ug/L	0.9434	0.0263	58.8	73.5-108	4.15	20	M
Metolachlor	63.8	0.50	ug/L	0.9434	67.5	NR	40.9-156	2.74	20	M1, E
Metribuzin	1.01	0.50	ug/L	0.9434	0.0606	100	70.9-136	2.66	20	
Pendimethalin	1.34	0.50	ug/L	0.9434	0.0391	138	55.4-155	1.06	20	
Phorate	0.583	0.30	ug/L	0.9434	0.112	49.9	60.2-108	3.49	20	M
Prometon	1.15	0.50	ug/L	0.9434	0.266	93.9	74.7-124	2.45	20	
Propachlor	0.706	0.50	ug/L	0.9434	ND	74.8	72.3-115	2.52	20	
Propazine	1.29	0.50	ug/L	0.9434	0.472	86.8	73.7-124	1.08	20	
Simazine	0.862	0.50	ug/L	0.9434	ND	91.4	74.8-114	5.89	20	
Terbufos	0.553	0.20	ug/L	0.9434	ND	58.6	56.1-114	2.07	20	
Triallate	0.606	0.50	ug/L	0.9434	ND	64.2	65.5-107	2.43	20	M
Trifluralin	0.840	0.50	ug/L	0.9434	0.0370	85.1	58-149	3.90	20	
Surrogate: Atrazine-d5	0.431		ug/L	0.4717		91.4	65.1-122			
Surrogate: Parathion-d10	0.485		ug/L	0.4717		103	22.3-159			
Surrogate: Triphenyl phosphate	0.641		ug/L	0.4717		136	65.2-151			



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 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10427352
 Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804156 - EPA 3510C

Blank (A804156-BLK1)

Prepared: 04/18/2018 Analyzed: 04/24/2018 19:26

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							

Surrogate: 2,4-D-d5

2.01 ug/L 2.016 99.7 44.2-121

LCS (A804156-BS1)

Prepared: 04/18/2018 Analyzed: 04/25/2018 03:47

2,4-D	1.74	0.50	ug/L	2.000		86.9	64.6-148			
2,4-DB	1.99	0.50	ug/L	2.000		99.5	66.7-143			
2,4,5-T	1.78	0.50	ug/L	2.000		88.9	63.4-133			
2,4,5-TP (Silvex)	1.77	0.50	ug/L	2.000		88.4	63-145			
Bentazon	1.06	0.50	ug/L	1.000		106	52.5-139			
Dicamba	1.67	0.50	ug/L	2.000		83.7	55.4-143			
MCPA	1.65	0.30	ug/L	2.000		82.7	33.5-143			
Picloram	0.830	0.50	ug/L	1.000		83.0	47.9-113			
Triclopyr	1.74	0.50	ug/L	2.000		87.0	65.1-141			

Surrogate: 2,4-D-d5

1.94 ug/L 2.016 96.2 44.2-121

LCS Dup (A804156-BSD1)

Prepared: 04/18/2018 Analyzed: 04/25/2018 04:22

2,4-D	1.74	0.50	ug/L	2.000		87.2	64.6-148	0.362	20	
2,4-DB	2.01	0.50	ug/L	2.000		100	66.7-143	0.905	20	
2,4,5-T	1.74	0.50	ug/L	2.000		87.0	63.4-133	2.10	20	
2,4,5-TP (Silvex)	1.85	0.50	ug/L	2.000		92.5	63-145	4.55	20	
Bentazon	0.953	0.50	ug/L	1.000		95.3	52.5-139	10.4	20	
Dicamba	1.79	0.50	ug/L	2.000		89.4	55.4-143	6.62	20	
MCPA	1.79	0.30	ug/L	2.000		89.4	33.5-143	7.77	20	
Picloram	0.822	0.50	ug/L	1.000		82.2	47.9-113	1.02	20	
Triclopyr	1.86	0.50	ug/L	2.000		93.1	65.1-141	6.76	20	

Surrogate: 2,4-D-d5

1.82 ug/L 2.016 90.5 44.2-121



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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427352
Project Manager: Jennifer Anderson

Notes and Definitions

- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- M1 Spike recoveries were not evaluated because of elevated levels of the spiked analyte in the parent sample.
- M The matrix spike and/or matrix spike duplicate recovery was outside of the laboratory control limits.
- E The concentration indicated is above the instrument calibration range. This value is an estimated concentration.
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Chain of Custody

A181605



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427352 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To		Subcontract To		Requested Analysis																
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700																		
							Preserved Containers													
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved													LAB USE ONLY	
1	TS-SB-08	PS	4/13/2018 15:20	10427352003	Water	2													Oi	
2																				
3																				
4																				
5																				
																	Comments			
Transfers	Released By	Date/Time	Received By	Date/Time																
1	<i>[Signature]</i>	4/16/18 16:30	<i>[Signature]</i>	4/17/18																
2				09:40																
3																				
Cooler Temperature on Receipt		Custody Seal		Received on Ice		Samples Intact														
4.8 °C		Y or N		Y or N		Y or N														

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274
exp 7/12/18

May 01, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10427354

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 13, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Montana Certificate #CERT0103
California Certification #2973
California Certification #2973
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
Montana DHHS Certification #: CERT0102
Minnesota Dept of Health Certification #: 1382680

Nevada DCNR Certification #: MN000372018-1
Wisconsin DNR Certification #: 999446800
North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10427354001	TS-SB-04 (7-15 WM)	Solid	04/13/18 09:00	04/13/18 16:30
10427354002	TS-SB-05 (5-7.5 WM)	Solid	04/13/18 10:10	04/13/18 16:30
10427354003	TS-SB-06 (8-12.5WM)	Solid	04/13/18 11:05	04/13/18 16:30
10427354004	TS-SB-07 (15.18.5)	Solid	04/13/18 12:20	04/13/18 16:30
10427354005	TS-SB-08 (10-20WM)	Solid	04/13/18 14:10	04/13/18 16:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10427354001	TS-SB-04 (7-15 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	JRH	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010C	IP	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	TT3	10	PASI-M		
		EPA 7471	LMW	1	PASI-M		
		ASTM D2974	BT	1	PASI-M		
		EPA 8270D	AT1	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10427354002	TS-SB-05 (5-7.5 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M
WI MOD DRO	JRH			2	PASI-M		
WI MOD GRO	AJR			2	PASI-M		
EPA 6010C	IP			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	TT3			10	PASI-M		
EPA 7471	LMW			1	PASI-M		
ASTM D2974	BT			1	PASI-M		
EPA 8270D	AT1			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8260B	CD2			70	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
10427354003	TS-SB-06 (8-12.5WM)			EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	BT	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427354004	TS-SB-07 (15.18.5)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	BT	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427354005	TS-SB-08 (10-20WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	IP	11	PASI-M

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	BT	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-04 (7-15 WM) **Lab ID: 10427354001** Collected: 04/13/18 09:00 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.3	1	04/25/18 10:56	04/30/18 14:26	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	309-00-2	
alpha-BHC	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	319-84-6	
beta-BHC	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	319-85-7	
delta-BHC	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	58-89-9	
Chlordane (Technical)	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	57-74-9	
alpha-Chlordane	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	5103-71-9	
gamma-Chlordane	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	5103-74-2	
4,4'-DDD	ND	ug/kg	188	50	04/16/18 14:37	04/20/18 08:21	72-54-8	
4,4'-DDE	ND	ug/kg	188	50	04/16/18 14:37	04/20/18 08:21	72-55-9	
4,4'-DDT	ND	ug/kg	188	50	04/16/18 14:37	04/20/18 08:21	50-29-3	
Dieldrin	ND	ug/kg	188	50	04/16/18 14:37	04/20/18 08:21	60-57-1	
Endosulfan I	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	959-98-8	
Endosulfan II	ND	ug/kg	188	50	04/16/18 14:37	04/20/18 08:21	33213-65-9	
Endosulfan sulfate	ND	ug/kg	188	50	04/16/18 14:37	04/20/18 08:21	1031-07-8	
Endrin	ND	ug/kg	188	50	04/16/18 14:37	04/20/18 08:21	72-20-8	
Endrin aldehyde	ND	ug/kg	188	50	04/16/18 14:37	04/20/18 08:21	7421-93-4	
Endrin ketone	ND	ug/kg	188	50	04/16/18 14:37	04/20/18 08:21	53494-70-5	
Heptachlor	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	76-44-8	
Heptachlor epoxide	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	1024-57-3	
Methoxychlor	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	72-43-5	
Toxaphene	ND	ug/kg	2820	50	04/16/18 14:37	04/20/18 08:21	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	50	04/16/18 14:37	04/20/18 08:21	877-09-8	1M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	50	04/16/18 14:37	04/20/18 08:21	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	11097-69-1	
PCB-1260 (Aroclor 1260)	150	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	11100-14-4	
PCB, Total	150	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	65	%	48-125	1	04/16/18 15:03	04/18/18 02:02	877-09-8	
Decachlorobiphenyl (S)	68	%	30-134	1	04/16/18 15:03	04/18/18 02:02	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-04 (7-15 WM) Lab ID: 10427354001 Collected: 04/13/18 09:00 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	371	mg/kg	193	20	04/16/18 14:24	04/19/18 17:44		T6
Surrogates								
n-Triacontane (S)	0	%	50-150	20	04/16/18 14:24	04/19/18 17:44	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	11.9	1	04/25/18 10:39	04/25/18 18:33		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/25/18 10:39	04/25/18 18:33	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	3310	mg/kg	11.0	1	04/17/18 04:48	04/17/18 19:26	7429-90-5	
Barium	47.3	mg/kg	0.55	1	04/17/18 04:48	04/17/18 19:26	7440-39-3	
Boron	ND	mg/kg	8.2	1	04/17/18 04:48	04/17/18 19:26	7440-42-8	
Copper	8.8	mg/kg	0.55	1	04/17/18 04:48	04/17/18 19:26	7440-50-8	
Iron	7490	mg/kg	2.7	1	04/17/18 04:48	04/17/18 19:26	7439-89-6	
Manganese	318	mg/kg	0.27	1	04/17/18 04:48	04/17/18 19:26	7439-96-5	
Nickel	8.0	mg/kg	1.1	1	04/17/18 04:48	04/17/18 19:26	7440-02-0	
Silver	ND	mg/kg	0.55	1	04/17/18 04:48	04/17/18 19:26	7440-22-4	
Tin	ND	mg/kg	4.1	1	04/17/18 04:48	04/17/18 19:26	7440-31-5	
Titanium	208	mg/kg	1.4	1	04/17/18 04:48	04/17/18 19:26	7440-32-6	
Zinc	58.5	mg/kg	1.1	1	04/17/18 04:48	04/17/18 19:26	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	12.0	mg/kg	1.1	5	04/20/18 09:20	04/21/18 02:34	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.56	20	04/17/18 05:10	04/17/18 12:24	7440-36-0	
Arsenic	3.9	mg/kg	0.56	20	04/17/18 05:10	04/17/18 12:24	7440-38-2	
Beryllium	ND	mg/kg	0.22	20	04/17/18 05:10	04/17/18 12:24	7440-41-7	
Cadmium	0.14	mg/kg	0.089	20	04/17/18 05:10	04/17/18 12:24	7440-43-9	
Cobalt	4.6	mg/kg	0.56	20	04/17/18 05:10	04/17/18 12:24	7440-48-4	
Lead	14.2	mg/kg	0.11	20	04/17/18 05:10	04/17/18 12:24	7439-92-1	
Lithium	4.8	mg/kg	0.56	20	04/17/18 05:10	04/17/18 12:24	7439-93-2	
Selenium	ND	mg/kg	0.56	20	04/17/18 05:10	04/17/18 12:24	7782-49-2	
Strontium	24.9	mg/kg	0.56	20	04/17/18 05:10	04/17/18 12:24	7440-24-6	
Vanadium	19.3	mg/kg	1.1	20	04/17/18 05:10	04/17/18 12:24	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.14	mg/kg	0.022	1	04/23/18 05:40	04/23/18 15:18	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	11.4	%	0.10	1		04/19/18 11:01		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: **TS-SB-04 (7-15 WM)** Lab ID: **10427354001** Collected: 04/13/18 09:00 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	208-96-8	
Anthracene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	120-12-7	
Benzo(a)anthracene	527	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	56-55-3	
Benzo(a)pyrene	423	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	50-32-8	
Benzo(b)fluoranthene	497	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	101-55-3	
Butylbenzylphthalate	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	85-68-7	
Carbazole	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	59-50-7	
4-Chloroaniline	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	108-60-1	
2-Chloronaphthalene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	91-58-7	
2-Chlorophenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	7005-72-3	
Chrysene	727	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	53-70-3	
Dibenzofuran	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	120-83-2	
Diethylphthalate	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	105-67-9	
Dimethylphthalate	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	131-11-3	
Di-n-butylphthalate	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	1910	1	04/19/18 17:13	04/20/18 17:00	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	606-20-2	
Di-n-octylphthalate	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	117-81-7	
Fluoranthene	997	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	206-44-0	
Fluorene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	87-68-3	
Hexachlorobenzene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	118-74-1	
Hexachloroethane	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	193-39-5	
Isophorone	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	78-59-1	
1-Methylnaphthalene	607	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	90-12-0	
2-Methylnaphthalene	826	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: **TS-SB-04 (7-15 WM)** Lab ID: **10427354001** Collected: 04/13/18 09:00 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	743	1	04/19/18 17:13	04/20/18 17:00		
Naphthalene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	91-20-3	
2-Nitroaniline	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	88-74-4	
3-Nitroaniline	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	99-09-2	
4-Nitroaniline	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	100-01-6	
Nitrobenzene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	98-95-3	
2-Nitrophenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	88-75-5	
4-Nitrophenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	86-30-6	
Pentachlorophenol	ND	ug/kg	754	1	04/19/18 17:13	04/20/18 17:00	87-86-5	
Phenanthrene	1440	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	85-01-8	
Phenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	108-95-2	
Pyrene	1320	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	73	%	43-125	1	04/19/18 17:13	04/20/18 17:00	4165-60-0	
2-Fluorobiphenyl (S)	81	%	30-132	1	04/19/18 17:13	04/20/18 17:00	321-60-8	
p-Terphenyl-d14 (S)	81	%	62-125	1	04/19/18 17:13	04/20/18 17:00	1718-51-0	
Phenol-d6 (S)	79	%	48-125	1	04/19/18 17:13	04/20/18 17:00	13127-88-3	
2-Fluorophenol (S)	77	%	40-125	1	04/19/18 17:13	04/20/18 17:00	367-12-4	
2,4,6-Tribromophenol (S)	71	%	60-125	1	04/19/18 17:13	04/20/18 17:00	118-79-6	
8270D MSSV PAH by SIM								
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	83-32-9	
Acenaphthylene	ND	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	208-96-8	
Anthracene	ND	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	120-12-7	
Benzo(a)anthracene	132	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	56-55-3	
Benzo(a)pyrene	124	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	50-32-8	
Benzo(b)fluoranthene	167	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	205-99-2	
Benzo(g,h,i)perylene	82.4	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	191-24-2	
Benzo(k)fluoranthene	69.8	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	207-08-9	
Chrysene	138	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	53-70-3	
Fluoranthene	293	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	206-44-0	
Fluorene	ND	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	86-73-7	
Indeno(1,2,3-cd)pyrene	71.6	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	193-39-5	
Naphthalene	ND	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	91-20-3	
Phenanthrene	239	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	85-01-8	
Pyrene	257	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	81	%	42-125	5	04/17/18 12:13	04/18/18 21:02	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-04 (7-15 WM) **Lab ID: 10427354001** Collected: 04/13/18 09:00 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	96	%	57-125	5	04/17/18 12:13	04/18/18 21:02	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1160	1	04/24/18 16:08	04/25/18 03:48	67-64-1	
Allyl chloride	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	107-05-1	
Benzene	ND	ug/kg	23.2	1	04/24/18 16:08	04/25/18 03:48	71-43-2	
Bromobenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	108-86-1	
Bromochloromethane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	74-97-5	
Bromodichloromethane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	75-27-4	
Bromoform	ND	ug/kg	580	1	04/24/18 16:08	04/25/18 03:48	75-25-2	
Bromomethane	ND	ug/kg	580	1	04/24/18 16:08	04/25/18 03:48	74-83-9	
2-Butanone (MEK)	ND	ug/kg	290	1	04/24/18 16:08	04/25/18 03:48	78-93-3	
n-Butylbenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	104-51-8	
sec-Butylbenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	135-98-8	
tert-Butylbenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	98-06-6	
Carbon tetrachloride	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	56-23-5	
Chlorobenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	108-90-7	
Chloroethane	ND	ug/kg	580	1	04/24/18 16:08	04/25/18 03:48	75-00-3	
Chloroform	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	67-66-3	
Chloromethane	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	74-87-3	
2-Chlorotoluene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	95-49-8	
4-Chlorotoluene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	580	1	04/24/18 16:08	04/25/18 03:48	96-12-8	
Dibromochloromethane	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	106-93-4	
Dibromomethane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	75-71-8	
1,1-Dichloroethane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	75-34-3	
1,2-Dichloroethane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	107-06-2	
1,1-Dichloroethene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	156-60-5	
Dichlorofluoromethane	ND	ug/kg	580	1	04/24/18 16:08	04/25/18 03:48	75-43-4	
1,2-Dichloropropane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	78-87-5	
1,3-Dichloropropane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	142-28-9	
2,2-Dichloropropane	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	594-20-7	
1,1-Dichloropropene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	60-29-7	
Ethylbenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	290	1	04/24/18 16:08	04/25/18 03:48	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-04 (7-15 WM) **Lab ID: 10427354001** Collected: 04/13/18 09:00 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	98-82-8	
p-Isopropyltoluene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	99-87-6	
Methylene Chloride	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	290	1	04/24/18 16:08	04/25/18 03:48	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	1634-04-4	
Naphthalene	448	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	91-20-3	
n-Propylbenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	103-65-1	
Styrene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	79-34-5	
Tetrachloroethene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	127-18-4	
Tetrahydrofuran	ND	ug/kg	2320	1	04/24/18 16:08	04/25/18 03:48	109-99-9	
Toluene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	79-00-5	
Trichloroethene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	79-01-6	
Trichlorofluoromethane	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	108-67-8	
Vinyl chloride	ND	ug/kg	23.2	1	04/24/18 16:08	04/25/18 03:48	75-01-4	
Xylene (Total)	ND	ug/kg	174	1	04/24/18 16:08	04/25/18 03:48	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%	75-125	1	04/24/18 16:08	04/25/18 03:48	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	04/24/18 16:08	04/25/18 03:48	2037-26-5	
4-Bromofluorobenzene (S)	96	%	75-125	1	04/24/18 16:08	04/25/18 03:48	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	11.1	5	04/23/18 11:09	04/24/18 13:26	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	12.0	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.37	1	04/20/18 10:25	04/20/18 13:49	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	2.8	mg/kg	0.99	1	04/18/18 14:45	04/19/18 18:11	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-05 (5-7.5 WM) **Lab ID: 10427354002** Collected: 04/13/18 10:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	13.8	1	04/25/18 10:56	04/27/18 17:27	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	309-00-2	
alpha-BHC	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	319-84-6	
beta-BHC	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	319-85-7	
delta-BHC	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	58-89-9	
Chlordane (Technical)	ND	ug/kg	490	20	04/16/18 14:37	04/20/18 08:39	57-74-9	
alpha-Chlordane	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	5103-71-9	
gamma-Chlordane	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	5103-74-2	
4,4'-DDD	ND	ug/kg	97.7	20	04/16/18 14:37	04/20/18 08:39	72-54-8	
4,4'-DDE	ND	ug/kg	97.7	20	04/16/18 14:37	04/20/18 08:39	72-55-9	
4,4'-DDT	ND	ug/kg	97.7	20	04/16/18 14:37	04/20/18 08:39	50-29-3	
Dieldrin	ND	ug/kg	97.7	20	04/16/18 14:37	04/20/18 08:39	60-57-1	
Endosulfan I	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	959-98-8	
Endosulfan II	ND	ug/kg	97.7	20	04/16/18 14:37	04/20/18 08:39	33213-65-9	
Endosulfan sulfate	ND	ug/kg	97.7	20	04/16/18 14:37	04/20/18 08:39	1031-07-8	
Endrin	ND	ug/kg	97.7	20	04/16/18 14:37	04/20/18 08:39	72-20-8	
Endrin aldehyde	ND	ug/kg	97.7	20	04/16/18 14:37	04/20/18 08:39	7421-93-4	
Endrin ketone	ND	ug/kg	97.7	20	04/16/18 14:37	04/20/18 08:39	53494-70-5	
Heptachlor	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	76-44-8	
Heptachlor epoxide	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	1024-57-3	
Methoxychlor	ND	ug/kg	490	20	04/16/18 14:37	04/20/18 08:39	72-43-5	
Toxaphene	ND	ug/kg	1470	20	04/16/18 14:37	04/20/18 08:39	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%.	30-150	20	04/16/18 14:37	04/20/18 08:39	877-09-8	3M, D3, S4
Decachlorobiphenyl (S)	0	%.	30-150	20	04/16/18 14:37	04/20/18 08:39	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	11100-14-4	
PCB, Total	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	74	%.	48-125	1	04/16/18 15:03	04/18/18 02:50	877-09-8	
Decachlorobiphenyl (S)	62	%.	30-134	1	04/16/18 15:03	04/18/18 02:50	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-05 (5-7.5 WM) **Lab ID: 10427354002** Collected: 04/13/18 10:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS		Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO						
WDRO C10-C28	1150	mg/kg	532	10	04/16/18 14:24	04/19/18 17:58		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	10	04/16/18 14:24	04/19/18 17:58	638-68-6	P3,S4
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil						
Gasoline Range Organics	38.9	mg/kg	19.1	1	04/25/18 10:39	04/25/18 16:31		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	04/25/18 10:39	04/25/18 16:31	98-08-8	
6010C MET ICP		Analytical Method: EPA 6010C Preparation Method: EPA 3050						
Aluminum	4730	mg/kg	14.7	1	04/17/18 04:48	04/17/18 19:30	7429-90-5	
Barium	174	mg/kg	0.73	1	04/17/18 04:48	04/17/18 19:30	7440-39-3	
Boron	18.4	mg/kg	11.0	1	04/17/18 04:48	04/17/18 19:30	7440-42-8	
Copper	18.2	mg/kg	0.73	1	04/17/18 04:48	04/17/18 19:30	7440-50-8	
Iron	27600	mg/kg	18.4	5	04/17/18 04:48	04/18/18 11:36	7439-89-6	
Manganese	723	mg/kg	0.37	1	04/17/18 04:48	04/17/18 19:30	7439-96-5	
Nickel	11.3	mg/kg	1.5	1	04/17/18 04:48	04/17/18 19:30	7440-02-0	
Silver	ND	mg/kg	0.73	1	04/17/18 04:48	04/17/18 19:30	7440-22-4	
Tin	10.5	mg/kg	5.5	1	04/17/18 04:48	04/17/18 19:30	7440-31-5	
Titanium	172	mg/kg	1.8	1	04/17/18 04:48	04/17/18 19:30	7440-32-6	
Zinc	999	mg/kg	1.5	1	04/17/18 04:48	04/17/18 19:30	7440-66-6	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3050B						
Chromium	38.2	mg/kg	1.4	5	04/20/18 09:20	04/21/18 02:38	7440-47-3	N2
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	0.78	mg/kg	0.73	20	04/17/18 05:10	04/17/18 12:27	7440-36-0	
Arsenic	11.4	mg/kg	0.73	20	04/17/18 05:10	04/17/18 12:27	7440-38-2	
Beryllium	0.31	mg/kg	0.29	20	04/17/18 05:10	04/17/18 12:27	7440-41-7	
Cadmium	3.4	mg/kg	0.12	20	04/17/18 05:10	04/17/18 12:27	7440-43-9	
Cobalt	5.2	mg/kg	0.73	20	04/17/18 05:10	04/17/18 12:27	7440-48-4	
Lead	579	mg/kg	0.15	20	04/17/18 05:10	04/17/18 12:27	7439-92-1	
Lithium	5.6	mg/kg	0.73	20	04/17/18 05:10	04/17/18 12:27	7439-93-2	
Selenium	ND	mg/kg	0.73	20	04/17/18 05:10	04/17/18 12:27	7782-49-2	
Strontium	72.7	mg/kg	0.73	20	04/17/18 05:10	04/17/18 12:27	7440-24-6	
Vanadium	19.5	mg/kg	1.5	20	04/17/18 05:10	04/17/18 12:27	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.14	mg/kg	0.027	1	04/23/18 05:40	04/23/18 15:20	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	31.9	%	0.10	1		04/19/18 11:02		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	83-32-9	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-05 (5-7.5 WM) **Lab ID: 10427354002** Collected: 04/13/18 10:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	208-96-8	
Anthracene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	120-12-7	
Benzo(a)anthracene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	56-55-3	
Benzo(a)pyrene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	101-55-3	
Butylbenzylphthalate	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	85-68-7	
Carbazole	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	59-50-7	
4-Chloroaniline	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	108-60-1	
2-Chloronaphthalene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	91-58-7	
2-Chlorophenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	7005-72-3	
Chrysene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	53-70-3	
Dibenzofuran	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	120-83-2	
Diethylphthalate	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	105-67-9	
Dimethylphthalate	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	131-11-3	
Di-n-butylphthalate	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2490	1	04/19/18 17:13	04/20/18 23:25	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	606-20-2	
Di-n-octylphthalate	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	122-66-7	
bis(2-Ethylhexyl)phthalate	6560	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	117-81-7	
Fluoranthene	718	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	206-44-0	
Fluorene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	87-68-3	
Hexachlorobenzene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	118-74-1	
Hexachloroethane	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	193-39-5	
Isophorone	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	78-59-1	
1-Methylnaphthalene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	90-12-0	
2-Methylnaphthalene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-05 (5-7.5 WM) **Lab ID: 10427354002** Collected: 04/13/18 10:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	966	1	04/19/18 17:13	04/20/18 23:25		
Naphthalene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	91-20-3	
2-Nitroaniline	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	88-74-4	
3-Nitroaniline	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	99-09-2	
4-Nitroaniline	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	100-01-6	
Nitrobenzene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	98-95-3	
2-Nitrophenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	88-75-5	
4-Nitrophenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	86-30-6	
Pentachlorophenol	ND	ug/kg	981	1	04/19/18 17:13	04/20/18 23:25	87-86-5	
Phenanthrene	815	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	85-01-8	
Phenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	108-95-2	
Pyrene	618	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	48	%	43-125	1	04/19/18 17:13	04/20/18 23:25	4165-60-0	
2-Fluorobiphenyl (S)	66	%	30-132	1	04/19/18 17:13	04/20/18 23:25	321-60-8	
p-Terphenyl-d14 (S)	65	%	62-125	1	04/19/18 17:13	04/20/18 23:25	1718-51-0	
Phenol-d6 (S)	52	%	48-125	1	04/19/18 17:13	04/20/18 23:25	13127-88-3	
2-Fluorophenol (S)	53	%	40-125	1	04/19/18 17:13	04/20/18 23:25	367-12-4	
2,4,6-Tribromophenol (S)	59	%	60-125	1	04/19/18 17:13	04/20/18 23:25	118-79-6	S5
8270D MSSV PAH by SIM								
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	167	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	83-32-9	
Acenaphthylene	ND	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	208-96-8	
Anthracene	217	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	120-12-7	
Benzo(a)anthracene	373	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	56-55-3	
Benzo(a)pyrene	307	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	50-32-8	
Benzo(b)fluoranthene	398	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	205-99-2	
Benzo(g,h,i)perylene	190	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	191-24-2	
Benzo(k)fluoranthene	112	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	207-08-9	
Chrysene	356	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	53-70-3	
Fluoranthene	872	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	206-44-0	
Fluorene	354	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	86-73-7	
Indeno(1,2,3-cd)pyrene	153	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	193-39-5	
Naphthalene	825	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	91-20-3	
Phenanthrene	1100	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	85-01-8	
Pyrene	781	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	71	%	42-125	5	04/17/18 12:13	04/18/18 21:43	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-05 (5-7.5 WM) **Lab ID: 10427354002** Collected: 04/13/18 10:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	78	%	57-125	5	04/17/18 12:13	04/18/18 21:43	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1960	1	04/24/18 16:08	04/25/18 04:05	67-64-1	
Allyl chloride	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	107-05-1	
Benzene	58.1	ug/kg	39.2	1	04/24/18 16:08	04/25/18 04:05	71-43-2	
Bromobenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	108-86-1	
Bromochloromethane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	74-97-5	
Bromodichloromethane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	75-27-4	
Bromoform	ND	ug/kg	980	1	04/24/18 16:08	04/25/18 04:05	75-25-2	
Bromomethane	ND	ug/kg	980	1	04/24/18 16:08	04/25/18 04:05	74-83-9	
2-Butanone (MEK)	ND	ug/kg	490	1	04/24/18 16:08	04/25/18 04:05	78-93-3	
n-Butylbenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	104-51-8	
sec-Butylbenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	135-98-8	
tert-Butylbenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	98-06-6	
Carbon tetrachloride	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	56-23-5	
Chlorobenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	108-90-7	
Chloroethane	ND	ug/kg	980	1	04/24/18 16:08	04/25/18 04:05	75-00-3	
Chloroform	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	67-66-3	
Chloromethane	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	74-87-3	
2-Chlorotoluene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	95-49-8	
4-Chlorotoluene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	980	1	04/24/18 16:08	04/25/18 04:05	96-12-8	
Dibromochloromethane	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	106-93-4	
Dibromomethane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	75-71-8	
1,1-Dichloroethane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	75-34-3	
1,2-Dichloroethane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	107-06-2	
1,1-Dichloroethene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	156-60-5	
Dichlorofluoromethane	ND	ug/kg	980	1	04/24/18 16:08	04/25/18 04:05	75-43-4	
1,2-Dichloropropane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	78-87-5	
1,3-Dichloropropane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	142-28-9	
2,2-Dichloropropane	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	594-20-7	
1,1-Dichloropropene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	60-29-7	
Ethylbenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	490	1	04/24/18 16:08	04/25/18 04:05	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-05 (5-7.5 WM) **Lab ID: 10427354002** Collected: 04/13/18 10:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	106	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	98-82-8	
p-Isopropyltoluene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	99-87-6	
Methylene Chloride	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	490	1	04/24/18 16:08	04/25/18 04:05	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	1634-04-4	
Naphthalene	493	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	91-20-3	
n-Propylbenzene	117	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	103-65-1	
Styrene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	630-20-6	
1,1,2,2-Tetrachloroethane	138	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	79-34-5	
Tetrachloroethene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	127-18-4	
Tetrahydrofuran	ND	ug/kg	3920	1	04/24/18 16:08	04/25/18 04:05	109-99-9	
Toluene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	79-00-5	
Trichloroethene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	79-01-6	
Trichlorofluoromethane	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	76-13-1	
1,2,4-Trimethylbenzene	386	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	108-67-8	
Vinyl chloride	ND	ug/kg	39.2	1	04/24/18 16:08	04/25/18 04:05	75-01-4	
Xylene (Total)	ND	ug/kg	294	1	04/24/18 16:08	04/25/18 04:05	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%	75-125	1	04/24/18 16:08	04/25/18 04:05	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	04/24/18 16:08	04/25/18 04:05	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125	1	04/24/18 16:08	04/25/18 04:05	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	57.1	20	04/23/18 11:09	04/24/18 13:27	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	38.2	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.38	1	04/20/18 10:25	04/20/18 13:52	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	4.1	mg/kg	0.99	1	04/18/18 14:45	04/19/18 19:49	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-06 (8-12.5WM) Lab ID: 10427354003 Collected: 04/13/18 11:05 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.3	1	04/25/18 10:56	04/27/18 17:34	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	309-00-2	
alpha-BHC	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	319-84-6	
beta-BHC	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	319-85-7	
delta-BHC	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	58-89-9	
Chlordane (Technical)	ND	ug/kg	420	20	04/16/18 14:37	04/20/18 08:57	57-74-9	
alpha-Chlordane	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	5103-71-9	
gamma-Chlordane	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	5103-74-2	
4,4'-DDD	ND	ug/kg	83.7	20	04/16/18 14:37	04/20/18 08:57	72-54-8	
4,4'-DDE	ND	ug/kg	83.7	20	04/16/18 14:37	04/20/18 08:57	72-55-9	
4,4'-DDT	ND	ug/kg	83.7	20	04/16/18 14:37	04/20/18 08:57	50-29-3	
Dieldrin	ND	ug/kg	83.7	20	04/16/18 14:37	04/20/18 08:57	60-57-1	
Endosulfan I	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	959-98-8	
Endosulfan II	ND	ug/kg	83.7	20	04/16/18 14:37	04/20/18 08:57	33213-65-9	
Endosulfan sulfate	ND	ug/kg	83.7	20	04/16/18 14:37	04/20/18 08:57	1031-07-8	
Endrin	ND	ug/kg	83.7	20	04/16/18 14:37	04/20/18 08:57	72-20-8	
Endrin aldehyde	ND	ug/kg	83.7	20	04/16/18 14:37	04/20/18 08:57	7421-93-4	
Endrin ketone	ND	ug/kg	83.7	20	04/16/18 14:37	04/20/18 08:57	53494-70-5	
Heptachlor	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	76-44-8	
Heptachlor epoxide	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	1024-57-3	
Methoxychlor	ND	ug/kg	420	20	04/16/18 14:37	04/20/18 08:57	72-43-5	
Toxaphene	ND	ug/kg	1260	20	04/16/18 14:37	04/20/18 08:57	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%.	30-150	20	04/16/18 14:37	04/20/18 08:57	877-09-8	3M, D3, S4
Decachlorobiphenyl (S)	0	%.	30-150	20	04/16/18 14:37	04/20/18 08:57	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	12672-29-6	
PCB-1254 (Aroclor 1254)	94.1	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	11100-14-4	
PCB, Total	94.1	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	75	%.	48-125	1	04/16/18 15:03	04/18/18 03:06	877-09-8	
Decachlorobiphenyl (S)	66	%.	30-134	1	04/16/18 15:03	04/18/18 03:06	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Project No.: 10427354

Sample: TS-SB-06 (8-12.5WM) Lab ID: 10427354003 Collected: 04/13/18 11:05 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	3820	mg/kg	614	50	04/16/18 14:24	04/20/18 09:34		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	50	04/16/18 14:24	04/20/18 09:34	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	14.4	1	04/25/18 10:39	04/25/18 16:55		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	04/25/18 10:39	04/25/18 16:55	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	8830	mg/kg	11.9	1	04/17/18 04:48	04/17/18 19:33	7429-90-5	
Barium	118	mg/kg	0.59	1	04/17/18 04:48	04/17/18 19:33	7440-39-3	
Boron	23.6	mg/kg	8.9	1	04/17/18 04:48	04/17/18 19:33	7440-42-8	
Copper	341	mg/kg	0.59	1	04/17/18 04:48	04/17/18 19:33	7440-50-8	
Iron	11500	mg/kg	3.0	1	04/17/18 04:48	04/17/18 19:33	7439-89-6	
Manganese	247	mg/kg	0.30	1	04/17/18 04:48	04/17/18 19:33	7439-96-5	
Nickel	21.2	mg/kg	1.2	1	04/17/18 04:48	04/17/18 19:33	7440-02-0	
Silver	ND	mg/kg	0.59	1	04/17/18 04:48	04/17/18 19:33	7440-22-4	
Tin	ND	mg/kg	4.5	1	04/17/18 04:48	04/17/18 19:33	7440-31-5	
Titanium	228	mg/kg	1.5	1	04/17/18 04:48	04/17/18 19:33	7440-32-6	
Zinc	519	mg/kg	1.2	1	04/17/18 04:48	04/17/18 19:33	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	24.3	mg/kg	1.2	5	04/20/18 09:20	04/21/18 02:52	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	3.1	mg/kg	0.59	20	04/17/18 05:10	04/17/18 12:30	7440-36-0	
Arsenic	5.5	mg/kg	0.59	20	04/17/18 05:10	04/17/18 12:30	7440-38-2	
Beryllium	ND	mg/kg	0.24	20	04/17/18 05:10	04/17/18 12:30	7440-41-7	
Cadmium	1.3	mg/kg	0.094	20	04/17/18 05:10	04/17/18 12:30	7440-43-9	
Cobalt	4.0	mg/kg	0.59	20	04/17/18 05:10	04/17/18 12:30	7440-48-4	
Lead	436	mg/kg	0.12	20	04/17/18 05:10	04/17/18 12:30	7439-92-1	
Lithium	3.5	mg/kg	0.59	20	04/17/18 05:10	04/17/18 12:30	7439-93-2	
Selenium	ND	mg/kg	0.59	20	04/17/18 05:10	04/17/18 12:30	7782-49-2	
Strontium	45.4	mg/kg	0.59	20	04/17/18 05:10	04/17/18 12:30	7440-24-6	
Vanadium	13.1	mg/kg	1.2	20	04/17/18 05:10	04/17/18 12:30	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.23	mg/kg	0.023	1	04/23/18 05:40	04/23/18 15:27	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	20.5	%	0.10	1		04/19/18 11:04		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: **TS-SB-06 (8-12.5WM)** Lab ID: **10427354003** Collected: 04/13/18 11:05 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	208-96-8	
Anthracene	5490	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	120-12-7	
Benzo(a)anthracene	13800	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	56-55-3	
Benzo(a)pyrene	12700	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	50-32-8	
Benzo(b)fluoranthene	18000	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	205-99-2	
Benzo(g,h,i)perylene	8300	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	191-24-2	
Benzo(k)fluoranthene	6380	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	101-55-3	
Butylbenzylphthalate	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	85-68-7	
Carbazole	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	59-50-7	
4-Chloroaniline	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	108-60-1	
2-Chloronaphthalene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	91-58-7	
2-Chlorophenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	7005-72-3	
Chrysene	14800	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	53-70-3	
Dibenzofuran	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	120-83-2	
Diethylphthalate	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	105-67-9	
Dimethylphthalate	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	131-11-3	
Di-n-butylphthalate	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	21400	10	04/19/18 17:13	04/23/18 21:33	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	606-20-2	
Di-n-octylphthalate	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	117-81-7	
Fluoranthene	31200	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	206-44-0	
Fluorene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	87-68-3	
Hexachlorobenzene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	118-74-1	
Hexachloroethane	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	67-72-1	
Indeno(1,2,3-cd)pyrene	7520	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	193-39-5	
Isophorone	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	78-59-1	
1-Methylnaphthalene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	90-12-0	
2-Methylnaphthalene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-06 (8-12.5WM) **Lab ID: 10427354003** Collected: 04/13/18 11:05 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	8300	10	04/19/18 17:13	04/23/18 21:33		
Naphthalene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	91-20-3	
2-Nitroaniline	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	88-74-4	
3-Nitroaniline	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	99-09-2	
4-Nitroaniline	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	100-01-6	
Nitrobenzene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	98-95-3	
2-Nitrophenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	88-75-5	
4-Nitrophenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	86-30-6	
Pentachlorophenol	ND	ug/kg	8420	10	04/19/18 17:13	04/23/18 21:33	87-86-5	
Phenanthrene	19500	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	85-01-8	
Phenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	108-95-2	
Pyrene	27200	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%	43-125	10	04/19/18 17:13	04/23/18 21:33	4165-60-0	S4
2-Fluorobiphenyl (S)	0	%	30-132	10	04/19/18 17:13	04/23/18 21:33	321-60-8	S4
p-Terphenyl-d14 (S)	0	%	62-125	10	04/19/18 17:13	04/23/18 21:33	1718-51-0	S4
Phenol-d6 (S)	0	%	48-125	10	04/19/18 17:13	04/23/18 21:33	13127-88-3	S4
2-Fluorophenol (S)	0	%	40-125	10	04/19/18 17:13	04/23/18 21:33	367-12-4	S4
2,4,6-Tribromophenol (S)	0	%	60-125	10	04/19/18 17:13	04/23/18 21:33	118-79-6	S4
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	367	ug/kg	62.9	5	04/17/18 12:13	04/18/18 22:03	83-32-9	
Acenaphthylene	ND	ug/kg	62.9	5	04/17/18 12:13	04/18/18 22:03	208-96-8	
Anthracene	1210	ug/kg	62.9	5	04/17/18 12:13	04/18/18 22:03	120-12-7	
Benzo(a)anthracene	3210	ug/kg	314	25	04/17/18 12:13	04/19/18 22:11	56-55-3	
Benzo(a)pyrene	3060	ug/kg	314	25	04/17/18 12:13	04/19/18 22:11	50-32-8	
Benzo(b)fluoranthene	3850	ug/kg	314	25	04/17/18 12:13	04/19/18 22:11	205-99-2	
Benzo(g,h,i)perylene	1690	ug/kg	62.9	5	04/17/18 12:13	04/18/18 22:03	191-24-2	
Benzo(k)fluoranthene	1390	ug/kg	62.9	5	04/17/18 12:13	04/18/18 22:03	207-08-9	
Chrysene	2910	ug/kg	314	25	04/17/18 12:13	04/19/18 22:11	218-01-9	
Dibenz(a,h)anthracene	511	ug/kg	62.9	5	04/17/18 12:13	04/18/18 22:03	53-70-3	
Fluoranthene	6940	ug/kg	314	25	04/17/18 12:13	04/19/18 22:11	206-44-0	
Fluorene	413	ug/kg	62.9	5	04/17/18 12:13	04/18/18 22:03	86-73-7	
Indeno(1,2,3-cd)pyrene	1550	ug/kg	62.9	5	04/17/18 12:13	04/18/18 22:03	193-39-5	
Naphthalene	ND	ug/kg	62.9	5	04/17/18 12:13	04/18/18 22:03	91-20-3	
Phenanthrene	4240	ug/kg	314	25	04/17/18 12:13	04/19/18 22:11	85-01-8	
Pyrene	5350	ug/kg	314	25	04/17/18 12:13	04/19/18 22:11	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	86	%	42-125	5	04/17/18 12:13	04/18/18 22:03	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-06 (8-12.5WM) Lab ID: 10427354003 Collected: 04/13/18 11:05 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Surrogates

p-Terphenyl-d14 (S)	101	%	57-125	5	04/17/18 12:13	04/18/18 22:03	1718-51-0	
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8260B MSV 5030 Med Level

Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B

Acetone	ND	ug/kg	1280	1	04/24/18 16:08	04/25/18 04:22	67-64-1	
Allyl chloride	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	107-05-1	
Benzene	ND	ug/kg	25.7	1	04/24/18 16:08	04/25/18 04:22	71-43-2	
Bromobenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	108-86-1	
Bromochloromethane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	74-97-5	
Bromodichloromethane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	75-27-4	
Bromoform	ND	ug/kg	642	1	04/24/18 16:08	04/25/18 04:22	75-25-2	
Bromomethane	ND	ug/kg	642	1	04/24/18 16:08	04/25/18 04:22	74-83-9	
2-Butanone (MEK)	ND	ug/kg	321	1	04/24/18 16:08	04/25/18 04:22	78-93-3	
n-Butylbenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	104-51-8	
sec-Butylbenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	135-98-8	
tert-Butylbenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	98-06-6	
Carbon tetrachloride	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	56-23-5	
Chlorobenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	108-90-7	
Chloroethane	ND	ug/kg	642	1	04/24/18 16:08	04/25/18 04:22	75-00-3	
Chloroform	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	67-66-3	
Chloromethane	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	74-87-3	
2-Chlorotoluene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	95-49-8	
4-Chlorotoluene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	642	1	04/24/18 16:08	04/25/18 04:22	96-12-8	
Dibromochloromethane	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	106-93-4	
Dibromomethane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	75-71-8	
1,1-Dichloroethane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	75-34-3	
1,2-Dichloroethane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	107-06-2	
1,1-Dichloroethene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	156-60-5	
Dichlorofluoromethane	ND	ug/kg	642	1	04/24/18 16:08	04/25/18 04:22	75-43-4	
1,2-Dichloropropane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	78-87-5	
1,3-Dichloropropane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	142-28-9	
2,2-Dichloropropane	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	594-20-7	
1,1-Dichloropropene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	60-29-7	
Ethylbenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	321	1	04/24/18 16:08	04/25/18 04:22	87-68-3	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-06 (8-12.5WM) Lab ID: 10427354003 Collected: 04/13/18 11:05 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	98-82-8	
p-Isopropyltoluene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	99-87-6	
Methylene Chloride	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	321	1	04/24/18 16:08	04/25/18 04:22	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	1634-04-4	
Naphthalene	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	91-20-3	
n-Propylbenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	103-65-1	
Styrene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	79-34-5	
Tetrachloroethene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	127-18-4	
Tetrahydrofuran	ND	ug/kg	2570	1	04/24/18 16:08	04/25/18 04:22	109-99-9	
Toluene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	79-00-5	
Trichloroethene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	79-01-6	
Trichlorofluoromethane	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	108-67-8	
Vinyl chloride	ND	ug/kg	25.7	1	04/24/18 16:08	04/25/18 04:22	75-01-4	
Xylene (Total)	ND	ug/kg	193	1	04/24/18 16:08	04/25/18 04:22	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	95	%	75-125	1	04/24/18 16:08	04/25/18 04:22	17060-07-0	
Toluene-d8 (S)	96	%	75-125	1	04/24/18 16:08	04/25/18 04:22	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125	1	04/24/18 16:08	04/25/18 04:22	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	48.4	20	04/23/18 11:09	04/24/18 13:27	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	24.3	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.30	1	04/20/18 10:25	04/20/18 13:52	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	04/18/18 14:45	04/19/18 18:31	16984-48-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-07 (15.18.5) **Lab ID: 10427354004** Collected: 04/13/18 12:20 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	9.58	1	04/25/18 10:56	04/27/18 17:40	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	309-00-2	
alpha-BHC	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	319-84-6	
beta-BHC	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	319-85-7	
delta-BHC	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	58-89-9	
Chlordane (Technical)	ND	ug/kg	35.9	2	04/16/18 14:37	04/20/18 01:56	57-74-9	
alpha-Chlordane	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	5103-71-9	
gamma-Chlordane	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	5103-74-2	
4,4'-DDD	ND	ug/kg	7.2	2	04/16/18 14:37	04/20/18 01:56	72-54-8	
4,4'-DDE	ND	ug/kg	7.2	2	04/16/18 14:37	04/20/18 01:56	72-55-9	
4,4'-DDT	ND	ug/kg	7.2	2	04/16/18 14:37	04/20/18 01:56	50-29-3	
Dieldrin	ND	ug/kg	7.2	2	04/16/18 14:37	04/20/18 01:56	60-57-1	
Endosulfan I	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	959-98-8	
Endosulfan II	ND	ug/kg	7.2	2	04/16/18 14:37	04/20/18 01:56	33213-65-9	
Endosulfan sulfate	ND	ug/kg	7.2	2	04/16/18 14:37	04/20/18 01:56	1031-07-8	
Endrin	ND	ug/kg	7.2	2	04/16/18 14:37	04/20/18 01:56	72-20-8	
Endrin aldehyde	ND	ug/kg	7.2	2	04/16/18 14:37	04/20/18 01:56	7421-93-4	
Endrin ketone	ND	ug/kg	7.2	2	04/16/18 14:37	04/20/18 01:56	53494-70-5	
Heptachlor	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	76-44-8	
Heptachlor epoxide	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	1024-57-3	
Methoxychlor	ND	ug/kg	35.9	2	04/16/18 14:37	04/20/18 01:56	72-43-5	
Toxaphene	ND	ug/kg	108	2	04/16/18 14:37	04/20/18 01:56	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	95	%	30-150	2	04/16/18 14:37	04/20/18 01:56	877-09-8	5M, D3
Decachlorobiphenyl (S)	92	%	30-150	2	04/16/18 14:37	04/20/18 01:56	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	11100-14-4	
PCB, Total	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	87	%	48-125	1	04/16/18 15:03	04/18/18 03:21	877-09-8	
Decachlorobiphenyl (S)	80	%	30-134	1	04/16/18 15:03	04/18/18 03:21	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WIDRO C10-C28	ND	mg/kg	7.2	1	04/16/18 14:24	04/19/18 19:45		

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-07 (15.18.5) **Lab ID: 10427354004** Collected: 04/13/18 12:20 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	92	%	50-150	1	04/16/18 14:24	04/19/18 19:45	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	11.2	1	04/25/18 10:39	04/25/18 17:19		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	04/25/18 10:39	04/25/18 17:19	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	2680	mg/kg	10.1	1	04/17/18 04:48	04/17/18 19:37	7429-90-5	
Barium	40.0	mg/kg	0.50	1	04/17/18 04:48	04/17/18 19:37	7440-39-3	
Boron	ND	mg/kg	7.6	1	04/17/18 04:48	04/17/18 19:37	7440-42-8	
Copper	6.3	mg/kg	0.50	1	04/17/18 04:48	04/17/18 19:37	7440-50-8	
Iron	7710	mg/kg	2.5	1	04/17/18 04:48	04/17/18 19:37	7439-89-6	
Manganese	300	mg/kg	0.25	1	04/17/18 04:48	04/17/18 19:37	7439-96-5	
Nickel	7.6	mg/kg	1.0	1	04/17/18 04:48	04/17/18 19:37	7440-02-0	
Silver	ND	mg/kg	0.50	1	04/17/18 04:48	04/17/18 19:37	7440-22-4	
Tin	ND	mg/kg	3.8	1	04/17/18 04:48	04/17/18 19:37	7440-31-5	
Titanium	182	mg/kg	1.3	1	04/17/18 04:48	04/17/18 19:37	7440-32-6	
Zinc	16.1	mg/kg	1.0	1	04/17/18 04:48	04/17/18 19:37	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	8.3	mg/kg	0.98	5	04/20/18 09:20	04/21/18 02:57	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.53	20	04/17/18 05:10	04/17/18 12:32	7440-36-0	
Arsenic	2.1	mg/kg	0.53	20	04/17/18 05:10	04/17/18 12:32	7440-38-2	
Beryllium	ND	mg/kg	0.21	20	04/17/18 05:10	04/17/18 12:32	7440-41-7	
Cadmium	0.12	mg/kg	0.085	20	04/17/18 05:10	04/17/18 12:32	7440-43-9	
Cobalt	3.4	mg/kg	0.53	20	04/17/18 05:10	04/17/18 12:32	7440-48-4	
Lead	4.8	mg/kg	0.11	20	04/17/18 05:10	04/17/18 12:32	7439-92-1	
Lithium	4.5	mg/kg	0.53	20	04/17/18 05:10	04/17/18 12:32	7439-93-2	
Selenium	ND	mg/kg	0.53	20	04/17/18 05:10	04/17/18 12:32	7782-49-2	
Strontium	27.3	mg/kg	0.53	20	04/17/18 05:10	04/17/18 12:32	7440-24-6	
Vanadium	19.7	mg/kg	1.1	20	04/17/18 05:10	04/17/18 12:32	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	ND	mg/kg	0.020	1	04/23/18 05:40	04/23/18 15:29	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	7.2	%	0.10	1		04/19/18 11:05		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	83-32-9	
Acenaphthylene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	208-96-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: **TS-SB-07 (15.18.5)** Lab ID: **10427354004** Collected: 04/13/18 12:20 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	120-12-7	
Benzo(a)anthracene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	56-55-3	
Benzo(a)pyrene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	101-55-3	
Butylbenzylphthalate	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	85-68-7	
Carbazole	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	59-50-7	
4-Chloroaniline	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	108-60-1	
2-Chloronaphthalene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	91-58-7	
2-Chlorophenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	7005-72-3	
Chrysene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	53-70-3	
Dibenzofuran	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	120-83-2	
Diethylphthalate	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	105-67-9	
Dimethylphthalate	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	131-11-3	
Di-n-butylphthalate	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	1830	1	04/19/18 17:13	04/20/18 17:30	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	606-20-2	
Di-n-octylphthalate	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	117-81-7	
Fluoranthene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	206-44-0	
Fluorene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	87-68-3	
Hexachlorobenzene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	118-74-1	
Hexachloroethane	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	193-39-5	
Isophorone	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	78-59-1	
1-Methylnaphthalene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	90-12-0	
2-Methylnaphthalene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: **TS-SB-07 (15.18.5)** Lab ID: **10427354004** Collected: 04/13/18 12:20 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	710	1	04/19/18 17:13	04/20/18 17:30		
Naphthalene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	91-20-3	
2-Nitroaniline	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	88-74-4	
3-Nitroaniline	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	99-09-2	
4-Nitroaniline	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	100-01-6	
Nitrobenzene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	98-95-3	
2-Nitrophenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	88-75-5	
4-Nitrophenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	86-30-6	
Pentachlorophenol	ND	ug/kg	721	1	04/19/18 17:13	04/20/18 17:30	87-86-5	
Phenanthrene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	85-01-8	
Phenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	108-95-2	
Pyrene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	58	%.	43-125	1	04/19/18 17:13	04/20/18 17:30	4165-60-0	
2-Fluorobiphenyl (S)	67	%.	30-132	1	04/19/18 17:13	04/20/18 17:30	321-60-8	
p-Terphenyl-d14 (S)	70	%.	62-125	1	04/19/18 17:13	04/20/18 17:30	1718-51-0	
Phenol-d6 (S)	62	%.	48-125	1	04/19/18 17:13	04/20/18 17:30	13127-88-3	
2-Fluorophenol (S)	62	%.	40-125	1	04/19/18 17:13	04/20/18 17:30	367-12-4	
2,4,6-Tribromophenol (S)	55	%.	60-125	1	04/19/18 17:13	04/20/18 17:30	118-79-6	S5
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	83-32-9	
Acenaphthylene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	208-96-8	
Anthracene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	120-12-7	
Benzo(a)anthracene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	56-55-3	
Benzo(a)pyrene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	207-08-9	
Chrysene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	53-70-3	
Fluoranthene	15.6	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	206-44-0	
Fluorene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	193-39-5	
Naphthalene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	91-20-3	
Phenanthrene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	85-01-8	
Pyrene	13.2	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	72	%.	42-125	1	04/17/18 12:13	04/18/18 17:39	321-60-8	
p-Terphenyl-d14 (S)	92	%.	57-125	1	04/17/18 12:13	04/18/18 17:39	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: **TS-SB-07 (15.18.5)** Lab ID: **10427354004** Collected: 04/13/18 12:20 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1040	1	04/24/18 16:08	04/25/18 04:39	67-64-1	
Allyl chloride	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	107-05-1	
Benzene	ND	ug/kg	20.8	1	04/24/18 16:08	04/25/18 04:39	71-43-2	
Bromobenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	108-86-1	
Bromochloromethane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	74-97-5	
Bromodichloromethane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	75-27-4	
Bromoform	ND	ug/kg	521	1	04/24/18 16:08	04/25/18 04:39	75-25-2	
Bromomethane	ND	ug/kg	521	1	04/24/18 16:08	04/25/18 04:39	74-83-9	
2-Butanone (MEK)	ND	ug/kg	261	1	04/24/18 16:08	04/25/18 04:39	78-93-3	
n-Butylbenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	104-51-8	
sec-Butylbenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	135-98-8	
tert-Butylbenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	98-06-6	
Carbon tetrachloride	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	56-23-5	
Chlorobenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	108-90-7	
Chloroethane	ND	ug/kg	521	1	04/24/18 16:08	04/25/18 04:39	75-00-3	
Chloroform	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	67-66-3	
Chloromethane	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	74-87-3	
2-Chlorotoluene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	95-49-8	
4-Chlorotoluene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	521	1	04/24/18 16:08	04/25/18 04:39	96-12-8	
Dibromochloromethane	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	106-93-4	
Dibromomethane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	75-71-8	
1,1-Dichloroethane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	75-34-3	
1,2-Dichloroethane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	107-06-2	
1,1-Dichloroethene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	156-60-5	
Dichlorofluoromethane	ND	ug/kg	521	1	04/24/18 16:08	04/25/18 04:39	75-43-4	
1,2-Dichloropropane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	78-87-5	
1,3-Dichloropropane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	142-28-9	
2,2-Dichloropropane	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	594-20-7	
1,1-Dichloropropene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	60-29-7	
Ethylbenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	261	1	04/24/18 16:08	04/25/18 04:39	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	98-82-8	
p-Isopropyltoluene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	99-87-6	
Methylene Chloride	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	261	1	04/24/18 16:08	04/25/18 04:39	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-07 (15.18.5) **Lab ID: 10427354004** Collected: 04/13/18 12:20 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	1634-04-4	
Naphthalene	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	91-20-3	
n-Propylbenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	103-65-1	
Styrene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	79-34-5	
Tetrachloroethene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	127-18-4	
Tetrahydrofuran	ND	ug/kg	2080	1	04/24/18 16:08	04/25/18 04:39	109-99-9	
Toluene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	79-00-5	
Trichloroethene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	79-01-6	
Trichlorofluoromethane	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	108-67-8	
Vinyl chloride	ND	ug/kg	20.8	1	04/24/18 16:08	04/25/18 04:39	75-01-4	
Xylene (Total)	ND	ug/kg	156	1	04/24/18 16:08	04/25/18 04:39	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	92	%.	75-125	1	04/24/18 16:08	04/25/18 04:39	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1	04/24/18 16:08	04/25/18 04:39	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125	1	04/24/18 16:08	04/25/18 04:39	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	2.1	1	04/23/18 11:09	04/24/18 13:52	18540-29-9	
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	8.3	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.32	1	04/20/18 10:25	04/20/18 13:53	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	0.99	mg/kg	0.99	1	04/18/18 14:45	04/19/18 17:32	16984-48-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-08 (10-20WM) Lab ID: 10427354005 Collected: 04/13/18 14:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	15.2	1	04/25/18 10:56	04/30/18 14:06	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	309-00-2	
alpha-BHC	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	319-84-6	
beta-BHC	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	319-85-7	
delta-BHC	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	58-89-9	
Chlordane (Technical)	ND	ug/kg	2750	100	04/16/18 14:37	04/20/18 10:29	57-74-9	
alpha-Chlordane	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	5103-71-9	
gamma-Chlordane	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	5103-74-2	
4,4'-DDD	ND	ug/kg	548	100	04/16/18 14:37	04/20/18 10:29	72-54-8	
4,4'-DDE	ND	ug/kg	548	100	04/16/18 14:37	04/20/18 10:29	72-55-9	
4,4'-DDT	ND	ug/kg	548	100	04/16/18 14:37	04/20/18 10:29	50-29-3	
Dieldrin	ND	ug/kg	548	100	04/16/18 14:37	04/20/18 10:29	60-57-1	
Endosulfan I	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	959-98-8	
Endosulfan II	ND	ug/kg	548	100	04/16/18 14:37	04/20/18 10:29	33213-65-9	
Endosulfan sulfate	ND	ug/kg	548	100	04/16/18 14:37	04/20/18 10:29	1031-07-8	
Endrin	ND	ug/kg	548	100	04/16/18 14:37	04/20/18 10:29	72-20-8	
Endrin aldehyde	ND	ug/kg	548	100	04/16/18 14:37	04/20/18 10:29	7421-93-4	
Endrin ketone	ND	ug/kg	548	100	04/16/18 14:37	04/20/18 10:29	53494-70-5	
Heptachlor	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	76-44-8	
Heptachlor epoxide	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	1024-57-3	
Methoxychlor	ND	ug/kg	2750	100	04/16/18 14:37	04/20/18 10:29	72-43-5	
Toxaphene	ND	ug/kg	8220	100	04/16/18 14:37	04/20/18 10:29	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	100	04/16/18 14:37	04/20/18 10:29	877-09-8	2M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	100	04/16/18 14:37	04/20/18 10:29	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	11100-14-4	
PCB, Total	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	53	%	48-125	1	04/16/18 15:03	04/18/18 03:37	877-09-8	
Decachlorobiphenyl (S)	50	%	30-134	1	04/16/18 15:03	04/18/18 03:37	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-08 (10-20WM) **Lab ID: 10427354005** Collected: 04/13/18 14:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	2810	mg/kg	831	10	04/16/18 14:24	04/19/18 18:19		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	10	04/16/18 14:24	04/19/18 18:19	638-68-6	P3,S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	47.7	mg/kg	22.6	1	04/25/18 10:39	04/25/18 17:44		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%.	80-150	1	04/25/18 10:39	04/25/18 17:44	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	1030	mg/kg	16.0	1	04/17/18 04:48	04/17/18 19:41	7429-90-5	
Barium	83.2	mg/kg	0.80	1	04/17/18 04:48	04/17/18 19:41	7440-39-3	
Boron	22.3	mg/kg	12.0	1	04/17/18 04:48	04/17/18 19:41	7440-42-8	
Copper	6.0	mg/kg	0.80	1	04/17/18 04:48	04/17/18 19:41	7440-50-8	
Iron	5320	mg/kg	4.0	1	04/17/18 04:48	04/17/18 19:41	7439-89-6	
Manganese	75.7	mg/kg	0.40	1	04/17/18 04:48	04/17/18 19:41	7439-96-5	
Nickel	2.3	mg/kg	1.6	1	04/17/18 04:48	04/17/18 19:41	7440-02-0	
Silver	ND	mg/kg	0.80	1	04/17/18 04:48	04/17/18 19:41	7440-22-4	
Tin	ND	mg/kg	6.0	1	04/17/18 04:48	04/17/18 19:41	7440-31-5	
Titanium	131	mg/kg	2.0	1	04/17/18 04:48	04/17/18 19:41	7440-32-6	
Zinc	137	mg/kg	1.6	1	04/17/18 04:48	04/17/18 19:41	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	110	mg/kg	1.5	5	04/20/18 09:20	04/21/18 03:01	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.78	20	04/17/18 05:10	04/17/18 12:35	7440-36-0	
Arsenic	ND	mg/kg	0.78	20	04/17/18 05:10	04/17/18 12:35	7440-38-2	
Beryllium	ND	mg/kg	0.31	20	04/17/18 05:10	04/17/18 12:35	7440-41-7	
Cadmium	0.13	mg/kg	0.12	20	04/17/18 05:10	04/17/18 12:35	7440-43-9	
Cobalt	0.79	mg/kg	0.78	20	04/17/18 05:10	04/17/18 12:35	7440-48-4	
Lead	56.1	mg/kg	0.16	20	04/17/18 05:10	04/17/18 12:35	7439-92-1	
Lithium	0.84	mg/kg	0.78	20	04/17/18 05:10	04/17/18 12:35	7439-93-2	
Selenium	ND	mg/kg	0.78	20	04/17/18 05:10	04/17/18 12:35	7782-49-2	
Strontium	64.2	mg/kg	0.78	20	04/17/18 05:10	04/17/18 12:35	7440-24-6	
Vanadium	2.5	mg/kg	1.6	20	04/17/18 05:10	04/17/18 12:35	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.15	mg/kg	0.032	1	04/23/18 05:40	04/23/18 15:31	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	39.4	%	0.10	1		04/19/18 11:06		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: **TS-SB-08 (10-20WM)** Lab ID: **10427354005** Collected: 04/13/18 14:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	208-96-8	
Anthracene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	120-12-7	
Benzo(a)anthracene	3330	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	56-55-3	
Benzo(a)pyrene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	50-32-8	
Benzo(b)fluoranthene	3570	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	101-55-3	
Butylbenzylphthalate	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	85-68-7	
Carbazole	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	59-50-7	
4-Chloroaniline	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	108-60-1	
2-Chloronaphthalene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	91-58-7	
2-Chlorophenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	7005-72-3	
Chrysene	3700	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	53-70-3	
Dibenzofuran	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	120-83-2	
Diethylphthalate	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	105-67-9	
Dimethylphthalate	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	131-11-3	
Di-n-butylphthalate	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	13900	5	04/19/18 17:13	04/24/18 17:51	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	606-20-2	
Di-n-octylphthalate	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	122-66-7	
bis(2-Ethylhexyl)phthalate	100000	ug/kg	10800	20	04/19/18 17:13	04/24/18 19:47	117-81-7	
Fluoranthene	8330	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	206-44-0	
Fluorene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	87-68-3	
Hexachlorobenzene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	118-74-1	
Hexachloroethane	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	193-39-5	
Isophorone	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	78-59-1	
1-Methylnaphthalene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	90-12-0	
2-Methylnaphthalene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-08 (10-20WM) **Lab ID: 10427354005** Collected: 04/13/18 14:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

2-Methylphenol(o-Cresol)	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	5410	5	04/19/18 17:13	04/24/18 17:51		
Naphthalene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	91-20-3	
2-Nitroaniline	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	88-74-4	
3-Nitroaniline	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	99-09-2	
4-Nitroaniline	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	100-01-6	
Nitrobenzene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	98-95-3	
2-Nitrophenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	88-75-5	
4-Nitrophenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	86-30-6	
Pentachlorophenol	ND	ug/kg	5500	5	04/19/18 17:13	04/24/18 17:51	87-86-5	
Phenanthrene	7550	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	85-01-8	
Phenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	108-95-2	
Pyrene	8120	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	60	%	43-125	5	04/19/18 17:13	04/24/18 17:51	4165-60-0	D4
2-Fluorobiphenyl (S)	73	%	30-132	5	04/19/18 17:13	04/24/18 17:51	321-60-8	
p-Terphenyl-d14 (S)	79	%	62-125	5	04/19/18 17:13	04/24/18 17:51	1718-51-0	
Phenol-d6 (S)	71	%	48-125	5	04/19/18 17:13	04/24/18 17:51	13127-88-3	
2-Fluorophenol (S)	72	%	40-125	5	04/19/18 17:13	04/24/18 17:51	367-12-4	
2,4,6-Tribromophenol (S)	66	%	60-125	5	04/19/18 17:13	04/24/18 17:51	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	674	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	83-32-9	
Acenaphthylene	ND	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	208-96-8	
Anthracene	1270	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	120-12-7	
Benzo(a)anthracene	1640	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	56-55-3	
Benzo(a)pyrene	1240	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	50-32-8	
Benzo(b)fluoranthene	1560	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	205-99-2	
Benzo(g,h,i)perylene	730	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	191-24-2	
Benzo(k)fluoranthene	760	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	207-08-9	
Chrysene	1940	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	218-01-9	
Dibenz(a,h)anthracene	220	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	53-70-3	
Fluoranthene	5080	ug/kg	411	25	04/17/18 12:13	04/19/18 21:50	206-44-0	
Fluorene	972	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	86-73-7	
Indeno(1,2,3-cd)pyrene	714	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	193-39-5	
Naphthalene	2240	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	91-20-3	
Phenanthrene	8530	ug/kg	411	25	04/17/18 12:13	04/19/18 21:50	85-01-8	
Pyrene	3920	ug/kg	411	25	04/17/18 12:13	04/19/18 21:50	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	67	%	42-125	5	04/17/18 12:13	04/18/18 21:23	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-08 (10-20WM) **Lab ID: 10427354005** Collected: 04/13/18 14:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	81	%	57-125	5	04/17/18 12:13	04/18/18 21:23	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	2290	1	04/24/18 16:08	04/25/18 04:55	67-64-1	
Allyl chloride	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	107-05-1	
Benzene	ND	ug/kg	45.7	1	04/24/18 16:08	04/25/18 04:55	71-43-2	
Bromobenzene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	108-86-1	
Bromochloromethane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	74-97-5	
Bromodichloromethane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	75-27-4	
Bromoform	ND	ug/kg	1140	1	04/24/18 16:08	04/25/18 04:55	75-25-2	
Bromomethane	ND	ug/kg	1140	1	04/24/18 16:08	04/25/18 04:55	74-83-9	
2-Butanone (MEK)	ND	ug/kg	572	1	04/24/18 16:08	04/25/18 04:55	78-93-3	
n-Butylbenzene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	104-51-8	
sec-Butylbenzene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	135-98-8	
tert-Butylbenzene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	98-06-6	
Carbon tetrachloride	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	56-23-5	
Chlorobenzene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	108-90-7	
Chloroethane	ND	ug/kg	1140	1	04/24/18 16:08	04/25/18 04:55	75-00-3	
Chloroform	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	67-66-3	
Chloromethane	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	74-87-3	
2-Chlorotoluene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	95-49-8	
4-Chlorotoluene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1140	1	04/24/18 16:08	04/25/18 04:55	96-12-8	
Dibromochloromethane	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	106-93-4	
Dibromomethane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	541-73-1	
1,4-Dichlorobenzene	512	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	75-71-8	
1,1-Dichloroethane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	75-34-3	
1,2-Dichloroethane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	107-06-2	
1,1-Dichloroethene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1140	1	04/24/18 16:08	04/25/18 04:55	75-43-4	
1,2-Dichloropropane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	78-87-5	
1,3-Dichloropropane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	142-28-9	
2,2-Dichloropropane	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	594-20-7	
1,1-Dichloropropene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	60-29-7	
Ethylbenzene	649	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	572	1	04/24/18 16:08	04/25/18 04:55	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-08 (10-20WM) **Lab ID: 10427354005** Collected: 04/13/18 14:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	292	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	98-82-8	
p-Isopropyltoluene	635	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	99-87-6	
Methylene Chloride	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	572	1	04/24/18 16:08	04/25/18 04:55	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	1634-04-4	
Naphthalene	4880	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	91-20-3	
n-Propylbenzene	329	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	103-65-1	
Styrene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	79-34-5	
Tetrachloroethene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	127-18-4	
Tetrahydrofuran	ND	ug/kg	4570	1	04/24/18 16:08	04/25/18 04:55	109-99-9	
Toluene	135	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	79-00-5	
Trichloroethene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	79-01-6	
Trichlorofluoromethane	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	76-13-1	
1,2,4-Trimethylbenzene	1130	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	95-63-6	
1,3,5-Trimethylbenzene	366	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	108-67-8	
Vinyl chloride	ND	ug/kg	45.7	1	04/24/18 16:08	04/25/18 04:55	75-01-4	
Xylene (Total)	1320	ug/kg	343	1	04/24/18 16:08	04/25/18 04:55	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%	75-125	1	04/24/18 16:08	04/25/18 04:55	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	04/24/18 16:08	04/25/18 04:55	2037-26-5	
4-Bromofluorobenzene (S)	97	%	75-125	1	04/24/18 16:08	04/25/18 04:55	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	65.2	20	04/23/18 11:09	04/24/18 13:53	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	110	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	1.1	mg/kg	0.65	1	04/20/18 10:25	04/20/18 13:54	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	04/18/18 14:45	04/19/18 17:52	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10427354

QC Batch: 141622 Analysis Method: EPA 1630 (1998)
QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
Associated Lab Samples: 10427354002, 10427354003, 10427354004

METHOD BLANK: 559956 Matrix: Solid
Associated Lab Samples: 10427354002, 10427354003, 10427354004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.16	04/27/18 14:14	N3

METHOD BLANK: 559957 Matrix: Solid
Associated Lab Samples: 10427354002, 10427354003, 10427354004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.05	04/27/18 14:20	N3

METHOD BLANK: 559958 Matrix: Solid
Associated Lab Samples: 10427354002, 10427354003, 10427354004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.14	04/27/18 14:27	N3

LABORATORY CONTROL SAMPLE: 559959

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	99.7	116	117	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559960 559961

Parameter	Units	10427018004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	374	387	412	449	110	116	65-135	9	35	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559962 559963

Parameter	Units	10427291002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	344	356	391	403	114	113	65-135	3	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 141683

Analysis Method: EPA 1630 (1998)

QC Batch Method: EPA 1630 (1998)

Analysis Description: 1630 Methyl Mercury

Associated Lab Samples: 10427354001, 10427354005

METHOD BLANK: 560161

Matrix: Solid

Associated Lab Samples: 10427354001, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.05	04/30/18 13:39	N3

METHOD BLANK: 560162

Matrix: Solid

Associated Lab Samples: 10427354001, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	2.98	04/30/18 13:46	N3

METHOD BLANK: 560163

Matrix: Solid

Associated Lab Samples: 10427354001, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.04	04/30/18 13:53	N3

LABORATORY CONTROL SAMPLE: 560164

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	104	119	115	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 560165

560166

Parameter	Units	10427354001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	357	357	354	388	99	108	65-135	9	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 534067 Analysis Method: WI MOD GRO
QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2901345 Matrix: Solid
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	04/25/18 14:28	
a,a,a-Trifluorotoluene (S)	%.	99	80-150	04/25/18 14:28	

LABORATORY CONTROL SAMPLE & LCSD: 2901346

2901347

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	43.7	44.3	87	89	80-120	2	20	
a,a,a-Trifluorotoluene (S)	%.				98	98	80-150			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2902666

2902667

Parameter	Units	10428015007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Gasoline Range Organics	mg/kg	ND	57.6	56.7	61.1	58.2	99	96	80-120	5	20	
a,a,a-Trifluorotoluene (S)	%.						98	99	80-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 533671

Analysis Method: EPA 7471

QC Batch Method: EPA 7471

Analysis Description: 7471 Mercury

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2898910

Matrix: Solid

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.020	04/23/18 15:14	

LABORATORY CONTROL SAMPLE: 2898911

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.42	0.46	111	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898912 2898913

Parameter	Units	10427354002		2898912		2898913		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Mercury	mg/kg	0.14	.62	.7	.7	0.81	0.96	109	115	80-120	17	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 532662 Analysis Method: EPA 6010C
 QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2892962 Matrix: Solid
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.9	04/17/18 18:34	
Barium	mg/kg	ND	0.50	04/17/18 18:34	
Boron	mg/kg	ND	7.4	04/17/18 18:34	
Copper	mg/kg	ND	0.50	04/17/18 18:34	
Iron	mg/kg	ND	2.5	04/17/18 18:34	
Manganese	mg/kg	ND	0.25	04/17/18 18:34	
Nickel	mg/kg	ND	0.99	04/17/18 18:34	
Silver	mg/kg	ND	0.50	04/17/18 18:34	
Tin	mg/kg	ND	3.7	04/17/18 18:34	
Titanium	mg/kg	ND	1.2	04/17/18 18:34	
Zinc	mg/kg	ND	0.99	04/17/18 18:34	

LABORATORY CONTROL SAMPLE: 2892963

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	990	992	100	80-120	
Barium	mg/kg	49.5	49.7	100	80-120	
Boron	mg/kg	49.5	46.6	94	80-120	
Copper	mg/kg	49.5	47.9	97	80-120	
Iron	mg/kg	990	986	100	80-120	
Manganese	mg/kg	49.5	50.0	101	80-120	
Nickel	mg/kg	49.5	49.4	100	80-120	
Silver	mg/kg	24.8	23.2	94	80-120	
Tin	mg/kg	49.5	50.1	101	80-120	
Titanium	mg/kg	49.5	49.4	100	80-120	
Zinc	mg/kg	49.5	50.2	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2892964 2892965

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427351005 Result	Spike Conc.	Spike Conc.	Result						
Aluminum	mg/kg	1400	1120	1110	3090	3090	152	153	75-125	0	20 P6
Barium	mg/kg	35.2	55.9	55.3	99.0	101	114	118	75-125	2	20
Boron	mg/kg	ND	55.9	55.3	54.9	55.1	90	91	75-125	0	20
Copper	mg/kg	41.0	55.9	55.3	132	119	162	141	75-125	10	20 M1
Iron	mg/kg	27900	1120	1110	65600	58600	3380	2780	75-125	11	20 P6
Manganese	mg/kg	155	55.9	55.3	380	325	403	307	75-125	16	20 M1
Nickel	mg/kg	21.6	55.9	55.3	92.0	83.3	126	111	75-125	10	20 M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Parameter	Units	2892964		2892965		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10427351005 Result	MS Spike Conc.	MSD Spike Conc.									
Silver	mg/kg	ND	28	27.7	25.3	25.3	90	91	75-125	0	20		
Tin	mg/kg	ND	55.9	55.3	54.1	53.3	91	91	75-125	1	20		
Titanium	mg/kg	176	55.9	55.3	269	258	165	149	75-125	4	20	M1	
Zinc	mg/kg	88.0	55.9	55.3	170	172	146	152	75-125	1	20	M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 437531 Analysis Method: EPA 6020
 QC Batch Method: EPA 3050B Analysis Description: 6020 MET
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2021107 Matrix: Solid
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.18	04/21/18 01:07	N2

LABORATORY CONTROL SAMPLE: 2021108

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.8	3.7	99	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2021109 2021110

Parameter	Units	2021109		2021110		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427291001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chromium	mg/kg	53.4	5.64	5.49	61.8	58.5	152	94	75-125	6	20 N2,P6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 532660 Analysis Method: EPA 6020A
 QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2892954 Matrix: Solid
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.50	04/17/18 11:38	
Arsenic	mg/kg	ND	0.50	04/17/18 11:38	
Beryllium	mg/kg	ND	0.20	04/17/18 11:38	
Cadmium	mg/kg	ND	0.079	04/17/18 11:38	
Cobalt	mg/kg	ND	0.50	04/17/18 11:38	
Lead	mg/kg	ND	0.099	04/17/18 11:38	
Lithium	mg/kg	ND	0.50	04/17/18 11:38	
Selenium	mg/kg	ND	0.50	04/17/18 11:38	
Strontium	mg/kg	ND	0.50	04/17/18 11:38	
Vanadium	mg/kg	ND	0.99	04/17/18 11:38	

LABORATORY CONTROL SAMPLE: 2892955

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	48.1	50.1	104	80-120	
Arsenic	mg/kg	48.1	48.5	101	80-120	
Beryllium	mg/kg	48.1	49.9	104	80-120	
Cadmium	mg/kg	48.1	48.4	101	80-120	
Cobalt	mg/kg	48.1	49.9	104	80-120	
Lead	mg/kg	48.1	48.9	102	80-120	
Lithium	mg/kg	48.1	50.1	104	80-120	
Selenium	mg/kg	48.1	49.3	102	80-120	
Strontium	mg/kg	48.1	48.7	101	80-120	
Vanadium	mg/kg	48.1	49.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2892956 2892957

Parameter	Units	10427419021		MS		MSD		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result							
Antimony	mg/kg	0.80	49	49	24.9	26.3	49	52	75-125	5	20	M6		
Arsenic	mg/kg	20.9	49	49	79.6	73.5	120	107	75-125	8	20			
Beryllium	mg/kg	0.84	49	49	49.6	51.1	100	102	75-125	3	20			
Cadmium	mg/kg	0.54	49	49	52.7	52.5	106	106	75-125	0	20			
Cobalt	mg/kg	9.3	49	49	65.5	63.7	114	111	75-125	3	20			
Lead	mg/kg	59.4	49	49	108	103	99	89	75-125	5	20			
Lithium	mg/kg	14.4	49	49	60.9	61.8	95	97	75-125	1	20			
Selenium	mg/kg	0.30J	49	49	48.4	49.8	98	101	75-125	3	20			
Strontium	mg/kg	34.6	49	49	94.7	91.9	122	117	75-125	3	20			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2892956		2892957								
Parameter	Units	10427419021 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Vanadium	mg/kg	32.6	49	49	89.6	87.1	116	111	75-125	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 533197 Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974 Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

SAMPLE DUPLICATE: 2896518

Parameter	Units	10427638001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	24.6	24.9	1	30	

SAMPLE DUPLICATE: 2896519

Parameter	Units	10427249001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	83.7	83.8	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 534064 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2901329 Matrix: Solid
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	04/25/18 01:17	
1,1,1-Trichloroethane	ug/kg	ND	50.0	04/25/18 01:17	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	04/25/18 01:17	
1,1,2-Trichloroethane	ug/kg	ND	50.0	04/25/18 01:17	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	04/25/18 01:17	
1,1-Dichloroethane	ug/kg	ND	50.0	04/25/18 01:17	
1,1-Dichloroethene	ug/kg	ND	50.0	04/25/18 01:17	
1,1-Dichloropropene	ug/kg	ND	50.0	04/25/18 01:17	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	04/25/18 01:17	
1,2,3-Trichloropropane	ug/kg	ND	200	04/25/18 01:17	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	04/25/18 01:17	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	04/25/18 01:17	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	04/25/18 01:17	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	04/25/18 01:17	
1,2-Dichlorobenzene	ug/kg	ND	50.0	04/25/18 01:17	
1,2-Dichloroethane	ug/kg	ND	50.0	04/25/18 01:17	
1,2-Dichloropropane	ug/kg	ND	50.0	04/25/18 01:17	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	04/25/18 01:17	
1,3-Dichlorobenzene	ug/kg	ND	50.0	04/25/18 01:17	
1,3-Dichloropropane	ug/kg	ND	50.0	04/25/18 01:17	
1,4-Dichlorobenzene	ug/kg	ND	50.0	04/25/18 01:17	
2,2-Dichloropropane	ug/kg	ND	200	04/25/18 01:17	
2-Butanone (MEK)	ug/kg	ND	250	04/25/18 01:17	
2-Chlorotoluene	ug/kg	ND	50.0	04/25/18 01:17	
4-Chlorotoluene	ug/kg	ND	50.0	04/25/18 01:17	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	04/25/18 01:17	
Acetone	ug/kg	ND	1000	04/25/18 01:17	
Allyl chloride	ug/kg	ND	200	04/25/18 01:17	
Benzene	ug/kg	ND	20.0	04/25/18 01:17	
Bromobenzene	ug/kg	ND	50.0	04/25/18 01:17	
Bromochloromethane	ug/kg	ND	50.0	04/25/18 01:17	
Bromodichloromethane	ug/kg	ND	50.0	04/25/18 01:17	
Bromoform	ug/kg	ND	500	04/25/18 01:17	MN
Bromomethane	ug/kg	ND	500	04/25/18 01:17	
Carbon tetrachloride	ug/kg	ND	50.0	04/25/18 01:17	
Chlorobenzene	ug/kg	ND	50.0	04/25/18 01:17	
Chloroethane	ug/kg	ND	500	04/25/18 01:17	
Chloroform	ug/kg	ND	50.0	04/25/18 01:17	
Chloromethane	ug/kg	ND	200	04/25/18 01:17	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	04/25/18 01:17	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	04/25/18 01:17	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

METHOD BLANK: 2901329

Matrix: Solid

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	04/25/18 01:17	
Dibromomethane	ug/kg	ND	50.0	04/25/18 01:17	
Dichlorodifluoromethane	ug/kg	ND	200	04/25/18 01:17	
Dichlorofluoromethane	ug/kg	ND	500	04/25/18 01:17	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	04/25/18 01:17	
Ethylbenzene	ug/kg	ND	50.0	04/25/18 01:17	
Hexachloro-1,3-butadiene	ug/kg	ND	250	04/25/18 01:17	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	04/25/18 01:17	
Methyl-tert-butyl ether	ug/kg	ND	50.0	04/25/18 01:17	
Methylene Chloride	ug/kg	ND	200	04/25/18 01:17	
n-Butylbenzene	ug/kg	ND	50.0	04/25/18 01:17	
n-Propylbenzene	ug/kg	ND	50.0	04/25/18 01:17	
Naphthalene	ug/kg	ND	200	04/25/18 01:17	
p-Isopropyltoluene	ug/kg	ND	50.0	04/25/18 01:17	
sec-Butylbenzene	ug/kg	ND	50.0	04/25/18 01:17	
Styrene	ug/kg	ND	50.0	04/25/18 01:17	
tert-Butylbenzene	ug/kg	ND	50.0	04/25/18 01:17	
Tetrachloroethene	ug/kg	ND	50.0	04/25/18 01:17	
Tetrahydrofuran	ug/kg	ND	2000	04/25/18 01:17	
Toluene	ug/kg	ND	50.0	04/25/18 01:17	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	04/25/18 01:17	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	04/25/18 01:17	
Trichloroethene	ug/kg	ND	50.0	04/25/18 01:17	
Trichlorofluoromethane	ug/kg	ND	200	04/25/18 01:17	
Vinyl chloride	ug/kg	ND	20.0	04/25/18 01:17	
Xylene (Total)	ug/kg	ND	150	04/25/18 01:17	
1,2-Dichloroethane-d4 (S)	%	94	75-125	04/25/18 01:17	
4-Bromofluorobenzene (S)	%	99	75-125	04/25/18 01:17	
Toluene-d8 (S)	%	97	75-125	04/25/18 01:17	

LABORATORY CONTROL SAMPLE & LCSD: 2901330

2901331

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	1050	999	105	100	59-125	5	20	
1,1,1-Trichloroethane	ug/kg	1000	1030	1010	103	101	59-125	2	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	985	943	99	94	58-125	4	20	
1,1,2-Trichloroethane	ug/kg	1000	1010	960	101	96	64-125	5	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	946	881	95	88	65-125	7	20	
1,1-Dichloroethane	ug/kg	1000	1010	971	101	97	63-125	4	20	
1,1-Dichloroethene	ug/kg	1000	1000	975	100	97	59-125	3	20	
1,1-Dichloropropene	ug/kg	1000	1050	1050	105	105	64-125	1	20	
1,2,3-Trichlorobenzene	ug/kg	1000	949	964	95	96	55-126	2	20	
1,2,3-Trichloropropane	ug/kg	1000	933	899	93	90	62-125	4	20	
1,2,4-Trichlorobenzene	ug/kg	1000	982	996	98	100	62-125	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

LABORATORY CONTROL SAMPLE & LCSD: 2901330		2901331								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	1000	961	936	96	94	59-125	3	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	2300	2320	92	93	54-125	1	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	1080	1010	108	101	64-125	7	20	
1,2-Dichlorobenzene	ug/kg	1000	980	963	98	96	63-125	2	20	
1,2-Dichloroethane	ug/kg	1000	937	893	94	89	57-125	5	20	
1,2-Dichloropropane	ug/kg	1000	947	917	95	92	67-125	3	20	
1,3,5-Trimethylbenzene	ug/kg	1000	988	965	99	97	59-125	2	20	
1,3-Dichlorobenzene	ug/kg	1000	975	967	98	97	64-125	1	20	
1,3-Dichloropropane	ug/kg	1000	986	964	99	96	64-125	2	20	
1,4-Dichlorobenzene	ug/kg	1000	937	921	94	92	63-125	2	20	
2,2-Dichloropropane	ug/kg	1000	1020	977	102	98	37-126	4	20	
2-Butanone (MEK)	ug/kg	5000	4810	4800	96	96	48-125	0	20	
2-Chlorotoluene	ug/kg	1000	981	942	98	94	62-125	4	20	
4-Chlorotoluene	ug/kg	1000	968	951	97	95	63-125	2	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4860	4550	97	91	52-135	6	20	
Acetone	ug/kg	5000	5580	5890	112	118	65-125	5	20	
Allyl chloride	ug/kg	1000	961	953	96	95	52-125	1	20	
Benzene	ug/kg	1000	1030	980	103	98	61-125	4	20	
Bromobenzene	ug/kg	1000	1010	1010	101	101	64-125	0	20	
Bromochloromethane	ug/kg	1000	960	960	96	96	65-125	0	20	
Bromodichloromethane	ug/kg	1000	1010	981	101	98	57-125	3	20	
Bromoform	ug/kg	1000	962	942	96	94	57-125	2	20	
Bromomethane	ug/kg	1000	758	832	76	83	60-125	9	20	
Carbon tetrachloride	ug/kg	1000	1040	983	104	98	58-125	6	20	
Chlorobenzene	ug/kg	1000	993	920	99	92	66-125	8	20	
Chloroethane	ug/kg	1000	895	850	89	85	62-125	5	20	
Chloroform	ug/kg	1000	942	908	94	91	59-125	4	20	
Chloromethane	ug/kg	1000	801	784	80	78	50-125	2	20	
cis-1,2-Dichloroethene	ug/kg	1000	982	964	98	96	61-125	2	20	
cis-1,3-Dichloropropene	ug/kg	1000	1040	1020	104	102	61-125	2	20	
Dibromochloromethane	ug/kg	1000	957	902	96	90	60-125	6	20	
Dibromomethane	ug/kg	1000	1030	994	103	99	69-125	4	20	
Dichlorodifluoromethane	ug/kg	1000	727	668	73	67	38-125	8	20	
Dichlorofluoromethane	ug/kg	1000	990	922	99	92	67-125	7	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	1910	1590	191	159	60-125	19	20	CH,L3,SS
Ethylbenzene	ug/kg	1000	1040	971	104	97	62-125	7	20	
Hexachloro-1,3-butadiene	ug/kg	1000	987	981	99	98	56-125	1	20	
Isopropylbenzene (Cumene)	ug/kg	1000	1060	985	106	99	65-125	8	20	
Methyl-tert-butyl ether	ug/kg	1000	931	887	93	89	59-125	5	20	
Methylene Chloride	ug/kg	1000	906	917	91	92	64-125	1	20	
n-Butylbenzene	ug/kg	1000	1020	983	102	98	59-125	3	20	
n-Propylbenzene	ug/kg	1000	1010	965	101	97	61-125	4	20	
Naphthalene	ug/kg	1000	961	966	96	97	53-125	0	20	
p-Isopropyltoluene	ug/kg	1000	1040	1000	104	100	63-125	4	20	
sec-Butylbenzene	ug/kg	1000	989	950	99	95	62-125	4	20	
Styrene	ug/kg	1000	1030	990	103	99	66-125	4	20	
tert-Butylbenzene	ug/kg	1000	980	942	98	94	64-125	4	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

LABORATORY CONTROL SAMPLE & LCSD: 2901330

Parameter	Units	2901331							Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD		
Tetrachloroethene	ug/kg	1000	1080	1020	108	102	67-125	6	20	
Tetrahydrofuran	ug/kg	10000	9720	9470	97	95	62-125	3	20	
Toluene	ug/kg	1000	967	915	97	91	61-125	6	20	
trans-1,2-Dichloroethene	ug/kg	1000	1050	1030	105	103	64-125	1	20	
trans-1,3-Dichloropropene	ug/kg	1000	1070	1030	107	103	56-125	4	20	
Trichloroethene	ug/kg	1000	1020	951	102	95	67-125	7	20	
Trichlorofluoromethane	ug/kg	1000	1010	956	101	96	65-125	6	20	
Vinyl chloride	ug/kg	1000	902	890	90	89	57-125	1	20	
Xylene (Total)	ug/kg	3000	3040	2830	101	94	62-125	7	20	
1,2-Dichloroethane-d4 (S)	%				97	96	75-125			
4-Bromofluorobenzene (S)	%				101	101	75-125			
Toluene-d8 (S)	%				103	101	75-125			

MATRIX SPIKE SAMPLE: 2901503

Parameter	Units	10428008008		MS		% Rec Limits	Qualifiers
		Result	Spike Conc.	Result	% Rec		
1,1,1,2-Tetrachloroethane	ug/kg	ND	1160	1340	115	64-146	
1,1,1-Trichloroethane	ug/kg	ND	1160	1490	128	56-148	
1,1,2,2-Tetrachloroethane	ug/kg	ND	1160	1310	112	36-150	
1,1,2-Trichloroethane	ug/kg	ND	1160	1280	110	67-148	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	1160	1280	110	60-142	
1,1-Dichloroethane	ug/kg	ND	1160	1350	116	57-140	
1,1-Dichloroethene	ug/kg	ND	1160	1330	115	59-139	
1,1-Dichloropropene	ug/kg	ND	1160	1480	127	61-142	
1,2,3-Trichlorobenzene	ug/kg	ND	1160	1280	110	69-150	
1,2,3-Trichloropropane	ug/kg	ND	1160	1350	116	64-150	
1,2,4-Trichlorobenzene	ug/kg	ND	1160	1300	112	71-149	
1,2,4-Trimethylbenzene	ug/kg	ND	1160	1280	110	67-149	
1,2-Dibromo-3-chloropropane	ug/kg	ND	2900	3230	111	61-150	
1,2-Dibromoethane (EDB)	ug/kg	ND	1160	1370	118	67-147	
1,2-Dichlorobenzene	ug/kg	ND	1160	1290	111	70-142	
1,2-Dichloroethane	ug/kg	ND	1160	1250	107	58-132	
1,2-Dichloropropane	ug/kg	ND	1160	1330	114	64-144	
1,3,5-Trimethylbenzene	ug/kg	ND	1160	1290	111	71-146	
1,3-Dichlorobenzene	ug/kg	ND	1160	1290	111	71-142	
1,3-Dichloropropane	ug/kg	ND	1160	1270	110	68-140	
1,4-Dichlorobenzene	ug/kg	ND	1160	1210	104	68-142	
2,2-Dichloropropane	ug/kg	ND	1160	1280	111	34-150	
2-Butanone (MEK)	ug/kg	ND	5810	7590	131	51-150	
2-Chlorotoluene	ug/kg	ND	1160	1290	111	66-144	
4-Chlorotoluene	ug/kg	ND	1160	1260	108	66-140	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	5810	6380	110	63-150	
Acetone	ug/kg	ND	5810	8260	142	54-150	
Allyl chloride	ug/kg	ND	1160	1350	116	53-135	
Benzene	ug/kg	ND	1160	1320	114	65-135	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

MATRIX SPIKE SAMPLE: 2901503		10428008008	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/kg	ND	1160	1370	118	71-141	
Bromochloromethane	ug/kg	ND	1160	1390	120	62-145	
Bromodichloromethane	ug/kg	ND	1160	1370	118	59-148	
Bromoform	ug/kg	ND	1160	1210	104	57-145	
Bromomethane	ug/kg	ND	1160	1230	106	51-129	
Carbon tetrachloride	ug/kg	ND	1160	1470	127	55-144	
Chlorobenzene	ug/kg	ND	1160	1250	107	70-142	
Chloroethane	ug/kg	ND	1160	1250	107	61-135	
Chloroform	ug/kg	ND	1160	1340	115	58-135	
Chloromethane	ug/kg	ND	1160	1080	93	37-125	
cis-1,2-Dichloroethene	ug/kg	ND	1160	1360	117	60-138	
cis-1,3-Dichloropropene	ug/kg	ND	1160	1380	118	62-142	
Dibromochloromethane	ug/kg	ND	1160	1240	107	65-141	
Dibromomethane	ug/kg	ND	1160	1360	117	72-150	
Dichlorodifluoromethane	ug/kg	ND	1160	897	77	30-125	
Dichlorofluoromethane	ug/kg	ND	1160	1300	112	62-148	
Diethyl ether (Ethyl ether)	ug/kg	ND	1160	2940	253	62-135	CH,M0,SS
Ethylbenzene	ug/kg	ND	1160	1280	110	72-138	
Hexachloro-1,3-butadiene	ug/kg	ND	1160	1300	112	38-150	
Isopropylbenzene (Cumene)	ug/kg	ND	1160	1320	114	75-148	
Methyl-tert-butyl ether	ug/kg	ND	1160	1280	110	63-139	
Methylene Chloride	ug/kg	ND	1160	1250	107	58-135	
n-Butylbenzene	ug/kg	ND	1160	1290	111	63-150	
n-Propylbenzene	ug/kg	ND	1160	1310	113	70-146	
Naphthalene	ug/kg	ND	1160	1300	111	63-150	
p-Isopropyltoluene	ug/kg	ND	1160	1340	116	72-150	
sec-Butylbenzene	ug/kg	ND	1160	1290	111	66-150	
Styrene	ug/kg	ND	1160	1310	113	72-146	
tert-Butylbenzene	ug/kg	ND	1160	1300	112	71-148	
Tetrachloroethene	ug/kg	ND	1160	1360	117	70-150	
Tetrahydrofuran	ug/kg	ND	11600	13900	120	62-150	
Toluene	ug/kg	ND	1160	1220	105	65-142	
trans-1,2-Dichloroethene	ug/kg	ND	1160	1390	120	55-141	
trans-1,3-Dichloropropene	ug/kg	ND	1160	1340	115	57-147	
Trichloroethene	ug/kg	ND	1160	1330	115	62-150	
Trichlorofluoromethane	ug/kg	ND	1160	1310	113	51-150	
Vinyl chloride	ug/kg	ND	1160	1210	104	45-132	
Xylene (Total)	ug/kg	ND	3480	3760	108	75-140	
1,2-Dichloroethane-d4 (S)	%					96	75-125
4-Bromofluorobenzene (S)	%					101	75-125
Toluene-d8 (S)	%					99	75-125

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

SAMPLE DUPLICATE: 2901333

Parameter	Units	10428008009 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,1-Trichloroethane	ug/kg	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,2-Trichloroethane	ug/kg	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	ND		30	
1,1-Dichloroethane	ug/kg	ND	ND		30	
1,1-Dichloroethene	ug/kg	ND	ND		30	
1,1-Dichloropropene	ug/kg	ND	ND		30	
1,2,3-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,3-Trichloropropane	ug/kg	ND	ND		30	
1,2,4-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,4-Trimethylbenzene	ug/kg	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/kg	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	ND		30	
1,2-Dichlorobenzene	ug/kg	ND	ND		30	
1,2-Dichloroethane	ug/kg	ND	ND		30	
1,2-Dichloropropane	ug/kg	ND	ND		30	
1,3,5-Trimethylbenzene	ug/kg	ND	ND		30	
1,3-Dichlorobenzene	ug/kg	ND	ND		30	
1,3-Dichloropropane	ug/kg	ND	ND		30	
1,4-Dichlorobenzene	ug/kg	ND	ND		30	
2,2-Dichloropropane	ug/kg	ND	ND		30	
2-Butanone (MEK)	ug/kg	ND	ND		30	
2-Chlorotoluene	ug/kg	ND	ND		30	
4-Chlorotoluene	ug/kg	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND		30	
Acetone	ug/kg	ND	ND		30	
Allyl chloride	ug/kg	ND	ND		30	
Benzene	ug/kg	ND	ND		30	
Bromobenzene	ug/kg	ND	ND		30	
Bromochloromethane	ug/kg	ND	ND		30	
Bromodichloromethane	ug/kg	ND	ND		30	
Bromoform	ug/kg	ND	ND		30	
Bromomethane	ug/kg	ND	ND		30	
Carbon tetrachloride	ug/kg	ND	ND		30	
Chlorobenzene	ug/kg	ND	ND		30	
Chloroethane	ug/kg	ND	ND		30	
Chloroform	ug/kg	ND	ND		30	
Chloromethane	ug/kg	ND	ND		30	
cis-1,2-Dichloroethene	ug/kg	ND	ND		30	
cis-1,3-Dichloropropene	ug/kg	ND	ND		30	
Dibromochloromethane	ug/kg	ND	ND		30	
Dibromomethane	ug/kg	ND	ND		30	
Dichlorodifluoromethane	ug/kg	ND	ND		30	
Dichlorofluoromethane	ug/kg	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/kg	ND	ND		30	
Ethylbenzene	ug/kg	ND	ND		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

SAMPLE DUPLICATE: 2901333

Parameter	Units	10428008009 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	ND	ND		30	
Isopropylbenzene (Cumene)	ug/kg	ND	ND		30	
Methyl-tert-butyl ether	ug/kg	ND	ND		30	
Methylene Chloride	ug/kg	ND	ND		30	
n-Butylbenzene	ug/kg	ND	ND		30	
n-Propylbenzene	ug/kg	ND	ND		30	
Naphthalene	ug/kg	ND	ND		30	
p-Isopropyltoluene	ug/kg	ND	ND		30	
sec-Butylbenzene	ug/kg	ND	ND		30	
Styrene	ug/kg	ND	ND		30	
tert-Butylbenzene	ug/kg	ND	ND		30	
Tetrachloroethene	ug/kg	ND	ND		30	
Tetrahydrofuran	ug/kg	ND	ND		30	
Toluene	ug/kg	ND	ND		30	
trans-1,2-Dichloroethene	ug/kg	ND	ND		30	
trans-1,3-Dichloropropene	ug/kg	ND	ND		30	
Trichloroethene	ug/kg	ND	ND		30	
Trichlorofluoromethane	ug/kg	ND	ND		30	
Vinyl chloride	ug/kg	ND	ND		30	
Xylene (Total)	ug/kg	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	95	94	3		
4-Bromofluorobenzene (S)	%.	97	99	1		
Toluene-d8 (S)	%.	98	100	1		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 532491 Analysis Method: EPA 8081B
QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2891843 Matrix: Solid
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/16/18 21:16	
4,4'-DDE	ug/kg	ND	3.3	04/16/18 21:16	
4,4'-DDT	ug/kg	ND	3.3	04/16/18 21:16	
Aldrin	ug/kg	ND	1.7	04/16/18 21:16	
alpha-BHC	ug/kg	ND	1.7	04/16/18 21:16	
alpha-Chlordane	ug/kg	ND	1.7	04/16/18 21:16	
beta-BHC	ug/kg	ND	1.7	04/16/18 21:16	
Chlordane (Technical)	ug/kg	ND	16.7	04/16/18 21:16	
delta-BHC	ug/kg	ND	1.7	04/16/18 21:16	
Dieldrin	ug/kg	ND	3.3	04/16/18 21:16	
Endosulfan I	ug/kg	ND	1.7	04/16/18 21:16	
Endosulfan II	ug/kg	ND	3.3	04/16/18 21:16	
Endosulfan sulfate	ug/kg	ND	3.3	04/16/18 21:16	
Endrin	ug/kg	ND	3.3	04/16/18 21:16	
Endrin aldehyde	ug/kg	ND	3.3	04/16/18 21:16	
Endrin ketone	ug/kg	ND	3.3	04/16/18 21:16	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/16/18 21:16	
gamma-Chlordane	ug/kg	ND	1.7	04/16/18 21:16	
Heptachlor	ug/kg	ND	1.7	04/16/18 21:16	
Heptachlor epoxide	ug/kg	ND	1.7	04/16/18 21:16	
Methoxychlor	ug/kg	ND	16.7	04/16/18 21:16	
Toxaphene	ug/kg	ND	50.0	04/16/18 21:16	
Decachlorobiphenyl (S)	%	96	30-150	04/16/18 21:16	
Tetrachloro-m-xylene (S)	%	98	30-150	04/16/18 21:16	

LABORATORY CONTROL SAMPLE: 2891844

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	33.5	100	62-127	
4,4'-DDE	ug/kg	33.3	33.3	100	66-125	
4,4'-DDT	ug/kg	33.3	33.6	101	67-128	
Aldrin	ug/kg	16.7	15.1	91	66-125	
alpha-BHC	ug/kg	16.7	16.1	96	64-125	
alpha-Chlordane	ug/kg	16.7	15.5	93	68-125	
beta-BHC	ug/kg	16.7	15.4	93	69-125	
delta-BHC	ug/kg	16.7	13.0	78	42-133	
Dieldrin	ug/kg	33.3	34.2	103	69-126	
Endosulfan I	ug/kg	16.7	14.2	85	63-125	
Endosulfan II	ug/kg	33.3	33.0	99	69-125	
Endosulfan sulfate	ug/kg	33.3	28.8	87	56-137	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

LABORATORY CONTROL SAMPLE: 2891844

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	31.5	95	69-125	
Endrin aldehyde	ug/kg	33.3	31.4	94	65-125	
Endrin ketone	ug/kg	33.3	33.1	99	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	15.9	95	67-125	
gamma-Chlordane	ug/kg	16.7	14.0	84	63-125	
Heptachlor	ug/kg	16.7	16.2	97	69-125	
Heptachlor epoxide	ug/kg	16.7	15.5	93	68-125	
Methoxychlor	ug/kg	167	163	98	65-134	
Decachlorobiphenyl (S)	%			94	30-150	
Tetrachloro-m-xylene (S)	%			98	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891845 2891846

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427018001 Result	Spike Conc.	Spike Conc.	MS Result						
4,4'-DDD	ug/kg	ND	50.7	50.5	53.3	56.7	105	112	56-125	6	20
4,4'-DDE	ug/kg	ND	50.7	50.5	56.1	55.9	111	110	32-150	0	20
4,4'-DDT	ug/kg	ND	50.7	50.5	54.8	52.9	108	105	60-132	4	20
Aldrin	ug/kg	ND	25.4	25.3	20J	21.5J	79	85	56-125		20
alpha-BHC	ug/kg	ND	25.4	25.3	25.2J	24.3J	99	96	54-136		20
alpha-Chlordane	ug/kg	ND	25.4	25.3	25.7	28.8	101	114	54-133	12	20
beta-BHC	ug/kg	ND	25.4	25.3	26.7	26.6	105	105	30-150	0	20
delta-BHC	ug/kg	ND	25.4	25.3	17.1J	18.7J	68	74	45-145		20
Dieldrin	ug/kg	ND	50.7	50.5	63.9	54.7	126	108	47-150	15	20
Endosulfan I	ug/kg	ND	25.4	25.3	24.1J	24.4J	95	97	35-145		20
Endosulfan II	ug/kg	ND	50.7	50.5	46.4J	49.1J	92	97	50-147		20
Endosulfan sulfate	ug/kg	ND	50.7	50.5	39.2J	44J	77	87	54-132		20
Endrin	ug/kg	ND	50.7	50.5	41.8J	44.2J	82	87	62-125		20
Endrin aldehyde	ug/kg	ND	50.7	50.5	45.3J	48.8J	89	97	33-150		20
Endrin ketone	ug/kg	ND	50.7	50.5	45.9J	49.7J	91	98	56-144		20
gamma-BHC (Lindane)	ug/kg	ND	25.4	25.3	23.7J	25.1J	94	99	63-125		20
gamma-Chlordane	ug/kg	ND	25.4	25.3	21.9J	23.2J	86	92	45-132		20
Heptachlor	ug/kg	ND	25.4	25.3	21.1J	23.1J	83	91	51-142		20
Heptachlor epoxide	ug/kg	ND	25.4	25.3	14.1J	25.5	56	101	50-142		20
Methoxychlor	ug/kg	ND	254	253	278	283	109	112	58-139	2	20
Decachlorobiphenyl (S)	%						0	0	30-150		S4
Tetrachloro-m-xylene (S)	%						0	0	30-150		4M, D3, S4

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 532605 Analysis Method: EPA 8082A
 QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2892737 Matrix: Solid
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/18/18 01:31	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/18/18 01:31	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/18/18 01:31	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/18/18 01:31	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/18/18 01:31	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/18/18 01:31	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/18/18 01:31	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/18/18 01:31	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/18/18 01:31	
Decachlorobiphenyl (S)	%	96	30-134	04/18/18 01:31	
Tetrachloro-m-xylene (S)	%	94	48-125	04/18/18 01:31	

LABORATORY CONTROL SAMPLE: 2892738

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	576	86	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	587	88	62-125	
Decachlorobiphenyl (S)	%			95	30-134	
Tetrachloro-m-xylene (S)	%			92	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2892739 2892740

Parameter	Units	2892739		2892740		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10427354001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
PCB-1016 (Aroclor 1016)	ug/kg	ND	751	751	652	620	87	83	30-150	5	30	
PCB-1260 (Aroclor 1260)	ug/kg	150	751	751	622	569	63	56	30-138	9	30	
Decachlorobiphenyl (S)	%						73	71	30-134			
Tetrachloro-m-xylene (S)	%						77	75	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 533361 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2897277 Matrix: Solid
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/20/18 12:32	
1,2-Dichlorobenzene	ug/kg	ND	330	04/20/18 12:32	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/20/18 12:32	
1,3-Dichlorobenzene	ug/kg	ND	330	04/20/18 12:32	
1,4-Dichlorobenzene	ug/kg	ND	330	04/20/18 12:32	
1-Methylnaphthalene	ug/kg	ND	330	04/20/18 12:32	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/20/18 12:32	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/20/18 12:32	
2,4-Dichlorophenol	ug/kg	ND	330	04/20/18 12:32	
2,4-Dimethylphenol	ug/kg	ND	330	04/20/18 12:32	
2,4-Dinitrophenol	ug/kg	ND	330	04/20/18 12:32	
2,4-Dinitrotoluene	ug/kg	ND	330	04/20/18 12:32	
2,6-Dinitrotoluene	ug/kg	ND	330	04/20/18 12:32	
2-Chloronaphthalene	ug/kg	ND	330	04/20/18 12:32	
2-Chlorophenol	ug/kg	ND	330	04/20/18 12:32	
2-Methylnaphthalene	ug/kg	ND	330	04/20/18 12:32	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/20/18 12:32	
2-Nitroaniline	ug/kg	ND	330	04/20/18 12:32	
2-Nitrophenol	ug/kg	ND	330	04/20/18 12:32	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/20/18 12:32	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/20/18 12:32	
3-Nitroaniline	ug/kg	ND	330	04/20/18 12:32	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/20/18 12:32	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/20/18 12:32	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/20/18 12:32	
4-Chloroaniline	ug/kg	ND	330	04/20/18 12:32	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/20/18 12:32	
4-Nitroaniline	ug/kg	ND	330	04/20/18 12:32	
4-Nitrophenol	ug/kg	ND	330	04/20/18 12:32	
Acenaphthene	ug/kg	ND	330	04/20/18 12:32	
Acenaphthylene	ug/kg	ND	330	04/20/18 12:32	
Anthracene	ug/kg	ND	330	04/20/18 12:32	
Benzo(a)anthracene	ug/kg	ND	330	04/20/18 12:32	
Benzo(a)pyrene	ug/kg	ND	330	04/20/18 12:32	
Benzo(b)fluoranthene	ug/kg	ND	330	04/20/18 12:32	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/20/18 12:32	
Benzo(k)fluoranthene	ug/kg	ND	330	04/20/18 12:32	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/20/18 12:32	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/20/18 12:32	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/20/18 12:32	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/20/18 12:32	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

METHOD BLANK: 2897277

Matrix: Solid

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/20/18 12:32	
Carbazole	ug/kg	ND	330	04/20/18 12:32	
Chrysene	ug/kg	ND	330	04/20/18 12:32	
Di-n-butylphthalate	ug/kg	ND	330	04/20/18 12:32	
Di-n-octylphthalate	ug/kg	ND	330	04/20/18 12:32	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/20/18 12:32	
Dibenzofuran	ug/kg	ND	330	04/20/18 12:32	
Diethylphthalate	ug/kg	ND	330	04/20/18 12:32	
Dimethylphthalate	ug/kg	ND	330	04/20/18 12:32	
Fluoranthene	ug/kg	ND	330	04/20/18 12:32	
Fluorene	ug/kg	ND	330	04/20/18 12:32	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/20/18 12:32	
Hexachlorobenzene	ug/kg	ND	330	04/20/18 12:32	
Hexachloroethane	ug/kg	ND	330	04/20/18 12:32	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/20/18 12:32	
Isophorone	ug/kg	ND	330	04/20/18 12:32	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/20/18 12:32	
N-Nitrosodimethylamine	ug/kg	ND	330	04/20/18 12:32	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/20/18 12:32	
Naphthalene	ug/kg	ND	330	04/20/18 12:32	
Nitrobenzene	ug/kg	ND	330	04/20/18 12:32	
Pentachlorophenol	ug/kg	ND	670	04/20/18 12:32	
Phenanthrene	ug/kg	ND	330	04/20/18 12:32	
Phenol	ug/kg	ND	330	04/20/18 12:32	
Pyrene	ug/kg	ND	330	04/20/18 12:32	
2,4,6-Tribromophenol (S)	%	70	60-125	04/20/18 12:32	
2-Fluorobiphenyl (S)	%	71	30-132	04/20/18 12:32	
2-Fluorophenol (S)	%	71	40-125	04/20/18 12:32	
Nitrobenzene-d5 (S)	%	68	43-125	04/20/18 12:32	
p-Terphenyl-d14 (S)	%	94	62-125	04/20/18 12:32	
Phenol-d6 (S)	%	70	48-125	04/20/18 12:32	

LABORATORY CONTROL SAMPLE: 2897278

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1180	71	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1200	72	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1380	83	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1190	72	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1180	71	39-125	
1-Methylnaphthalene	ug/kg	1670	1210	72	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1300	78	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1370	82	61-125	
2,4-Dichlorophenol	ug/kg	1670	1270	76	57-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

LABORATORY CONTROL SAMPLE: 2897278

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1240	74	51-125	
2,4-Dinitrophenol	ug/kg	1670	943	57	30-132	6M
2,4-Dinitrotoluene	ug/kg	1670	1410	85	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1360	81	63-125	
2-Chloronaphthalene	ug/kg	1670	1240	74	61-125	
2-Chlorophenol	ug/kg	1670	1200	72	46-125	
2-Methylnaphthalene	ug/kg	1670	1200	72	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1200	72	50-125	
2-Nitroaniline	ug/kg	1670	1410	85	61-125	
2-Nitrophenol	ug/kg	1670	1270	76	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1300	78	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1230	74	47-125	6M
3-Nitroaniline	ug/kg	1670	1260	75	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1330J	80	30-141	
4-Bromophenylphenyl ether	ug/kg	1670	1340	80	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1270	76	64-125	
4-Chloroaniline	ug/kg	1670	1130	68	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1270	76	64-125	
4-Nitroaniline	ug/kg	1670	1440	86	59-125	
4-Nitrophenol	ug/kg	1670	1360	82	54-125	
Acenaphthene	ug/kg	1670	1250	75	62-125	
Acenaphthylene	ug/kg	1670	1280	77	61-125	
Anthracene	ug/kg	1670	1320	79	66-125	
Benzo(a)anthracene	ug/kg	1670	1360	82	69-125	
Benzo(a)pyrene	ug/kg	1670	1350	81	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1330	80	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1430	86	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1360	82	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1230	74	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1190	72	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1240	74	37-125	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1470	88	69-131	
Butylbenzylphthalate	ug/kg	1670	1430	86	69-129	
Carbazole	ug/kg	1670	1340	80	66-125	
Chrysene	ug/kg	1670	1380	83	68-125	
Di-n-butylphthalate	ug/kg	1670	1410	85	69-125	
Di-n-octylphthalate	ug/kg	1670	1460	87	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1420	85	64-125	
Dibenzofuran	ug/kg	1670	1260	76	65-125	
Diethylphthalate	ug/kg	1670	1340	81	67-125	
Dimethylphthalate	ug/kg	1670	1340	81	67-125	
Fluoranthene	ug/kg	1670	1340	81	66-125	
Fluorene	ug/kg	1670	1280	77	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1220	73	40-125	
Hexachlorobenzene	ug/kg	1670	1320	79	62-125	
Hexachloroethane	ug/kg	1670	1210	73	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1400	84	64-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

LABORATORY CONTROL SAMPLE: 2897278

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1230	74	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1210	72	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1200	72	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1350	81	65-125	
Naphthalene	ug/kg	1670	1190	71	48-125	
Nitrobenzene	ug/kg	1670	1260	75	48-125	
Pentachlorophenol	ug/kg	1670	1230	74	41-125	
Phenanthrene	ug/kg	1670	1320	79	66-125	
Phenol	ug/kg	1670	1250	75	46-125	
Pyrene	ug/kg	1670	1410	85	69-125	
2,4,6-Tribromophenol (S)	%			75	60-125	
2-Fluorobiphenyl (S)	%			71	30-132	
2-Fluorophenol (S)	%			71	40-125	
Nitrobenzene-d5 (S)	%			69	43-125	
p-Terphenyl-d14 (S)	%			89	62-125	
Phenol-d6 (S)	%			68	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897279 2897280

Parameter	Units	10427355002		MSD		MSD		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
1,2,4-Trichlorobenzene	ug/kg	ND	1870	1850	1170	1150	63	62	30-127	2	30		
1,2-Dichlorobenzene	ug/kg	ND	1870	1850	1120	1080	60	58	30-125	4	30		
1,2-Diphenylhydrazine	ug/kg	ND	1870	1850	1490	1450	80	78	30-150	3	30		
1,3-Dichlorobenzene	ug/kg	ND	1870	1850	1080	1100	58	60	30-125	2	30		
1,4-Dichlorobenzene	ug/kg	ND	1870	1850	1060	1040	57	56	30-125	2	30		
1-Methylnaphthalene	ug/kg	ND	1870	1850	1270	1280	68	69	42-125	1	30		
2,4,5-Trichlorophenol	ug/kg	ND	1870	1850	1490	1470	80	79	30-150	1	30		
2,4,6-Trichlorophenol	ug/kg	ND	1870	1850	1410	1420	76	76	30-150	0	30		
2,4-Dichlorophenol	ug/kg	ND	1870	1850	1410	1350	76	73	30-135	4	30		
2,4-Dimethylphenol	ug/kg	ND	1870	1850	1290	1350	69	73	30-148	4	30		
2,4-Dinitrophenol	ug/kg	ND	1870	1850	923	728	50	39	30-125	24	30	6M	
2,4-Dinitrotoluene	ug/kg	ND	1870	1850	1550	1500	83	81	30-150	3	30		
2,6-Dinitrotoluene	ug/kg	ND	1870	1850	1530	1510	82	82	30-150	1	30		
2-Chloronaphthalene	ug/kg	ND	1870	1850	1380	1370	74	74	30-138	1	30		
2-Chlorophenol	ug/kg	ND	1870	1850	1230	1180	66	63	30-130	4	30		
2-Methylnaphthalene	ug/kg	ND	1870	1850	1270	1240	68	67	46-125	2	30		
2-Methylphenol(o-Cresol)	ug/kg	ND	1870	1850	1310	1260	70	68	30-133	3	30		
2-Nitroaniline	ug/kg	ND	1870	1850	1580	1550	85	84	30-150	2	30		
2-Nitrophenol	ug/kg	ND	1870	1850	1140	1240	61	67	30-134	8	30		
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	1870	1850	1270	1220	68	66	30-138	4	30		
3,3'-Dichlorobenzidine	ug/kg	ND	1870	1850	1410	1510	76	82	30-149	7	30	6M	
3-Nitroaniline	ug/kg	ND	1870	1850	1330	1360	71	73	30-150	2	30		
4,6-Dinitro-2-methylphenol	ug/kg	ND	1870	1850	1380J	1150J	74	62	30-133		30		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897279												2897280											
Parameter	Units	MS		MSD		MS		MSD		% Rec		Max		Qual									
		10427355002	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD												
4-Bromophenylphenyl ether	ug/kg	ND	1870	1850	1530	1480	82	80	44-125	4	30												
4-Chloro-3-methylphenol	ug/kg	ND	1870	1850	1430	1390	77	75	30-150	3	30												
4-Chloroaniline	ug/kg	ND	1870	1850	1000	1110	54	60	30-125	11	30												
4-Chlorophenylphenyl ether	ug/kg	ND	1870	1850	1330	1400	71	76	44-125	5	30												
4-Nitroaniline	ug/kg	ND	1870	1850	1490	1490	80	80	30-150	0	30												
4-Nitrophenol	ug/kg	ND	1870	1850	1560	1450	84	78	30-150	7	30												
Acenaphthene	ug/kg	ND	1870	1850	1390	1330	74	72	40-125	4	30												
Acenaphthylene	ug/kg	ND	1870	1850	1410	1400	76	75	30-150	0	30												
Anthracene	ug/kg	ND	1870	1850	1490	1490	80	80	30-150	0	30												
Benzo(a)anthracene	ug/kg	ND	1870	1850	1540	1570	83	85	30-150	2	30												
Benzo(a)pyrene	ug/kg	ND	1870	1850	1510	1510	81	81	30-150	0	30												
Benzo(b)fluoranthene	ug/kg	ND	1870	1850	1570	1600	84	87	30-150	2	30												
Benzo(g,h,i)perylene	ug/kg	ND	1870	1850	1620	1600	87	86	30-150	1	30												
Benzo(k)fluoranthene	ug/kg	ND	1870	1850	1500	1500	81	81	30-150	0	30												
bis(2-Chloroethoxy)methane	ug/kg	ND	1870	1850	1240	1270	67	68	30-134	2	30												
bis(2-Chloroethyl) ether	ug/kg	ND	1870	1850	1170	1120	63	61	30-125	4	30												
bis(2-Chloroisopropyl) ether	ug/kg	ND	1870	1850	1170	1090	63	59	30-125	6	30												
bis(2-Ethylhexyl)phthalate	ug/kg	ND	1870	1850	1630	1590	88	86	30-150	3	30												
Butylbenzylphthalate	ug/kg	ND	1870	1850	1660	1570	89	85	30-150	5	30												
Carbazole	ug/kg	ND	1870	1850	1510	1490	81	80	41-125	2	30												
Chrysene	ug/kg	ND	1870	1850	1560	1570	84	85	30-150	1	30												
Di-n-butylphthalate	ug/kg	ND	1870	1850	1520	1540	82	83	30-150	1	30												
Di-n-octylphthalate	ug/kg	ND	1870	1850	1630	1570	88	85	30-150	4	30												
Dibenz(a,h)anthracene	ug/kg	ND	1870	1850	1530	1500	82	81	30-150	1	30												
Dibenzofuran	ug/kg	ND	1870	1850	1400	1400	75	75	45-125	0	30												
Diethylphthalate	ug/kg	ND	1870	1850	1450	1490	78	81	30-150	3	30												
Dimethylphthalate	ug/kg	ND	1870	1850	1470	1380	79	75	30-150	6	30												
Fluoranthene	ug/kg	ND	1870	1850	1490	1590	80	86	30-150	6	30												
Fluorene	ug/kg	ND	1870	1850	1450	1390	78	75	30-150	4	30												
Hexachloro-1,3-butadiene	ug/kg	ND	1870	1850	1160	1140	62	61	30-128	2	30												
Hexachlorobenzene	ug/kg	ND	1870	1850	1520	1470	81	79	30-150	3	30												
Hexachloroethane	ug/kg	ND	1870	1850	1170	1080	63	59	30-125	8	30												
Indeno(1,2,3-cd)pyrene	ug/kg	ND	1870	1850	1580	1570	85	85	30-150	1	30												
Isophorone	ug/kg	ND	1870	1850	1260	1240	68	67	30-140	1	30												
N-Nitroso-di-n-propylamine	ug/kg	ND	1870	1850	1220	1120	65	61	30-147	8	30												
N-Nitrosodimethylamine	ug/kg	ND	1870	1850	1210	1050	65	56	30-125	15	30												
N-Nitrosodiphenylamine	ug/kg	ND	1870	1850	1480	1500	80	81	30-150	1	30												
Naphthalene	ug/kg	ND	1870	1850	1170	1170	63	63	44-125	0	30												
Nitrobenzene	ug/kg	ND	1870	1850	1220	1200	65	64	30-136	2	30												
Pentachlorophenol	ug/kg	ND	1870	1850	1230	1260	66	68	30-150	2	30												
Phenanthrene	ug/kg	ND	1870	1850	1510	1540	81	83	30-150	2	30												
Phenol	ug/kg	ND	1870	1850	1230	1180	66	64	30-129	4	30												
Pyrene	ug/kg	ND	1870	1850	1650	1750	89	95	30-150	6	30												
2,4,6-Tribromophenol (S)	%						74	73	60-125														
2-Fluorobiphenyl (S)	%						68	68	30-132														
2-Fluorophenol (S)	%						59	55	40-125														

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897279		2897280		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10427355002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Nitrobenzene-d5 (S)	%.					58	57	43-125			
p-Terphenyl-d14 (S)	%.					87	83	62-125			
Phenol-d6 (S)	%.					63	59	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 532788 Analysis Method: EPA 8270D by SIM
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2893351 Matrix: Solid
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/18/18 11:32	
Acenaphthylene	ug/kg	ND	10.0	04/18/18 11:32	
Anthracene	ug/kg	ND	10.0	04/18/18 11:32	
Benzo(a)anthracene	ug/kg	ND	10.0	04/18/18 11:32	
Benzo(a)pyrene	ug/kg	ND	10.0	04/18/18 11:32	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/18/18 11:32	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/18/18 11:32	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/18/18 11:32	
Chrysene	ug/kg	ND	10.0	04/18/18 11:32	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/18/18 11:32	
Fluoranthene	ug/kg	ND	10.0	04/18/18 11:32	
Fluorene	ug/kg	ND	10.0	04/18/18 11:32	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/18/18 11:32	
Naphthalene	ug/kg	ND	10.0	04/18/18 11:32	
Phenanthrene	ug/kg	ND	10.0	04/18/18 11:32	
Pyrene	ug/kg	ND	10.0	04/18/18 11:32	
2-Fluorobiphenyl (S)	%	83	42-125	04/18/18 11:32	
p-Terphenyl-d14 (S)	%	99	57-125	04/18/18 11:32	

LABORATORY CONTROL SAMPLE: 2893353

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	24.2	73	52-125	
Acenaphthylene	ug/kg	33.3	25.6	77	50-125	
Anthracene	ug/kg	33.3	27.5	82	65-125	
Benzo(a)anthracene	ug/kg	33.3	28.8	86	60-125	
Benzo(a)pyrene	ug/kg	33.3	28.3	85	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	31.7	95	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	31.0	93	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	29.4	88	67-125	
Chrysene	ug/kg	33.3	28.8	86	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	33.4	100	63-125	
Fluoranthene	ug/kg	33.3	28.9	87	75-125	
Fluorene	ug/kg	33.3	26.1	78	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	32.3	97	63-125	
Naphthalene	ug/kg	33.3	24.3	73	49-125	
Phenanthrene	ug/kg	33.3	27.0	81	65-125	
Pyrene	ug/kg	33.3	29.4	88	64-125	
2-Fluorobiphenyl (S)	%			79	42-125	
p-Terphenyl-d14 (S)	%			94	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Parameter	Units	2893354		2893355		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10427477002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Acenaphthene	ug/kg	ND	37.1	37.2	34.5J	109	93	293	30-125		30	M1	
Acenaphthylene	ug/kg	ND	37.1	37.2	43.4J	47.1J	117	127	30-133		30		
Anthracene	ug/kg	ND	37.1	37.2	65.4	180	176	483	30-150	93	30	M1,R1	
Benzo(a)anthracene	ug/kg	0.12	37.1	37.2	163	365	117	662	30-150	77	30	M1,R1	
Benzo(a)pyrene	ug/kg	0.14	37.1	37.2	179	374	114	638	30-150	71	30	M1,R1	
Benzo(b)fluoranthene	ug/kg	0.16	37.1	37.2	212	478	152	868	30-150	77	30	M1,R1	
Benzo(g,h,i)perylene	ug/kg	0.13	37.1	37.2	173	316	125	509	30-150	58	30	M1,R1	
Benzo(k)fluoranthene	ug/kg	0.068	37.1	37.2	78.1	176	26	290	30-150	77	30	M1,R1	
Chrysene	ug/kg	0.11	37.1	37.2	158	365	120	676	30-150	79	30	M1,R1	
Dibenz(a,h)anthracene	ug/kg	ND	37.1	37.2	96.2	128	259	344	30-131	28	30	M1	
Fluoranthene	ug/kg	0.24	37.1	37.2	291	825	134	1570	30-150	96	30	M1,R1	
Fluorene	ug/kg	ND	37.1	37.2	40.2J	92.1	108	248	30-147		30	M1	
Indeno(1,2,3-cd)pyrene	ug/kg	0.077	37.1	37.2	119	234	113	422	30-150	65	30	M1,R1	
Naphthalene	ug/kg	ND	37.1	37.2	28.2J	47J	76	126	30-131		30		
Phenanthrene	ug/kg	0.12	37.1	37.2	160	618	113	1340	30-150	118	30	M1,R1	
Pyrene	ug/kg	0.22	37.1	37.2	276	691	145	1260	30-150	86	30	M1,R1	
2-Fluorobiphenyl (S)	%.						81	84	42-125				D3
p-Terphenyl-d14 (S)	%.						94	98	57-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 532497 Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2891856

Matrix: Solid

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	04/19/18 17:29	
n-Triacontane (S)	%.	110	50-150	04/19/18 17:29	

LABORATORY CONTROL SAMPLE & LCSD: 2891857

2891858

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	77.3	77.6	97	97	70-120	0	20	
n-Triacontane (S)	%.				104	99	50-150			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 438492 Analysis Method: EPA 7196A
 QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2026403 Matrix: Solid
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/24/18 13:00	

LABORATORY CONTROL SAMPLE: 2026404

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1010	924	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026421 2026422

Parameter	Units	10427291008 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Chromium, Hexavalent	mg/kg	ND	1080	1150	839	962	77	84	75-125	14	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026423 2026424

Parameter	Units	10427291008 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Chromium, Hexavalent	mg/kg	ND	42.9	42.7	28.6	29.2	67	68	75-125	2	20	M3

SAMPLE DUPLICATE: 2026425

Parameter	Units	10427354004 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 286553 Analysis Method: EPA 9012
 QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 1676305 Matrix: Solid
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/20/18 13:32	

LABORATORY CONTROL SAMPLE: 1676306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.0	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1676307 1676308

Parameter	Units	40167646001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.10J	2.22	2.34	2.3	2.4	98	99	80-120	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1676309 1676310

Parameter	Units	10427291004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.67	3.98	3.65	4.2	3.7	88	82	80-120	12	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 140842

Analysis Method: EPA 9056A

QC Batch Method: EPA 300.0

Analysis Description: 9056 IC Anions, Soil

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 557419

Matrix: Solid

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	0.99	04/19/18 16:14	

LABORATORY CONTROL SAMPLE: 557418

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	50.3	52.6	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557420 557421

Parameter	Units	10427291004 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result						
Fluoride	mg/kg	1.4	49.8	49.8	12.1	12.9	21	23	80-120	7	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557422 557423

Parameter	Units	10427291008 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result						
Fluoride	mg/kg	ND	49.7	49	35.4	35.5	69	71	80-120	0	20	M1

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth

PASI-G Pace Analytical Services - Green Bay

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

ANALYTE QUALIFIERS

1M Sample was black in color and slightly viscous.

2M Sample was black in color and viscous. Sample was centrifuged and decanted prior to analysis.

3M Sample was black in color.

4M Sample was dark brown in color.

5M Sample was yellow in color.

6M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

D4 Sample was diluted due to the presence of high levels of target analytes.

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

ANALYTE QUALIFIERS

- M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.
- N2 The lab does not hold NELAC/TNI accreditation for this parameter.
- N3 Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
- P3 Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
- P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
- R1 RPD value was outside control limits.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.
- S5 Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
- SS This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.
- T6 High boiling point hydrocarbons are present in the sample.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10427354

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427354001	TS-SB-04 (7-15 WM)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427354002	TS-SB-05 (5-7.5 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427354003	TS-SB-06 (8-12.5WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427354004	TS-SB-07 (15.18.5)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427354005	TS-SB-08 (10-20WM)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427354001	TS-SB-04 (7-15 WM)	EPA 3550	532491	EPA 8081B	532802
10427354002	TS-SB-05 (5-7.5 WM)	EPA 3550	532491	EPA 8081B	532802
10427354003	TS-SB-06 (8-12.5WM)	EPA 3550	532491	EPA 8081B	532802
10427354004	TS-SB-07 (15.18.5)	EPA 3550	532491	EPA 8081B	532802
10427354005	TS-SB-08 (10-20WM)	EPA 3550	532491	EPA 8081B	532802
10427354001	TS-SB-04 (7-15 WM)	EPA 3550	532605	EPA 8082A	532864
10427354002	TS-SB-05 (5-7.5 WM)	EPA 3550	532605	EPA 8082A	532864
10427354003	TS-SB-06 (8-12.5WM)	EPA 3550	532605	EPA 8082A	532864
10427354004	TS-SB-07 (15.18.5)	EPA 3550	532605	EPA 8082A	532864
10427354005	TS-SB-08 (10-20WM)	EPA 3550	532605	EPA 8082A	532864
10427354001	TS-SB-04 (7-15 WM)	WI MOD DRO	532497	WI MOD DRO	532700
10427354002	TS-SB-05 (5-7.5 WM)	WI MOD DRO	532497	WI MOD DRO	532700
10427354003	TS-SB-06 (8-12.5WM)	WI MOD DRO	532497	WI MOD DRO	532700
10427354004	TS-SB-07 (15.18.5)	WI MOD DRO	532497	WI MOD DRO	532700
10427354005	TS-SB-08 (10-20WM)	WI MOD DRO	532497	WI MOD DRO	532700
10427354001	TS-SB-04 (7-15 WM)	EPA 5030 Medium Soil	534067	WI MOD GRO	534264
10427354002	TS-SB-05 (5-7.5 WM)	EPA 5030 Medium Soil	534067	WI MOD GRO	534264
10427354003	TS-SB-06 (8-12.5WM)	EPA 5030 Medium Soil	534067	WI MOD GRO	534264
10427354004	TS-SB-07 (15.18.5)	EPA 5030 Medium Soil	534067	WI MOD GRO	534264
10427354005	TS-SB-08 (10-20WM)	EPA 5030 Medium Soil	534067	WI MOD GRO	534264
10427354001	TS-SB-04 (7-15 WM)	EPA 3050	532662	EPA 6010C	532713
10427354002	TS-SB-05 (5-7.5 WM)	EPA 3050	532662	EPA 6010C	532713
10427354003	TS-SB-06 (8-12.5WM)	EPA 3050	532662	EPA 6010C	532713
10427354004	TS-SB-07 (15.18.5)	EPA 3050	532662	EPA 6010C	532713
10427354005	TS-SB-08 (10-20WM)	EPA 3050	532662	EPA 6010C	532713
10427354001	TS-SB-04 (7-15 WM)	EPA 3050B	437531	EPA 6020	438359
10427354002	TS-SB-05 (5-7.5 WM)	EPA 3050B	437531	EPA 6020	438359
10427354003	TS-SB-06 (8-12.5WM)	EPA 3050B	437531	EPA 6020	438359
10427354004	TS-SB-07 (15.18.5)	EPA 3050B	437531	EPA 6020	438359
10427354005	TS-SB-08 (10-20WM)	EPA 3050B	437531	EPA 6020	438359
10427354001	TS-SB-04 (7-15 WM)	EPA 3050	532660	EPA 6020A	532720
10427354002	TS-SB-05 (5-7.5 WM)	EPA 3050	532660	EPA 6020A	532720
10427354003	TS-SB-06 (8-12.5WM)	EPA 3050	532660	EPA 6020A	532720
10427354004	TS-SB-07 (15.18.5)	EPA 3050	532660	EPA 6020A	532720
10427354005	TS-SB-08 (10-20WM)	EPA 3050	532660	EPA 6020A	532720
10427354001	TS-SB-04 (7-15 WM)	EPA 7471	533671	EPA 7471	533807
10427354002	TS-SB-05 (5-7.5 WM)	EPA 7471	533671	EPA 7471	533807
10427354003	TS-SB-06 (8-12.5WM)	EPA 7471	533671	EPA 7471	533807
10427354004	TS-SB-07 (15.18.5)	EPA 7471	533671	EPA 7471	533807

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427354005	TS-SB-08 (10-20WM)	EPA 7471	533671	EPA 7471	533807
10427354001	TS-SB-04 (7-15 WM)	ASTM D2974	533197		
10427354002	TS-SB-05 (5-7.5 WM)	ASTM D2974	533197		
10427354003	TS-SB-06 (8-12.5WM)	ASTM D2974	533197		
10427354004	TS-SB-07 (15.18.5)	ASTM D2974	533197		
10427354005	TS-SB-08 (10-20WM)	ASTM D2974	533197		
10427354001	TS-SB-04 (7-15 WM)	EPA 3550	533361	EPA 8270D	533537
10427354002	TS-SB-05 (5-7.5 WM)	EPA 3550	533361	EPA 8270D	533537
10427354003	TS-SB-06 (8-12.5WM)	EPA 3550	533361	EPA 8270D	533537
10427354004	TS-SB-07 (15.18.5)	EPA 3550	533361	EPA 8270D	533537
10427354005	TS-SB-08 (10-20WM)	EPA 3550	533361	EPA 8270D	533537
10427354001	TS-SB-04 (7-15 WM)	EPA 3550	532788	EPA 8270D by SIM	532973
10427354002	TS-SB-05 (5-7.5 WM)	EPA 3550	532788	EPA 8270D by SIM	532973
10427354003	TS-SB-06 (8-12.5WM)	EPA 3550	532788	EPA 8270D by SIM	532973
10427354004	TS-SB-07 (15.18.5)	EPA 3550	532788	EPA 8270D by SIM	532973
10427354005	TS-SB-08 (10-20WM)	EPA 3550	532788	EPA 8270D by SIM	532973
10427354001	TS-SB-04 (7-15 WM)	EPA 5035/5030B	534064	EPA 8260B	534331
10427354002	TS-SB-05 (5-7.5 WM)	EPA 5035/5030B	534064	EPA 8260B	534331
10427354003	TS-SB-06 (8-12.5WM)	EPA 5035/5030B	534064	EPA 8260B	534331
10427354004	TS-SB-07 (15.18.5)	EPA 5035/5030B	534064	EPA 8260B	534331
10427354005	TS-SB-08 (10-20WM)	EPA 5035/5030B	534064	EPA 8260B	534331
10427354001	TS-SB-04 (7-15 WM)	EPA 3060A	438492	EPA 7196A	438766
10427354002	TS-SB-05 (5-7.5 WM)	EPA 3060A	438492	EPA 7196A	438766
10427354003	TS-SB-06 (8-12.5WM)	EPA 3060A	438492	EPA 7196A	438766
10427354004	TS-SB-07 (15.18.5)	EPA 3060A	438492	EPA 7196A	438766
10427354005	TS-SB-08 (10-20WM)	EPA 3060A	438492	EPA 7196A	438766
10427354001	TS-SB-04 (7-15 WM)	Trivalent Chromium Calculation	439198		
10427354002	TS-SB-05 (5-7.5 WM)	Trivalent Chromium Calculation	439198		
10427354003	TS-SB-06 (8-12.5WM)	Trivalent Chromium Calculation	439198		
10427354004	TS-SB-07 (15.18.5)	Trivalent Chromium Calculation	439198		
10427354005	TS-SB-08 (10-20WM)	Trivalent Chromium Calculation	439198		
10427354001	TS-SB-04 (7-15 WM)	EPA 9012A	286553	EPA 9012	286614
10427354002	TS-SB-05 (5-7.5 WM)	EPA 9012A	286553	EPA 9012	286614
10427354003	TS-SB-06 (8-12.5WM)	EPA 9012A	286553	EPA 9012	286614
10427354004	TS-SB-07 (15.18.5)	EPA 9012A	286553	EPA 9012	286614
10427354005	TS-SB-08 (10-20WM)	EPA 9012A	286553	EPA 9012	286614
10427354001	TS-SB-04 (7-15 WM)	EPA 300.0	140842	EPA 9056A	140851
10427354002	TS-SB-05 (5-7.5 WM)	EPA 300.0	140842	EPA 9056A	140851
10427354003	TS-SB-06 (8-12.5WM)	EPA 300.0	140842	EPA 9056A	140851
10427354004	TS-SB-07 (15.18.5)	EPA 300.0	140842	EPA 9056A	140851
10427354005	TS-SB-08 (10-20WM)	EPA 300.0	140842	EPA 9056A	140851

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10427354

Minnesota Pollution Control Agency		Chain-of-Custody Form				Work Order Number:		COC Type:		Page: 1 of				
PROJECT/CLIENT INFO						Turnaround Time:		COC ID:		FOR LAB USE ONLY				
Facility Code: <i>MPCA-Freeway LF solids</i>				Program Code (MDH Lab Only):		Lab Name:		LABORATORY						
Project Name: <i>MPCA-Freeway LF solids</i>				Project Task Code:		Address: <i>18-00383</i>		Lab Work Order Sticker						
Project Manager:						Phone No: <i>EPIC Profile #38716</i>								
Potential Hazard? If yes, add information to Sampler Comments Section														
SAMPLE DETAILS						ANALYSIS REQUESTED								
SAMPLE TYPE CODES S=Routine Sample S-VP=Integrated Vertical Profile Sample S-CWOP=Composite Sample		QC CODES QC-FB=Field Blank Sample QC-FR=Field Replicate Sample QC-TB=Trip Blank Sample		LAB MATRIX CODES DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe		AR CODES AR=Air BL=Biological Material OT=Other TS=Tissue		FIELD MATRIX CODES Wt-Ground=Groundwater Wt-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample						
Location Identifier	Sample Type	Date	Time	Start Depth, feet	End Depth, feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Lab Sample No.	#
<i>13-5B-04 (7-15 Wm)</i>	<i>S</i>	<i>4/13/18</i>	<i>0900</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>001</i>	<i>1</i>
<i>13-5B-05 (21-24 S)</i>	<i>S</i>	<i>4/13/18</i>	<i>1010</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X X</i>		<i>2</i>
<i>13-5B-06 (5-7.5 Wm)</i>	<i>S</i>	<i>4/13/18</i>	<i>1010</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X X</i>	<i>002</i>	<i>4</i>
<i>13-5B-06 (8-12.5 Wm)</i>	<i>S</i>	<i>4/13/18</i>	<i>1105</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X X</i>	<i>003</i>	<i>5</i>
<i>13-5B-07 (15-19 S)</i>	<i>S</i>	<i>4/13/18</i>	<i>1220</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X X</i>	<i>004</i>	<i>6</i>
<i>13-5B-08 (10-20 Wm)</i>	<i>S</i>	<i>4/13/18</i>	<i>1410</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>005</i>	<i>7</i>
														<i>8</i>
														<i>9</i>
														<i>10</i>

see attached for soil buckets (-Dioxins)
+Dioxins

Sampled By: *David Anderson* Sampler's Signature: *David Anderson* Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
<i>David Anderson / Pace Analytical</i>	<i>4/13/18/1630</i>	<i>Matt Pace</i>	<i>4/13/18 1630</i>

T=3.8

Sample Condition Upon Receipt **Client Name:** MN POLLUTION AGENCY **Project #:** _____

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

WO# : 10427354

PM: JMA **Due Date: 04/27/18**

CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer J51401163 **Type of Ice:** Wet Blue None Dry Melted
Used: G87A9155100842

Cooler Temp Read (°C): 3.6 **Cooler Temp Corrected (°C):** 3.8 **Biological Tissue Frozen?** Yes No N/A
Temp should be above freezing to 6°C **Correction Factor:** +0.2 **Date and Initials of Person Examining Contents:** 4/13/18

USDA Regulated Soil (N/A, water sample)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ **Date/Time:** _____

Comments/Resolution: _____

Project Manager Review: [Signature] **Date:** 04/16/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately
 half of the samples. To be determined in the field by MPCA staff.

Chain of Custody

WO#: 12107162



12107162

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427354 Workorder Name: 18-00383 MPCA Freeway LF Solid Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To		Subcontract To				Requested Analysis																							
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042				Fluoride by method 9056																							
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix											Unpreserved	Preserved Containers			LAB USE ONLY									
1	TS-SB-04 (7-15 WM)	PS	4/13/2018 09:00	10427354001	Solid											1													
2	TS-SB-05 (5-7.5 WM)	PS	4/13/2018 10:10	10427354002	Solid											1													
3	TS-SB-06 (8-12.5WM)	PS	4/13/2018 11:05	10427354003	Solid											1													
4	TS-SB-07 (15.18.5)	PS	4/13/2018 12:20	10427354004	Solid											1													
5	TS-SB-08 (10-20WM)	PS	4/13/2018 14:10	10427354005	Solid	1																							

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>My New</i>	<i>4/16/18 17:45</i>	<i>CS</i>	<i>4/16/18 17:45</i>	
2	<i>CS</i>	<i>4/16/18 21:30</i>	<i>B. Mathias</i>	<i>4/17/18 0700</i>	
3					

Cooler Temperature on Receipt *56* °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace - MPLS Project #: _____

WO# : 12107162
 PM: HRZ Due Date: 04/27/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 5.3 Cooler Temp Corrected °C: 5.16 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: 4/20/18 CRB

Comments: Bm 4/17/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N
 Project Manager Review: Angela L... Date: 4/17/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

401675-41

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN



Workorder: 10427354 Workorder Name: 18-00383 MPCA Freeway LF Solid Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To		Subcontract To		Requested Analysis																				
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Green Bay 1241 Bellevue Street Suite 9 Green Bay, WI 54302 Phone (920)469-2436																						
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Total Cyanide by 9012	LAB USE ONLY												
						Unpreserved																		
1	TS-SB-04 (7-15 WM) 001	PS	4/13/2018 09:00	10427354001	Solid	1						X												
2	TS-SB-05 (5-7.5 WM) 002	PS	4/13/2018 10:10	10427354002	Solid	1						X												
3	TS-SB-06 (8-12.5 WM) 003	PS	4/13/2018 11:05	10427354003	Solid	1						X												
4	TS-SB-07 (15.18.5) 004	PS	4/13/2018 12:20	10427354004	Solid	1						X												
5	TS-SB-08 (10-20 WM) 005	PS	4/13/2018 14:10	10427354005	Solid	1						X												


Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	4/16/18 17:00	<i>[Signature]</i>	4/17/18 09:01	
2	<i>[Signature]</i>	4/17/18 09:01	<i>[Signature]</i>	4/17/18 09:01	
3					

Cooler Temperature on Receipt 2 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace MN
Courier: CS Logistics Fed Ex Speedee UPS **Waltco**
 Client Pace Other: _____
Tracking #: 1643529-1
Custody Seal on Cooler/Box Present: yes no Seals intact: yes no
Custody Seal on Samples Present: yes no Seals intact: yes no
Packing Material: Bubble Wrap Bubble Bags None Other
Thermometer Used SR-75 **Type of Ice:** Wet Blue Dry None
Cooler Temperature Uncorr: 2 / Corr: 2 Samples on ice, cooling process has begun

Project #: _____
WO#: 40167541

 40167541

Temp Blank Present: yes no **Biological Tissue is Frozen:** yes no
 Temp should be above freezing to 6°C.
 Biota Samples may be received at ≤ 0°C.

Person examining contents:
 Date: 4/17/18
 Initials: SM

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>TRUD</u> <u>SM 4/17/18</u>
Samples Arrived within Hold Time: - VOA Samples frozen upon receipt	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No	5. Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		8.
Correct Containers Used: -Pace Containers Used: -Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: <u>5</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>client label has no collect times</u> <u>SM 4/17/18</u>
Trip Blank Present: Trip Blank Custody Seals Present Pace Trip Blank Lot # (if purchased):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.

Client Notification/ Resolution:
 Person Contacted: _____ Date/Time: _____ If checked, see attached form for additional comments
 Comments/ Resolution: _____

Project Manager Review: Cia **Date:** 4/17/18

WO#: 12107162

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Chain of Custody

PM: HRZ Due Date: 04/27/18
 CLIENT: PACE MPLS

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427354 Workorder Name: 18-00383 MPCA Freeway LF Solid Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To		Subcontract To					Requested Analysis											
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Duluth 4730 Oneota St. Duluth, MN 55807 Phone (218)727-6380																
							Methyl Mercury by 1630											
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					LAB USE ONLY							
						Unpreserved												
1	TS-SB-04 (7-15 WM)	PS	4/13/2018 09:00	10427354001	Solid	1						X						
2	TS-SB-05 (5-7.5 WM)	PS	4/13/2018 10:10	10427354002	Solid	1						X						
3	TS-SB-06 (8-12.5WM)	PS	4/13/2018 11:05	10427354003	Solid	1						X						
4	TS-SB-07 (15.18.5)	PS	4/13/2018 12:20	10427354004	Solid	1						X						
5	TS-SB-08 (10-20WM)	PS	4/13/2018 14:10	10427354005	Solid	1						X						
												Comments						
Transfers	Released By	Date/Time	Received By	Date/Time														
1	<i>[Signature]</i>	4/16/18 12:00	<i>CB</i>	4/16/18 12:15														
2	<i>CB</i>	4/17/18 15:15	<i>[Signature]</i>	4/17/18 15:15														
3																		
Cooler Temperature on Receipt		°C	Custody Seal Y or N		Received on Ice Y or N		Samples Intact Y or N											

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: PACE MPLS Project #: _____

WO#: 12107162

PM: HRZ Due Date: 04/27/18
CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 01339252/1710 IR-1 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 5.9 Cooler Temp Corrected °C: 5.9 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6°C Correction Factor: 0.0 Date and Initials of Person Examining Contents: 4/17/18 *[Signature]*

If temperature is ≤0°C, is there evidence of ice formation? Yes No NA

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____ Date: _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50194568

Date/Time and Initials of person examining contents: 7/2 4/12/2 0945

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 7632 1990

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N

Cooler Temperature: 2.1/2.3 Ice Visible in Sample Containers?: Yes No N

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		/	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		/	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			/
Chain of Custody Present:	/		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	/		Dissolved Metals field filtered?:			/
Short Hold Time Analysis (<72hr)?: Analysis:		/	Headspace Wisconsin Sulfide			/
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			/
Rush TAT Requested:		/	Headspace in VOA Vials (>6mm):			/
Containers Intact?:	/		Trip Blank Present?:		/	
Sample Labels Match COC?: Except TCs, which only require sample ID	/		Trip Blank Custody Seals?:		/	

Comments:

Sample Container Count

WO#: 50194568



CLIENT: Page MN

COC PAGE 1 of 1

COC ID# _____

Project # 50194568

Sample Line Item	DG9H VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	SBS DI	Bulk Kit	Matrix Si/W (Soil/Water/ Aqueous Li	pH <2	pH >9	pH >1		
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
WGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				

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2525 Advance Road
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April 25, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Solid - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/17/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427354
 Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TS-SB-04 (7-15 WM) (10427354001)	A181608-01	Solid	04/13/2018	04/17/2018
TS-SB-05 (5-7.5 WM) (10427354002)	A181608-02	Solid	04/13/2018	04/17/2018
TS-SB-06 (8-12.5WM) (10427354003)	A181608-03	Solid	04/13/2018	04/17/2018
TS-SB-07 (15.18.5) (10427354004)	A181608-04	Solid	04/13/2018	04/17/2018
TS-SB-08 (10-20WM) (10427354005)	A181608-05	Solid	04/13/2018	04/17/2018

CASE NARRATIVE

Sample Receipt Information:

5 samples were received on 04/17/2018. Samples were received at 4.8 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Additional Comments:

Sample A181608-05 had to be run at an initial dilution factor of 1:50 for the MDA List II analysis, due to the sample matrix. The reporting limits have been raised accordingly.



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 Project Number: 10427354
 Project Manager: Jennifer Anderson

TS-SB-04 (7-15 WM) (10427354001)

A181608-01 (Solid)

Date Sampled
04/13/2018 09:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804172

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 09:38	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:36	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:36	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:36	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:36	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:36	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:36	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:36	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:36	EPA 8321B	

Surrogate: DCAA 91.6 % 70.8-116 04/20/2018 04/22/2018 10:36 EPA 8321B

Classical Chemistry Parameters

Preparation Batch: A804164

% Solids	86.5	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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 Project Number: 10427354
 Project Manager: Jennifer Anderson

TS-SB-05 (5-7.5 WM) (10427354002)
A181608-02 (Solid)

Date Sampled
 04/13/2018 10:10

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804172

2,4-D	0.30	0.10	mg/kg dry	1	04/20/2018	04/22/2018 11:43	EPA 8321B	P
2,4-DB	0.45	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:44	EPA 8321B	P
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:44	EPA 8321B	
2,4,5-TP	0.13	0.10	mg/kg dry	1	04/20/2018	04/22/2018 11:43	EPA 8321B	P
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 11:43	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:44	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 11:43	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 11:43	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:44	EPA 8321B	

Surrogate: DCAA 83.0 % 70.8-116 04/20/2018 04/22/2018 11:43 EPA 8321B

Classical Chemistry Parameters

Preparation Batch: A804164

% Solids	74.5	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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 Project Number: 10427354
 Project Manager: Jennifer Anderson

TS-SB-06 (8-12.5WM) (10427354003)
A181608-03 (Solid)

Date Sampled
 04/13/2018 11:05

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804172

2,4-D	0.29	0.10	mg/kg dry	1	04/20/2018	04/22/2018 12:51	EPA 8321B	P
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 12:51	EPA 8321B	
2,4,5-T	0.18	0.10	mg/kg dry	1	04/20/2018	04/22/2018 12:51	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 12:51	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 12:51	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 12:51	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 12:51	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 12:51	EPA 8321B	
Triclopyr	0.22	0.10	mg/kg dry	1	04/20/2018	04/22/2018 12:51	EPA 8321B	
<i>Surrogate: DCAA</i>		<i>90.8 %</i>	<i>70.8-116</i>		<i>04/20/2018</i>	<i>04/22/2018 12:51</i>	<i>EPA 8321B</i>	

Classical Chemistry Parameters

Preparation Batch: A804164

% Solids	82.7	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427354
 Project Manager: Jennifer Anderson

TS-SB-07 (15.18.5) (10427354004)
A181608-04 (Solid)

Date Sampled
 04/13/2018 12:20

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804172

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 02:47	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 02:47	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 02:47	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 02:47	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 01:57	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 02:47	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 02:47	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 02:47	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 02:47	EPA 8321B	
Surrogate: DCAA		98.1 %		70.8-116	04/20/2018	04/22/2018 02:47	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804164

% Solids	92.7	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427354
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804172 - EPA 3570

Blank (A804172-BLK1)										
Prepared: 04/20/2018 Analyzed: 04/22/2018 01:40										
2,4-D	ND	0.10	mg/kg wet							
2,4-D [2C]	ND	0.10	mg/kg wet							
2,4-DB	ND	0.10	mg/kg wet							
2,4-DB [2C]	ND	0.10	mg/kg wet							
2,4,5-T	ND	0.10	mg/kg wet							
2,4,5-T [2C]	ND	0.10	mg/kg wet							
2,4,5-TP	ND	0.10	mg/kg wet							
2,4,5-TP [2C]	ND	0.10	mg/kg wet							
Bentazon	ND	0.10	mg/kg wet							
Bentazon [2C]	ND	0.10	mg/kg wet							
Dicamba	ND	0.10	mg/kg wet							
Dicamba [2C]	ND	0.10	mg/kg wet							
MCPA	ND	0.10	mg/kg wet							
MCPA [2C]	ND	0.10	mg/kg wet							
Picloram	ND	0.10	mg/kg wet							
Picloram [2C]	ND	0.10	mg/kg wet							
Triclopyr	ND	0.10	mg/kg wet							
Triclopyr [2C]	ND	0.10	mg/kg wet							
Surrogate: DCAA	20.0		mg/kg wet	20.00		99.9	70.8-116			
Surrogate: DCAA [2C]	19.0		mg/kg wet	20.00		95.1	62.3-114			

LCS (A804172-BS1)										
Prepared: 04/20/2018 Analyzed: 04/22/2018 00:33										
2,4-D	1.88	0.10	mg/kg wet	2.000		94.2	81.6-107			
2,4-D [2C]	1.80	0.10	mg/kg wet	2.000		90.0	71.8-120			
2,4-DB	1.78	0.10	mg/kg wet	2.000		89.2	76.4-107			
2,4-DB [2C]	1.67	0.10	mg/kg wet	2.000		83.4	62.2-129			
2,4,5-T	1.95	0.10	mg/kg wet	2.000		97.3	81.2-110			
2,4,5-T [2C]	1.79	0.10	mg/kg wet	2.000		89.7	70.6-125			
2,4,5-TP	1.85	0.10	mg/kg wet	2.000		92.5	79.1-106			
2,4,5-TP [2C]	1.65	0.10	mg/kg wet	2.000		82.5	68.2-118			
Bentazon	1.00	0.10	mg/kg wet	1.000		100	82.5-119			
Bentazon [2C]	1.06	0.10	mg/kg wet	1.000		106	73.3-125			
Dicamba	1.90	0.10	mg/kg wet	2.000		95.2	85.1-108			
Dicamba [2C]	1.84	0.10	mg/kg wet	2.000		91.8	71.4-115			
Picloram	0.967	0.10	mg/kg wet	1.000		96.7	86.1-106			
Picloram [2C]	0.860	0.10	mg/kg wet	1.000		86.0	74.5-114			
Triclopyr	1.85	0.10	mg/kg wet	2.000		92.6	78.6-106			
Triclopyr [2C]	1.69	0.10	mg/kg wet	2.000		84.6	69.4-118			
Surrogate: DCAA	20.3		mg/kg wet	20.00		101	70.8-116			
Surrogate: DCAA [2C]	17.8		mg/kg wet	20.00		89.2	62.3-114			

LCS (A804172-BS2)										
Prepared: 04/20/2018 Analyzed: 04/21/2018 23:26										
MCPA	2.15	0.10	mg/kg wet	2.000		108	79.4-116			
MCPA [2C]	1.90	0.10	mg/kg wet	2.000		95.1	77-123			



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Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427354
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804172 - EPA 3570

LCS (A804172-BS2)

Prepared: 04/20/2018 Analyzed: 04/21/2018 23:26

Surrogate: DCAA	20.6		mg/kg wet	20.00		103	70.8-116			
Surrogate: DCAA [2C]	21.6		mg/kg wet	20.00		108	62.3-114			

Matrix Spike (A804172-MS1)

Source: A181608-04

Prepared: 04/20/2018 Analyzed: 04/22/2018 03:54

2,4-D	1.96	0.10	mg/kg dry	2.158	ND	90.7	71.4-105			
2,4-D [2C]	2.00	0.10	mg/kg dry	2.158	ND	92.9	50.5-123			
2,4-DB	1.84	0.10	mg/kg dry	2.158	ND	85.4	46.4-117			
2,4-DB [2C]	1.93	0.10	mg/kg dry	2.158	ND	89.3	44.5-121			
2,4,5-T	2.00	0.10	mg/kg dry	2.158	ND	92.7	66.2-110			
2,4,5-T [2C]	1.96	0.10	mg/kg dry	2.158	ND	90.8	43.6-126			
2,4,5-TP	1.93	0.10	mg/kg dry	2.158	ND	89.3	52.4-114			
2,4,5-TP [2C]	1.72	0.10	mg/kg dry	2.158	ND	79.9	47.6-117			
Bentazon	1.04	0.10	mg/kg dry	1.079	0.0620	90.6	61.5-117			
Bentazon [2C]	1.19	0.10	mg/kg dry	1.079	ND	110	50.7-127			
Dicamba	1.69	0.10	mg/kg dry	2.158	ND	78.4	48.4-111			
Dicamba [2C]	1.71	0.10	mg/kg dry	2.158	ND	79.3	43.3-108			
Picloram	0.711	0.10	mg/kg dry	1.079	ND	65.9	26.7-110			
Picloram [2C]	0.433	0.10	mg/kg dry	1.079	0.00608	39.5	10.8-110			
Triclopyr	1.95	0.10	mg/kg dry	2.158	ND	90.5	56-113			
Triclopyr [2C]	1.81	0.10	mg/kg dry	2.158	ND	84.0	47.9-120			
Surrogate: DCAA	21.0		mg/kg dry	21.58		97.1	70.8-116			
Surrogate: DCAA [2C]	19.2		mg/kg dry	21.58		88.8	62.3-114			

Matrix Spike (A804172-MS2)

Source: A181608-04

Prepared: 04/20/2018 Analyzed: 04/22/2018 08:22

MCPA	2.20	0.10	mg/kg dry	2.158	ND	102	74.2-114			
MCPA [2C]	2.15	0.10	mg/kg dry	2.158	ND	99.8	60.9-122			
Surrogate: DCAA	21.4		mg/kg dry	21.58		99.3	70.8-116			
Surrogate: DCAA [2C]	21.4		mg/kg dry	21.58		99.0	62.3-114			

Matrix Spike Dup (A804172-MSD1)

Source: A181608-04

Prepared: 04/20/2018 Analyzed: 04/22/2018 05:01

2,4-D	1.96	0.10	mg/kg dry	2.158	ND	90.6	71.4-105	0.123	20	
2,4-D [2C]	2.07	0.10	mg/kg dry	2.158	ND	95.9	50.5-123	3.23	20	
2,4-DB	1.86	0.10	mg/kg dry	2.158	ND	86.3	46.4-117	1.04	20	
2,4-DB [2C]	1.91	0.10	mg/kg dry	2.158	ND	88.4	44.5-121	1.02	20	
2,4,5-T	2.02	0.10	mg/kg dry	2.158	ND	93.4	66.2-110	0.787	20	
2,4,5-T [2C]	1.93	0.10	mg/kg dry	2.158	ND	89.3	43.6-126	1.68	20	
2,4,5-TP	1.94	0.10	mg/kg dry	2.158	ND	90.1	52.4-114	0.957	20	
2,4,5-TP [2C]	1.75	0.10	mg/kg dry	2.158	ND	81.2	47.6-117	1.62	20	
Bentazon	1.05	0.10	mg/kg dry	1.079	0.0620	91.5	61.5-117	0.899	20	
Bentazon [2C]	1.22	0.10	mg/kg dry	1.079	ND	113	50.7-127	2.11	20	
Dicamba	1.71	0.10	mg/kg dry	2.158	ND	79.3	48.4-111	1.10	20	
Dicamba [2C]	1.77	0.10	mg/kg dry	2.158	ND	82.0	43.3-108	3.39	20	
Picloram	0.697	0.10	mg/kg dry	1.079	ND	64.6	26.7-110	2.08	20	
Picloram [2C]	0.462	0.10	mg/kg dry	1.079	0.00608	42.2	10.8-110	6.45	20	



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 Project Number: 10427354
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804172 - EPA 3570

Matrix Spike Dup (A804172-MSD1)		Source: A181608-04			Prepared: 04/20/2018 Analyzed: 04/22/2018 05:01					
Triclopyr	1.96	0.10	mg/kg dry	2.158	ND	90.8	56-113	0.393	20	
Triclopyr [2C]	1.83	0.10	mg/kg dry	2.158	ND	84.8	47.9-120	0.917	20	
Surrogate: DCAA	20.9		mg/kg dry	21.58		96.9	70.8-116			
Surrogate: DCAA [2C]	18.9		mg/kg dry	21.58		87.7	62.3-114			
Matrix Spike Dup (A804172-MSD2)		Source: A181608-04			Prepared: 04/20/2018 Analyzed: 04/22/2018 09:29					
MCPA	2.26	0.10	mg/kg dry	2.158	ND	105	74.2-114	2.48	20	
MCPA [2C]	2.20	0.10	mg/kg dry	2.158	ND	102	60.9-122	2.11	20	
Surrogate: DCAA	21.6		mg/kg dry	21.58		100	70.8-116			
Surrogate: DCAA [2C]	22.9		mg/kg dry	21.58		106	62.3-114			



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Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Solid - MN Project Number: 10427354 Project Manager: Jennifer Anderson
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Classical Chemistry Parameters - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804164 - % Solids

Duplicate (A804164-DUP1)	Source: A181613-14	Prepared: 04/18/2018	Analyzed: 04/19/2018 11:20		
% Solids	93.3	0.00 % by Weight	97.0	3.88	20



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Project Number: 10427354
Project Manager: Jennifer Anderson

Notes and Definitions

- P The difference in the concentrations between the primary and confirmation column was > 40%.
- LC Results may be biased low because of low continuing calibration verification (CCV).
- DO Diluted out.
- D Data reported from a dilution
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Chain of Custody

A181608



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427354 Workorder Name: 18-00383 MPCA Freeway LF Solid Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To		Subcontract To				Requested Analysis														
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700																		
						MDA List II														
						Preserved Containers														
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved														LAB USE ONLY
1	TS-SB-04 (7-15 WM)	PS	4/13/2018 09:00	10427354001	Solid	1														01
2	TS-SB-05 (5-7.5 WM)	PS	4/13/2018 10:10	10427354002	Solid	1														02
3	TS-SB-06 (8-12.5WM)	PS	4/13/2018 11:05	10427354003	Solid	1														03
4	TS-SB-07 (15.18.5)	PS	4/13/2018 12:20	10427354004	Solid	1														04
5	TS-SB-08 (10-20WM)	PS	4/13/2018 14:10	10427354005	Solid	1														05
																			Comments	
Transfers	Released By	Date/Time	Received By	Date/Time																
1	<i>[Signature]</i>	4/16/18 1630	<i>[Signature]</i>	4/17/18																
2				0940																
3																				
Cooler Temperature on Receipt		4.8 °C	Custody Seal Y or N		Received on Ice Y or N		Samples Intact Y or N													

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274
exp 7/12/18

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

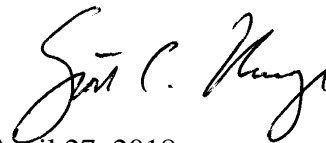
PaceProject#: 10427356
Sample Receipt Date: 04/13/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 27, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

April 27, 2018

DISCUSSION

This report presents the results from the analyses performed on two samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 31-72%. Except for one low value, which was flagged "R" on the results table, the labeled internal standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 104%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

WO#: 10427356



10427356

Report No.....10427356_8290TCDD_DFR

Study Form Form 10-2012 Work Order Number: COC Type: Page: 1 of 1
 Turnaround Time: COC ID:

Control Agency: PROJECT/CLIENT INFO
 Facility Code: *MPCA-Freeway LF solids* Program Code (MDH Lab Only):
 Project Name: *MPCA-Freeway LF solids* Project Task Code:
 Project Manager: Address: *18-00383*
 Potential Hazard? If yes, add information to Sampler Comments Section Phone No: *Epic Profile #38716*

FOR LAB USE ONLY
 Lab Work Order Sticker

SAMPLE TYPE CODES: Sample-Routine Sample, S-IVP-Integrated Vertical Profile Sample, S-CWOP-Composite Sample
 LAB MATRIX CODES: DW=Drinking Water, NWS=Non-potable Water, SD=Soil/Solid, WP=Wipe, AR=Air, BL=Biological Material, OT=Other, TS=Tissue
 FIELD MATRIX CODES: Ww-Ground=Groundwater, Ww-Surf=Surface Water, QC-BLANK=Artificial Blank Water, Leachate=Leachate Sample
 ANALYSIS REQUESTED

DJA
4/13/18

Location Identifier	Sample Type	Date	Time	Start Depth, feet	End Depth, feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	LABORATORY	Lab Sample No.	#
<i>15-SB-04 (7-15 W/M)</i>	<i>S</i>	<i>4/13/18</i>	<i>0910</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>see attached for soils/waste (-Dioxins)</i>		<i>001</i>	<i>4/13/18</i>
<i>15-SB-05 (21-24 S)</i>	<i>S</i>	<i>4/13/18</i>	<i>1010</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X X</i>		<i>002</i>	<i>4/13/18</i>
<i>15-SB-06 (5-7.5 W/M)</i>	<i>S</i>	<i>4/13/18</i>	<i>1010</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X X</i>		<i>003</i>	<i>4/13/18</i>
<i>15-SB-06 (8-12.5 W/M)</i>	<i>S</i>	<i>4/13/18</i>	<i>1105</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X X</i>		<i>003</i>	<i>4/13/18</i>
<i>15-SB-07 (15-19 S)</i>	<i>S</i>	<i>4/13/18</i>	<i>1220</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X X</i>		<i>002</i>	<i>4/13/18</i>
<i>15-SB-08 (18-20 W/M)</i>	<i>S</i>	<i>4/13/18</i>	<i>1410</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X X</i>		<i>002</i>	<i>4/13/18</i>

Sampled By: *Damb Anderson* Sampler's Signature: *Damb Anderson* Phone #:

Receiving Comments:

Relinquished By/Affiliation: *Damb Anderson / Pace Analytical* Date/Time: *4/13/18/1630*
 Accepted By/Affiliation: *MMA Pace* Date/Time: *4/13/18 1630*

001
002
003
002
1630
T-3.8

Sample Condition Upon Receipt **Client Name:** MN POLLUTION AGENCY **Project #:** _____

Courier: Fed Ex UPS USPS Client

Commercial Pace SpeeDee Other: _____

Tracking Number: _____

WO#: 10427356

PM: SCU **Due Date: 04/27/18**

CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer Used: 151401163 G87A9155100842 **Type of Ice:** Wet Blue None Dry Melted

Cooler Temp Read (°C): 3.6 **Cooler Temp Corrected (°C):** 3.8 **Biological Tissue Frozen?** Yes No N/A

Temp should be above freezing to 6°C **Correction Factor:** +0.2 **Date and Initials of Person Examining Contents:** 4/13/18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
(HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature] **Date:** 4/16/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	TS-SB-05 (5-7.5WM)		
Lab Sample ID	10427356001		
Filename	U180423A_05		
Injected By	BAL		
Total Amount Extracted	13.8 g	Matrix	Solid
% Moisture	31.9	Dilution	NA
Dry Weight Extracted	9.40 g	Collected	04/13/2018 10:10
ICAL ID	U180405	Received	04/13/2018 16:35
CCal Filename(s)	U180422B_15 & U180423A_10	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/23/2018 05:32

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	31 R
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	27

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	TS-SB-07 (15-18.5)		
Lab Sample ID	10427356002		
Filename	U180423A_06		
Injected By	BAL		
Total Amount Extracted	12.6 g	Matrix	Solid
% Moisture	7.2	Dilution	NA
Dry Weight Extracted	11.7 g	Collected	04/13/2018 12:20
ICAL ID	U180405	Received	04/13/2018 16:35
CCal Filename(s)	U180422B_15 & U180423A_10	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/23/2018 06:20

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	72
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	70

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61774	Matrix	Solid
Filename	Y180422A_04	Dilution	NA
Total Amount Extracted	79.7 g	Extracted	04/17/2018 15:45
ICAL ID	Y180204	Analyzed	04/22/2018 16:10
CCal Filename(s)	Y180421B_16 & Y180422A_12	Injected By	BAL

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	63

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

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 without the written consent of Pace Analytical Services, Inc.



Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61775	Matrix	Solid
Filename	Y180422A_01	Dilution	NA
Total Amount Extracted	75.1 g	Extracted	04/17/2018 15:45
ICAL ID	Y180204	Analyzed	04/22/2018 13:59
CCal Filename(s)	Y180421B_16 & Y180422A_12	Injected By	BAL
Method Blank ID	BLANK-61774		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.21	104	2,3,7,8-TCDD-13C	2.0	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	62

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, Inc.

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

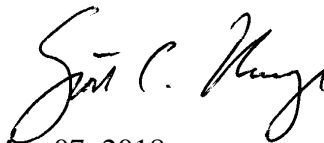
PaceProject#: 10427641
Sample Receipt Date: 04/17/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



May 07, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

May 7, 2018

DISCUSSION

This report presents the results from the analyses performed on three samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The samples were received above the recommended temperature range of 0-6 degrees Celsius.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 50-58%. All of the labeled internal standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 104%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, Inc.

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE	MN002
Arkansas	88-0680	New York (NEL	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

WO# 10427641



10427641

Report No.....10427641_8290TCDD_DFR

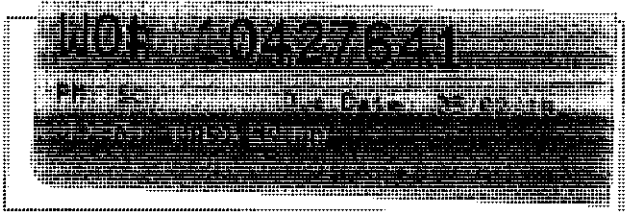
		Chain-of-Custody Form (MPCA 274-1000)		Work Order Number:		COC Type:								
PROJECT/CLIENT INFO		Turnaround Time:		COC ID:		FOR LAB USE ONLY								
Facility Code: MPCA-Freeway LF Solids		Program Code (MDH Lab Only):		Lab Name:		LABORATORY								
Project Name: MPCA-Freeway LF Solids		Project Task Code:		Address: 18-00383		Lab Work Order Sticker								
Project Manager:		Potential Hazard?		Phone No:		EPIC Profile #38716								
If yes, add information to Sampler Comments Section		ANALYSIS REQUESTED		ANALYSIS REQUESTED		ANALYSIS REQUESTED								
SAMPLE TYPE CODES Sample=Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample		LAB MATRIX CODES DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe		FIELD MATRIX CODES GW=Ground-Groundwater SW=Surf-Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample		AR=Air BL=Biological Material OT=Other TS=Tissue								
Location Identifier	Sample Type	Date	Time	Start Depth, in feet	End Depth, in feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS PRESERV.	Lab Sample No.	#
FD-TT-09	S	4/17/18	9:20	4'	12'	C	SD	WM			13		001	1
FD-TT-10	S	4/17/18	12:15	2'	10'	C	SD	WM			13			2
FD-TT-11 (M-01)	S	4/17/18	13:24	4'	12'	C	SD	WM			13		002	3
FD-TT-12 (M-02)	S	4/17/18	14:37	3'	12'	C	SD	WM			13			4
FD-TT-13 (M-03)	S	4/17/18	15:30	3'	12'	C	SD	WM			13		003	5
														6
														7
														8
														9
														10
Sampled By:										Sampler's Signature:		Phone #:		
Receiving Comments:														
Relinquished By/Affiliation:										Date/Time:		Accepted By/ Affiliation:		Date/Time:
(Sampler) Note Relinquished / Pace										4/17/18 1730		MPCA Pace		4/17/18 1730

see attached for soils/mats (+Dioxins)

1730
T=9.6

Sample Condition Upon Receipt

Client Name: mn Pollution Control Project #: 10427641



Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 Type of Ice: Wet Blue None Dry Melted
 Used: G87A9155100842

Cooler Temp Read (°C): 9.4 Cooler Temp Corrected (°C): 9.6 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: ET 4/17/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2. No "list" included
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. <u>ET 4/17/18</u>
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: [Signature] Date: 04/18/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

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Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-TT-09 (4-12 WM)		
Lab Sample ID	10427641001		
Filename	U180505A_02		
Injected By	BAL		
Total Amount Extracted	13.8 g	Matrix	Solid
% Moisture	22.0	Dilution	NA
Dry Weight Extracted	10.8 g	Collected	04/17/2018 09:20
ICAL ID	U180405	Received	04/17/2018 17:30
CCal Filename(s)	U180504B_15 & U180505A_10	Extracted	04/24/2018 14:55
Method Blank ID	BLANK-61921	Analyzed	05/05/2018 06:41

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	56
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	55

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-TT-11 (4-12 WM)		
Lab Sample ID	10427641002		
Filename	U180505A_03		
Injected By	BAL		
Total Amount Extracted	12.5 g	Matrix	Solid
% Moisture	20.8	Dilution	NA
Dry Weight Extracted	9.90 g	Collected	04/17/2018 13:24
ICAL ID	U180405	Received	04/17/2018 17:30
CCal Filename(s)	U180504B_15 & U180505A_10	Extracted	04/24/2018 14:55
Method Blank ID	BLANK-61921	Analyzed	05/05/2018 07:28

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	58
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	65

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-TT-13 (3-12)		
Lab Sample ID	10427641003		
Filename	U180505A_04		
Injected By	BAL		
Total Amount Extracted	13.7 g	Matrix	Solid
% Moisture	66.6	Dilution	NA
Dry Weight Extracted	4.58 g	Collected	04/17/2018 15:30
ICAL ID	U180405	Received	04/17/2018 17:30
CCal Filename(s)	U180504B_15 & U180505A_10	Extracted	04/24/2018 14:55
Method Blank ID	BLANK-61921	Analyzed	05/05/2018 08:16

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	3.3	----	1.0	2,3,7,8-TCDD-13C	2.00	50
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	50

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61921	Matrix	Solid
Filename	F180429A_04	Dilution	NA
Total Amount Extracted	10.1 g	Extracted	04/24/2018 14:55
ICAL ID	F180405	Analyzed	04/29/2018 13:19
CCal Filename(s)	F180428A_14 & F180429A_17	Injected By	BAL

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	63
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	62

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61922	Matrix	Solid
Filename	F180429A_02	Dilution	NA
Total Amount Extracted	10.0 g	Extracted	04/24/2018 14:55
ICAL ID	F180405	Analyzed	04/29/2018 11:50
CCal Filename(s)	F180428A_14 & F180429A_17	Injected By	BAL
Method Blank ID	BLANK-61921		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.21	104	2,3,7,8-TCDD-13C	2.0	68
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	67

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

REPORT OF LABORATORY ANALYSIS

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May 02, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427642

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 17, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427642

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Montana Certificate #CERT0103
California Certification #2973
California Certification #2973
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
Montana DHHS Certification #: CERT0102
Minnesota Dept of Health Certification #: 1382680

Nevada DCNR Certification #: MN000372018-1
Wisconsin DNR Certification #: 999446800
North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10427642001	FD-TT-09 (4-12 WM)	Solid	04/17/18 09:20	04/17/18 17:30
10427642002	FD-TT-10 (2'-10' WM)	Solid	04/17/18 12:15	04/17/18 17:30
10427642003	FD-TT-11 (4-12 WM)	Solid	04/17/18 13:24	04/17/18 17:30
10427642004	FD-TT-12 (3-12)	Solid	04/17/18 14:37	04/17/18 17:30
10427642005	FD-TT-13 (3-12)	Solid	04/17/18 15:30	04/17/18 17:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10427642001	FD-TT-09 (4-12 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	JRH	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010C	DM	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	RJS	10	PASI-M		
		EPA 7471	LMW	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	AT1	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10427642002	FD-TT-10 (2'-10' WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M
WI MOD DRO	JRH			2	PASI-M		
WI MOD GRO	AJR			2	PASI-M		
EPA 6010C	DM			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	RJS			10	PASI-M		
EPA 7471	LMW			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	AT1			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8260B	CD2			70	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
10427642003	FD-TT-11 (4-12 WM)			EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427642004	FD-TT-12 (3-12)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427642005	FD-TT-13 (3-12)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-09 (4-12 WM) **Lab ID: 10427642001** Collected: 04/17/18 09:20 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.3	1	04/25/18 10:56	04/30/18 14:13	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	309-00-2	
alpha-BHC	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	319-84-6	
beta-BHC	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	319-85-7	
delta-BHC	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	58-89-9	
Chlordane (Technical)	ND	ug/kg	427	20	04/19/18 13:04	04/27/18 01:07	57-74-9	
alpha-Chlordane	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	5103-71-9	
gamma-Chlordane	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	5103-74-2	
4,4'-DDD	ND	ug/kg	85.2	20	04/19/18 13:04	04/27/18 01:07	72-54-8	
4,4'-DDE	ND	ug/kg	85.2	20	04/19/18 13:04	04/27/18 01:07	72-55-9	
4,4'-DDT	ND	ug/kg	85.2	20	04/19/18 13:04	04/27/18 01:07	50-29-3	
Dieldrin	ND	ug/kg	85.2	20	04/19/18 13:04	04/27/18 01:07	60-57-1	
Endosulfan I	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	959-98-8	
Endosulfan II	ND	ug/kg	85.2	20	04/19/18 13:04	04/27/18 01:07	33213-65-9	
Endosulfan sulfate	ND	ug/kg	85.2	20	04/19/18 13:04	04/27/18 01:07	1031-07-8	
Endrin	ND	ug/kg	85.2	20	04/19/18 13:04	04/27/18 01:07	72-20-8	
Endrin aldehyde	ND	ug/kg	85.2	20	04/19/18 13:04	04/27/18 01:07	7421-93-4	
Endrin ketone	ND	ug/kg	85.2	20	04/19/18 13:04	04/27/18 01:07	53494-70-5	
Heptachlor	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	76-44-8	
Heptachlor epoxide	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	1024-57-3	
Methoxychlor	ND	ug/kg	427	20	04/19/18 13:04	04/27/18 01:07	72-43-5	
Toxaphene	ND	ug/kg	1280	20	04/19/18 13:04	04/27/18 01:07	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	04/19/18 13:04	04/27/18 01:07	877-09-8	4M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	20	04/19/18 13:04	04/27/18 01:07	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	11141-16-5	
PCB-1242 (Aroclor 1242)	406	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	12672-29-6	
PCB-1254 (Aroclor 1254)	139	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	11100-14-4	
PCB, Total	545	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	80	%	48-125	1	04/19/18 13:39	04/23/18 17:33	877-09-8	
Decachlorobiphenyl (S)	115	%	30-134	1	04/19/18 13:39	04/23/18 17:33	2051-24-3	CH

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-09 (4-12 WM) Lab ID: 10427642001 Collected: 04/17/18 09:20 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	65.0	mg/kg	11.0	1	04/19/18 14:54	04/20/18 16:04		T6
Surrogates								
n-Triacontane (S)	91	%.	50-150	1	04/19/18 14:54	04/20/18 16:04	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	14.1	1	04/27/18 16:39	05/01/18 04:30		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	04/27/18 16:39	05/01/18 04:30	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	10100	mg/kg	12.6	1	04/20/18 05:22	04/23/18 11:28	7429-90-5	
Barium	204	mg/kg	0.63	1	04/20/18 05:22	04/23/18 11:28	7440-39-3	
Boron	75.3	mg/kg	9.4	1	04/20/18 05:22	04/23/18 11:28	7440-42-8	
Copper	75.0	mg/kg	0.63	1	04/20/18 05:22	04/23/18 11:28	7440-50-8	
Iron	33200	mg/kg	15.7	5	04/20/18 05:22	04/23/18 12:38	7439-89-6	
Manganese	328	mg/kg	0.31	1	04/20/18 05:22	04/23/18 11:28	7439-96-5	
Nickel	24.7	mg/kg	1.3	1	04/20/18 05:22	04/23/18 11:28	7440-02-0	
Silver	ND	mg/kg	0.63	1	04/20/18 05:22	04/23/18 11:28	7440-22-4	
Tin	48.6	mg/kg	4.7	1	04/20/18 05:22	04/23/18 11:28	7440-31-5	
Titanium	333	mg/kg	1.6	1	04/20/18 05:22	04/23/18 11:28	7440-32-6	
Zinc	214	mg/kg	1.3	1	04/20/18 05:22	04/23/18 11:28	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	5.4	mg/kg	0.24	1	04/25/18 09:25	04/26/18 02:47	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.9	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:29	7440-36-0	
Arsenic	12.7	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:29	7440-38-2	
Beryllium	1.0	mg/kg	0.24	20	04/20/18 06:41	04/21/18 04:29	7440-41-7	
Cadmium	2.5	mg/kg	0.097	20	04/20/18 06:41	04/21/18 04:29	7440-43-9	
Cobalt	7.5	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:29	7440-48-4	
Lead	173	mg/kg	0.12	20	04/20/18 06:41	04/21/18 04:29	7439-92-1	
Lithium	6.8	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:29	7439-93-2	
Selenium	2.3	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:29	7782-49-2	
Strontium	56.0	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:29	7440-24-6	
Vanadium	42.0	mg/kg	1.2	20	04/20/18 06:41	04/21/18 04:29	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.24	mg/kg	0.026	1	04/20/18 04:53	04/22/18 16:23	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	22.0	%	0.10	1		04/24/18 13:48		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: **FD-TT-09 (4-12 WM)** Lab ID: **10427642001** Collected: 04/17/18 09:20 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	208-96-8	
Anthracene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	120-12-7	
Benzo(a)anthracene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	56-55-3	
Benzo(a)pyrene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	101-55-3	
Butylbenzylphthalate	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	85-68-7	
Carbazole	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	59-50-7	
4-Chloroaniline	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	108-60-1	
2-Chloronaphthalene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	91-58-7	
2-Chlorophenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	7005-72-3	
Chrysene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	53-70-3	
Dibenzofuran	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	120-83-2	
Diethylphthalate	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	105-67-9	
Dimethylphthalate	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	131-11-3	
Di-n-butylphthalate	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2180	1	04/19/18 19:31	04/23/18 22:30	534-52-1	M1
2,4-Dinitrophenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	51-28-5	M1
2,4-Dinitrotoluene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	606-20-2	
Di-n-octylphthalate	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	117-81-7	
Fluoranthene	565	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	206-44-0	
Fluorene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	87-68-3	
Hexachlorobenzene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	118-74-1	
Hexachloroethane	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	193-39-5	
Isophorone	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	78-59-1	
1-Methylnaphthalene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	90-12-0	
2-Methylnaphthalene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: **FD-TT-09 (4-12 WM)** Lab ID: **10427642001** Collected: 04/17/18 09:20 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	845	1	04/19/18 19:31	04/23/18 22:30		
Naphthalene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	91-20-3	
2-Nitroaniline	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	88-74-4	
3-Nitroaniline	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	99-09-2	
4-Nitroaniline	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	100-01-6	
Nitrobenzene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	98-95-3	
2-Nitrophenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	88-75-5	
4-Nitrophenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	86-30-6	
Pentachlorophenol	ND	ug/kg	858	1	04/19/18 19:31	04/23/18 22:30	87-86-5	
Phenanthrene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	85-01-8	
Phenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	108-95-2	
Pyrene	511	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	51	%	43-125	1	04/19/18 19:31	04/23/18 22:30	4165-60-0	
2-Fluorobiphenyl (S)	45	%	30-132	1	04/19/18 19:31	04/23/18 22:30	321-60-8	
p-Terphenyl-d14 (S)	66	%	62-125	1	04/19/18 19:31	04/23/18 22:30	1718-51-0	
Phenol-d6 (S)	55	%	48-125	1	04/19/18 19:31	04/23/18 22:30	13127-88-3	
2-Fluorophenol (S)	56	%	40-125	1	04/19/18 19:31	04/23/18 22:30	367-12-4	
2,4,6-Tribromophenol (S)	59	%	60-125	1	04/19/18 19:31	04/23/18 22:30	118-79-6	SO

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	83-32-9	
Acenaphthylene	ND	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	208-96-8	
Anthracene	66.4	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	120-12-7	
Benzo(a)anthracene	252	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	56-55-3	
Benzo(a)pyrene	300	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	50-32-8	
Benzo(b)fluoranthene	397	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	205-99-2	
Benzo(g,h,i)perylene	205	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	191-24-2	
Benzo(k)fluoranthene	146	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	207-08-9	
Chrysene	262	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	53-70-3	
Fluoranthene	501	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	206-44-0	
Fluorene	ND	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	86-73-7	
Indeno(1,2,3-cd)pyrene	170	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	193-39-5	
Naphthalene	ND	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	91-20-3	
Phenanthrene	231	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	85-01-8	
Pyrene	434	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	86	%	42-125	5	04/19/18 18:12	04/20/18 17:07	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: **FD-TT-09 (4-12 WM)** Lab ID: **10427642001** Collected: 04/17/18 09:20 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	92	%	57-125	5	04/19/18 18:12	04/20/18 17:07	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1390	1	04/26/18 10:20	04/26/18 14:02	67-64-1	
Allyl chloride	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	107-05-1	
Benzene	ND	ug/kg	27.8	1	04/26/18 10:20	04/26/18 14:02	71-43-2	
Bromobenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	108-86-1	
Bromochloromethane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	74-97-5	
Bromodichloromethane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	75-27-4	
Bromoform	ND	ug/kg	695	1	04/26/18 10:20	04/26/18 14:02	75-25-2	
Bromomethane	ND	ug/kg	695	1	04/26/18 10:20	04/26/18 14:02	74-83-9	
2-Butanone (MEK)	ND	ug/kg	347	1	04/26/18 10:20	04/26/18 14:02	78-93-3	
n-Butylbenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	104-51-8	
sec-Butylbenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	135-98-8	
tert-Butylbenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	98-06-6	
Carbon tetrachloride	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	56-23-5	
Chlorobenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	108-90-7	
Chloroethane	ND	ug/kg	695	1	04/26/18 10:20	04/26/18 14:02	75-00-3	
Chloroform	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	67-66-3	
Chloromethane	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	74-87-3	
2-Chlorotoluene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	95-49-8	
4-Chlorotoluene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	695	1	04/26/18 10:20	04/26/18 14:02	96-12-8	
Dibromochloromethane	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	106-93-4	
Dibromomethane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	75-71-8	
1,1-Dichloroethane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	75-34-3	
1,2-Dichloroethane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	107-06-2	
1,1-Dichloroethene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	156-60-5	
Dichlorofluoromethane	ND	ug/kg	695	1	04/26/18 10:20	04/26/18 14:02	75-43-4	
1,2-Dichloropropane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	78-87-5	
1,3-Dichloropropane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	142-28-9	
2,2-Dichloropropane	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	594-20-7	
1,1-Dichloropropene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	60-29-7	MO
Ethylbenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	347	1	04/26/18 10:20	04/26/18 14:02	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-09 (4-12 WM) **Lab ID: 10427642001** Collected: 04/17/18 09:20 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	98-82-8	
p-Isopropyltoluene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	99-87-6	
Methylene Chloride	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	75-09-2	L2
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	347	1	04/26/18 10:20	04/26/18 14:02	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	1634-04-4	
Naphthalene	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	91-20-3	
n-Propylbenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	103-65-1	
Styrene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	79-34-5	
Tetrachloroethene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	127-18-4	
Tetrahydrofuran	ND	ug/kg	2780	1	04/26/18 10:20	04/26/18 14:02	109-99-9	
Toluene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	79-00-5	
Trichloroethene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	79-01-6	
Trichlorofluoromethane	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	108-67-8	
Vinyl chloride	ND	ug/kg	27.8	1	04/26/18 10:20	04/26/18 14:02	75-01-4	
Xylene (Total)	ND	ug/kg	208	1	04/26/18 10:20	04/26/18 14:02	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	92	%	75-125	1	04/26/18 10:20	04/26/18 14:02	17060-07-0	
Toluene-d8 (S)	96	%	75-125	1	04/26/18 10:20	04/26/18 14:02	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125	1	04/26/18 10:20	04/26/18 14:02	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	49.3	20	04/23/18 11:09	04/24/18 13:55	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	5.4	mg/kg	1.0	1		05/02/18 08:16	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.52	mg/kg	0.50	1	04/25/18 11:00	04/25/18 13:32	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	04/25/18 14:45	04/26/18 03:47	16984-48-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-10 (2'-10' WM) **Lab ID: 10427642002** Collected: 04/17/18 12:15 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.5	1	04/25/18 10:56	04/30/18 14:19	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	309-00-2	
alpha-BHC	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	319-84-6	
beta-BHC	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	319-85-7	
delta-BHC	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	58-89-9	
Chlordane (Technical)	ND	ug/kg	419	20	04/19/18 13:04	04/27/18 00:49	57-74-9	
alpha-Chlordane	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	5103-71-9	
gamma-Chlordane	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	5103-74-2	
4,4'-DDD	185	ug/kg	83.5	20	04/19/18 13:04	04/27/18 00:49	72-54-8	
4,4'-DDE	ND	ug/kg	83.5	20	04/19/18 13:04	04/27/18 00:49	72-55-9	
4,4'-DDT	216	ug/kg	83.5	20	04/19/18 13:04	04/27/18 00:49	50-29-3	
Dieldrin	ND	ug/kg	83.5	20	04/19/18 13:04	04/27/18 00:49	60-57-1	
Endosulfan I	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	959-98-8	
Endosulfan II	ND	ug/kg	83.5	20	04/19/18 13:04	04/27/18 00:49	33213-65-9	
Endosulfan sulfate	ND	ug/kg	83.5	20	04/19/18 13:04	04/27/18 00:49	1031-07-8	
Endrin	ND	ug/kg	83.5	20	04/19/18 13:04	04/27/18 00:49	72-20-8	
Endrin aldehyde	ND	ug/kg	83.5	20	04/19/18 13:04	04/27/18 00:49	7421-93-4	
Endrin ketone	ND	ug/kg	83.5	20	04/19/18 13:04	04/27/18 00:49	53494-70-5	
Heptachlor	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	76-44-8	
Heptachlor epoxide	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	1024-57-3	
Methoxychlor	ND	ug/kg	419	20	04/19/18 13:04	04/27/18 00:49	72-43-5	
Toxaphene	ND	ug/kg	1250	20	04/19/18 13:04	04/27/18 00:49	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	04/19/18 13:04	04/27/18 00:49	877-09-8	4M, D4, S4
Decachlorobiphenyl (S)	0	%	30-150	20	04/19/18 13:04	04/27/18 00:49	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	11100-14-4	
PCB, Total	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	81	%	48-125	1	04/19/18 13:39	04/23/18 19:56	877-09-8	
Decachlorobiphenyl (S)	105	%	30-134	1	04/19/18 13:39	04/23/18 19:56	2051-24-3	CH

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-10 (2'-10' WM) **Lab ID: 10427642002** Collected: 04/17/18 12:15 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	208-96-8	
Anthracene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	120-12-7	
Benzo(a)anthracene	1010	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	56-55-3	
Benzo(a)pyrene	974	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	50-32-8	
Benzo(b)fluoranthene	1370	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	205-99-2	
Benzo(g,h,i)perylene	711	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	191-24-2	
Benzo(k)fluoranthene	526	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	101-55-3	
Butylbenzylphthalate	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	85-68-7	
Carbazole	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	59-50-7	
4-Chloroaniline	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	108-60-1	
2-Chloronaphthalene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	91-58-7	
2-Chlorophenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	7005-72-3	
Chrysene	1090	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	53-70-3	
Dibenzofuran	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	120-83-2	
Diethylphthalate	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	105-67-9	
Dimethylphthalate	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	131-11-3	
Di-n-butylphthalate	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2130	1	04/19/18 19:31	04/23/18 23:55	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	606-20-2	
Di-n-octylphthalate	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	117-81-7	
Fluoranthene	2170	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	206-44-0	
Fluorene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	87-68-3	
Hexachlorobenzene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	118-74-1	
Hexachloroethane	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	67-72-1	
Indeno(1,2,3-cd)pyrene	599	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	193-39-5	
Isophorone	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	78-59-1	
1-Methylnaphthalene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	90-12-0	
2-Methylnaphthalene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	91-57-6	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-10 (2'-10' WM) **Lab ID: 10427642002** Collected: 04/17/18 12:15 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	826	1	04/19/18 19:31	04/23/18 23:55		
Naphthalene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	91-20-3	
2-Nitroaniline	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	88-74-4	
3-Nitroaniline	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	99-09-2	
4-Nitroaniline	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	100-01-6	
Nitrobenzene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	98-95-3	
2-Nitrophenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	88-75-5	
4-Nitrophenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	86-30-6	
Pentachlorophenol	ND	ug/kg	839	1	04/19/18 19:31	04/23/18 23:55	87-86-5	
Phenanthrene	1250	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	85-01-8	
Phenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	108-95-2	
Pyrene	2040	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	61	%	43-125	1	04/19/18 19:31	04/23/18 23:55	4165-60-0	
2-Fluorobiphenyl (S)	61	%	30-132	1	04/19/18 19:31	04/23/18 23:55	321-60-8	
p-Terphenyl-d14 (S)	88	%	62-125	1	04/19/18 19:31	04/23/18 23:55	1718-51-0	
Phenol-d6 (S)	67	%	48-125	1	04/19/18 19:31	04/23/18 23:55	13127-88-3	
2-Fluorophenol (S)	64	%	40-125	1	04/19/18 19:31	04/23/18 23:55	367-12-4	
2,4,6-Tribromophenol (S)	78	%	60-125	1	04/19/18 19:31	04/23/18 23:55	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	237	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	83-32-9	
Acenaphthylene	ND	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	208-96-8	
Anthracene	615	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	120-12-7	
Benzo(a)anthracene	1430	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	56-55-3	
Benzo(a)pyrene	1520	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	50-32-8	
Benzo(b)fluoranthene	2080	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	205-99-2	
Benzo(g,h,i)perylene	991	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	191-24-2	
Benzo(k)fluoranthene	702	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	207-08-9	
Chrysene	1610	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	218-01-9	
Dibenz(a,h)anthracene	243	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	53-70-3	
Fluoranthene	3640	ug/kg	126	10	04/19/18 18:12	04/23/18 17:42	206-44-0	
Fluorene	264	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	86-73-7	
Indeno(1,2,3-cd)pyrene	804	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	193-39-5	
Naphthalene	ND	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	91-20-3	
Phenanthrene	2520	ug/kg	126	10	04/19/18 18:12	04/23/18 17:42	85-01-8	
Pyrene	2860	ug/kg	126	10	04/19/18 18:12	04/23/18 17:42	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	84	%	42-125	5	04/19/18 18:12	04/20/18 17:28	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-10 (2'-10' WM) **Lab ID: 10427642002** Collected: 04/17/18 12:15 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	91	%	57-125	5	04/19/18 18:12	04/20/18 17:28	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1660	1	04/26/18 10:20	04/26/18 16:33	67-64-1	
Allyl chloride	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	107-05-1	
Benzene	37.4	ug/kg	33.2	1	04/26/18 10:20	04/26/18 16:33	71-43-2	
Bromobenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	108-86-1	
Bromochloromethane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	74-97-5	
Bromodichloromethane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	75-27-4	
Bromoform	ND	ug/kg	831	1	04/26/18 10:20	04/26/18 16:33	75-25-2	
Bromomethane	ND	ug/kg	831	1	04/26/18 10:20	04/26/18 16:33	74-83-9	
2-Butanone (MEK)	ND	ug/kg	416	1	04/26/18 10:20	04/26/18 16:33	78-93-3	
n-Butylbenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	104-51-8	
sec-Butylbenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	135-98-8	
tert-Butylbenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	98-06-6	
Carbon tetrachloride	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	56-23-5	
Chlorobenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	108-90-7	
Chloroethane	ND	ug/kg	831	1	04/26/18 10:20	04/26/18 16:33	75-00-3	
Chloroform	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	67-66-3	
Chloromethane	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	74-87-3	
2-Chlorotoluene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	95-49-8	
4-Chlorotoluene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	831	1	04/26/18 10:20	04/26/18 16:33	96-12-8	
Dibromochloromethane	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	106-93-4	
Dibromomethane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	75-71-8	
1,1-Dichloroethane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	75-34-3	
1,2-Dichloroethane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	107-06-2	
1,1-Dichloroethene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	156-60-5	
Dichlorofluoromethane	ND	ug/kg	831	1	04/26/18 10:20	04/26/18 16:33	75-43-4	
1,2-Dichloropropane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	78-87-5	
1,3-Dichloropropane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	142-28-9	
2,2-Dichloropropane	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	594-20-7	
1,1-Dichloropropene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	60-29-7	
Ethylbenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	416	1	04/26/18 10:20	04/26/18 16:33	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-10 (2'-10' WM) **Lab ID: 10427642002** Collected: 04/17/18 12:15 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	98-82-8	
p-Isopropyltoluene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	99-87-6	
Methylene Chloride	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	75-09-2	L2
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	416	1	04/26/18 10:20	04/26/18 16:33	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	1634-04-4	
Naphthalene	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	91-20-3	
n-Propylbenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	103-65-1	
Styrene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	79-34-5	
Tetrachloroethene	422	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	127-18-4	
Tetrahydrofuran	ND	ug/kg	3320	1	04/26/18 10:20	04/26/18 16:33	109-99-9	
Toluene	159	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	79-00-5	
Trichloroethene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	79-01-6	
Trichlorofluoromethane	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	108-67-8	
Vinyl chloride	ND	ug/kg	33.2	1	04/26/18 10:20	04/26/18 16:33	75-01-4	
Xylene (Total)	ND	ug/kg	249	1	04/26/18 10:20	04/26/18 16:33	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%	75-125	1	04/26/18 10:20	04/26/18 16:33	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	04/26/18 10:20	04/26/18 16:33	2037-26-5	
4-Bromofluorobenzene (S)	96	%	75-125	1	04/26/18 10:20	04/26/18 16:33	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	25.3	10	04/28/18 10:30	04/30/18 14:42	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	7.4	mg/kg	1.0	1		05/02/18 08:16	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.45	1	04/25/18 11:00	04/25/18 13:33	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	1.3	mg/kg	1.0	1	04/25/18 14:45	04/26/18 01:11	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: **FD-TT-11 (4-12 WM)** Lab ID: **10427642003** Collected: 04/17/18 13:24 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.6	1	04/25/18 10:56	04/30/18 14:59	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	309-00-2	
alpha-BHC	ND	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	319-84-6	
beta-BHC	ND	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	319-85-7	
delta-BHC	ND	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	58-89-9	
Chlordane (Technical)	ND	ug/kg	1050	50	04/19/18 13:04	04/27/18 00:12	57-74-9	
alpha-Chlordane	ND	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	5103-71-9	
gamma-Chlordane	130	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	5103-74-2	
4,4'-DDD	ND	ug/kg	210	50	04/19/18 13:04	04/27/18 00:12	72-54-8	
4,4'-DDE	ND	ug/kg	210	50	04/19/18 13:04	04/27/18 00:12	72-55-9	
4,4'-DDT	ND	ug/kg	210	50	04/19/18 13:04	04/27/18 00:12	50-29-3	
Dieldrin	ND	ug/kg	210	50	04/19/18 13:04	04/27/18 00:12	60-57-1	
Endosulfan I	ND	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	959-98-8	
Endosulfan II	ND	ug/kg	210	50	04/19/18 13:04	04/27/18 00:12	33213-65-9	
Endosulfan sulfate	ND	ug/kg	210	50	04/19/18 13:04	04/27/18 00:12	1031-07-8	
Endrin	ND	ug/kg	210	50	04/19/18 13:04	04/27/18 00:12	72-20-8	
Endrin aldehyde	ND	ug/kg	210	50	04/19/18 13:04	04/27/18 00:12	7421-93-4	
Endrin ketone	ND	ug/kg	210	50	04/19/18 13:04	04/27/18 00:12	53494-70-5	
Heptachlor	145	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	76-44-8	
Heptachlor epoxide	256	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	1024-57-3	
Methoxychlor	ND	ug/kg	1050	50	04/19/18 13:04	04/27/18 00:12	72-43-5	
Toxaphene	ND	ug/kg	3160	50	04/19/18 13:04	04/27/18 00:12	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	50	04/19/18 13:04	04/27/18 00:12	877-09-8	2M, D4, S4
Decachlorobiphenyl (S)	0	%	30-150	50	04/19/18 13:04	04/27/18 00:12	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	41.6	1	04/19/18 13:39	04/23/18 19:24	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	41.6	1	04/19/18 13:39	04/23/18 19:24	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	41.6	1	04/19/18 13:39	04/23/18 19:24	11141-16-5	
PCB-1242 (Aroclor 1242)	54600	ug/kg	2080	50	04/19/18 13:39	04/24/18 10:57	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	41.6	1	04/19/18 13:39	04/23/18 19:24	12672-29-6	
PCB-1254 (Aroclor 1254)	6580	ug/kg	2080	50	04/19/18 13:39	04/24/18 10:57	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	41.6	1	04/19/18 13:39	04/23/18 19:24	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	41.6	1	04/19/18 13:39	04/23/18 19:24	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	41.6	1	04/19/18 13:39	04/23/18 19:24	11100-14-4	
PCB, Total	61100	ug/kg	2080	50	04/19/18 13:39	04/24/18 10:57	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	82	%	48-125	1	04/19/18 13:39	04/23/18 19:24	877-09-8	
Decachlorobiphenyl (S)	107	%	30-134	1	04/19/18 13:39	04/23/18 19:24	2051-24-3	CH

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-11 (4-12 WM) Lab ID: 10427642003 Collected: 04/17/18 13:24 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS		Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO						
WDRO C10-C28	485	mg/kg	129	10	04/19/18 14:54	04/20/18 15:35		T6
Surrogates								
n-Triacontane (S)	0	%	50-150	10	04/19/18 14:54	04/20/18 15:35	638-68-6	S4
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil						
Gasoline Range Organics	ND	mg/kg	15.7	1	04/27/18 16:39	05/01/18 05:19		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/27/18 16:39	05/01/18 05:19	98-08-8	
6010C MET ICP		Analytical Method: EPA 6010C Preparation Method: EPA 3050						
Aluminum	9820	mg/kg	11.8	1	04/20/18 05:22	04/23/18 11:39	7429-90-5	
Barium	282	mg/kg	0.59	1	04/20/18 05:22	04/23/18 11:39	7440-39-3	
Boron	65.4	mg/kg	8.9	1	04/20/18 05:22	04/23/18 11:39	7440-42-8	
Copper	43.0	mg/kg	0.59	1	04/20/18 05:22	04/23/18 11:39	7440-50-8	
Iron	27800	mg/kg	14.8	5	04/20/18 05:22	04/23/18 12:49	7439-89-6	
Manganese	238	mg/kg	0.30	1	04/20/18 05:22	04/23/18 11:39	7439-96-5	
Nickel	22.0	mg/kg	1.2	1	04/20/18 05:22	04/23/18 11:39	7440-02-0	
Silver	ND	mg/kg	0.59	1	04/20/18 05:22	04/23/18 11:39	7440-22-4	
Tin	6.3	mg/kg	4.4	1	04/20/18 05:22	04/23/18 11:39	7440-31-5	
Titanium	411	mg/kg	1.5	1	04/20/18 05:22	04/23/18 11:39	7440-32-6	
Zinc	209	mg/kg	1.2	1	04/20/18 05:22	04/23/18 11:39	7440-66-6	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3050B						
Chromium	11.7	mg/kg	0.23	1	04/25/18 09:25	04/26/18 03:24	7440-47-3	N2
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	4.1	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:48	7440-36-0	
Arsenic	13.6	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:48	7440-38-2	
Beryllium	1.1	mg/kg	0.24	20	04/20/18 06:41	04/21/18 04:48	7440-41-7	
Cadmium	1.9	mg/kg	0.096	20	04/20/18 06:41	04/21/18 04:48	7440-43-9	
Cobalt	7.7	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:48	7440-48-4	
Lead	6520	mg/kg	1.2	200	04/20/18 06:41	04/23/18 20:05	7439-92-1	
Lithium	6.8	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:48	7439-93-2	
Selenium	1.7	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:48	7782-49-2	
Strontium	87.5	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:48	7440-24-6	
Vanadium	49.0	mg/kg	1.2	20	04/20/18 06:41	04/21/18 04:48	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.13	mg/kg	0.022	1	04/20/18 04:53	04/22/18 16:27	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	20.8	%	0.10	1		04/24/18 13:48		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	780	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-11 (4-12 WM) **Lab ID: 10427642003** Collected: 04/17/18 13:24 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	208-96-8	
Anthracene	1990	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	120-12-7	
Benzo(a)anthracene	4470	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	56-55-3	
Benzo(a)pyrene	3890	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	50-32-8	
Benzo(b)fluoranthene	4850	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	205-99-2	
Benzo(g,h,i)perylene	2680	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	191-24-2	
Benzo(k)fluoranthene	2190	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	101-55-3	
Butylbenzylphthalate	423	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	85-68-7	
Carbazole	984	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	59-50-7	
4-Chloroaniline	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	108-60-1	
2-Chloronaphthalene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	91-58-7	
2-Chlorophenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	7005-72-3	
Chrysene	4660	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	53-70-3	
Dibenzofuran	482	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	120-83-2	
Diethylphthalate	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	105-67-9	
Dimethylphthalate	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	131-11-3	
Di-n-butylphthalate	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2140	1	04/19/18 19:31	04/25/18 23:03	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	606-20-2	
Di-n-octylphthalate	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	117-81-7	
Fluoranthene	9750	ug/kg	832	2	04/19/18 19:31	04/26/18 15:42	206-44-0	
Fluorene	887	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	87-68-3	
Hexachlorobenzene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	118-74-1	
Hexachloroethane	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	67-72-1	
Indeno(1,2,3-cd)pyrene	2290	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	193-39-5	
Isophorone	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	78-59-1	
1-Methylnaphthalene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	90-12-0	
2-Methylnaphthalene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-11 (4-12 WM) **Lab ID: 10427642003** Collected: 04/17/18 13:24 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	832	1	04/19/18 19:31	04/25/18 23:03		
Naphthalene	792	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	91-20-3	
2-Nitroaniline	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	88-74-4	
3-Nitroaniline	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	99-09-2	
4-Nitroaniline	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	100-01-6	
Nitrobenzene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	98-95-3	
2-Nitrophenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	88-75-5	
4-Nitrophenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	86-30-6	
Pentachlorophenol	ND	ug/kg	844	1	04/19/18 19:31	04/25/18 23:03	87-86-5	
Phenanthrene	6610	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	85-01-8	
Phenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	108-95-2	
Pyrene	9500	ug/kg	832	2	04/19/18 19:31	04/26/18 15:42	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	53	%	43-125	1	04/19/18 19:31	04/25/18 23:03	4165-60-0	
2-Fluorobiphenyl (S)	55	%	30-132	1	04/19/18 19:31	04/25/18 23:03	321-60-8	
p-Terphenyl-d14 (S)	74	%	62-125	1	04/19/18 19:31	04/25/18 23:03	1718-51-0	
Phenol-d6 (S)	59	%	48-125	1	04/19/18 19:31	04/25/18 23:03	13127-88-3	
2-Fluorophenol (S)	53	%	40-125	1	04/19/18 19:31	04/25/18 23:03	367-12-4	
2,4,6-Tribromophenol (S)	68	%	60-125	1	04/19/18 19:31	04/25/18 23:03	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	163	ug/kg	63.0	5	04/19/18 18:12	04/20/18 17:49	83-32-9	
Acenaphthylene	444	ug/kg	63.0	5	04/19/18 18:12	04/20/18 17:49	208-96-8	
Anthracene	954	ug/kg	63.0	5	04/19/18 18:12	04/20/18 17:49	120-12-7	
Benzo(a)anthracene	3260	ug/kg	315	25	04/19/18 18:12	04/23/18 19:06	56-55-3	
Benzo(a)pyrene	3110	ug/kg	315	25	04/19/18 18:12	04/23/18 19:06	50-32-8	
Benzo(b)fluoranthene	3520	ug/kg	315	25	04/19/18 18:12	04/23/18 19:06	205-99-2	
Benzo(g,h,i)perylene	1650	ug/kg	63.0	5	04/19/18 18:12	04/20/18 17:49	191-24-2	
Benzo(k)fluoranthene	1140	ug/kg	63.0	5	04/19/18 18:12	04/20/18 17:49	207-08-9	
Chrysene	2790	ug/kg	315	25	04/19/18 18:12	04/23/18 19:06	218-01-9	
Dibenz(a,h)anthracene	457	ug/kg	63.0	5	04/19/18 18:12	04/20/18 17:49	53-70-3	
Fluoranthene	5790	ug/kg	315	25	04/19/18 18:12	04/23/18 19:06	206-44-0	
Fluorene	237	ug/kg	63.0	5	04/19/18 18:12	04/20/18 17:49	86-73-7	
Indeno(1,2,3-cd)pyrene	1370	ug/kg	63.0	5	04/19/18 18:12	04/20/18 17:49	193-39-5	
Naphthalene	416	ug/kg	63.0	5	04/19/18 18:12	04/20/18 17:49	91-20-3	
Phenanthrene	2730	ug/kg	315	25	04/19/18 18:12	04/23/18 19:06	85-01-8	
Pyrene	6120	ug/kg	315	25	04/19/18 18:12	04/23/18 19:06	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	84	%	42-125	5	04/19/18 18:12	04/20/18 17:49	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-11 (4-12 WM) **Lab ID: 10427642003** Collected: 04/17/18 13:24 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	89	%	57-125	5	04/19/18 18:12	04/20/18 17:49	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1450	1	04/26/18 10:20	04/26/18 16:50	67-64-1	
Allyl chloride	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	107-05-1	
Benzene	ND	ug/kg	29.0	1	04/26/18 10:20	04/26/18 16:50	71-43-2	
Bromobenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	108-86-1	
Bromochloromethane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	74-97-5	
Bromodichloromethane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	75-27-4	
Bromoform	ND	ug/kg	726	1	04/26/18 10:20	04/26/18 16:50	75-25-2	
Bromomethane	ND	ug/kg	726	1	04/26/18 10:20	04/26/18 16:50	74-83-9	
2-Butanone (MEK)	ND	ug/kg	363	1	04/26/18 10:20	04/26/18 16:50	78-93-3	
n-Butylbenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	104-51-8	
sec-Butylbenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	135-98-8	
tert-Butylbenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	98-06-6	
Carbon tetrachloride	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	56-23-5	
Chlorobenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	108-90-7	
Chloroethane	ND	ug/kg	726	1	04/26/18 10:20	04/26/18 16:50	75-00-3	
Chloroform	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	67-66-3	
Chloromethane	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	74-87-3	
2-Chlorotoluene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	95-49-8	
4-Chlorotoluene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	726	1	04/26/18 10:20	04/26/18 16:50	96-12-8	
Dibromochloromethane	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	106-93-4	
Dibromomethane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	75-71-8	
1,1-Dichloroethane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	75-34-3	
1,2-Dichloroethane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	107-06-2	
1,1-Dichloroethene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	156-60-5	
Dichlorofluoromethane	ND	ug/kg	726	1	04/26/18 10:20	04/26/18 16:50	75-43-4	
1,2-Dichloropropane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	78-87-5	
1,3-Dichloropropane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	142-28-9	
2,2-Dichloropropane	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	594-20-7	
1,1-Dichloropropene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	60-29-7	
Ethylbenzene	73.6	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	363	1	04/26/18 10:20	04/26/18 16:50	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-11 (4-12 WM) **Lab ID: 10427642003** Collected: 04/17/18 13:24 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	98-82-8	
p-Isopropyltoluene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	99-87-6	
Methylene Chloride	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	75-09-2	L2
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	363	1	04/26/18 10:20	04/26/18 16:50	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	1634-04-4	
Naphthalene	558	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	91-20-3	
n-Propylbenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	103-65-1	
Styrene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	79-34-5	
Tetrachloroethene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	127-18-4	
Tetrahydrofuran	ND	ug/kg	2900	1	04/26/18 10:20	04/26/18 16:50	109-99-9	
Toluene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	79-00-5	
Trichloroethene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	79-01-6	
Trichlorofluoromethane	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	76-13-1	
1,2,4-Trimethylbenzene	73.5	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	108-67-8	
Vinyl chloride	ND	ug/kg	29.0	1	04/26/18 10:20	04/26/18 16:50	75-01-4	
Xylene (Total)	ND	ug/kg	218	1	04/26/18 10:20	04/26/18 16:50	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	92	%	75-125	1	04/26/18 10:20	04/26/18 16:50	17060-07-0	
Toluene-d8 (S)	96	%	75-125	1	04/26/18 10:20	04/26/18 16:50	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125	1	04/26/18 10:20	04/26/18 16:50	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	49.5	20	04/28/18 10:30	04/30/18 14:42	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	11.7	mg/kg	1.0	1		05/02/18 08:16	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.48	1	04/25/18 11:00	04/25/18 13:37	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.98	1	04/25/18 14:45	04/25/18 23:53	16984-48-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-12 (3-12) **Lab ID: 10427642004** Collected: 04/17/18 14:37 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	14.1	1	04/25/18 10:56	04/30/18 15:06	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	309-00-2	
alpha-BHC	ND	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	319-84-6	
beta-BHC	ND	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	319-85-7	
delta-BHC	ND	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	58-89-9	
Chlordane (Technical)	ND	ug/kg	116	5	04/19/18 13:04	04/26/18 23:17	57-74-9	
alpha-Chlordane	19.0	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	5103-71-9	
gamma-Chlordane	15.1	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	5103-74-2	
4,4'-DDD	ND	ug/kg	23.0	5	04/19/18 13:04	04/26/18 23:17	72-54-8	
4,4'-DDE	ND	ug/kg	23.0	5	04/19/18 13:04	04/26/18 23:17	72-55-9	
4,4'-DDT	ND	ug/kg	23.0	5	04/19/18 13:04	04/26/18 23:17	50-29-3	
Dieldrin	ND	ug/kg	23.0	5	04/19/18 13:04	04/26/18 23:17	60-57-1	
Endosulfan I	ND	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	959-98-8	
Endosulfan II	ND	ug/kg	23.0	5	04/19/18 13:04	04/26/18 23:17	33213-65-9	
Endosulfan sulfate	ND	ug/kg	23.0	5	04/19/18 13:04	04/26/18 23:17	1031-07-8	
Endrin	ND	ug/kg	23.0	5	04/19/18 13:04	04/26/18 23:17	72-20-8	
Endrin aldehyde	ND	ug/kg	23.0	5	04/19/18 13:04	04/26/18 23:17	7421-93-4	
Endrin ketone	ND	ug/kg	23.0	5	04/19/18 13:04	04/26/18 23:17	53494-70-5	
Heptachlor	ND	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	76-44-8	
Heptachlor epoxide	ND	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	1024-57-3	
Methoxychlor	ND	ug/kg	116	5	04/19/18 13:04	04/26/18 23:17	72-43-5	
Toxaphene	ND	ug/kg	346	5	04/19/18 13:04	04/26/18 23:17	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	84	%	30-150	5	04/19/18 13:04	04/26/18 23:17	877-09-8	5M,D4
Decachlorobiphenyl (S)	91	%	30-150	5	04/19/18 13:04	04/26/18 23:17	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	11141-16-5	
PCB-1242 (Aroclor 1242)	604	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	12672-29-6	
PCB-1254 (Aroclor 1254)	155	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	11100-14-4	
PCB, Total	759	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	69	%	48-125	1	04/19/18 13:39	04/23/18 18:21	877-09-8	
Decachlorobiphenyl (S)	107	%	30-134	1	04/19/18 13:39	04/23/18 18:21	2051-24-3	CH
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	222	mg/kg	13.2	1	04/19/18 14:54	04/20/18 15:49		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-12 (3-12) **Lab ID:** 10427642004 Collected: 04/17/18 14:37 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	73	%	50-150	1	04/19/18 14:54	04/20/18 15:49	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	37.5	mg/kg	15.8	1	04/27/18 16:39	05/01/18 05:43		
Surrogates								
a,a,a-Trifluorotoluene (S)	97	%	80-150	1	04/27/18 16:39	05/01/18 05:43	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	10900	mg/kg	13.2	1	04/20/18 05:22	04/23/18 11:42	7429-90-5	
Barium	109	mg/kg	0.66	1	04/20/18 05:22	04/23/18 11:42	7440-39-3	
Boron	198	mg/kg	9.9	1	04/20/18 05:22	04/23/18 11:42	7440-42-8	
Copper	31.6	mg/kg	0.66	1	04/20/18 05:22	04/23/18 11:42	7440-50-8	
Iron	38800	mg/kg	16.5	5	04/20/18 05:22	04/23/18 12:52	7439-89-6	
Manganese	145	mg/kg	0.33	1	04/20/18 05:22	04/23/18 11:42	7439-96-5	
Nickel	27.4	mg/kg	1.3	1	04/20/18 05:22	04/23/18 11:42	7440-02-0	
Silver	ND	mg/kg	0.66	1	04/20/18 05:22	04/23/18 11:42	7440-22-4	
Tin	ND	mg/kg	5.0	1	04/20/18 05:22	04/23/18 11:42	7440-31-5	
Titanium	478	mg/kg	1.7	1	04/20/18 05:22	04/23/18 11:42	7440-32-6	
Zinc	171	mg/kg	1.3	1	04/20/18 05:22	04/23/18 11:42	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	11.4	mg/kg	0.26	1	04/25/18 09:25	04/26/18 03:28	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.2	mg/kg	0.67	20	04/20/18 06:41	04/23/18 20:09	7440-36-0	
Arsenic	17.3	mg/kg	0.67	20	04/20/18 06:41	04/23/18 20:09	7440-38-2	
Beryllium	2.9	mg/kg	0.27	20	04/20/18 06:41	04/23/18 20:09	7440-41-7	
Cadmium	1.9	mg/kg	0.11	20	04/20/18 06:41	04/23/18 20:09	7440-43-9	
Cobalt	7.2	mg/kg	0.67	20	04/20/18 06:41	04/23/18 20:09	7440-48-4	
Lead	28.5	mg/kg	0.13	20	04/20/18 06:41	04/23/18 20:09	7439-92-1	
Lithium	10.8	mg/kg	0.67	20	04/20/18 06:41	04/23/18 20:09	7439-93-2	
Selenium	5.4	mg/kg	0.67	20	04/20/18 06:41	04/23/18 20:09	7782-49-2	
Strontium	66.6	mg/kg	0.67	20	04/20/18 06:41	04/23/18 20:09	7440-24-6	
Vanadium	81.3	mg/kg	1.3	20	04/20/18 06:41	04/23/18 20:09	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.14	mg/kg	0.026	1	04/20/18 04:53	04/22/18 16:29	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	27.9	%	0.10	1		04/24/18 13:49		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	83-32-9	
Acenaphthylene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-12 (3-12) **Lab ID: 10427642004** Collected: 04/17/18 14:37 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	120-12-7	
Benzo(a)anthracene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	56-55-3	
Benzo(a)pyrene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	101-55-3	
Butylbenzylphthalate	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	85-68-7	
Carbazole	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	59-50-7	
4-Chloroaniline	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	108-60-1	
2-Chloronaphthalene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	91-58-7	
2-Chlorophenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	7005-72-3	
Chrysene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	53-70-3	
Dibenzofuran	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	120-83-2	
Diethylphthalate	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	105-67-9	
Dimethylphthalate	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	131-11-3	
Di-n-butylphthalate	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2350	1	04/19/18 19:31	04/25/18 19:42	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	606-20-2	
Di-n-octylphthalate	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	117-81-7	
Fluoranthene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	206-44-0	
Fluorene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	87-68-3	
Hexachlorobenzene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	118-74-1	
Hexachloroethane	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	193-39-5	
Isophorone	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	78-59-1	
1-Methylnaphthalene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	90-12-0	
2-Methylnaphthalene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: **FD-TT-12 (3-12)** Lab ID: **10427642004** Collected: 04/17/18 14:37 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

3&4-Methylphenol(m&p Cresol)	ND	ug/kg	914	1	04/19/18 19:31	04/25/18 19:42		
Naphthalene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	91-20-3	
2-Nitroaniline	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	88-74-4	
3-Nitroaniline	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	99-09-2	
4-Nitroaniline	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	100-01-6	
Nitrobenzene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	98-95-3	
2-Nitrophenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	88-75-5	
4-Nitrophenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	86-30-6	
Pentachlorophenol	ND	ug/kg	928	1	04/19/18 19:31	04/25/18 19:42	87-86-5	
Phenanthrene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	85-01-8	
Phenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	108-95-2	
Pyrene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	42	%.	43-125	1	04/19/18 19:31	04/25/18 19:42	4165-60-0	S0
2-Fluorobiphenyl (S)	49	%.	30-132	1	04/19/18 19:31	04/25/18 19:42	321-60-8	
p-Terphenyl-d14 (S)	64	%.	62-125	1	04/19/18 19:31	04/25/18 19:42	1718-51-0	
Phenol-d6 (S)	48	%.	48-125	1	04/19/18 19:31	04/25/18 19:42	13127-88-3	
2-Fluorophenol (S)	45	%.	40-125	1	04/19/18 19:31	04/25/18 19:42	367-12-4	
2,4,6-Tribromophenol (S)	63	%.	60-125	1	04/19/18 19:31	04/25/18 19:42	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	49.1	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	83-32-9	M1
Acenaphthylene	ND	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	208-96-8	
Anthracene	94.1	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	120-12-7	M1,R1
Benzo(a)anthracene	660	ug/kg	69.3	5	04/19/18 18:12	04/23/18 18:45	56-55-3	M1
Benzo(a)pyrene	680	ug/kg	69.3	5	04/19/18 18:12	04/23/18 18:45	50-32-8	M1,R1
Benzo(b)fluoranthene	879	ug/kg	69.3	5	04/19/18 18:12	04/23/18 18:45	205-99-2	M1,R1
Benzo(g,h,i)perylene	358	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	191-24-2	M1
Benzo(k)fluoranthene	293	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	207-08-9	M1
Chrysene	570	ug/kg	69.3	5	04/19/18 18:12	04/23/18 18:45	218-01-9	M1
Dibenz(a,h)anthracene	88.8	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	53-70-3	M1
Fluoranthene	1040	ug/kg	69.3	5	04/19/18 18:12	04/23/18 18:45	206-44-0	M1,R1
Fluorene	43.3	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	86-73-7	M1
Indeno(1,2,3-cd)pyrene	308	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	193-39-5	M1
Naphthalene	106	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	91-20-3	M1
Phenanthrene	318	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	85-01-8	M1
Pyrene	872	ug/kg	69.3	5	04/19/18 18:12	04/23/18 18:45	129-00-0	M1,R1
Surrogates								
2-Fluorobiphenyl (S)	86	%.	42-125	1	04/19/18 18:12	04/20/18 15:44	321-60-8	
p-Terphenyl-d14 (S)	92	%.	57-125	1	04/19/18 18:12	04/20/18 15:44	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-12 (3-12) **Lab ID: 10427642004** Collected: 04/17/18 14:37 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1480	1	04/26/18 10:20	04/26/18 17:07	67-64-1	
Allyl chloride	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	107-05-1	
Benzene	73.8	ug/kg	29.6	1	04/26/18 10:20	04/26/18 17:07	71-43-2	
Bromobenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	108-86-1	
Bromochloromethane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	74-97-5	
Bromodichloromethane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	75-27-4	
Bromoform	ND	ug/kg	740	1	04/26/18 10:20	04/26/18 17:07	75-25-2	
Bromomethane	ND	ug/kg	740	1	04/26/18 10:20	04/26/18 17:07	74-83-9	
2-Butanone (MEK)	ND	ug/kg	370	1	04/26/18 10:20	04/26/18 17:07	78-93-3	
n-Butylbenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	104-51-8	
sec-Butylbenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	135-98-8	
tert-Butylbenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	98-06-6	
Carbon tetrachloride	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	56-23-5	
Chlorobenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	108-90-7	
Chloroethane	ND	ug/kg	740	1	04/26/18 10:20	04/26/18 17:07	75-00-3	
Chloroform	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	67-66-3	
Chloromethane	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	74-87-3	
2-Chlorotoluene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	95-49-8	
4-Chlorotoluene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	740	1	04/26/18 10:20	04/26/18 17:07	96-12-8	
Dibromochloromethane	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	106-93-4	
Dibromomethane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	75-71-8	
1,1-Dichloroethane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	75-34-3	
1,2-Dichloroethane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	107-06-2	
1,1-Dichloroethene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	156-60-5	
Dichlorofluoromethane	ND	ug/kg	740	1	04/26/18 10:20	04/26/18 17:07	75-43-4	
1,2-Dichloropropane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	78-87-5	
1,3-Dichloropropane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	142-28-9	
2,2-Dichloropropane	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	594-20-7	
1,1-Dichloropropene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	60-29-7	
Ethylbenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	370	1	04/26/18 10:20	04/26/18 17:07	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	98-82-8	
p-Isopropyltoluene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	99-87-6	
Methylene Chloride	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	75-09-2	L2
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	370	1	04/26/18 10:20	04/26/18 17:07	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-12 (3-12) **Lab ID:** 10427642004 Collected: 04/17/18 14:37 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	1634-04-4	
Naphthalene	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	91-20-3	
n-Propylbenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	103-65-1	
Styrene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	79-34-5	
Tetrachloroethene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	127-18-4	
Tetrahydrofuran	ND	ug/kg	2960	1	04/26/18 10:20	04/26/18 17:07	109-99-9	
Toluene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	79-00-5	
Trichloroethene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	79-01-6	
Trichlorofluoromethane	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	108-67-8	
Vinyl chloride	ND	ug/kg	29.6	1	04/26/18 10:20	04/26/18 17:07	75-01-4	
Xylene (Total)	ND	ug/kg	222	1	04/26/18 10:20	04/26/18 17:07	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%.	75-125	1	04/26/18 10:20	04/26/18 17:07	17060-07-0	
Toluene-d8 (S)	96	%.	75-125	1	04/26/18 10:20	04/26/18 17:07	2037-26-5	
4-Bromofluorobenzene (S)	96	%.	75-125	1	04/26/18 10:20	04/26/18 17:07	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	27.4	10	04/28/18 10:30	04/30/18 14:43	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	11.4	mg/kg	1.0	1		05/02/18 08:16	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.51	1	04/25/18 11:00	04/25/18 13:37	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	1.9	mg/kg	0.99	1	04/25/18 14:45	04/26/18 01:31	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-13 (3-12) **Lab ID: 10427642005** Collected: 04/17/18 15:30 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	30.3	1	04/25/18 10:56	04/30/18 15:13	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	309-00-2	
alpha-BHC	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	319-84-6	
beta-BHC	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	319-85-7	
delta-BHC	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	58-89-9	
Chlordane (Technical)	ND	ug/kg	500	10	04/19/18 13:04	04/26/18 22:59	57-74-9	
alpha-Chlordane	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	5103-71-9	
gamma-Chlordane	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	5103-74-2	
4,4'-DDD	ND	ug/kg	99.7	10	04/19/18 13:04	04/26/18 22:59	72-54-8	
4,4'-DDE	ND	ug/kg	99.7	10	04/19/18 13:04	04/26/18 22:59	72-55-9	
4,4'-DDT	ND	ug/kg	99.7	10	04/19/18 13:04	04/26/18 22:59	50-29-3	
Dieldrin	ND	ug/kg	99.7	10	04/19/18 13:04	04/26/18 22:59	60-57-1	
Endosulfan I	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	959-98-8	
Endosulfan II	ND	ug/kg	99.7	10	04/19/18 13:04	04/26/18 22:59	33213-65-9	
Endosulfan sulfate	ND	ug/kg	99.7	10	04/19/18 13:04	04/26/18 22:59	1031-07-8	
Endrin	ND	ug/kg	99.7	10	04/19/18 13:04	04/26/18 22:59	72-20-8	
Endrin aldehyde	ND	ug/kg	99.7	10	04/19/18 13:04	04/26/18 22:59	7421-93-4	
Endrin ketone	ND	ug/kg	99.7	10	04/19/18 13:04	04/26/18 22:59	53494-70-5	
Heptachlor	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	76-44-8	
Heptachlor epoxide	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	1024-57-3	
Methoxychlor	ND	ug/kg	500	10	04/19/18 13:04	04/26/18 22:59	72-43-5	
Toxaphene	ND	ug/kg	1500	10	04/19/18 13:04	04/26/18 22:59	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	10	04/19/18 13:04	04/26/18 22:59	877-09-8	6M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	10	04/19/18 13:04	04/26/18 22:59	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	98.5	1	04/19/18 13:39	04/23/18 18:37	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	98.5	1	04/19/18 13:39	04/23/18 18:37	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	98.5	1	04/19/18 13:39	04/23/18 18:37	11141-16-5	
PCB-1242 (Aroclor 1242)	33000	ug/kg	985	10	04/19/18 13:39	04/24/18 10:10	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	98.5	1	04/19/18 13:39	04/23/18 18:37	12672-29-6	
PCB-1254 (Aroclor 1254)	11200	ug/kg	985	10	04/19/18 13:39	04/24/18 10:10	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	98.5	1	04/19/18 13:39	04/23/18 18:37	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	98.5	1	04/19/18 13:39	04/23/18 18:37	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	98.5	1	04/19/18 13:39	04/23/18 18:37	11100-14-4	
PCB, Total	44200	ug/kg	985	10	04/19/18 13:39	04/24/18 10:10	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	99	%	48-125	1	04/19/18 13:39	04/23/18 18:37	877-09-8	
Decachlorobiphenyl (S)	95	%	30-134	1	04/19/18 13:39	04/23/18 18:37	2051-24-3	CH

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-13 (3-12) **Lab ID: 10427642005** Collected: 04/17/18 15:30 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS		Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO						
WDRO C10-C28	3790	mg/kg	609	20	04/19/18 14:54	04/21/18 09:58		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	20	04/19/18 14:54	04/21/18 09:58	638-68-6	S4
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil						
Gasoline Range Organics	854	mg/kg	34.4	1	04/27/18 16:39	05/01/18 06:07		
Surrogates								
a,a,a-Trifluorotoluene (S)	96	%.	80-150	1	04/27/18 16:39	05/01/18 06:07	98-08-8	
6010C MET ICP		Analytical Method: EPA 6010C Preparation Method: EPA 3050						
Aluminum	7360	mg/kg	28.0	1	04/20/18 05:22	04/23/18 11:45	7429-90-5	
Barium	289	mg/kg	1.4	1	04/20/18 05:22	04/23/18 11:45	7440-39-3	
Boron	167	mg/kg	21.0	1	04/20/18 05:22	04/23/18 11:45	7440-42-8	
Copper	96.5	mg/kg	1.4	1	04/20/18 05:22	04/23/18 11:45	7440-50-8	
Iron	72600	mg/kg	35.0	5	04/20/18 05:22	04/23/18 12:55	7439-89-6	
Manganese	806	mg/kg	0.70	1	04/20/18 05:22	04/23/18 11:45	7439-96-5	
Nickel	23.8	mg/kg	2.8	1	04/20/18 05:22	04/23/18 11:45	7440-02-0	
Silver	ND	mg/kg	1.4	1	04/20/18 05:22	04/23/18 11:45	7440-22-4	
Tin	33.1	mg/kg	10.5	1	04/20/18 05:22	04/23/18 11:45	7440-31-5	
Titanium	193	mg/kg	3.5	1	04/20/18 05:22	04/23/18 11:45	7440-32-6	
Zinc	553	mg/kg	2.8	1	04/20/18 05:22	04/23/18 11:45	7440-66-6	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3050B						
Chromium	12.6	mg/kg	0.57	1	04/25/18 09:25	04/26/18 03:33	7440-47-3	N2
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	5.0	mg/kg	1.4	20	04/20/18 06:41	04/23/18 20:14	7440-36-0	
Arsenic	5.8	mg/kg	1.4	20	04/20/18 06:41	04/23/18 20:14	7440-38-2	
Beryllium	ND	mg/kg	0.57	20	04/20/18 06:41	04/23/18 20:14	7440-41-7	
Cadmium	2.4	mg/kg	0.23	20	04/20/18 06:41	04/23/18 20:14	7440-43-9	
Cobalt	3.5	mg/kg	1.4	20	04/20/18 06:41	04/23/18 20:14	7440-48-4	
Lead	94.3	mg/kg	0.29	20	04/20/18 06:41	04/23/18 20:14	7439-92-1	
Lithium	2.1	mg/kg	1.4	20	04/20/18 06:41	04/23/18 20:14	7439-93-2	
Selenium	ND	mg/kg	1.4	20	04/20/18 06:41	04/23/18 20:14	7782-49-2	
Strontium	41.3	mg/kg	1.4	20	04/20/18 06:41	04/23/18 20:14	7440-24-6	
Vanadium	22.1	mg/kg	2.9	20	04/20/18 06:41	04/23/18 20:14	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.75	mg/kg	0.053	1	04/20/18 04:53	04/22/18 16:31	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	66.6	%	0.10	1		04/24/18 13:49		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-13 (3-12) **Lab ID: 10427642005** Collected: 04/17/18 15:30 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	208-96-8	
Anthracene	3520	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	120-12-7	
Benzo(a)anthracene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	56-55-3	
Benzo(a)pyrene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	101-55-3	
Butylbenzylphthalate	1490	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	85-68-7	
Carbazole	1430	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	59-50-7	
4-Chloroaniline	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	108-60-1	
2-Chloronaphthalene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	91-58-7	
2-Chlorophenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	7005-72-3	
Chrysene	993	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	53-70-3	
Dibenzofuran	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	120-83-2	
Diethylphthalate	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	105-67-9	
Dimethylphthalate	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	131-11-3	
Di-n-butylphthalate	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	5080	1	04/19/18 19:31	04/26/18 15:08	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	606-20-2	
Di-n-octylphthalate	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	122-66-7	
bis(2-Ethylhexyl)phthalate	125000	ug/kg	9850	10	04/19/18 19:31	04/26/18 16:40	117-81-7	
Fluoranthene	2730	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	206-44-0	
Fluorene	1390	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	87-68-3	
Hexachlorobenzene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	118-74-1	
Hexachloroethane	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	193-39-5	
Isophorone	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	78-59-1	
1-Methylnaphthalene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	90-12-0	
2-Methylnaphthalene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-13 (3-12) **Lab ID: 10427642005** Collected: 04/17/18 15:30 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

2-Methylphenol(o-Cresol)	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1970	1	04/19/18 19:31	04/26/18 15:08		
Naphthalene	1650	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	91-20-3	
2-Nitroaniline	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	88-74-4	
3-Nitroaniline	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	99-09-2	
4-Nitroaniline	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	100-01-6	
Nitrobenzene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	88-95-3	
2-Nitrophenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	88-75-5	
4-Nitrophenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	86-30-6	
Pentachlorophenol	ND	ug/kg	2000	1	04/19/18 19:31	04/26/18 15:08	87-86-5	
Phenanthrene	4060	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	85-01-8	
Phenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	108-95-2	
Pyrene	1890	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	43	%	43-125	1	04/19/18 19:31	04/26/18 15:08	4165-60-0	
2-Fluorobiphenyl (S)	48	%	30-132	1	04/19/18 19:31	04/26/18 15:08	321-60-8	
p-Terphenyl-d14 (S)	60	%	62-125	1	04/19/18 19:31	04/26/18 15:08	1718-51-0	S5
Phenol-d6 (S)	50	%	48-125	1	04/19/18 19:31	04/26/18 15:08	13127-88-3	
2-Fluorophenol (S)	45	%	40-125	1	04/19/18 19:31	04/26/18 15:08	367-12-4	
2,4,6-Tribromophenol (S)	55	%	60-125	1	04/19/18 19:31	04/26/18 15:08	118-79-6	S5

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	887	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	83-32-9	
Acenaphthylene	ND	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	208-96-8	
Anthracene	5550	ug/kg	299	10	04/19/18 18:12	04/23/18 18:03	120-12-7	
Benzo(a)anthracene	643	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	56-55-3	
Benzo(a)pyrene	317	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	50-32-8	
Benzo(b)fluoranthene	507	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	205-99-2	
Benzo(g,h,i)perylene	150	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	191-24-2	
Benzo(k)fluoranthene	207	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	207-08-9	
Chrysene	1130	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	53-70-3	
Fluoranthene	2760	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	206-44-0	
Fluorene	1560	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	193-39-5	
Naphthalene	2480	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	91-20-3	
Phenanthrene	4450	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	85-01-8	
Pyrene	1860	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	88	%	42-125	5	04/19/18 18:12	04/20/18 18:09	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: **FD-TT-13 (3-12)** Lab ID: **10427642005** Collected: 04/17/18 15:30 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	93	%	57-125	5	04/19/18 18:12	04/20/18 18:09	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	3030	1	04/26/18 10:20	04/26/18 14:19	67-64-1	
Allyl chloride	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	107-05-1	
Benzene	ND	ug/kg	60.6	1	04/26/18 10:20	04/26/18 14:19	71-43-2	
Bromobenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	108-86-1	
Bromochloromethane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	74-97-5	
Bromodichloromethane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	75-27-4	
Bromoform	ND	ug/kg	1520	1	04/26/18 10:20	04/26/18 14:19	75-25-2	
Bromomethane	ND	ug/kg	1520	1	04/26/18 10:20	04/26/18 14:19	74-83-9	
2-Butanone (MEK)	ND	ug/kg	758	1	04/26/18 10:20	04/26/18 14:19	78-93-3	
n-Butylbenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	104-51-8	
sec-Butylbenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	135-98-8	
tert-Butylbenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	98-06-6	
Carbon tetrachloride	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	56-23-5	
Chlorobenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	108-90-7	
Chloroethane	ND	ug/kg	1520	1	04/26/18 10:20	04/26/18 14:19	75-00-3	
Chloroform	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	67-66-3	
Chloromethane	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	74-87-3	
2-Chlorotoluene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	95-49-8	
4-Chlorotoluene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1520	1	04/26/18 10:20	04/26/18 14:19	96-12-8	
Dibromochloromethane	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	106-93-4	
Dibromomethane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	75-71-8	
1,1-Dichloroethane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	75-34-3	
1,2-Dichloroethane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	107-06-2	
1,1-Dichloroethene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1520	1	04/26/18 10:20	04/26/18 14:19	75-43-4	
1,2-Dichloropropane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	78-87-5	
1,3-Dichloropropane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	142-28-9	
2,2-Dichloropropane	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	594-20-7	
1,1-Dichloropropene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	60-29-7	
Ethylbenzene	435	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	100-41-4	D6
Hexachloro-1,3-butadiene	ND	ug/kg	758	1	04/26/18 10:20	04/26/18 14:19	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-13 (3-12) **Lab ID:** 10427642005 Collected: 04/17/18 15:30 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	98-82-8	
p-Isopropyltoluene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	99-87-6	
Methylene Chloride	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	75-09-2	L2
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	758	1	04/26/18 10:20	04/26/18 14:19	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	1634-04-4	
Naphthalene	972	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	91-20-3	D6
n-Propylbenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	103-65-1	
Styrene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	79-34-5	
Tetrachloroethene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	127-18-4	
Tetrahydrofuran	ND	ug/kg	6060	1	04/26/18 10:20	04/26/18 14:19	109-99-9	
Toluene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	79-00-5	
Trichloroethene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	79-01-6	
Trichlorofluoromethane	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	76-13-1	
1,2,4-Trimethylbenzene	538	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	95-63-6	D6
1,3,5-Trimethylbenzene	156	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	108-67-8	D6
Vinyl chloride	ND	ug/kg	60.6	1	04/26/18 10:20	04/26/18 14:19	75-01-4	
Xylene (Total)	1350	ug/kg	455	1	04/26/18 10:20	04/26/18 14:19	1330-20-7	D6
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%	75-125	1	04/26/18 10:20	04/26/18 14:19	17060-07-0	1M
Toluene-d8 (S)	96	%	75-125	1	04/26/18 10:20	04/26/18 14:19	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125	1	04/26/18 10:20	04/26/18 14:19	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	60.6	10	04/28/18 10:30	04/30/18 14:43	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	12.6	mg/kg	1.0	1		05/02/18 08:16	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	2.4	mg/kg	1.7	1	04/25/18 11:00	04/25/18 13:40	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	04/25/18 14:45	04/26/18 00:52	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 141683 Analysis Method: EPA 1630 (1998)

QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 560161 Matrix: Solid

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.05	04/30/18 13:39	N3

METHOD BLANK: 560162 Matrix: Solid

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	2.98	04/30/18 13:46	N3

METHOD BLANK: 560163 Matrix: Solid

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.04	04/30/18 13:53	N3

LABORATORY CONTROL SAMPLE: 560164

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	104	119	115	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 560165 560166

Parameter	Units	10427354001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	357	357	354	388	99	108	65-135	9	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 534800

Analysis Method: WI MOD GRO

QC Batch Method: EPA 5030 Medium Soil

Analysis Description: WIGRO Solid GCV

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2905429

Matrix: Solid

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	04/30/18 21:12	
a,a,a-Trifluorotoluene (S)	%.	98	80-150	04/30/18 21:12	

LABORATORY CONTROL SAMPLE & LCSD: 2905430

2905431

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	42.8	41.3	86	83	80-120	4	20	
a,a,a-Trifluorotoluene (S)	%.				98	97	80-150			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2905441

2905442

Parameter	Units	10428528007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Gasoline Range Organics	mg/kg	ND	57.9	56.1	49.4	46.5	85	83	80-120	6	20	
a,a,a-Trifluorotoluene (S)	%.						99	99	80-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 533419

Analysis Method: EPA 7471

QC Batch Method: EPA 7471

Analysis Description: 7471 Mercury

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2897699

Matrix: Solid

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.018	04/22/18 15:58	

LABORATORY CONTROL SAMPLE: 2897700

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.48	0.53	110	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897701 2897702

Parameter	Units	10426879001		2897701		2897702		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result				
Mercury	mg/kg	<0.018	.47	.5	0.48	0.46	103	93	80-120	4	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427642

QC Batch: 533415 Analysis Method: EPA 6010C
QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2897683 Matrix: Solid
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	10.0	04/23/18 10:48	
Barium	mg/kg	ND	0.50	04/23/18 10:48	
Boron	mg/kg	ND	7.5	04/23/18 10:48	
Copper	mg/kg	ND	0.50	04/23/18 10:48	
Iron	mg/kg	ND	2.5	04/23/18 10:48	
Manganese	mg/kg	ND	0.25	04/23/18 10:48	
Nickel	mg/kg	ND	1.0	04/23/18 10:48	
Silver	mg/kg	ND	0.50	04/23/18 10:48	
Tin	mg/kg	ND	3.8	04/23/18 10:48	
Titanium	mg/kg	ND	1.2	04/23/18 10:48	
Zinc	mg/kg	ND	1.0	04/23/18 10:48	

LABORATORY CONTROL SAMPLE: 2897684

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	1000	997	100	80-120	
Barium	mg/kg	50	51.0	102	80-120	
Boron	mg/kg	50	46.7	93	80-120	
Copper	mg/kg	50	49.1	98	80-120	
Iron	mg/kg	1000	1010	101	80-120	
Manganese	mg/kg	50	50.9	102	80-120	
Nickel	mg/kg	50	49.8	100	80-120	
Silver	mg/kg	25	23.5	94	80-120	
Tin	mg/kg	50	49.4	99	80-120	
Titanium	mg/kg	50	49.8	100	80-120	
Zinc	mg/kg	50	48.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897685 2897686

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427793001 Result	Spike Conc.	Spike Conc.	Result						
Aluminum	mg/kg	34800	990	952	35400	35400	64	61	75-125	0	20 P6
Barium	mg/kg	1320	49.5	47.6	1320	1320	-1	0	75-125	0	20 P6
Boron	mg/kg	43.3	49.5	47.6	87.4	85.7	89	89	75-125	2	20
Copper	mg/kg	2140	49.5	47.6	2090	2100	-85	-66	75-125	1	20 P6
Iron	mg/kg	31500	990	952	31000	31000	-51	-51	75-125	0	20 P6
Manganese	mg/kg	8040	49.5	47.6	7800	8030	-469	-22	75-125	3	20 P6
Nickel	mg/kg	113	49.5	47.6	148	147	70	71	75-125	1	20 M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Parameter	Units	2897685		2897686		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427793001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Silver	mg/kg	18.5	24.8	23.8	48.7	49.0	122	128	75-125	1	20 M1
Tin	mg/kg	94.8	49.5	47.6	127	127	66	67	75-125	1	20 M1
Titanium	mg/kg	1650	49.5	47.6	1620	1690	-64	67	75-125	4	20 P6
Zinc	mg/kg	1960	49.5	47.6	1950	1930	-21	-53	75-125	1	20 P6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 438855 Analysis Method: EPA 6020
 QC Batch Method: EPA 3050B Analysis Description: 6020 MET
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2027873 Matrix: Solid
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.19	04/26/18 02:38	N2

LABORATORY CONTROL SAMPLE: 2027874

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.7	3.9	106	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027875 2027876

Parameter	Units	2027875		2027876		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427642001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chromium	mg/kg	5.4	4.87	4.87	7.0	6.1	34	15	75-125	14	20 M0, N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 533412 Analysis Method: EPA 6020A
QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2897671 Matrix: Solid
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.48	04/21/18 02:51	
Arsenic	mg/kg	ND	0.48	04/21/18 02:51	
Beryllium	mg/kg	ND	0.19	04/21/18 02:51	
Cadmium	mg/kg	ND	0.076	04/21/18 02:51	
Cobalt	mg/kg	ND	0.48	04/21/18 02:51	
Lead	mg/kg	ND	0.095	04/23/18 17:49	
Lithium	mg/kg	ND	0.48	04/21/18 02:51	
Selenium	mg/kg	ND	0.48	04/21/18 02:51	
Strontium	mg/kg	ND	0.48	04/21/18 02:51	
Vanadium	mg/kg	ND	0.95	04/21/18 02:51	

LABORATORY CONTROL SAMPLE: 2897672

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	47.6	47.6	100	80-120	
Arsenic	mg/kg	47.6	47.9	101	80-120	
Beryllium	mg/kg	47.6	47.3	99	80-120	
Cadmium	mg/kg	47.6	47.1	99	80-120	
Cobalt	mg/kg	47.6	49.3	104	80-120	
Lead	mg/kg	47.6	48.7	102	80-120	
Lithium	mg/kg	47.6	45.4	95	80-120	
Selenium	mg/kg	47.6	47.6	100	80-120	
Strontium	mg/kg	47.6	47.2	99	80-120	
Vanadium	mg/kg	47.6	47.7	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897673 2897674

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10427861001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Antimony	mg/kg	0.59	49.5	48.5	21.6	20.0	42	40	75-125	8	20	M6
Arsenic	mg/kg	18.4	49.5	48.5	70.6	64.2	105	94	75-125	9	20	
Beryllium	mg/kg	0.60	49.5	48.5	46.4	44.0	92	90	75-125	5	20	
Cadmium	mg/kg	0.45	49.5	48.5	51.2	46.6	103	95	75-125	9	20	
Cobalt	mg/kg	6.1	49.5	48.5	59.2	53.9	107	99	75-125	9	20	
Lead	mg/kg	39.8	49.5	48.5	87.6	85.0	97	93	75-125	3	20	
Lithium	mg/kg	11.0	49.5	48.5	55.2	54.2	89	89	75-125	2	20	
Selenium	mg/kg	1.0	49.5	48.5	49.9	46.1	99	93	75-125	8	20	
Strontium	mg/kg	136	49.5	48.5	199	177	127	85	75-125	11	20	M6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Parameter	Units	2897673		2897674		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10427861001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Vanadium	mg/kg	22.3	49.5	48.5	76.0	68.8	108	96	75-125	10	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 534034

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

SAMPLE DUPLICATE: 2901166

Parameter	Units	10428311003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	13.7	14.8	8	30	

SAMPLE DUPLICATE: 2901255

Parameter	Units	10427906006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.4	21.5	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 534461 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2903647 Matrix: Solid
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	04/26/18 13:11	
1,1,1-Trichloroethane	ug/kg	ND	50.0	04/26/18 13:11	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	04/26/18 13:11	
1,1,2-Trichloroethane	ug/kg	ND	50.0	04/26/18 13:11	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	04/26/18 13:11	
1,1-Dichloroethane	ug/kg	ND	50.0	04/26/18 13:11	
1,1-Dichloroethene	ug/kg	ND	50.0	04/26/18 13:11	
1,1-Dichloropropene	ug/kg	ND	50.0	04/26/18 13:11	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	04/26/18 13:11	
1,2,3-Trichloropropane	ug/kg	ND	200	04/26/18 13:11	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	04/26/18 13:11	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	04/26/18 13:11	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	04/26/18 13:11	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	04/26/18 13:11	
1,2-Dichlorobenzene	ug/kg	ND	50.0	04/26/18 13:11	
1,2-Dichloroethane	ug/kg	ND	50.0	04/26/18 13:11	
1,2-Dichloropropane	ug/kg	ND	50.0	04/26/18 13:11	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	04/26/18 13:11	
1,3-Dichlorobenzene	ug/kg	ND	50.0	04/26/18 13:11	
1,3-Dichloropropane	ug/kg	ND	50.0	04/26/18 13:11	
1,4-Dichlorobenzene	ug/kg	ND	50.0	04/26/18 13:11	
2,2-Dichloropropane	ug/kg	ND	200	04/26/18 13:11	
2-Butanone (MEK)	ug/kg	ND	250	04/26/18 13:11	
2-Chlorotoluene	ug/kg	ND	50.0	04/26/18 13:11	
4-Chlorotoluene	ug/kg	ND	50.0	04/26/18 13:11	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	04/26/18 13:11	
Acetone	ug/kg	ND	1000	04/26/18 13:11	
Allyl chloride	ug/kg	ND	200	04/26/18 13:11	
Benzene	ug/kg	ND	20.0	04/26/18 13:11	
Bromobenzene	ug/kg	ND	50.0	04/26/18 13:11	
Bromochloromethane	ug/kg	ND	50.0	04/26/18 13:11	
Bromodichloromethane	ug/kg	ND	50.0	04/26/18 13:11	
Bromoform	ug/kg	ND	500	04/26/18 13:11	MN
Bromomethane	ug/kg	ND	500	04/26/18 13:11	
Carbon tetrachloride	ug/kg	ND	50.0	04/26/18 13:11	
Chlorobenzene	ug/kg	ND	50.0	04/26/18 13:11	
Chloroethane	ug/kg	ND	500	04/26/18 13:11	
Chloroform	ug/kg	ND	50.0	04/26/18 13:11	
Chloromethane	ug/kg	ND	200	04/26/18 13:11	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	04/26/18 13:11	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	04/26/18 13:11	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

METHOD BLANK: 2903647

Matrix: Solid

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	04/26/18 13:11	
Dibromomethane	ug/kg	ND	50.0	04/26/18 13:11	
Dichlorodifluoromethane	ug/kg	ND	200	04/26/18 13:11	
Dichlorofluoromethane	ug/kg	ND	500	04/26/18 13:11	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	04/26/18 13:11	
Ethylbenzene	ug/kg	ND	50.0	04/26/18 13:11	
Hexachloro-1,3-butadiene	ug/kg	ND	250	04/26/18 13:11	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	04/26/18 13:11	
Methyl-tert-butyl ether	ug/kg	ND	50.0	04/26/18 13:11	
Methylene Chloride	ug/kg	ND	200	04/26/18 13:11	
n-Butylbenzene	ug/kg	ND	50.0	04/26/18 13:11	
n-Propylbenzene	ug/kg	ND	50.0	04/26/18 13:11	
Naphthalene	ug/kg	ND	200	04/26/18 13:11	
p-Isopropyltoluene	ug/kg	ND	50.0	04/26/18 13:11	
sec-Butylbenzene	ug/kg	ND	50.0	04/26/18 13:11	
Styrene	ug/kg	ND	50.0	04/26/18 13:11	
tert-Butylbenzene	ug/kg	ND	50.0	04/26/18 13:11	
Tetrachloroethene	ug/kg	ND	50.0	04/26/18 13:11	
Tetrahydrofuran	ug/kg	ND	2000	04/26/18 13:11	
Toluene	ug/kg	ND	50.0	04/26/18 13:11	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	04/26/18 13:11	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	04/26/18 13:11	
Trichloroethene	ug/kg	ND	50.0	04/26/18 13:11	
Trichlorofluoromethane	ug/kg	ND	200	04/26/18 13:11	
Vinyl chloride	ug/kg	ND	20.0	04/26/18 13:11	
Xylene (Total)	ug/kg	ND	150	04/26/18 13:11	
1,2-Dichloroethane-d4 (S)	%	95	75-125	04/26/18 13:11	
4-Bromofluorobenzene (S)	%	96	75-125	04/26/18 13:11	
Toluene-d8 (S)	%	96	75-125	04/26/18 13:11	

LABORATORY CONTROL SAMPLE & LCSD: 2903648

2903649

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	773	714	77	71	59-125	8	20	
1,1,1-Trichloroethane	ug/kg	1000	816	763	82	76	59-125	7	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	735	660	74	66	58-125	11	20	
1,1,2-Trichloroethane	ug/kg	1000	737	691	74	69	64-125	6	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	733	671	73	67	65-125	9	20	
1,1-Dichloroethane	ug/kg	1000	722	664	72	66	63-125	8	20	
1,1-Dichloroethene	ug/kg	1000	782	703	78	70	59-125	11	20	
1,1-Dichloropropene	ug/kg	1000	805	731	81	73	64-125	10	20	
1,2,3-Trichlorobenzene	ug/kg	1000	724	658	72	66	55-126	10	20	
1,2,3-Trichloropropane	ug/kg	1000	706	646	71	65	62-125	9	20	
1,2,4-Trichlorobenzene	ug/kg	1000	752	672	75	67	62-125	11	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

LABORATORY CONTROL SAMPLE & LCSD: 2903648		2903649		LCS	LCSD	% Rec	LCSD	% Rec	Max	
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	% Rec	% Rec	Limits	RPD	RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	1000	737	661	74	66	59-125	11	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	1730	1620	69	65	54-125	7	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	796	745	80	74	64-125	7	20	
1,2-Dichlorobenzene	ug/kg	1000	752	668	75	67	63-125	12	20	
1,2-Dichloroethane	ug/kg	1000	693	643	69	64	57-125	8	20	
1,2-Dichloropropane	ug/kg	1000	716	684	72	68	67-125	5	20	
1,3,5-Trimethylbenzene	ug/kg	1000	751	711	75	71	59-125	6	20	
1,3-Dichlorobenzene	ug/kg	1000	720	663	72	66	64-125	8	20	
1,3-Dichloropropane	ug/kg	1000	732	682	73	68	64-125	7	20	
1,4-Dichlorobenzene	ug/kg	1000	714	654	71	65	63-125	9	20	
2,2-Dichloropropane	ug/kg	1000	778	701	78	70	37-126	10	20	
2-Butanone (MEK)	ug/kg	5000	3310	3010	66	60	48-125	9	20	
2-Chlorotoluene	ug/kg	1000	721	671	72	67	62-125	7	20	
4-Chlorotoluene	ug/kg	1000	738	667	74	67	63-125	10	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	3550	3140	71	63	52-135	12	20	
Acetone	ug/kg	5000	4320	4190	86	84	65-125	3	20	
Allyl chloride	ug/kg	1000	674	607	67	61	52-125	10	20	
Benzene	ug/kg	1000	751	691	75	69	61-125	8	20	
Bromobenzene	ug/kg	1000	766	664	77	66	64-125	14	20	
Bromochloromethane	ug/kg	1000	744	662	74	66	65-125	12	20	
Bromodichloromethane	ug/kg	1000	760	707	76	71	57-125	7	20	
Bromoform	ug/kg	1000	739	662	74	66	57-125	11	20	
Bromomethane	ug/kg	1000	816	783	82	78	60-125	4	20	
Carbon tetrachloride	ug/kg	1000	782	701	78	70	58-125	11	20	
Chlorobenzene	ug/kg	1000	719	681	72	68	66-125	5	20	
Chloroethane	ug/kg	1000	877	797	88	80	62-125	10	20	
Chloroform	ug/kg	1000	701	662	70	66	59-125	6	20	
Chloromethane	ug/kg	1000	802	747	80	75	50-125	7	20	
cis-1,2-Dichloroethene	ug/kg	1000	736	691	74	69	61-125	6	20	
cis-1,3-Dichloropropene	ug/kg	1000	770	735	77	74	61-125	5	20	
Dibromochloromethane	ug/kg	1000	706	663	71	66	60-125	6	20	
Dibromomethane	ug/kg	1000	774	700	77	70	69-125	10	20	
Dichlorodifluoromethane	ug/kg	1000	860	775	86	78	38-125	10	20	
Dichlorofluoromethane	ug/kg	1000	950	917	95	92	67-125	3	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	1150	1270	115	127	60-125	10	20	CH,L3,SS
Ethylbenzene	ug/kg	1000	760	699	76	70	62-125	8	20	
Hexachloro-1,3-butadiene	ug/kg	1000	773	692	77	69	56-125	11	20	
Isopropylbenzene (Cumene)	ug/kg	1000	807	746	81	75	65-125	8	20	
Methyl-tert-butyl ether	ug/kg	1000	698	646	70	65	59-125	8	20	
Methylene Chloride	ug/kg	1000	674	594	67	59	64-125	13	20	L2
n-Butylbenzene	ug/kg	1000	776	697	78	70	59-125	11	20	
n-Propylbenzene	ug/kg	1000	740	677	74	68	61-125	9	20	
Naphthalene	ug/kg	1000	740	692	74	69	53-125	7	20	
p-Isopropyltoluene	ug/kg	1000	763	724	76	72	63-125	5	20	
sec-Butylbenzene	ug/kg	1000	750	687	75	69	62-125	9	20	
Styrene	ug/kg	1000	790	695	79	69	66-125	13	20	
tert-Butylbenzene	ug/kg	1000	741	668	74	67	64-125	10	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

LABORATORY CONTROL SAMPLE & LCSD: 2903648

2903649

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Tetrachloroethane	ug/kg	1000	821	741	82	74	67-125	10	20	
Tetrahydrofuran	ug/kg	10000	7750	7440	77	74	62-125	4	20	
Toluene	ug/kg	1000	707	648	71	65	61-125	9	20	
trans-1,2-Dichloroethene	ug/kg	1000	798	730	80	73	64-125	9	20	
trans-1,3-Dichloropropene	ug/kg	1000	791	727	79	73	56-125	8	20	
Trichloroethene	ug/kg	1000	756	699	76	70	67-125	8	20	
Trichlorofluoromethane	ug/kg	1000	999	965	100	97	65-125	3	20	
Vinyl chloride	ug/kg	1000	929	841	93	84	57-125	10	20	
Xylene (Total)	ug/kg	3000	2210	2030	74	68	62-125	8	20	
1,2-Dichloroethane-d4 (S)	%				95	93	75-125			
4-Bromofluorobenzene (S)	%				98	101	75-125			
Toluene-d8 (S)	%				100	101	75-125			

MATRIX SPIKE SAMPLE: 2903650

Parameter	Units	10427642001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	1320	1480	112	64-146	
1,1,1-Trichloroethane	ug/kg	ND	1320	1510	114	56-148	
1,1,2,2-Tetrachloroethane	ug/kg	ND	1320	1470	112	36-150	
1,1,2-Trichloroethane	ug/kg	ND	1320	1430	108	67-148	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	1320	1310	99	60-142	
1,1-Dichloroethane	ug/kg	ND	1320	1370	103	57-140	
1,1-Dichloroethene	ug/kg	ND	1320	1350	102	59-139	
1,1-Dichloropropene	ug/kg	ND	1320	1470	111	61-142	
1,2,3-Trichlorobenzene	ug/kg	ND	1320	1440	109	69-150	
1,2,3-Trichloropropane	ug/kg	ND	1320	1410	107	64-150	
1,2,4-Trichlorobenzene	ug/kg	ND	1320	1490	113	71-149	
1,2,4-Trimethylbenzene	ug/kg	ND	1320	1430	108	67-149	
1,2-Dibromo-3-chloropropane	ug/kg	ND	3310	3600	109	61-150	
1,2-Dibromoethane (EDB)	ug/kg	ND	1320	1540	117	67-147	
1,2-Dichlorobenzene	ug/kg	ND	1320	1430	108	70-142	
1,2-Dichloroethane	ug/kg	ND	1320	1310	99	58-132	
1,2-Dichloropropane	ug/kg	ND	1320	1400	106	64-144	
1,3,5-Trimethylbenzene	ug/kg	ND	1320	1430	108	71-146	
1,3-Dichlorobenzene	ug/kg	ND	1320	1410	107	71-142	
1,3-Dichloropropane	ug/kg	ND	1320	1420	108	68-140	
1,4-Dichlorobenzene	ug/kg	ND	1320	1330	101	68-142	
2,2-Dichloropropane	ug/kg	ND	1320	1470	111	34-150	
2-Butanone (MEK)	ug/kg	ND	6610	7390	112	51-150	
2-Chlorotoluene	ug/kg	ND	1320	1430	108	66-144	
4-Chlorotoluene	ug/kg	ND	1320	1380	104	66-140	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	6610	6890	104	63-150	
Acetone	ug/kg	ND	6610	9080	137	54-150	
Allyl chloride	ug/kg	ND	1320	1250	95	53-135	
Benzene	ug/kg	ND	1320	1420	107	65-135	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

MATRIX SPIKE SAMPLE: 2903650		10427642001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/kg	ND	1320	1450	110	71-141	
Bromochloromethane	ug/kg	ND	1320	1340	102	62-145	
Bromodichloromethane	ug/kg	ND	1320	1460	110	59-148	
Bromoform	ug/kg	ND	1320	1380	105	57-145	
Bromomethane	ug/kg	ND	1320	1310	99	51-129	
Carbon tetrachloride	ug/kg	ND	1320	1490	113	55-144	
Chlorobenzene	ug/kg	ND	1320	1400	106	70-142	
Chloroethane	ug/kg	ND	1320	1400	106	61-135	
Chloroform	ug/kg	ND	1320	1340	102	58-135	
Chloromethane	ug/kg	ND	1320	1180	89	37-125	
cis-1,2-Dichloroethene	ug/kg	ND	1320	1410	106	60-138	
cis-1,3-Dichloropropene	ug/kg	ND	1320	1510	114	62-142	
Dibromochloromethane	ug/kg	ND	1320	1390	105	65-141	
Dibromomethane	ug/kg	ND	1320	1420	107	72-150	
Dichlorodifluoromethane	ug/kg	ND	1320	1010	77	30-125	
Dichlorofluoromethane	ug/kg	ND	1320	1510	114	62-148	
Diethyl ether (Ethyl ether)	ug/kg	ND	1320	2970	225	62-135	CH,M0,SS
Ethylbenzene	ug/kg	ND	1320	1460	111	72-138	
Hexachloro-1,3-butadiene	ug/kg	ND	1320	1780	135	38-150	
Isopropylbenzene (Cumene)	ug/kg	ND	1320	1530	116	75-148	
Methyl-tert-butyl ether	ug/kg	ND	1320	1370	104	63-139	
Methylene Chloride	ug/kg	ND	1320	1280	97	58-135	
n-Butylbenzene	ug/kg	ND	1320	1520	115	63-150	
n-Propylbenzene	ug/kg	ND	1320	1430	108	70-146	
Naphthalene	ug/kg	ND	1320	1450	110	63-150	
p-Isopropyltoluene	ug/kg	ND	1320	1520	115	72-150	
sec-Butylbenzene	ug/kg	ND	1320	1440	109	66-150	
Styrene	ug/kg	ND	1320	1480	112	72-146	
tert-Butylbenzene	ug/kg	ND	1320	1470	111	71-148	
Tetrachloroethene	ug/kg	ND	1320	1570	118	70-150	
Tetrahydrofuran	ug/kg	ND	13200	15000	113	62-150	
Toluene	ug/kg	ND	1320	1350	102	65-142	
trans-1,2-Dichloroethene	ug/kg	ND	1320	1470	111	55-141	
trans-1,3-Dichloropropene	ug/kg	ND	1320	1490	113	57-147	
Trichloroethene	ug/kg	ND	1320	1470	111	62-150	
Trichlorofluoromethane	ug/kg	ND	1320	1600	121	51-150	
Vinyl chloride	ug/kg	ND	1320	1330	101	45-132	
Xylene (Total)	ug/kg	ND	3970	4260	107	75-140	
1,2-Dichloroethane-d4 (S)	%					94	75-125
4-Bromofluorobenzene (S)	%					98	75-125
Toluene-d8 (S)	%					99	75-125

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

SAMPLE DUPLICATE: 2903753

Parameter	Units	10427642005 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,1-Trichloroethane	ug/kg	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,2-Trichloroethane	ug/kg	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	ND		30	
1,1-Dichloroethane	ug/kg	ND	ND		30	
1,1-Dichloroethene	ug/kg	ND	ND		30	
1,1-Dichloropropene	ug/kg	ND	ND		30	
1,2,3-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,3-Trichloropropane	ug/kg	ND	ND		30	
1,2,4-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,4-Trimethylbenzene	ug/kg	538	2900	137	30	D6
1,2-Dibromo-3-chloropropane	ug/kg	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	ND		30	
1,2-Dichlorobenzene	ug/kg	ND	173		30	
1,2-Dichloroethane	ug/kg	ND	ND		30	
1,2-Dichloropropane	ug/kg	ND	ND		30	
1,3,5-Trimethylbenzene	ug/kg	156	1030	147	30	D6
1,3-Dichlorobenzene	ug/kg	ND	ND		30	
1,3-Dichloropropane	ug/kg	ND	ND		30	
1,4-Dichlorobenzene	ug/kg	ND	381		30	
2,2-Dichloropropane	ug/kg	ND	ND		30	
2-Butanone (MEK)	ug/kg	ND	ND		30	
2-Chlorotoluene	ug/kg	ND	ND		30	
4-Chlorotoluene	ug/kg	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND		30	
Acetone	ug/kg	ND	ND		30	
Allyl chloride	ug/kg	ND	ND		30	
Benzene	ug/kg	ND	ND		30	
Bromobenzene	ug/kg	ND	ND		30	
Bromochloromethane	ug/kg	ND	ND		30	
Bromodichloromethane	ug/kg	ND	ND		30	
Bromoform	ug/kg	ND	ND		30	
Bromomethane	ug/kg	ND	ND		30	
Carbon tetrachloride	ug/kg	ND	ND		30	
Chlorobenzene	ug/kg	ND	ND		30	
Chloroethane	ug/kg	ND	ND		30	
Chloroform	ug/kg	ND	ND		30	
Chloromethane	ug/kg	ND	ND		30	
cis-1,2-Dichloroethene	ug/kg	ND	ND		30	
cis-1,3-Dichloropropene	ug/kg	ND	ND		30	
Dibromochloromethane	ug/kg	ND	ND		30	
Dibromomethane	ug/kg	ND	ND		30	
Dichlorodifluoromethane	ug/kg	ND	ND		30	
Dichlorofluoromethane	ug/kg	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/kg	ND	ND		30	
Ethylbenzene	ug/kg	435	4490	165	30	D6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

SAMPLE DUPLICATE: 2903753

Parameter	Units	10427642005 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	ND	ND		30	
Isopropylbenzene (Cumene)	ug/kg	ND	262		30	
Methyl-tert-butyl ether	ug/kg	ND	ND		30	
Methylene Chloride	ug/kg	ND	ND		30	
n-Butylbenzene	ug/kg	ND	391		30	
n-Propylbenzene	ug/kg	ND	544		30	
Naphthalene	ug/kg	972	22500	183	30	D6
p-Isopropyltoluene	ug/kg	ND	601		30	
sec-Butylbenzene	ug/kg	ND	289		30	
Styrene	ug/kg	ND	ND		30	
tert-Butylbenzene	ug/kg	ND	ND		30	
Tetrachloroethene	ug/kg	ND	ND		30	
Tetrahydrofuran	ug/kg	ND	ND		30	
Toluene	ug/kg	ND	226		30	
trans-1,2-Dichloroethene	ug/kg	ND	ND		30	
trans-1,3-Dichloropropene	ug/kg	ND	ND		30	
Trichloroethene	ug/kg	ND	127J		30	
Trichlorofluoromethane	ug/kg	ND	ND		30	
Vinyl chloride	ug/kg	ND	ND		30	
Xylene (Total)	ug/kg	1350	11900	159	30	D6
1,2-Dichloroethane-d4 (S)	%	94	94	5		1M
4-Bromofluorobenzene (S)	%	101	95	1		
Toluene-d8 (S)	%	96	97	7		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 533317 Analysis Method: EPA 8081B
QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2896992 Matrix: Solid
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/26/18 20:33	
4,4'-DDE	ug/kg	ND	3.3	04/26/18 20:33	
4,4'-DDT	ug/kg	ND	3.3	04/26/18 20:33	
Aldrin	ug/kg	ND	1.7	04/26/18 20:33	
alpha-BHC	ug/kg	ND	1.7	04/26/18 20:33	
alpha-Chlordane	ug/kg	ND	1.7	04/26/18 20:33	
beta-BHC	ug/kg	ND	1.7	04/26/18 20:33	
Chlordane (Technical)	ug/kg	ND	16.7	04/26/18 20:33	
delta-BHC	ug/kg	ND	1.7	04/26/18 20:33	
Dieldrin	ug/kg	ND	3.3	04/26/18 20:33	
Endosulfan I	ug/kg	ND	1.7	04/26/18 20:33	
Endosulfan II	ug/kg	ND	3.3	04/26/18 20:33	
Endosulfan sulfate	ug/kg	ND	3.3	04/26/18 20:33	
Endrin	ug/kg	ND	3.3	04/26/18 20:33	
Endrin aldehyde	ug/kg	ND	3.3	04/26/18 20:33	
Endrin ketone	ug/kg	ND	3.3	04/26/18 20:33	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/26/18 20:33	
gamma-Chlordane	ug/kg	ND	1.7	04/26/18 20:33	
Heptachlor	ug/kg	ND	1.7	04/26/18 20:33	
Heptachlor epoxide	ug/kg	ND	1.7	04/26/18 20:33	
Methoxychlor	ug/kg	ND	16.7	04/26/18 20:33	
Toxaphene	ug/kg	ND	50.0	04/26/18 20:33	
Decachlorobiphenyl (S)	%	98	30-150	04/26/18 20:33	
Tetrachloro-m-xylene (S)	%	105	30-150	04/26/18 20:33	

LABORATORY CONTROL SAMPLE: 2896993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	35.6	107	62-127	
4,4'-DDE	ug/kg	33.3	34.8	104	66-125	
4,4'-DDT	ug/kg	33.3	31.8	96	67-128	
Aldrin	ug/kg	16.7	16.5	99	66-125	
alpha-BHC	ug/kg	16.7	17.5	105	64-125	
alpha-Chlordane	ug/kg	16.7	16.7	100	68-125	
beta-BHC	ug/kg	16.7	16.8	101	69-125	
delta-BHC	ug/kg	16.7	14.3	86	42-133	
Dieldrin	ug/kg	33.3	37.3	112	69-126	
Endosulfan I	ug/kg	16.7	16.0	96	63-125	
Endosulfan II	ug/kg	33.3	35.8	107	69-125	
Endosulfan sulfate	ug/kg	33.3	31.8	95	56-137	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

LABORATORY CONTROL SAMPLE: 2896993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	34.5	103	69-125	
Endrin aldehyde	ug/kg	33.3	34.0	102	65-125	
Endrin ketone	ug/kg	33.3	36.0	108	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	17.4	104	67-125	
gamma-Chlordane	ug/kg	16.7	15.3	92	63-125	
Heptachlor	ug/kg	16.7	16.5	99	69-125	
Heptachlor epoxide	ug/kg	16.7	17.0	102	68-125	
Methoxychlor	ug/kg	167	160	96	65-134	
Decachlorobiphenyl (S)	%			100	30-150	
Tetrachloro-m-xylene (S)	%			107	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896994 2896995

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427824001 Result	Spike Conc.	Spike Conc.	MS Result						
4,4'-DDD	ug/kg	ND	43.8	43.8	79J	92J	180	210	56-125	20	M6
4,4'-DDE	ug/kg	ND	43.8	43.8	61.7J	61.2J	141	140	32-150	20	
4,4'-DDT	ug/kg	ND	43.8	43.8	ND	105J	49	239	60-132	20	M6
Aldrin	ug/kg	ND	21.9	21.9	29.1J	43.3J	133	198	56-125	20	M6
alpha-BHC	ug/kg	ND	21.9	21.9	30.3J	25.5J	138	116	54-136	20	M6
alpha-Chlordane	ug/kg	ND	21.9	21.9	43.8J	97.5J	200	445	54-133	20	M6
beta-BHC	ug/kg	ND	21.9	21.9	ND	69.2J	190	315	30-150	20	M6
delta-BHC	ug/kg	ND	21.9	21.9	21.3J	19.8J	97	90	45-145	20	
Dieldrin	ug/kg	ND	43.8	43.8	67.4J	76.3J	154	174	47-150	20	M6
Endosulfan I	ug/kg	ND	21.9	21.9	23.9J	22.6J	109	103	35-145	20	
Endosulfan II	ug/kg	ND	43.8	43.8	53.3J	50.6J	122	115	50-147	20	
Endosulfan sulfate	ug/kg	ND	43.8	43.8	44.3J	43.8J	101	100	54-132	20	
Endrin	ug/kg	ND	43.8	43.8	49.3J	39.3J	113	90	62-125	20	
Endrin aldehyde	ug/kg	ND	43.8	43.8	48.2J	49.1J	110	112	33-150	20	
Endrin ketone	ug/kg	ND	43.8	43.8	83.8J	97.2J	191	222	56-144	20	M6
gamma-BHC (Lindane)	ug/kg	ND	21.9	21.9	26.3J	27.8J	120	127	63-125	20	M6
gamma-Chlordane	ug/kg	ND	21.9	21.9	43.3J	88.3J	198	403	45-132	20	M6
Heptachlor	ug/kg	ND	21.9	21.9	33.4J	24.2J	152	110	51-142	20	M6
Heptachlor epoxide	ug/kg	ND	21.9	21.9	27.4J	27J	125	123	50-142	20	
Methoxychlor	ug/kg	ND	219	219	261J	243J	119	111	58-139	20	
Decachlorobiphenyl (S)	%						0	0	30-150		S4
Tetrachloro-m-xylene (S)	%						0	0	30-150		3M, D3, S4

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 533330 Analysis Method: EPA 8082A
QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2897062 Matrix: Solid
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/23/18 17:02	
Decachlorobiphenyl (S)	%	125	30-134	04/23/18 17:02	CH
Tetrachloro-m-xylene (S)	%	88	48-125	04/23/18 17:02	

LABORATORY CONTROL SAMPLE: 2897063

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	502	75	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	549	82	62-125	
Decachlorobiphenyl (S)	%			126	30-134	CH
Tetrachloro-m-xylene (S)	%			88	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897064 2897065

Parameter	Units	10427642001		2897065		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
PCB-1016 (Aroclor 1016)	ug/kg	ND	853	852	783	92	101	30-150	9	30	
PCB-1260 (Aroclor 1260)	ug/kg	ND	853	852	757	89	88	30-138	1	30	
Decachlorobiphenyl (S)	%					110	108	30-134			CH
Tetrachloro-m-xylene (S)	%					78	75	48-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 533315 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2896984 Matrix: Solid
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/23/18 16:07	
1,2-Dichlorobenzene	ug/kg	ND	330	04/23/18 16:07	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/23/18 16:07	
1,3-Dichlorobenzene	ug/kg	ND	330	04/23/18 16:07	
1,4-Dichlorobenzene	ug/kg	ND	330	04/23/18 16:07	
1-Methylnaphthalene	ug/kg	ND	330	04/23/18 16:07	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/23/18 16:07	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/23/18 16:07	
2,4-Dichlorophenol	ug/kg	ND	330	04/23/18 16:07	
2,4-Dimethylphenol	ug/kg	ND	330	04/23/18 16:07	
2,4-Dinitrophenol	ug/kg	ND	330	04/23/18 16:07	
2,4-Dinitrotoluene	ug/kg	ND	330	04/23/18 16:07	
2,6-Dinitrotoluene	ug/kg	ND	330	04/23/18 16:07	
2-Chloronaphthalene	ug/kg	ND	330	04/23/18 16:07	
2-Chlorophenol	ug/kg	ND	330	04/23/18 16:07	
2-Methylnaphthalene	ug/kg	ND	330	04/23/18 16:07	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/23/18 16:07	
2-Nitroaniline	ug/kg	ND	330	04/23/18 16:07	
2-Nitrophenol	ug/kg	ND	330	04/23/18 16:07	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/23/18 16:07	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/23/18 16:07	
3-Nitroaniline	ug/kg	ND	330	04/23/18 16:07	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/23/18 16:07	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/23/18 16:07	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/23/18 16:07	
4-Chloroaniline	ug/kg	ND	330	04/23/18 16:07	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/23/18 16:07	
4-Nitroaniline	ug/kg	ND	330	04/23/18 16:07	
4-Nitrophenol	ug/kg	ND	330	04/23/18 16:07	
Acenaphthene	ug/kg	ND	330	04/23/18 16:07	
Acenaphthylene	ug/kg	ND	330	04/23/18 16:07	
Anthracene	ug/kg	ND	330	04/23/18 16:07	
Benzo(a)anthracene	ug/kg	ND	330	04/23/18 16:07	
Benzo(a)pyrene	ug/kg	ND	330	04/23/18 16:07	
Benzo(b)fluoranthene	ug/kg	ND	330	04/23/18 16:07	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/23/18 16:07	
Benzo(k)fluoranthene	ug/kg	ND	330	04/23/18 16:07	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/23/18 16:07	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/23/18 16:07	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/23/18 16:07	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/23/18 16:07	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

METHOD BLANK: 2896984

Matrix: Solid

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/23/18 16:07	
Carbazole	ug/kg	ND	330	04/23/18 16:07	
Chrysene	ug/kg	ND	330	04/23/18 16:07	
Di-n-butylphthalate	ug/kg	ND	330	04/23/18 16:07	
Di-n-octylphthalate	ug/kg	ND	330	04/23/18 16:07	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/23/18 16:07	
Dibenzofuran	ug/kg	ND	330	04/23/18 16:07	
Diethylphthalate	ug/kg	ND	330	04/23/18 16:07	
Dimethylphthalate	ug/kg	ND	330	04/23/18 16:07	
Fluoranthene	ug/kg	ND	330	04/23/18 16:07	
Fluorene	ug/kg	ND	330	04/23/18 16:07	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/23/18 16:07	
Hexachlorobenzene	ug/kg	ND	330	04/23/18 16:07	
Hexachloroethane	ug/kg	ND	330	04/23/18 16:07	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/23/18 16:07	
Isophorone	ug/kg	ND	330	04/23/18 16:07	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/23/18 16:07	
N-Nitrosodimethylamine	ug/kg	ND	330	04/23/18 16:07	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/23/18 16:07	
Naphthalene	ug/kg	ND	330	04/23/18 16:07	
Nitrobenzene	ug/kg	ND	330	04/23/18 16:07	
Pentachlorophenol	ug/kg	ND	670	04/23/18 16:07	
Phenanthrene	ug/kg	ND	330	04/23/18 16:07	
Phenol	ug/kg	ND	330	04/23/18 16:07	
Pyrene	ug/kg	ND	330	04/23/18 16:07	
2,4,6-Tribromophenol (S)	%	69	60-125	04/23/18 16:07	
2-Fluorobiphenyl (S)	%	67	30-132	04/23/18 16:07	
2-Fluorophenol (S)	%	64	40-125	04/23/18 16:07	
Nitrobenzene-d5 (S)	%	63	43-125	04/23/18 16:07	
p-Terphenyl-d14 (S)	%	79	62-125	04/23/18 16:07	
Phenol-d6 (S)	%	63	48-125	04/23/18 16:07	

LABORATORY CONTROL SAMPLE: 2896985

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1210	73	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1230	74	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1300	78	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1230	74	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1220	73	39-125	
1-Methylnaphthalene	ug/kg	1670	1320	79	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1340	81	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1310	79	61-125	
2,4-Dichlorophenol	ug/kg	1670	1370	82	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

LABORATORY CONTROL SAMPLE: 2896985

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1280	77	51-125	
2,4-Dinitrophenol	ug/kg	1670	1130	68	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1550	93	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1470	88	63-125	
2-Chloronaphthalene	ug/kg	1670	1310	79	61-125	
2-Chlorophenol	ug/kg	1670	1230	74	46-125	
2-Methylnaphthalene	ug/kg	1670	1290	77	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1240	74	50-125	
2-Nitroaniline	ug/kg	1670	1350	81	61-125	
2-Nitrophenol	ug/kg	1670	1340	80	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1290	77	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1370	82	47-125	
3-Nitroaniline	ug/kg	1670	1370	82	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1540J	93	30-141	7M
4-Bromophenylphenyl ether	ug/kg	1670	1340	81	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1420	85	64-125	
4-Chloroaniline	ug/kg	1670	1080	65	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1350	81	64-125	
4-Nitroaniline	ug/kg	1670	1330	80	59-125	
4-Nitrophenol	ug/kg	1670	1240	75	54-125	
Acenaphthene	ug/kg	1670	1310	79	62-125	
Acenaphthylene	ug/kg	1670	1330	80	61-125	
Anthracene	ug/kg	1670	1350	81	66-125	
Benzo(a)anthracene	ug/kg	1670	1430	86	69-125	
Benzo(a)pyrene	ug/kg	1670	1410	85	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1440	87	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1450	87	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1400	84	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1230	74	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1130	68	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	978	59	37-125	7M
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1600	96	69-131	
Butylbenzylphthalate	ug/kg	1670	1550	93	69-129	
Carbazole	ug/kg	1670	1430	86	66-125	
Chrysene	ug/kg	1670	1410	85	68-125	
Di-n-butylphthalate	ug/kg	1670	1520	91	69-125	
Di-n-octylphthalate	ug/kg	1670	1640	98	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1480	89	64-125	
Dibenzofuran	ug/kg	1670	1380	83	65-125	
Diethylphthalate	ug/kg	1670	1420	85	67-125	
Dimethylphthalate	ug/kg	1670	1420	85	67-125	
Fluoranthene	ug/kg	1670	1410	85	66-125	
Fluorene	ug/kg	1670	1370	82	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1190	71	40-125	
Hexachlorobenzene	ug/kg	1670	1370	82	62-125	
Hexachloroethane	ug/kg	1670	1190	72	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1450	87	64-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

LABORATORY CONTROL SAMPLE: 2896985

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1260	76	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1220	73	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1330	80	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1410	85	65-125	
Naphthalene	ug/kg	1670	1240	74	48-125	
Nitrobenzene	ug/kg	1670	1200	72	48-125	
Pentachlorophenol	ug/kg	1670	1120	67	41-125	
Phenanthrene	ug/kg	1670	1350	81	66-125	
Phenol	ug/kg	1670	1210	73	46-125	
Pyrene	ug/kg	1670	1460	88	69-125	
2,4,6-Tribromophenol (S)	%			76	60-125	
2-Fluorobiphenyl (S)	%			68	30-132	
2-Fluorophenol (S)	%			61	40-125	
Nitrobenzene-d5 (S)	%			59	43-125	
p-Terphenyl-d14 (S)	%			82	62-125	
Phenol-d6 (S)	%			63	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896986 2896987

Parameter	Units	10427642001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
1,2,4-Trichlorobenzene	ug/kg	ND	2130	2140	1630	1720	77	81	30-127	5	30		
1,2-Dichlorobenzene	ug/kg	ND	2130	2140	1610	1550	76	73	30-125	3	30		
1,2-Diphenylhydrazine	ug/kg	ND	2130	2140	1560	1800	73	84	30-150	15	30		
1,3-Dichlorobenzene	ug/kg	ND	2130	2140	1570	1470	74	69	30-125	7	30		
1,4-Dichlorobenzene	ug/kg	ND	2130	2140	1570	1500	74	70	30-125	5	30		
1-Methylnaphthalene	ug/kg	ND	2130	2140	1740	1900	81	89	42-125	9	30		
2,4,5-Trichlorophenol	ug/kg	ND	2130	2140	1690	1950	80	91	30-150	14	30		
2,4,6-Trichlorophenol	ug/kg	ND	2130	2140	1750	1990	82	93	30-150	13	30		
2,4-Dichlorophenol	ug/kg	ND	2130	2140	1820	1980	85	93	30-135	8	30		
2,4-Dimethylphenol	ug/kg	ND	2130	2140	1770	1930	83	90	30-148	9	30		
2,4-Dinitrophenol	ug/kg	ND	2130	2140	ND	ND	0	0	30-125		30	M1	
2,4-Dinitrotoluene	ug/kg	ND	2130	2140	1630	1760	77	82	30-150	7	30		
2,6-Dinitrotoluene	ug/kg	ND	2130	2140	1630	1820	77	85	30-150	11	30		
2-Chloronaphthalene	ug/kg	ND	2130	2140	1700	1930	80	90	30-138	13	30		
2-Chlorophenol	ug/kg	ND	2130	2140	1680	1720	79	80	30-130	2	30		
2-Methylnaphthalene	ug/kg	ND	2130	2140	1700	1860	79	87	46-125	9	30		
2-Methylphenol(o-Cresol)	ug/kg	ND	2130	2140	1720	1840	81	86	30-133	6	30		
2-Nitroaniline	ug/kg	ND	2130	2140	1830	2180	86	102	30-150	17	30		
2-Nitrophenol	ug/kg	ND	2130	2140	1360	1410	64	66	30-134	4	30		
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	2130	2140	1740	1870	82	88	30-138	7	30		
3,3'-Dichlorobenzidine	ug/kg	ND	2130	2140	1780	1880	84	88	30-149	5	30		
3-Nitroaniline	ug/kg	ND	2130	2140	1680	1930	79	91	30-150	14	30		
4,6-Dinitro-2-methylphenol	ug/kg	ND	2130	2140	259J	ND	12	0	30-133		30	7M, M1	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896986 2896987												
Parameter	Units	MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		10427642001	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec				
4-Bromophenylphenyl ether	ug/kg	ND	2130	2140	1750	1930	82	90	44-125	9	30	
4-Chloro-3-methylphenol	ug/kg	ND	2130	2140	1910	2070	90	97	30-150	8	30	
4-Chloroaniline	ug/kg	ND	2130	2140	996	1070	47	50	30-125	7	30	
4-Chlorophenylphenyl ether	ug/kg	ND	2130	2140	1710	1990	81	93	44-125	15	30	
4-Nitroaniline	ug/kg	ND	2130	2140	1850	2240	87	105	30-150	19	30	
4-Nitrophenol	ug/kg	ND	2130	2140	1520	1800	71	84	30-150	17	30	
Acenaphthene	ug/kg	ND	2130	2140	1610	1840	73	84	40-125	13	30	
Acenaphthylene	ug/kg	ND	2130	2140	1690	1910	79	90	30-150	13	30	
Anthracene	ug/kg	ND	2130	2140	1760	1990	77	88	30-150	13	30	
Benzo(a)anthracene	ug/kg	ND	2130	2140	2080	2270	85	94	30-150	9	30	
Benzo(a)pyrene	ug/kg	ND	2130	2140	1990	2290	81	95	30-150	14	30	
Benzo(b)fluoranthene	ug/kg	ND	2130	2140	2120	2370	83	95	30-150	11	30	
Benzo(g,h,i)perylene	ug/kg	ND	2130	2140	1920	2210	82	95	30-150	14	30	
Benzo(k)fluoranthene	ug/kg	ND	2130	2140	1940	2190	84	95	30-150	12	30	
bis(2-Chloroethoxy)methane	ug/kg	ND	2130	2140	1670	1760	78	83	30-134	6	30	
bis(2-Chloroethyl) ether	ug/kg	ND	2130	2140	1590	1570	75	74	30-125	1	30	
bis(2-Chloroisopropyl) ether	ug/kg	ND	2130	2140	1300	1290	61	61	30-125	0	30	7M
bis(2-Ethylhexyl)phthalate	ug/kg	ND	2130	2140	2220	2540	98	113	30-150	14	30	
Butylbenzylphthalate	ug/kg	ND	2130	2140	2110	2580	97	119	30-150	20	30	
Carbazole	ug/kg	ND	2130	2140	1800	2040	82	93	41-125	12	30	
Chrysene	ug/kg	ND	2130	2140	2040	2290	83	95	30-150	11	30	
Di-n-butylphthalate	ug/kg	ND	2130	2140	1880	2150	88	101	30-150	14	30	
Di-n-octylphthalate	ug/kg	ND	2130	2140	2090	2370	98	111	30-150	13	30	
Dibenz(a,h)anthracene	ug/kg	ND	2130	2140	1870	2110	88	99	30-150	12	30	
Dibenzofuran	ug/kg	ND	2130	2140	1720	1980	80	92	45-125	14	30	
Diethylphthalate	ug/kg	ND	2130	2140	1760	2070	83	97	30-150	16	30	
Dimethylphthalate	ug/kg	ND	2130	2140	1800	2040	85	96	30-150	12	30	
Fluoranthene	ug/kg	565	2130	2140	2230	2380	78	85	30-150	7	30	
Fluorene	ug/kg	ND	2130	2140	1710	1950	78	89	30-150	13	30	
Hexachloro-1,3-butadiene	ug/kg	ND	2130	2140	1600	1620	75	76	30-128	2	30	
Hexachlorobenzene	ug/kg	ND	2130	2140	1760	1950	83	91	30-150	10	30	
Hexachloroethane	ug/kg	ND	2130	2140	642	673	30	32	30-125	5	30	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	2130	2140	1930	2210	84	97	30-150	14	30	
Isophorone	ug/kg	ND	2130	2140	1650	1750	78	82	30-140	6	30	
N-Nitroso-di-n-propylamine	ug/kg	ND	2130	2140	1610	1670	76	78	30-147	3	30	
N-Nitrosodimethylamine	ug/kg	ND	2130	2140	1640	1450	77	68	30-125	12	30	
N-Nitrosodiphenylamine	ug/kg	ND	2130	2140	1810	2020	85	94	30-150	11	30	
Naphthalene	ug/kg	ND	2130	2140	1660	1730	78	81	44-125	4	30	
Nitrobenzene	ug/kg	ND	2130	2140	1600	1640	75	77	30-136	2	30	
Pentachlorophenol	ug/kg	ND	2130	2140	1430	1530	67	72	30-150	7	30	
Phenanthrene	ug/kg	ND	2130	2140	1800	2050	67	79	30-150	13	30	
Phenol	ug/kg	ND	2130	2140	1600	1720	75	81	30-129	7	30	
Pyrene	ug/kg	511	2130	2140	2370	2530	87	95	30-150	7	30	
2,4,6-Tribromophenol (S)	%						69	80	60-125			
2-Fluorobiphenyl (S)	%						49	53	30-132			
2-Fluorophenol (S)	%						63	59	40-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Parameter	Units	2896986		2896987		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Nitrobenzene-d5 (S)	%.					57	54	43-125			
p-Terphenyl-d14 (S)	%.					76	86	62-125			
Phenol-d6 (S)	%.					64	65	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 533341 Analysis Method: EPA 8270D by SIM
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2897115 Matrix: Solid
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/20/18 12:15	
Acenaphthylene	ug/kg	ND	10.0	04/20/18 12:15	
Anthracene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(a)anthracene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(a)pyrene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/20/18 12:15	
Chrysene	ug/kg	ND	10.0	04/20/18 12:15	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/20/18 12:15	
Fluoranthene	ug/kg	ND	10.0	04/20/18 12:15	
Fluorene	ug/kg	ND	10.0	04/20/18 12:15	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/20/18 12:15	
Naphthalene	ug/kg	ND	10.0	04/20/18 12:15	
Phenanthrene	ug/kg	ND	10.0	04/20/18 12:15	
Pyrene	ug/kg	ND	10.0	04/20/18 12:15	
2-Fluorobiphenyl (S)	%	72	42-125	04/20/18 12:15	
p-Terphenyl-d14 (S)	%	88	57-125	04/20/18 12:15	

LABORATORY CONTROL SAMPLE: 2897116

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	25.3	76	52-125	
Acenaphthylene	ug/kg	33.3	24.9	75	50-125	
Anthracene	ug/kg	33.3	26.9	81	65-125	
Benzo(a)anthracene	ug/kg	33.3	29.0	87	60-125	
Benzo(a)pyrene	ug/kg	33.3	27.9	84	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	30.3	91	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	29.6	89	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	30.6	92	67-125	
Chrysene	ug/kg	33.3	30.1	90	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	30.5	92	63-125	
Fluoranthene	ug/kg	33.3	29.5	88	75-125	
Fluorene	ug/kg	33.3	25.5	77	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	30.0	90	63-125	
Naphthalene	ug/kg	33.3	24.8	75	49-125	
Phenanthrene	ug/kg	33.3	27.8	83	65-125	
Pyrene	ug/kg	33.3	28.2	85	64-125	
2-Fluorobiphenyl (S)	%			76	42-125	
p-Terphenyl-d14 (S)	%			89	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Parameter	Units	2897117		2897118		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Acenaphthene	ug/kg	49.1	46	46.2	130	103	177	117	30-125	24	30 M1
Acenaphthylene	ug/kg	ND	46	46.2	37.4	38.8	81	84	30-133	4	30
Anthracene	ug/kg	94.1	46	46.2	96.2	163	4	149	30-150	51	30 M1,R1
Benzo(a)anthracene	ug/kg	660	46	46.2	111	85.5	-1190	-1250	30-150	25	30 M1
Benzo(a)pyrene	ug/kg	680	46	46.2	109	79.9	-1240	-1300	30-150	31	30 M1,R1
Benzo(b)fluoranthene	ug/kg	879	46	46.2	138	101	-1610	-1690	30-150	31	30 M1,R1
Benzo(g,h,i)perylene	ug/kg	358	46	46.2	81.6	66.3	-599	-632	30-150	21	30 M1
Benzo(k)fluoranthene	ug/kg	293	46	46.2	75.1	59.2	-473	-507	30-150	24	30 M1
Chrysene	ug/kg	570	46	46.2	112	101	-996	-1020	30-150	10	30 M1
Dibenz(a,h)anthracene	ug/kg	88.8	46	46.2	49.0	45.5	-86	-94	30-131	7	30 M1
Fluoranthene	ug/kg	1040	46	46.2	241	169	-1720	-1880	30-150	35	30 M1,R1
Fluorene	ug/kg	43.3	46	46.2	96.7	112	116	148	30-147	14	30 M1
Indeno(1,2,3-cd)pyrene	ug/kg	308	46	46.2	71.6	62.1	-514	-534	30-150	14	30 M1
Naphthalene	ug/kg	106	46	46.2	222	190	252	182	30-131	16	30 M1
Phenanthrene	ug/kg	318	46	46.2	240	256	-169	-135	30-150	6	30 M1
Pyrene	ug/kg	872	46	46.2	191	139	-1480	-1590	30-150	32	30 M1,R1
2-Fluorobiphenyl (S)	%.						81	83	42-125		
p-Terphenyl-d14 (S)	%.						82	90	57-125		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 533207 Analysis Method: WI MOD DRO
 QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2896541 Matrix: Solid
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	04/20/18 15:21	
n-Triacontane (S)	%.	90	50-150	04/20/18 15:21	

LABORATORY CONTROL SAMPLE & LCSD: 2896542

Parameter	Units	2896543								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	72.5	70.0	91	87	70-120	4	20	
n-Triacontane (S)	%.				98	89	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427642

QC Batch: 438492 Analysis Method: EPA 7196A
QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
Associated Lab Samples: 10427642001

METHOD BLANK: 2026403 Matrix: Solid
Associated Lab Samples: 10427642001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/24/18 13:00	

LABORATORY CONTROL SAMPLE: 2026404

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1010	924	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026421 2026422

Parameter	Units	10427291008 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Chromium, Hexavalent	mg/kg	ND	1080	1150	839	962	77	84	75-125	14	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026423 2026424

Parameter	Units	10427291008 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Chromium, Hexavalent	mg/kg	ND	42.9	42.7	28.6	29.2	67	68	75-125	2	20	M3

SAMPLE DUPLICATE: 2026425

Parameter	Units	10427354004 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427642

QC Batch: 439469 Analysis Method: EPA 7196A
QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
Associated Lab Samples: 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2030574 Matrix: Solid
Associated Lab Samples: 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/30/18 13:42	

LABORATORY CONTROL SAMPLE: 2030575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1100	980	89	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2030576 2030577

Parameter	Units	50194874001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	1180	1120	1190	1120	100	100	75-125	6	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2030578 2030579

Parameter	Units	50194874001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	46.6	46.4	28.6	26.1	54	49	75-125	9	20	M3

SAMPLE DUPLICATE: 2030580

Parameter	Units	10427642002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427642

QC Batch: 286937 Analysis Method: EPA 9012
QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 1678360 Matrix: Solid
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/25/18 13:16	

LABORATORY CONTROL SAMPLE: 1678361

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.1	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1678362 1678363

Parameter	Units	10427642001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Cyanide	mg/kg	0.52	3.72	4.0	3.72	4.1	93	97	80-120	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1678364 1678365

Parameter	Units	10428096003 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Cyanide	mg/kg	0.45	2.7	3.5	2.6	2.7	112	87	80-120	25	20	M0,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427642

QC Batch: 141337 Analysis Method: EPA 9056A
QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 559083 Matrix: Solid
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	1.0	04/25/18 23:33	

LABORATORY CONTROL SAMPLE: 559082

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	49.8	55.2	111	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559084 559085

Parameter	Units	10427642003 Result	559084		559085		% Rec	MSD	% Rec	MSD	% Rec	Limits	RPD	Max RPD	Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result									
Fluoride	mg/kg	ND	49.3	49.7	34.2	29.5	69	59	80-120	15	20	M1			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559086 559087

Parameter	Units	10427642001 Result	559086		559087		% Rec	MSD	% Rec	MSD	% Rec	Limits	RPD	Max RPD	Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result									
Fluoride	mg/kg	ND	50.5	49.3	21.2	19.1	42	39	80-120	10	20	M1			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth

PASI-G Pace Analytical Services - Green Bay

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10427642

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

ANALYTE QUALIFIERS

1M Analysis suggests sample and QC sample duplicate are non-homogeneous. Results confirmed by second analysis.

2M Sample was black in color and slightly viscous. Sample was centrifuged and decanted prior to analysis.

3M Sample was black in color and viscous. Sample was centrifuged and decanted prior to analysis.

4M Sample was black in color.

5M Sample was brown in color.

6M Sample was dark brown in color.

7M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

ANALYTE QUALIFIERS

- D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
- D4 Sample was diluted due to the presence of high levels of target analytes.
- D6 The precision between the sample and sample duplicate exceeded laboratory control limits.
- L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
- L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.
- N2 The lab does not hold NELAC/TNI accreditation for this parameter.
- N3 Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
- P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
- R1 RPD value was outside control limits.
- S0 Surrogate recovery outside laboratory control limits.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.
- S5 Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
- SS This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.
- T6 High boiling point hydrocarbons are present in the sample.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427642001	FD-TT-09 (4-12 WM)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427642002	FD-TT-10 (2'-10' WM)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427642003	FD-TT-11 (4-12 WM)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427642004	FD-TT-12 (3-12)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427642005	FD-TT-13 (3-12)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427642001	FD-TT-09 (4-12 WM)	EPA 3550	533317	EPA 8081B	534051
10427642002	FD-TT-10 (2'-10' WM)	EPA 3550	533317	EPA 8081B	534051
10427642003	FD-TT-11 (4-12 WM)	EPA 3550	533317	EPA 8081B	534051
10427642004	FD-TT-12 (3-12)	EPA 3550	533317	EPA 8081B	534051
10427642005	FD-TT-13 (3-12)	EPA 3550	533317	EPA 8081B	534051
10427642001	FD-TT-09 (4-12 WM)	EPA 3550	533330	EPA 8082A	533720
10427642002	FD-TT-10 (2'-10' WM)	EPA 3550	533330	EPA 8082A	533720
10427642003	FD-TT-11 (4-12 WM)	EPA 3550	533330	EPA 8082A	533720
10427642004	FD-TT-12 (3-12)	EPA 3550	533330	EPA 8082A	533720
10427642005	FD-TT-13 (3-12)	EPA 3550	533330	EPA 8082A	533720
10427642001	FD-TT-09 (4-12 WM)	WI MOD DRO	533207	WI MOD DRO	533600
10427642002	FD-TT-10 (2'-10' WM)	WI MOD DRO	533207	WI MOD DRO	533600
10427642003	FD-TT-11 (4-12 WM)	WI MOD DRO	533207	WI MOD DRO	533600
10427642004	FD-TT-12 (3-12)	WI MOD DRO	533207	WI MOD DRO	533600
10427642005	FD-TT-13 (3-12)	WI MOD DRO	533207	WI MOD DRO	533600
10427642001	FD-TT-09 (4-12 WM)	EPA 5030 Medium Soil	534800	WI MOD GRO	534916
10427642002	FD-TT-10 (2'-10' WM)	EPA 5030 Medium Soil	534800	WI MOD GRO	534916
10427642003	FD-TT-11 (4-12 WM)	EPA 5030 Medium Soil	534800	WI MOD GRO	534916
10427642004	FD-TT-12 (3-12)	EPA 5030 Medium Soil	534800	WI MOD GRO	534916
10427642005	FD-TT-13 (3-12)	EPA 5030 Medium Soil	534800	WI MOD GRO	534916
10427642001	FD-TT-09 (4-12 WM)	EPA 3050	533415	EPA 6010C	533499
10427642002	FD-TT-10 (2'-10' WM)	EPA 3050	533415	EPA 6010C	533499
10427642003	FD-TT-11 (4-12 WM)	EPA 3050	533415	EPA 6010C	533499
10427642004	FD-TT-12 (3-12)	EPA 3050	533415	EPA 6010C	533499
10427642005	FD-TT-13 (3-12)	EPA 3050	533415	EPA 6010C	533499
10427642001	FD-TT-09 (4-12 WM)	EPA 3050B	438855	EPA 6020	439080
10427642002	FD-TT-10 (2'-10' WM)	EPA 3050B	438855	EPA 6020	439080
10427642003	FD-TT-11 (4-12 WM)	EPA 3050B	438855	EPA 6020	439080
10427642004	FD-TT-12 (3-12)	EPA 3050B	438855	EPA 6020	439080
10427642005	FD-TT-13 (3-12)	EPA 3050B	438855	EPA 6020	439080
10427642001	FD-TT-09 (4-12 WM)	EPA 3050	533412	EPA 6020A	533510
10427642002	FD-TT-10 (2'-10' WM)	EPA 3050	533412	EPA 6020A	533510
10427642003	FD-TT-11 (4-12 WM)	EPA 3050	533412	EPA 6020A	533510
10427642004	FD-TT-12 (3-12)	EPA 3050	533412	EPA 6020A	533510
10427642005	FD-TT-13 (3-12)	EPA 3050	533412	EPA 6020A	533510
10427642001	FD-TT-09 (4-12 WM)	EPA 7471	533419	EPA 7471	533655
10427642002	FD-TT-10 (2'-10' WM)	EPA 7471	533419	EPA 7471	533655
10427642003	FD-TT-11 (4-12 WM)	EPA 7471	533419	EPA 7471	533655
10427642004	FD-TT-12 (3-12)	EPA 7471	533419	EPA 7471	533655
10427642005	FD-TT-13 (3-12)	EPA 7471	533419	EPA 7471	533655

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427642001	FD-TT-09 (4-12 WM)	ASTM D2974	534034		
10427642002	FD-TT-10 (2'-10' WM)	ASTM D2974	534034		
10427642003	FD-TT-11 (4-12 WM)	ASTM D2974	534034		
10427642004	FD-TT-12 (3-12)	ASTM D2974	534034		
10427642005	FD-TT-13 (3-12)	ASTM D2974	534034		
10427642001	FD-TT-09 (4-12 WM)	EPA 3550	533315	EPA 8270D	533819
10427642002	FD-TT-10 (2'-10' WM)	EPA 3550	533315	EPA 8270D	533819
10427642003	FD-TT-11 (4-12 WM)	EPA 3550	533315	EPA 8270D	533819
10427642004	FD-TT-12 (3-12)	EPA 3550	533315	EPA 8270D	533819
10427642005	FD-TT-13 (3-12)	EPA 3550	533315	EPA 8270D	533819
10427642005	FD-TT-13 (3-12)	EPA 3550	533315	EPA 8270D	533819
10427642001	FD-TT-09 (4-12 WM)	EPA 3550	533341	EPA 8270D by SIM	533540
10427642002	FD-TT-10 (2'-10' WM)	EPA 3550	533341	EPA 8270D by SIM	533540
10427642003	FD-TT-11 (4-12 WM)	EPA 3550	533341	EPA 8270D by SIM	533540
10427642004	FD-TT-12 (3-12)	EPA 3550	533341	EPA 8270D by SIM	533540
10427642005	FD-TT-13 (3-12)	EPA 3550	533341	EPA 8270D by SIM	533540
10427642001	FD-TT-09 (4-12 WM)	EPA 5035/5030B	534461	EPA 8260B	534737
10427642002	FD-TT-10 (2'-10' WM)	EPA 5035/5030B	534461	EPA 8260B	534737
10427642003	FD-TT-11 (4-12 WM)	EPA 5035/5030B	534461	EPA 8260B	534737
10427642004	FD-TT-12 (3-12)	EPA 5035/5030B	534461	EPA 8260B	534737
10427642005	FD-TT-13 (3-12)	EPA 5035/5030B	534461	EPA 8260B	534737
10427642001	FD-TT-09 (4-12 WM)	EPA 3060A	438492	EPA 7196A	438766
10427642002	FD-TT-10 (2'-10' WM)	EPA 3060A	439469	EPA 7196A	439714
10427642003	FD-TT-11 (4-12 WM)	EPA 3060A	439469	EPA 7196A	439714
10427642004	FD-TT-12 (3-12)	EPA 3060A	439469	EPA 7196A	439714
10427642005	FD-TT-13 (3-12)	EPA 3060A	439469	EPA 7196A	439714
10427642001	FD-TT-09 (4-12 WM)	Trivalent Chromium Calculation	440098		
10427642002	FD-TT-10 (2'-10' WM)	Trivalent Chromium Calculation	440098		
10427642003	FD-TT-11 (4-12 WM)	Trivalent Chromium Calculation	440098		
10427642004	FD-TT-12 (3-12)	Trivalent Chromium Calculation	440098		
10427642005	FD-TT-13 (3-12)	Trivalent Chromium Calculation	440098		
10427642001	FD-TT-09 (4-12 WM)	EPA 9012A	286937	EPA 9012	286958
10427642002	FD-TT-10 (2'-10' WM)	EPA 9012A	286937	EPA 9012	286958
10427642003	FD-TT-11 (4-12 WM)	EPA 9012A	286937	EPA 9012	286958
10427642004	FD-TT-12 (3-12)	EPA 9012A	286937	EPA 9012	286958
10427642005	FD-TT-13 (3-12)	EPA 9012A	286937	EPA 9012	286958
10427642001	FD-TT-09 (4-12 WM)	EPA 300.0	141337	EPA 9056A	141349
10427642002	FD-TT-10 (2'-10' WM)	EPA 300.0	141337	EPA 9056A	141349
10427642003	FD-TT-11 (4-12 WM)	EPA 300.0	141337	EPA 9056A	141349
10427642004	FD-TT-12 (3-12)	EPA 300.0	141337	EPA 9056A	141349
10427642005	FD-TT-13 (3-12)	EPA 300.0	141337	EPA 9056A	141349

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427642

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
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REPORT OF LABORATORY ANALYSIS

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WO# 10427642



Minnesota Pollution Control Agency

Chain-of-Custody Form

Work Order Number:

Turnaround Time:

10427642

of

LAB USE ONLY

PROJECT/CLIENT INFO

LABORATORY

Facility Code: *MPCA-Freeway LF solids* Program Code (MDR Lab Only):

Lab Name:

Project Name: *MPCA-Freeway LF solids* Project Task Code:

Address:

*18-00383
EPIC Profile #38716*

Project Manager:

Phone No:

Potential Hazard?

If yes, add information to Sampler Comments Section

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 S=Routine Sample
 S-IVP=Integrated Vertical Profile Sample
 S-CWOP=Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES
 DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES
 Ww-Ground=Groundwater
 Ws-Surf=Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in feet	End Depth, in feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	Lab Sample No.	#	
FD-TT-09	S	4/17/18	9:20	4'	12'	C	SD	WM			13	X	X									001	1
FD-TT-10	S	4/17/18	12:15	2'	10'	C	SD	WM			13	X	X									002	2
FD-TT-11	S	4/17/18	13:24	4'	12'	C	SD	WM			13	X	X									003	3
FD-TT-12	S	4/17/18	14:37	3'	12'	C	SD	WM			13	X	X									004	4
FD-TT-B(3-12)	S	4/17/18	15:33	3'	12'	C	SD	WM			13	X	X									005	5
																							6
																							7
																							8
																							9
																							10

see attached for soils/waste (-Dioxins) + Dioxins

Sampled By: _____ Sampler's Signature: _____ Phone #: _____

Receiving Comments: _____

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
<i>Noty Richard / Pace</i>	<i>4/17/18 1730</i>	<i>MCA Pace</i>	<i>4/17/18 1730</i>

1730
T=9.6

Sample Condition Upon Receipt

Client Name: mn Pollution Control Project #: WO# : 10427642

WO# : 10427642
 PM: JMA Due Date: 05/02/18
 CLIENT: ASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No *4/17/18*

Thermometer Used: 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 9.4 Cooler Temp Corrected (°C): 9.6 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: ET 4/17/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <i>4/17/18</i> <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2. No "list" included
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. <i>4/17/18</i>
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: [Signature] Date: 04/19/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigaiton Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Litium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Sample Condition Upon Receipt

Client Name: Pace MN
 Project #: _____
 Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

WO# : 12107383
 PM: HRZ Due Date: 05/02/18
 CLIENT: PACE MPLS

Tracking Number: _____
 Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No
 Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun
 Cooler Temp Read °C: 5.1 Cooler Temp Corrected °C: 5.4 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: -0.3 Date and Initials of Person Examining Contents: 4-20-18 DC
 Comments: BM 4/20/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SK</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Caitlin Date: 4/20/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Sample Preservation Receipt Form

Client Name: Pace MW

Project # 40167758

All containers needing preservation have been checked and noted below: Yes No N/A

Initial when completed:

Date/Time:

Lab Lot# of pH paper:

Lab Std #ID of preservation (if pH adjusted):

Pace Lab #	Glass						Plastic						Vials				Jars			General			VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)					
	AG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP2N	BP2Z	BP3U	BP3C	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU								WPFU	SP5T	ZPLC	GN	
001																																		2.5 / 5 / 10
002																																		2.5 / 5 / 10
003																																		2.5 / 5 / 10
004																																		2.5 / 5 / 10
005																																		2.5 / 5 / 10
006																																		2.5 / 5 / 10
007																																		2.5 / 5 / 10
008																																		2.5 / 5 / 10
009																																		2.5 / 5 / 10
010																																		2.5 / 5 / 10
011																																		2.5 / 5 / 10
012																																		2.5 / 5 / 10
013																																		2.5 / 5 / 10
014																																		2.5 / 5 / 10
015																																		2.5 / 5 / 10
016																																		2.5 / 5 / 10
017																																		2.5 / 5 / 10
018																																		2.5 / 5 / 10
019																																		2.5 / 5 / 10
020																																		2.5 / 5 / 10

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm) : Yes No N/A *If yes look in headspace column

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	DG9A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO3	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL		
AG5U	100 mL amber glass unpres	BP3C	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres	BP3S	250 mL plastic H2SO4			GN:	



Document Name:
Sample Condition Upon Receipt (SCUR)
 Document No.:
F-GB-C-031-rev.06

Document Revised: 31Jan2018
 Issuing Authority:
 Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #:

Client Name: Pace MN

WO# : 40167733

40167733

Courier: CS Logistics Fed Ex Speedee UPS Waltco
 Client Pace Other: _____

Tracking #: 1697357

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Custody Seal on Samples Present: yes no Seals intact: yes no

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR - 66 Type of Ice: Wet Blue Dry None

Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 3 / Corr: 3.5

Temp Blank Present: yes no

Biological Tissue is Frozen: yes no

Person examining contents:
 Date: 4/20/18
 Initials: RS

Temp should be above freezing to 6°C.
 Biota Samples may be received at ≤ 0°C.

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>IRWU RS 4/20/18</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
-Pace IR Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>NO collect times on client labels</u> <u>RS 4/20/18</u>
-Includes date/time/ID/Analysis Matrix: <u>S</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: _____ If checked, see attached form for additional comments
 Person Contacted: _____ Date/Time: _____
 Comments/ Resolution: _____

Project Manager Review: CKV

Date: 4/20/18

Chain of Custody

WO#: 12107383
 PM: HRZ Due Date: 05/04/18
 CLIENT: PACE MPLS

Page 83 of 100

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427642 Workorder Name: 18-00383 MPCA-Freeway LF Solid Owner Received Date: 4/17/2018 Results Requested By: 5/2/2018

Report To		Subcontract To				Requested Analysis																						
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Duluth 4730 Oneota St. Duluth, MN 55807 Phone (218)727-6380																										
						Preserved Containers					Methyl Mercury by 1630					LAB USE ONLY												
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved																						
1	FD-TT-09 (4-12 WM)	PS	4/17/2018 09:20	10427642001	Solid	1																						
2	FD-TT-10 (2'-10' WM)	PS	4/17/2018 12:15	10427642002	Solid	1																						
3	FD-TT-11 (4-12 WM)	PS	4/17/2018 13:24	10427642003	Solid	1																						
4	FD-TT-12 (3-12)	PS	4/17/2018 14:37	10427642004	Solid	1																						
5	FD-TT-13 (3-12)	PS	4/17/2018 15:30	10427642005	Solid	1																						
												Comments																
Transfers	Released By	Date/Time	Received By	Date/Time																								
1	<i>[Signature]</i>	4/19/18 17:20	<i>[Signature]</i>	4-19-18 19:30																								
2	<i>[Signature]</i>	4-19-18 23:15	<i>[Signature]</i>	4/20/18 08:00																								
3																												
Cooler Temperature on Receipt 4.0 °C		Custody Seal <input checked="" type="checkbox"/> or N		Received on Ice <input checked="" type="checkbox"/> or N		Samples Intact <input checked="" type="checkbox"/> or N																						

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: PACE MPLS Project #: _____

WO#: 12107383

PM: HRZ Due Date: 05/04/18

CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 01339252/1710 IR-1 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 4.0 Cooler Temp Corrected °C: 4.8 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6°C Correction Factor: 0.0 Date and Initials of Person Examining Contents: 4/20/18 *[Signature]*

If temperature is ≤0°C, is there evidence of ice formation? Yes No NA

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____ Date: _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50194903

Date/Time and Initials of person examining contents: JH 4-20-18 954

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 2530

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 123456ABCDEF Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 2.2/2.5 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		<input checked="" type="checkbox"/>	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			<input checked="" type="checkbox"/>
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		<input checked="" type="checkbox"/>	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			<input checked="" type="checkbox"/>
Chain of Custody Present:	<input checked="" type="checkbox"/>		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>		Dissolved Metals field filtered?:			<input checked="" type="checkbox"/>
Short Hold Time Analysis (<72hr)? Analysis:		<input checked="" type="checkbox"/>	Headspace Wisconsin Sulfide			<input checked="" type="checkbox"/>
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	<u>Present</u>	<u>Absent</u>	<u>N/A</u>
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			<input checked="" type="checkbox"/>
Rush TAT Requested:		<input checked="" type="checkbox"/>	Headspace in VOA Vials (>6mm):			<input checked="" type="checkbox"/>
Containers Intact?:	<input checked="" type="checkbox"/>		Trip Blank Present?:		<input checked="" type="checkbox"/>	
Sample Labels Match COC?: Except TCs, which only require sample ID	<input checked="" type="checkbox"/>		Trip Blank Custody Seals?:		<input checked="" type="checkbox"/>	

Comments:

Sample Container Count

CLIENT: Pace MN

WO#: 50194903



COC PAGE ___ of ___

COC ID# _____

Project # 50194903

Sample Line Item	DG9H VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	Matrix S (Soil/Wa Aqueous	pH <2	pH >9	pH >1	
1																			Sc			
2																			Sc			
3																			Sc			
4																			Sc			
5																			St			
6																						
7																						
8																						
9																						
10																						
11																						
12																						

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
WGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				

Page 87 of 100



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 28, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Solid - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/20/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427642
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-TT-09 (4-12 WM) (10427642001)	A181623-01	Solid	04/17/2018	04/20/2018
FD-TT-10 (2'-10' WM) (10427642002)	A181623-02	Solid	04/17/2018	04/20/2018
FD-TT-11 (4-12 WM) (10427642003)	A181623-03	Solid	04/17/2018	04/20/2018
FD-TT-12 (3-12) (10427642004)	A181623-04	Solid	04/17/2018	04/20/2018
FD-TT-13 (3-12) (10427642005)	A181623-05	Solid	04/17/2018	04/20/2018

CASE NARRATIVE

Sample Receipt Information:

5 samples were received on 04/20/2018. Samples were received at 2.3 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Laboratory Control Samples (LCS):

The LC footnote on sample A181623-05 states that there was a low CCV recovery for bentazon. The lower control limit is 85% and the lowest recovery was 83.2%.



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427642
 Project Manager: Jennifer Anderson

FD-TT-09 (4-12 WM) (10427642001)

A181623-01 (Solid)

Date Sampled
04/17/2018 09:20

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804178

2,4-D	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 08:02	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 08:02	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 08:02	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 08:02	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 08:02	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 08:42	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 08:02	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 08:02	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 08:02	EPA 8321B	
<i>Surrogate: DCAA</i>		83.5 %		70.8-116	04/22/2018	04/23/2018 08:02	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	67.3	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427642
 Project Manager: Jennifer Anderson

FD-TT-10 (2'-10' WM) (10427642002)
A181623-02 (Solid)

Date Sampled
 04/17/2018 12:15

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804178

2,4-D	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 09:10	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 09:48	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 09:10	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 09:10	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 09:10	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 09:10	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 09:10	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 09:10	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 09:10	EPA 8321B	
Surrogate: DCAA		84.3 %		70.8-116	04/22/2018	04/23/2018 09:10	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	79.1	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427642
 Project Manager: Jennifer Anderson

FD-TT-11 (4-12 WM) (10427642003)

A181623-03 (Solid)

Date Sampled
04/17/2018 13:24

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804178

2,4-D	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 10:54	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 10:17	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 10:17	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 10:54	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 10:17	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 10:17	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 10:17	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 10:17	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 10:17	EPA 8321B	
Surrogate: DCAA		87.6 %		70.8-116	04/22/2018	04/23/2018 10:17	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	78.3	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427642
Project Manager: Jennifer Anderson

FD-TT-12 (3-12) (10427642004)
A181623-04 (Solid)

Date Sampled
04/17/2018 14:37

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804178

2,4-D	0.13	0.10	mg/kg dry	1	04/22/2018	04/23/2018 12:00	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 12:00	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 11:24	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 11:24	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 11:24	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 11:24	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 11:24	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 11:24	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 11:24	EPA 8321B	

Surrogate: DCAA 87.5 % 70.8-116 04/22/2018 04/23/2018 11:24 EPA 8321B

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	72.4	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427642
Project Manager: Jennifer Anderson

FD-TT-13 (3-12) (10427642005)

A181623-05 (Solid)

Date Sampled
04/17/2018 15:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804178

2,4-D	0.18	0.10	mg/kg dry	1	04/22/2018	04/23/2018 12:31	EPA 8321B	P
2,4-DB	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 13:06	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 13:06	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 12:31	EPA 8321B	
Bentazon	0.31	0.10	mg/kg dry	1	04/22/2018	04/23/2018 13:06	EPA 8321B	LC, P
Dicamba	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 12:31	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 12:31	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 12:31	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 13:06	EPA 8321B	
<i>Surrogate: DCAA</i>		<i>80.7 %</i>	<i>70.8-116</i>		<i>04/22/2018</i>	<i>04/23/2018 12:31</i>	<i>EPA 8321B</i>	

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	62.5	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427642
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804178 - EPA 3570

Blank (A804178-BLK1)										
Prepared: 04/22/2018 Analyzed: 04/22/2018 20:52										
2,4-D	ND	0.10	mg/kg wet							
2,4-D [2C]	ND	0.10	mg/kg wet							
2,4-DB	ND	0.10	mg/kg wet							
2,4-DB [2C]	ND	0.10	mg/kg wet							
2,4,5-T	ND	0.10	mg/kg wet							
2,4,5-T [2C]	ND	0.10	mg/kg wet							
2,4,5-TP	ND	0.10	mg/kg wet							
2,4,5-TP [2C]	ND	0.10	mg/kg wet							
Bentazon	ND	0.10	mg/kg wet							
Bentazon [2C]	ND	0.10	mg/kg wet							
Dicamba	ND	0.10	mg/kg wet							
Dicamba [2C]	ND	0.10	mg/kg wet							
MCPA	ND	0.10	mg/kg wet							
MCPA [2C]	ND	0.10	mg/kg wet							
Picloram	ND	0.10	mg/kg wet							
Picloram [2C]	ND	0.10	mg/kg wet							
Triclopyr	ND	0.10	mg/kg wet							
Triclopyr [2C]	ND	0.10	mg/kg wet							
Surrogate: DCAA	19.9		mg/kg wet	20.00		99.7	70.8-116			
Surrogate: DCAA [2C]	17.9		mg/kg wet	20.00		89.4	62.3-114			

LCS (A804178-BS1)										
Prepared: 04/22/2018 Analyzed: 04/22/2018 19:45										
2,4-D	1.89	0.10	mg/kg wet	2.000		94.5	81.6-107			
2,4-D [2C]	1.73	0.10	mg/kg wet	2.000		86.5	71.8-120			
2,4-DB	1.77	0.10	mg/kg wet	2.000		88.7	76.4-107			
2,4-DB [2C]	1.66	0.10	mg/kg wet	2.000		82.9	62.2-129			
2,4,5-T	1.96	0.10	mg/kg wet	2.000		98.0	81.2-110			
2,4,5-T [2C]	1.87	0.10	mg/kg wet	2.000		93.6	70.6-125			
2,4,5-TP	1.86	0.10	mg/kg wet	2.000		92.8	79.1-106			
2,4,5-TP [2C]	1.74	0.10	mg/kg wet	2.000		86.9	68.2-118			
Bentazon	1.02	0.10	mg/kg wet	1.000		102	82.5-119			
Bentazon [2C]	0.877	0.10	mg/kg wet	1.000		87.7	73.3-125			
Dicamba	1.93	0.10	mg/kg wet	2.000		96.3	85.1-108			
Dicamba [2C]	1.83	0.10	mg/kg wet	2.000		91.4	71.4-115			
Picloram	0.978	0.10	mg/kg wet	1.000		97.8	86.1-106			
Picloram [2C]	0.846	0.10	mg/kg wet	1.000		84.6	74.5-114			
Triclopyr	1.86	0.10	mg/kg wet	2.000		92.9	78.6-106			
Triclopyr [2C]	1.71	0.10	mg/kg wet	2.000		85.6	69.4-118			
Surrogate: DCAA	19.8		mg/kg wet	20.00		98.9	70.8-116			
Surrogate: DCAA [2C]	18.3		mg/kg wet	20.00		91.7	62.3-114			

LCS (A804178-BS2)										
Prepared: 04/22/2018 Analyzed: 04/22/2018 18:37										
MCPA	2.14	0.10	mg/kg wet	2.000		107	79.4-116			
MCPA [2C]	1.92	0.10	mg/kg wet	2.000		95.9	77-123			



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Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427642
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804178 - EPA 3570

LCS (A804178-BS2)

Prepared: 04/22/2018 Analyzed: 04/22/2018 18:37

Surrogate: DCAA	19.9		mg/kg wet	20.00		99.4	70.8-116			
Surrogate: DCAA [2C]	20.2		mg/kg wet	20.00		101	62.3-114			

Matrix Spike (A804178-MS1)

Source: A181624-02

Prepared: 04/22/2018 Analyzed: 04/22/2018 23:06

2,4-D	2.05	0.10	mg/kg dry	2.490	ND	82.5	71.4-105			
2,4-D [2C]	1.94	0.10	mg/kg dry	2.490	0.220	69.1	50.5-123			
2,4-DB	1.91	0.10	mg/kg dry	2.490	0.0501	74.6	46.4-117			
2,4-DB [2C]	1.76	0.10	mg/kg dry	2.490	0.252	60.6	44.5-121			
2,4,5-T	2.16	0.10	mg/kg dry	2.490	ND	86.8	66.2-110			
2,4,5-T [2C]	1.87	0.10	mg/kg dry	2.490	ND	75.2	43.6-126			
2,4,5-TP	2.01	0.10	mg/kg dry	2.490	0.199	72.7	52.4-114			
2,4,5-TP [2C]	1.61	0.10	mg/kg dry	2.490	0.219	55.8	47.6-117			
Bentazon	1.13	0.10	mg/kg dry	1.245	ND	91.0	61.5-117			
Bentazon [2C]	1.20	0.10	mg/kg dry	1.245	ND	96.2	50.7-127			
Dicamba	1.71	0.10	mg/kg dry	2.490	ND	68.7	48.4-111			
Dicamba [2C]	1.86	0.10	mg/kg dry	2.490	0.290	63.1	43.3-108			
Picloram	0.654	0.10	mg/kg dry	1.245	ND	52.6	26.7-110			
Picloram [2C]	0.505	0.10	mg/kg dry	1.245	ND	40.6	10.8-110			
Triclopyr	2.16	0.10	mg/kg dry	2.490	0.182	79.6	56-113			
Triclopyr [2C]	1.70	0.10	mg/kg dry	2.490	0.211	60.0	47.9-120			
Surrogate: DCAA	21.6		mg/kg dry	24.89		86.8	70.8-116			
Surrogate: DCAA [2C]	20.6		mg/kg dry	24.89		82.8	62.3-114			

Matrix Spike (A804178-MS2)

Source: A181624-02

Prepared: 04/22/2018 Analyzed: 04/23/2018 01:20

MCPA	2.29	0.10	mg/kg dry	2.490	ND	92.0	74.2-114			
MCPA [2C]	2.16	0.10	mg/kg dry	2.490	ND	86.7	60.9-122			
Surrogate: DCAA	21.5		mg/kg dry	24.89		86.2	70.8-116			
Surrogate: DCAA [2C]	22.0		mg/kg dry	24.89		88.3	62.3-114			

Matrix Spike Dup (A804178-MSD1)

Source: A181624-02

Prepared: 04/22/2018 Analyzed: 04/23/2018 00:13

2,4-D	2.10	0.10	mg/kg dry	2.490	ND	84.3	71.4-105	2.19	20	
2,4-D [2C]	2.24	0.10	mg/kg dry	2.490	0.220	81.2	50.5-123	14.4	20	
2,4-DB	1.94	0.10	mg/kg dry	2.490	0.0501	76.1	46.4-117	1.91	20	
2,4-DB [2C]	1.82	0.10	mg/kg dry	2.490	0.252	63.2	44.5-121	3.63	20	
2,4,5-T	2.13	0.10	mg/kg dry	2.490	ND	85.4	66.2-110	1.61	20	
2,4,5-T [2C]	1.69	0.10	mg/kg dry	2.490	ND	67.7	43.6-126	10.5	20	
2,4,5-TP	1.97	0.10	mg/kg dry	2.490	0.199	71.0	52.4-114	2.17	20	
2,4,5-TP [2C]	1.69	0.10	mg/kg dry	2.490	0.219	59.2	47.6-117	5.02	20	
Bentazon	1.13	0.10	mg/kg dry	1.245	ND	90.5	61.5-117	0.559	20	
Bentazon [2C]	1.21	0.10	mg/kg dry	1.245	ND	96.9	50.7-127	0.794	20	
Dicamba	1.70	0.10	mg/kg dry	2.490	ND	68.5	48.4-111	0.297	20	
Dicamba [2C]	2.04	0.10	mg/kg dry	2.490	0.290	70.2	43.3-108	9.07	20	
Picloram	0.591	0.10	mg/kg dry	1.245	ND	47.5	26.7-110	10.2	20	
Picloram [2C]	0.569	0.10	mg/kg dry	1.245	ND	45.7	10.8-110	11.8	20	



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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427642
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804178 - EPA 3570

Matrix Spike Dup (A804178-MSD1)		Source: A181624-02			Prepared: 04/22/2018 Analyzed: 04/23/2018 00:13					
Triclopyr	2.16	0.10	mg/kg dry	2.490	0.182	79.6	56-113	0.0287	20	
Triclopyr [2C]	2.10	0.10	mg/kg dry	2.490	0.211	76.0	47.9-120	20.9	20	X
Surrogate: DCAA	21.7		mg/kg dry	24.89		87.1	70.8-116			
Surrogate: DCAA [2C]	20.6		mg/kg dry	24.89		82.8	62.3-114			
Matrix Spike Dup (A804178-MSD2)		Source: A181624-02			Prepared: 04/22/2018 Analyzed: 04/23/2018 02:27					
MCPA	2.35	0.10	mg/kg dry	2.490	ND	94.2	74.2-114	2.42	20	
MCPA [2C]	2.47	0.10	mg/kg dry	2.490	ND	99.2	60.9-122	13.5	20	
Surrogate: DCAA	21.5		mg/kg dry	24.89		86.3	70.8-116			
Surrogate: DCAA [2C]	23.4		mg/kg dry	24.89		94.0	62.3-114			



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Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Solid - MN Project Number: 10427642 Project Manager: Jennifer Anderson
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Classical Chemistry Parameters - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804195 - % Solids

Duplicate (A804195-DUP1)	Source: A181708-01		Prepared: 04/25/2018 Analyzed: 04/27/2018 09:07							
% Solids	79.2	0.00	% by Weight		79.6			0.516	20	



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1700 Elm Street, Suite 200
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Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427642
Project Manager: Jennifer Anderson

Notes and Definitions

- X Precision for the matrix spike duplicate, laboratory control sample duplicate or lab duplicate was outside of control limits.
- P The difference in the concentrations between the primary and confirmation column was > 40%.
- LC Results may be biased low because of low continuing calibration verification (CCV).
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Chain of Custody

A 181623



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427642 Workorder Name: 18-00383 MPCA-Freeway LF Solid Owner Received Date: 4/17/2018 Results Requested By: 5/2/2018

Report To		Subcontract To				Requested Analysis																							
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700																											
							Preserved Containers																						
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved																					LAB USE ONLY		
1	FD-TT-09 (4-12 WM)	PS	4/17/2018 09:20	10427642001	Solid	1							X	01															
2	FD-TT-10 (2'-10' WM)	PS	4/17/2018 12:15	10427642002	Solid	1							X	02															
3	FD-TT-11 (4-12 WM)	PS	4/17/2018 13:24	10427642003	Solid	1							X	03															
4	FD-TT-12 (3-12)	PS	4/17/2018 14:37	10427642004	Solid	1							X	04															
5	FD-TT-13 (3-12)	PS	4/17/2018 15:30	10427642005	Solid	1							X	05															
MIDA List II																													
Transfers																Comments													
Released By	Date/Time	Received By	Date/Time																										
Kory Paul Pace	4/19/18 16:20	Kori Ann Kellie	4/20/18 10:08																										
1																													
2																													
3																													
Cooler Temperature on Receipt 2.3 °C				Custody Seal (Y) or N				Received on Ice (Y) or N				Samples Intact (Y) or N																	

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274 exp 7/12/18

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

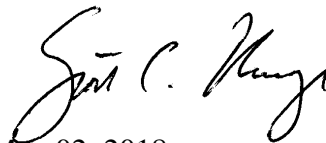
PaceProject#: 10427643
Sample Receipt Date: 04/17/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



May 02, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

May 2, 2018



DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of PACE Minnesota Field. The sample was analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration points and a nominal 1-liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. One container was received above the recommended temperature range of 0-6 degrees Celsius.

The isotopically-labeled TCDD internal standard in the sample extract was recovered at 65%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 102%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L


REPORT OF LABORATORY ANALYSIS

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Report No.....10427896

Appendix A

Sample Management

 Minnesota Pollution Control Agency		Chain-of-Custody Form				Work Order Number:		COC Type:		Page: 1 of 1																					
PROJECT/CLIENT INFO						Turnaround Time:		COC ID:		FOR LAB USE ONLY																					
LABORATORY																															
Facility Code: <i>MPCA - Freeway LE Waters</i>				Program Code (MDH Lab Only):		Lab Name:																									
Project Name: <i>MPCA - Freeway LE Waters</i>				Project Task Code:		Address: <i>18-00383</i>																									
Project Manager:						<i>EPIC Profile # 38716</i>																									
Potential Hazard?				If yes, add information to Sampler Comments Section		Phone No:																									
SAMPLE DETAILS						ANALYSIS REQUESTED																									
SAMPLE TYPE CODES Sample=Routine Sample S-TVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample		QC=Field Blank Sample QC-FR=Field Replacer Sample QC-TB=Trip Blank Sample		LAB MATRIX CODES DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe		AR=At BL=Biological Material OT=Other TS=Tissue		FIELD MATRIX CODES Wt=Ground=Groundwater Wt-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample		PRESERV.																					
										ANALYSIS																					
Location Identifier		Sample Type		Date		Time		Start Depth, in		End Depth, in		Grab (G) or Composite (C) Sample		Lab Matrix Code		Field Matrix Code		AIS		Sampler Comments (filter volume, special handling, etc.)		# of Cont		ANALYSIS		Lab Sample No.		#			
<i>FD-11-10 18-1A</i>		<i>5</i>		<i>4/17/18</i>		<i>12:12</i>		<i>12</i>		<i>12</i>		<i>G</i>		<i>NW</i>		<i>GROUND</i>						<i>41</i>		<i>X</i>		<i>X</i>		<i>001</i>		<i>1</i>	
								</																							

Sample Condition Upon Receipt

Client Name: Pollution Control

Project #: **WO# 10427643**
 PM: SCII Due Date: 05/02/18
 CLIENT: PACE MINNAPOLIS

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer: 151401163 Used: 687A9155100842 Type of Ice: Dry Blue None Dry Melted

Cooler Temp Read (°C): 9.0, 8.8 Cooler Temp Corrected (°C): 9.2, 6.0 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: ST 4/17/18

USDA Regulated Soil? N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (Internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2. NO LOGS PROVIDED
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>not</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample #
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: [Signature] Date: 04/18/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold; incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10427896

Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-TT-10		
Lab Sample ID	10427643001		
Filename	U180423A_07		
Injected By	BAL		
Total Amount Extracted	496 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	04/17/2018 12:15
ICAL ID	U180405	Received	04/17/2018 17:30
CCal Filename(s)	U180422B_15	Extracted	04/18/2018 15:45
Method Blank ID	BLANK-61806	Analyzed	04/23/2018 07:08

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	65
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	71

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61806	Matrix	Water
Filename	Y180422A_05	Dilution	NA
Total Amount Extracted	1040 mL	Extracted	04/18/2018 15:45
ICAL ID	Y180204	Analyzed	04/22/2018 16:54
CCal Filename(s)	Y180421B_16	Injected By	BAL

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	66
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	80

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61807	Matrix	Water
Filename	Y180422A_02	Dilution	NA
Total Amount Extracted	1010 mL	Extracted	04/18/2018 15:45
ICAL ID	Y180204	Analyzed	04/22/2018 14:42
CCal Filename	Y180421B_16	Injected By	BAL
Method Blank ID	BLANK-61806		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	10	7.3	14.6	102
2,3,7,8-TCDD-37Cl4	10	6.8	3.7	15.8	68
2,3,7,8-TCDD-13C	100	60	25.0	141.0	60

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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May 08, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 17, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
California Certification #2973
California Certification #2973
Montana Certificate #CERT0103
Alaska Certification UST-107
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad

Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

Pennsylvania Certification IDs

KY WW Permit #: KY0098221	Ohio EPA Rad Approval: #41249
KY WW Permit #: KY0000221	Oregon/TNI Certification #: PA200002-010
Louisiana DHH/TNI Certification #: LA180012	Pennsylvania/TNI Certification #: 65-00282
Louisiana DEQ/TNI Certification #: 4086	Puerto Rico Certification #: PA01457
Maine Certification #: 2017020	Rhode Island Certification #: 65-00282
Maryland Certification #: 308	South Dakota Certification
Massachusetts Certification #: M-PA1457	Tennessee Certification #: 02867
Michigan/PADEP Certification #: 9991	Texas/TNI Certification #: T104704188-17-3
Missouri Certification #: 235	Utah/TNI Certification #: PA014572017-9
Montana Certification #: Cert0082	USDA Soil Permit #: P330-17-00091
Nebraska Certification #: NE-OS-29-14	Vermont Dept. of Health: ID# VT-0282
Nevada Certification #: PA014572018-1	Virgin Island/PADEP Certification
New Hampshire/TNI Certification #: 297617	Virginia/VELAP Certification #: 9526
New Jersey/TNI Certification #: PA051	Washington Certification #: C868
New Mexico Certification #: PA01457	West Virginia DEP Certification #: 143
New York/TNI Certification #: 10888	West Virginia DHHR Certification #: 9964C
North Carolina Certification #: 42706	Wisconsin Approve List for Rad
North Dakota Certification #: R-190	Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174	Nebraska Certification: NE-OS-28-14
Alabama Certification #: 41320	Nevada Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216	New Hampshire Certification #: 2958
Delaware Certification: FL NELAC Reciprocity	New Jersey Certification #: FL022
Florida Certification #: E83079	New York Certification #: 11608
Georgia Certification #: 955	North Carolina Environmental Certificate #: 667
Guam Certification: FL NELAC Reciprocity	North Carolina Certification #: 12710
Hawaii Certification: FL NELAC Reciprocity	Oklahoma Certification #: D9947
Illinois Certification #: 200068	Pennsylvania Certification #: 68-00547
Indiana Certification: FL NELAC Reciprocity	Puerto Rico Certification #: FL01264
Kansas Certification #: E-10383	South Carolina Certification: #96042001
Kentucky Certification #: 90050	Tennessee Certification #: TN02974
Louisiana Certification #: FL NELAC Reciprocity	Texas Certification: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007	US Virgin Islands Certification: FL NELAC Reciprocity
Maryland Certification: #346	Virginia Environmental Certification #: 460165
Michigan Certification #: 9911	Wyoming Certification: FL NELAC Reciprocity
Mississippi Certification: FL NELAC Reciprocity	West Virginia Certification #: 9962C
Missouri Certification #: 236	Wisconsin Certification #: 399079670
Montana Certification #: Cert 0074	Wyoming (EPA Region 8): FL NELAC Reciprocity

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512	New York State Department of Health, Serial #56192 and 56193
Minnesota Department of Health, Certificate #1385941	North Carolina Division of Water Resources, Certificate #659
Arkansas Department of Environmental Quality, Certificate #17-046-0	Virginia Department of General Services, Certificate #9028
Georgia Environmental Protection Division, Stipulation	Wisconsin Department of Natural Resources, Laboratory #999472650
Illinois Environmental Protection Agency, Certificate #004325	U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278
Michigan Department of Environmental Quality, Laboratory #0034	

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10427644001	FD-TT-10	Water	04/17/18 12:15	04/17/18 17:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10427644001	FD-TT-10	EPA 531.1	AC1	3	PASI-O
		EPA 547	AC1	1	PASI-O
		EPA 549.2	AC1	2	PASI-O
		EPA 552.3	MMB	7	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 548.1	LAJ	1	PASI-O
		EPA 8270D	AT1	72	PASI-M
		EPA 524.2	AEZ	4	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NJV	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-H+B	KEO	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	AR3	2	PASI-M
		EPA 300.1	CMB	1	PASI-O
		EPA 300.1	CMB	1	PASI-O
		SM 3500-Cr B Modified	JFP	1	PASI-M
EPA 350.1	CLJ	1	PASI-V		
EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
EPA 353.2	JFP	3	PASI-M		
EPA 9016	AMM	1	PASI-GRMI		

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SAMPLE ANALYTE COUNT

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Sample: FD-TT-10	Lab ID: 10427644001	Collected: 04/17/18 12:15	Received: 04/17/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data								
Analytical Method:								
Field pH	5.9		0.10	1		04/17/18 12:15		
Field Temperature	3.6		0.50	1		04/17/18 12:15		
531.1 HPLC Carbamates								
Analytical Method: EPA 531.1								
Aldicarb	ND	ug/L	2.0	1		05/05/18 10:24	116-06-3	
Carbofuran	ND	ug/L	2.0	1		05/05/18 10:24	1563-66-2	
Surrogates								
BDMC (S)	104	%	80-120	1		05/05/18 10:24		
547 HPLC Glyphosate								
Analytical Method: EPA 547								
Glyphosate	ND	ug/L	6.0	1		04/27/18 20:44		
549.2 HPLC Paraquat Diquat								
Analytical Method: EPA 549.2 Preparation Method: EPA 549.2								
Diquat	ND	ug/L	0.40	1	04/23/18 22:57	04/25/18 11:17	85-00-7	
Paraquat	ND	ug/L	0.40	1	04/23/18 22:57	04/25/18 11:17	1910-42-5	
552.3 Haloacetic Acids								
Analytical Method: EPA 552.3 Preparation Method: EPA 552.3								
Dibromoacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/26/18 00:03	631-64-1	
Dichloroacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/26/18 00:03	79-43-6	
Haloacetic Acids (Total)	ND	ug/L	1.0	1	04/21/18 00:13	04/26/18 00:03		
Monobromoacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/26/18 00:03	79-08-3	
Monochloroacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/26/18 00:03	79-11-8	
Trichloroacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/26/18 00:03	76-03-9	
Surrogates								
2,3-Dibromopropanoic Acid (S)	117	%	70-130	1	04/21/18 00:13	04/26/18 00:03	600-05-5	
8011 GCS EDB and DBCP								
Analytical Method: EPA 8011 Preparation Method: EPA 8011								
1,2-Dibromo-3-chloropropane	ND	ug/L	0.0098	1	04/24/18 14:16	04/25/18 01:05	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.0098	1	04/24/18 14:16	04/25/18 01:05	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	103	%	30-150	1	04/24/18 14:16	04/25/18 01:05	460-00-4	
8015M Alcohols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	ug/L	5000	1		04/25/18 15:59	67-56-1	
8015M Glycols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/23/18 16:27	107-21-1	
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	309-00-2	L2
alpha-BHC	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	319-84-6	
beta-BHC	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	319-85-7	
delta-BHC	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	58-89-9	
Chlordane (Technical)	ND	ug/L	10.6	20	04/20/18 13:40	04/25/18 23:16	57-74-9	
alpha-Chlordane	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	5103-71-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Sample: FD-TT-10	Lab ID: 10427644001	Collected: 04/17/18 12:15	Received: 04/17/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
gamma-Chlordane	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	5103-74-2	
4,4'-DDD	ND	ug/L	2.1	20	04/20/18 13:40	04/25/18 23:16	72-54-8	
4,4'-DDE	ND	ug/L	2.1	20	04/20/18 13:40	04/25/18 23:16	72-55-9	
4,4'-DDT	ND	ug/L	2.1	20	04/20/18 13:40	04/25/18 23:16	50-29-3	
Dieldrin	ND	ug/L	2.1	20	04/20/18 13:40	04/25/18 23:16	60-57-1	
Endosulfan I	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	959-98-8	
Endosulfan II	ND	ug/L	2.1	20	04/20/18 13:40	04/25/18 23:16	33213-65-9	
Endosulfan sulfate	ND	ug/L	2.1	20	04/20/18 13:40	04/25/18 23:16	1031-07-8	
Endrin	ND	ug/L	2.1	20	04/20/18 13:40	04/25/18 23:16	72-20-8	
Endrin aldehyde	ND	ug/L	2.1	20	04/20/18 13:40	04/25/18 23:16	7421-93-4	
Endrin ketone	ND	ug/L	2.1	20	04/20/18 13:40	04/25/18 23:16	53494-70-5	
Heptachlor	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	76-44-8	
Heptachlor epoxide	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	1024-57-3	
Methoxychlor	ND	ug/L	10.6	20	04/20/18 13:40	04/25/18 23:16	72-43-5	
Toxaphene	ND	ug/L	31.9	20	04/20/18 13:40	04/25/18 23:16	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	62-125	20	04/20/18 13:40	04/25/18 23:16	877-09-8	1M, D3, S4
Decachlorobiphenyl (S)	0	%	30-143	20	04/20/18 13:40	04/25/18 23:16	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 14:55	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 14:55	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 14:55	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 14:55	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 14:55	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 14:55	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 14:55	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 14:55	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 14:55	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	65	%	30-125	1	04/20/18 13:39	04/23/18 14:55	877-09-8	
Decachlorobiphenyl (S)	85	%	30-125	1	04/20/18 13:39	04/23/18 14:55	2051-24-3	CH
8315A GCSV Aldehydes								
Analytical Method: EPA 8315A Preparation Method: EPA 8315A								
Formaldehyde	ND	ug/L	100	1	04/20/18 11:17	04/21/18 11:27	50-00-0	
8316 W GCSV Acrylamide								
Analytical Method: EPA 8316								
Acrylamide	ND	ug/L	20.0	1		04/24/18 11:42	79-06-1	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	04/30/18 15:28	05/01/18 09:12	7429-90-5	
Barium, Dissolved	132	ug/L	10.0	1	04/30/18 15:28	05/01/18 09:12	7440-39-3	
Copper, Dissolved	26.6	ug/L	10.0	1	04/30/18 15:28	05/01/18 09:12	7440-50-8	
Manganese, Dissolved	496	ug/L	5.0	1	04/30/18 15:28	05/01/18 09:12	7439-96-5	
Nickel, Dissolved	159	ug/L	20.0	1	04/30/18 15:28	05/01/18 09:12	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/30/18 15:28	05/01/18 09:12	7440-22-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Sample: FD-TT-10	Lab ID: 10427644001	Collected: 04/17/18 12:15	Received: 04/17/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Tin, Dissolved	ND	ug/L	75.0	1	04/30/18 15:28	05/01/18 09:12	7440-31-5	
Zinc, Dissolved	509	ug/L	20.0	1	04/30/18 15:28	05/01/18 09:12	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	22.7	ug/L	2.5	5	04/30/18 16:00	05/01/18 08:11	7440-47-3	
Total Hardness by 2340B	1450000	ug/L	14100	100	04/30/18 16:00	05/01/18 08:45		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	2.1	ug/L	0.50	1	04/30/18 15:28	05/01/18 07:57	7440-36-0	
Arsenic, Dissolved	1.7	ug/L	0.50	1	04/30/18 15:28	05/01/18 07:57	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/30/18 15:28	05/01/18 07:57	7440-41-7	
Boron, Dissolved	7030	ug/L	100	20	04/30/18 15:28	05/01/18 09:20	7440-42-8	
Cadmium, Dissolved	0.93	ug/L	0.080	1	04/30/18 15:28	05/01/18 07:57	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	04/30/18 15:28	05/01/18 07:57	7440-47-3	
Cobalt, Dissolved	4.1	ug/L	0.50	1	04/30/18 15:28	05/01/18 07:57	7440-48-4	
Lead, Dissolved	0.67	ug/L	0.10	1	04/30/18 15:28	05/01/18 07:57	7439-92-1	
Selenium, Dissolved	44.0	ug/L	0.50	1	04/30/18 15:28	05/01/18 07:57	7782-49-2	
Thallium, Dissolved	0.57	ug/L	0.10	1	04/30/18 15:28	05/01/18 07:57	7440-28-0	
Uranium-238, Dissolved	16.5	ug/L	0.50	1	04/30/18 15:28	05/01/18 07:57	7440-61-1	
Vanadium, Dissolved	3.7	ug/L	1.0	1	04/30/18 15:28	05/01/18 07:57	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	04/30/18 14:15	05/01/18 13:53	7439-97-6	
548.1 GCS Endothall								
Analytical Method: EPA 548.1 Preparation Method: EPA 548.1								
Endothall	ND	ug/L	9.0	1	04/23/18 08:14	04/24/18 21:57		
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Phenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	108-95-2	
bis(2-Chloroethyl) ether	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	111-44-4	
2-Chlorophenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	95-57-8	
1,3-Dichlorobenzene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	106-46-7	
1,2-Dichlorobenzene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	95-50-1	
2-Methylphenol(o-Cresol)	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	95-48-7	
bis(2-Chloroisopropyl) ether	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	108-60-1	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.4	1	04/19/18 14:59	04/23/18 18:36		
N-Nitroso-di-n-propylamine	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	621-64-7	
Hexachloroethane	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	67-72-1	
Nitrobenzene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	98-95-3	
Isophorone	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	78-59-1	
2-Nitrophenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	88-75-5	
2,4-Dimethylphenol	ND	ug/L	51.0	1	04/19/18 14:59	04/23/18 18:36	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	111-91-1	
2,4-Dichlorophenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	120-82-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Sample: FD-TT-10	Lab ID: 10427644001	Collected: 04/17/18 12:15	Received: 04/17/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Naphthalene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	91-20-3	
4-Chloroaniline	ND	ug/L	51.0	1	04/19/18 14:59	04/23/18 18:36	106-47-8	
Hexachloro-1,3-butadiene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	87-68-3	
4-Chloro-3-methylphenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	59-50-7	
2-Methylnaphthalene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	91-57-6	
2,4,6-Trichlorophenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	88-06-2	
2,4,5-Trichlorophenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	95-95-4	
2-Chloronaphthalene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	91-58-7	
2-Nitroaniline	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	88-74-4	
Dimethylphthalate	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	131-11-3	
Acenaphthylene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	208-96-8	
2,6-Dinitrotoluene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	606-20-2	
3-Nitroaniline	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	99-09-2	
Acenaphthene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	83-32-9	
2,4-Dinitrophenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	51-28-5	
4-Nitrophenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	100-02-7	
Dibenzofuran	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	132-64-9	
2,4-Dinitrotoluene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	121-14-2	
Diethylphthalate	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	84-66-2	
4-Chlorophenylphenyl ether	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	7005-72-3	
Fluorene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	86-73-7	
4-Nitroaniline	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	100-01-6	
4,6-Dinitro-2-methylphenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	534-52-1	
N-Nitrosodiphenylamine	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	86-30-6	
4-Bromophenylphenyl ether	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	101-55-3	
Hexachlorobenzene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	118-74-1	
Pentachlorophenol	ND	ug/L	20.4	1	04/19/18 14:59	04/23/18 18:36	87-86-5	
Phenanthrene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	85-01-8	
Anthracene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	120-12-7	
Di-n-butylphthalate	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	84-74-2	
Fluoranthene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	206-44-0	
Pyrene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	129-00-0	
Butylbenzylphthalate	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/L	51.0	1	04/19/18 14:59	04/23/18 18:36	91-94-1	
Benzo(a)anthracene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	56-55-3	
Chrysene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	218-01-9	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	117-81-7	
Di-n-octylphthalate	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	117-84-0	
Benzo(b)fluoranthene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	205-99-2	
Benzo(k)fluoranthene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	207-08-9	
Benzo(a)pyrene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	50-32-8	
Indeno(1,2,3-cd)pyrene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	193-39-5	
Dibenz(a,h)anthracene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	53-70-3	
Benzo(g,h,i)perylene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	191-24-2	
N-Nitrosodimethylamine	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	62-75-9	
1,2-Diphenylhydrazine	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	122-66-7	
Carbazole	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	86-74-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

Sample: FD-TT-10	Lab ID: 10427644001	Collected: 04/17/18 12:15	Received: 04/17/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
1-Methylnaphthalene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	90-12-0	
Surrogates								
Nitrobenzene-d5 (S)	73	%.	60-125	1	04/19/18 14:59	04/23/18 18:36	4165-60-0	
2-Fluorobiphenyl (S)	81	%.	56-125	1	04/19/18 14:59	04/23/18 18:36	321-60-8	
p-Terphenyl-d14 (S)	84	%.	58-125	1	04/19/18 14:59	04/23/18 18:36	1718-51-0	
Phenol-d6 (S)	74	%.	58-125	1	04/19/18 14:59	04/23/18 18:36	13127-88-3	
2-Fluorophenol (S)	69	%.	55-125	1	04/19/18 14:59	04/23/18 18:36	367-12-4	
2,4,6-Tribromophenol (S)	98	%.	65-125	1	04/19/18 14:59	04/23/18 18:36	118-79-6	
524.2 MSV								
Analytical Method: EPA 524.2								
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/19/18 15:38		
Surrogates								
4-Bromofluorobenzene (S)	97	%.	75-125	1		04/19/18 15:38	460-00-4	
Toluene-d8 (S)	97	%.	75-125	1		04/19/18 15:38	2037-26-5	
1,2-Dichloroethane-d4 (S)	98	%.	75-125	1		04/19/18 15:38	17060-07-0	
Field Data								
Analytical Method:								
Field pH	5.9	Std. Units		1		04/17/18 12:15		
Field Temperature	3.6	deg C		1		04/17/18 12:15		
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	3.8	mg/L	2.0	1	04/18/18 10:19	04/23/18 10:12		B3
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	4.9	1		04/27/18 11:31		
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	388	NTU	6.0	20		04/18/18 15:34		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	397	mg/L	10.0	1		04/24/18 09:00		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	7.1	Std. Units	0.10	1		04/27/18 11:10		H6
Trivalent Chromium Calculation								
Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	0.023	mg/L	0.010	1		05/01/18 16:04		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	199	mg/L	6.0	5		04/19/18 19:52	16887-00-6	
Fluoride	0.17	mg/L	0.050	1		04/19/18 17:31	16984-48-8	
300.1 Oxihalide IC Anions 14d								
Analytical Method: EPA 300.1								
Chlorite	ND	ug/L	50.0	10		04/22/18 17:22		D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Sample: FD-TT-10	Lab ID: 10427644001	Collected: 04/17/18 12:15	Received: 04/17/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.1 Oxihalide IC Anions 28d	Analytical Method: EPA 300.1							
Bromate	ND	ug/L	10.0	10		04/22/18 17:22	15541-45-4	D3
Chromium, Hexavalent	Analytical Method: SM 3500-Cr B Modified							
Chromium, Hexavalent	ND	mg/L	0.010	1		04/18/18 12:38		FS,H1, M1
350.1 Ammonia, Unionized	Analytical Method: EPA 350.1							
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		05/02/18 09:48		
350.1 Ammonia, Distilled	Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)							
Nitrogen, Ammonia	0.11	mg/L	0.10	1	04/19/18 15:00	04/20/18 07:17	7664-41-7	
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrate as N	0.025	mg/L	0.020	1		04/18/18 15:24	14797-55-8	FS
Nitrite as N	ND	mg/L	0.020	1		04/18/18 15:24	14797-65-0	FS
Nitrogen, NO2 plus NO3	0.034	mg/L	0.020	1		04/18/18 15:24		FS
9016 Cyanide, Free	Analytical Method: EPA 9016 Preparation Method: EPA 9016							
Cyanide, Free	ND	ug/L	5.0	1	04/24/18 16:40	04/24/18 17:42		
SM4500CN-E Cyanide	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E							
Cyanide	13.4	ug/L	10.0	1	04/26/18 11:59	04/27/18 10:06	57-12-5	
SM4500P-E, Total Phosphorus	Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B							
Phosphorus	0.24	mg/L	0.050	1	04/24/18 09:40	04/24/18 14:03	7723-14-0	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 444330 Analysis Method: EPA 531.1
QC Batch Method: EPA 531.1 Analysis Description: 531.1 HPLC Carbamate
Associated Lab Samples: 10427644001

METHOD BLANK: 2409910 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aldicarb	ug/L	ND	2.0	05/05/18 01:44	
Carbofuran	ug/L	ND	2.0	05/05/18 01:44	
BDMC (S)	%	107	80-120	05/05/18 01:44	

LABORATORY CONTROL SAMPLE: 2409911

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aldicarb	ug/L	10	9.9	99	80-120	
Carbofuran	ug/L	10	11.2	112	80-120	
BDMC (S)	%			105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2409912 2409913

Parameter	Units	60268261001 Result	MS		MSD		MS		MSD		% Rec Limits	Max	
			Spike Conc.	MS Result	MSD Result	% Rec	% Rec	RPD	RPD	Qual			
Aldicarb	ug/L	ND	10	10	8.2	8.0	82	80	80-120	2	20	H3	
Carbofuran	ug/L	ND	10	10	9.6	8.6	96	86	80-120	11	20	H3	
BDMC (S)	%						100	106	80-120				

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 443429 Analysis Method: EPA 547
QC Batch Method: EPA 547 Analysis Description: 547 HPLC Glyphosate
Associated Lab Samples: 10427644001

METHOD BLANK: 2405632 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Glyphosate	ug/L	ND	6.0	04/27/18 18:40	

LABORATORY CONTROL SAMPLE: 2405633

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Glyphosate	ug/L	50	44.9	90	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2405634 2405635

Parameter	Units	35385680001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Glyphosate	ug/L	4.2U	50	50	45.6	44.6	91	89	80-120	2	30	H1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2405636 2405637

Parameter	Units	35387707062 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Glyphosate	ug/L	4.2U	50	50	48.9	48.7	98	97	80-120	0	30	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 438905 Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10427644001

METHOD BLANK: 2027992 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methanol	ug/L	ND	5000	04/25/18 14:17	

LABORATORY CONTROL SAMPLE: 2027993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methanol	ug/L	50000	46800	94	79-111	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027994 2027995

Parameter	Units	10428032001		MS		MSD		MS		MSD		% Rec Limits	Max RPD	RPD	Qual
		Result	ND	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Methanol	ug/L	ND	50000	50000	47100	51900	91	101	43-138	10	20				

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 438205 Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10427644001

METHOD BLANK: 2024704 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylene glycol	mg/L	ND	5.0	04/23/18 14:09	

LABORATORY CONTROL SAMPLE: 2024705

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylene glycol	mg/L	25	29.3	117	55-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026734 2026735

Parameter	Units	50194690001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Ethylene glycol	mg/L	ND	25	25	21.9	24.7	87	99	38-154	12	20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 21113	Analysis Method: EPA 8316
QC Batch Method: EPA 8316	Analysis Description: 8316 W GCSV Acrylamide
Associated Lab Samples: 10427644001	

METHOD BLANK: 84170 Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acrylamide	ug/L	ND	20.0	04/24/18 11:22	

LABORATORY CONTROL SAMPLE: 84171

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acrylamide	ug/L	1000	1000	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 84172 84173

Parameter	Units	10428032004 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Acrylamide	ug/L	ND	1000	1000	921	1040	92	104	78-135	12	16	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 535087	Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1	Analysis Description: 245.1 Mercury - Dissolved
Associated Lab Samples: 10427644001	

METHOD BLANK: 2907218 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	05/01/18 13:46	

LABORATORY CONTROL SAMPLE & LCSD: 2907219 2907220

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury, Dissolved	ug/L	5	4.9	4.8	97	97	85-115	0	20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 535081	Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7	Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10427644001	

METHOD BLANK: 2907200 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	05/01/18 09:04	
Barium, Dissolved	ug/L	ND	10.0	05/01/18 09:04	
Copper, Dissolved	ug/L	ND	10.0	05/01/18 09:04	
Manganese, Dissolved	ug/L	ND	5.0	05/01/18 09:04	
Nickel, Dissolved	ug/L	ND	20.0	05/01/18 09:04	
Silver, Dissolved	ug/L	ND	10.0	05/01/18 09:04	
Tin, Dissolved	ug/L	ND	75.0	05/01/18 09:04	
Zinc, Dissolved	ug/L	ND	20.0	05/01/18 09:04	

LABORATORY CONTROL SAMPLE & LCSD: 2907201

Parameter	Units	2907202								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Aluminum, Dissolved	ug/L	20000	21400	21300	107	107	85-115	1	20	
Barium, Dissolved	ug/L	1000	1070	1060	107	106	85-115	0	20	
Copper, Dissolved	ug/L	1000	1030	1020	103	102	85-115	0	20	
Manganese, Dissolved	ug/L	1000	1070	1060	107	106	85-115	1	20	
Nickel, Dissolved	ug/L	1000	1060	1050	106	105	85-115	1	20	
Silver, Dissolved	ug/L	500	515	513	103	103	85-115	1	20	
Tin, Dissolved	ug/L	1000	1030	1020	103	102	85-115	0	20	
Zinc, Dissolved	ug/L	1000	1070	1070	107	107	85-115	0	20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 535083	Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8	Analysis Description: 200.8 MET
Associated Lab Samples: 10427644001	

METHOD BLANK: 2907207 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	0.50	05/01/18 09:17	

LABORATORY CONTROL SAMPLE & LCSD: 2907208

Parameter	Units	2907209								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Chromium	ug/L	100	112	108	112	108	85-115	3	20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 535082 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10427644001

METHOD BLANK: 2907203 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	05/01/18 07:54	
Arsenic, Dissolved	ug/L	ND	0.50	05/01/18 07:54	
Beryllium, Dissolved	ug/L	ND	0.20	05/01/18 07:54	
Boron, Dissolved	ug/L	ND	5.0	05/01/18 07:54	
Cadmium, Dissolved	ug/L	ND	0.080	05/01/18 07:54	
Chromium, Dissolved	ug/L	ND	0.50	05/01/18 07:54	
Cobalt, Dissolved	ug/L	ND	0.50	05/01/18 07:54	
Lead, Dissolved	ug/L	ND	0.10	05/01/18 07:54	
Selenium, Dissolved	ug/L	ND	0.50	05/01/18 07:54	
Thallium, Dissolved	ug/L	ND	0.10	05/01/18 07:54	
Uranium-238, Dissolved	ug/L	ND	0.50	05/01/18 07:54	
Vanadium, Dissolved	ug/L	ND	1.0	05/01/18 07:54	

LABORATORY CONTROL SAMPLE & LCSD: 2907204

Parameter	Units	2907205								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Antimony, Dissolved	ug/L	100	94.5	94.6	95	95	85-115	0	20	
Arsenic, Dissolved	ug/L	100	101	105	101	105	85-115	4	20	
Beryllium, Dissolved	ug/L	100	95.9	98.5	96	99	85-115	3	20	
Boron, Dissolved	ug/L	100	98.4	102	98	102	85-115	4	20	
Cadmium, Dissolved	ug/L	100	98.9	104	99	104	85-115	5	20	
Chromium, Dissolved	ug/L	100	101	104	101	104	85-115	3	20	
Cobalt, Dissolved	ug/L	100	99.8	103	100	103	85-115	3	20	
Lead, Dissolved	ug/L	100	101	105	101	105	85-115	4	20	
Selenium, Dissolved	ug/L	100	99.0	101	99	101	85-115	2	20	
Thallium, Dissolved	ug/L	100	97.1	101	97	101	85-115	4	20	
Uranium-238, Dissolved	ug/L	100	102	107	102	107	85-115	5	20	
Vanadium, Dissolved	ug/L	100	100	104	100	104	85-115	3	20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 533263 Analysis Method: EPA 524.2
QC Batch Method: EPA 524.2 Analysis Description: 524.2 MSV
Associated Lab Samples: 10427644001

METHOD BLANK: 2896754 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	ND	4.0	04/19/18 12:52	
1,2-Dichloroethane-d4 (S)	%	100	75-125	04/19/18 12:52	
4-Bromofluorobenzene (S)	%	96	75-125	04/19/18 12:52	
Toluene-d8 (S)	%	95	75-125	04/19/18 12:52	

LABORATORY CONTROL SAMPLE & LCSD: 2896755

Parameter	Units	2897075		LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result						
Total Trihalomethanes (Calc.)	ug/L	80	79.9	77.2	100	96	70-130	3	20
1,2-Dichloroethane-d4 (S)	%				100	100	75-125		
4-Bromofluorobenzene (S)	%				96	97	75-125		
Toluene-d8 (S)	%				96	97	75-125		

MATRIX SPIKE SAMPLE: 2897077

Parameter	Units	10427761007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,2-Dichloroethane-d4 (S)	%				100	75-125	
4-Bromofluorobenzene (S)	%				97	75-125	
Toluene-d8 (S)	%				96	75-125	

SAMPLE DUPLICATE: 2897076

Parameter	Units	60268271001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2-Dichloroethane-d4 (S)	%	102	102	0		
4-Bromofluorobenzene (S)	%	98	95	3		
Toluene-d8 (S)	%	95	96	0		

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 441896 Analysis Method: EPA 548.1
QC Batch Method: EPA 548.1 Analysis Description: 548 GCS Endothall
Associated Lab Samples: 10427644001

METHOD BLANK: 2398250 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Endothall	ug/L	ND	9.0	04/24/18 16:59	

LABORATORY CONTROL SAMPLE: 2398251

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	50	52.4	105	64-137	

LABORATORY CONTROL SAMPLE: 2398252

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	9	8J	89	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2399191 2399192

Parameter	Units	35387317001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endothall	ug/L	<4.3	50	50	39.4	38.6	79	77	64-137	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2399777 2399778

Parameter	Units	35387490001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endothall	ug/L	4.3U	50	50	34.5	21.0	69	42	64-137	49	30	M1,R1

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch:	442185	Analysis Method:	EPA 549.2
QC Batch Method:	EPA 549.2	Analysis Description:	549 HPLC Paraquat Diquat
Associated Lab Samples:	10427644001		

METHOD BLANK: 2399617 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diquat	ug/L	ND	0.40	04/25/18 09:23	
Paraquat	ug/L	ND	0.40	04/25/18 09:23	

LABORATORY CONTROL SAMPLE: 2399618

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	2	1.9	94	70-130	
Paraquat	ug/L	2	1.7	87	70-130	

LABORATORY CONTROL SAMPLE: 2399619

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	.4	0.60	150	50-150	
Paraquat	ug/L	.4	0.42	105	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2400097 2400098

Parameter	Units	35387317001 Result	MS Spike Conc.	MSD Spike Conc.	2400097		2400098		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Diquat	ug/L	<0.30	2	2	2.0	1.9	100	93	70-130	7	30	
Paraquat	ug/L	<0.30	2	2	1.5	1.5	76	75	70-130	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2400099 2400100

Parameter	Units	35387317002 Result	MS Spike Conc.	MSD Spike Conc.	2400099		2400100		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Diquat	ug/L	<0.30	2	2	1.9	1.7	95	87	70-130	9	30	
Paraquat	ug/L	<0.30	2	2	1.5	1.4	77	69	70-130	11	30 M1	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 441812 Analysis Method: EPA 552.3
 QC Batch Method: EPA 552.3 Analysis Description: 5523 Haloacetic Acids
 Associated Lab Samples: 10427644001

METHOD BLANK: 2397907 Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromoacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Dichloroacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Haloacetic Acids (Total)	ug/L	ND	1.0	04/25/18 15:02	
Monobromoacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Monochloroacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Trichloroacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
2,3-Dibromopropanoic Acid (S)	%	115	70-130	04/25/18 15:02	

LABORATORY CONTROL SAMPLE: 2397908

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromoacetic Acid	ug/L	10	12.4	124	70-130	
Dichloroacetic Acid	ug/L	10	10.5	105	70-130	
Haloacetic Acids (Total)	ug/L	50	55.7	111	70-130	
Monobromoacetic Acid	ug/L	10	10.8	108	70-130	
Monochloroacetic Acid	ug/L	10	10.9	109	70-130	
Trichloroacetic Acid	ug/L	10	11.1	111	70-130	
2,3-Dibromopropanoic Acid (S)	%			123	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398523 2398524

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Spike Conc.	Result	Spike Conc.	Result						
Dibromoacetic Acid	ug/L	10	0.75J	10	13.2	125	117	70-130	6	30	
Dichloroacetic Acid	ug/L	10	28.5	10	40.3	119	87	70-130	8	30	
Haloacetic Acids (Total)	ug/L	50	33.1	50	93.8	121	110	70-130	6	30	
Monobromoacetic Acid	ug/L	10	0.29U	10	11.0	110	115	70-130	5	30	
Monochloroacetic Acid	ug/L	10	0.90U	10	13.7	137	121	70-130	12	30	M1
Trichloroacetic Acid	ug/L	10	3.9	10	15.6	117	109	70-130	5	30	
2,3-Dibromopropanoic Acid (S)	%					136	114	70-130		30	S0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398525 2398526

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Spike Conc.	Result	Spike Conc.	Result						
Dibromoacetic Acid	ug/L	10	0.76J	10	12.5	117	122	70-130	4	30	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Parameter	Units	2398525		2398526		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Dichloroacetic Acid	ug/L	28.5	10	10	36.8	36.9	83	84	70-130	0	30	
Haloacetic Acids (Total)	ug/L	33.2	50	50	85.7	87.0	105	108	70-130	2	30	
Monobromoacetic Acid	ug/L	0.29U	10	10	10.9	10.5	109	105	70-130	4	30	
Monochloroacetic Acid	ug/L	0.90U	10	10	11.5	12.0	115	120	70-130	4	30	
Trichloroacetic Acid	ug/L	3.9	10	10	14.0	14.7	101	108	70-130	5	30	
2,3-Dibromopropanoic Acid (S)	%						110	116	70-130		30	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 534073 Analysis Method: EPA 8011
QC Batch Method: EPA 8011 Analysis Description: GCS 8011 EDB DBCP
Associated Lab Samples: 10427644001

METHOD BLANK: 2901365 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	ND	0.010	04/24/18 22:05	
1,2-Dibromoethane (EDB)	ug/L	ND	0.010	04/24/18 22:05	
4-Bromofluorobenzene (S)	%.	102	30-150	04/24/18 22:05	

LABORATORY CONTROL SAMPLE & LCSD: 2901366

Parameter	Units	2901367								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	.11	0.10	0.097	95	89	60-140	7	20	
1,2-Dibromoethane (EDB)	ug/L	.11	0.11	0.10	100	94	60-140	6	20	
4-Bromofluorobenzene (S)	%.				107	106	30-150			

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 533542 Analysis Method: EPA 8081B
QC Batch Method: EPA Mod. 3510C Analysis Description: 8081B GCS Pesticides
Associated Lab Samples: 10427644001

METHOD BLANK: 2898180 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/25/18 19:54	
4,4'-DDE	ug/L	ND	0.10	04/25/18 19:54	
4,4'-DDT	ug/L	ND	0.10	04/25/18 19:54	
Aldrin	ug/L	ND	0.050	04/25/18 19:54	
alpha-BHC	ug/L	ND	0.050	04/25/18 19:54	
alpha-Chlordane	ug/L	ND	0.050	04/25/18 19:54	
beta-BHC	ug/L	ND	0.050	04/25/18 19:54	
Chlordane (Technical)	ug/L	ND	0.50	04/25/18 19:54	
delta-BHC	ug/L	ND	0.050	04/25/18 19:54	
Dieldrin	ug/L	ND	0.10	04/25/18 19:54	
Endosulfan I	ug/L	ND	0.050	04/25/18 19:54	
Endosulfan II	ug/L	ND	0.10	04/25/18 19:54	
Endosulfan sulfate	ug/L	ND	0.10	04/25/18 19:54	
Endrin	ug/L	ND	0.10	04/25/18 19:54	
Endrin aldehyde	ug/L	ND	0.10	04/25/18 19:54	
Endrin ketone	ug/L	ND	0.10	04/25/18 19:54	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/25/18 19:54	
gamma-Chlordane	ug/L	ND	0.050	04/25/18 19:54	
Heptachlor	ug/L	ND	0.050	04/25/18 19:54	
Heptachlor epoxide	ug/L	ND	0.050	04/25/18 19:54	
Methoxychlor	ug/L	ND	0.50	04/25/18 19:54	
Toxaphene	ug/L	ND	1.5	04/25/18 19:54	
Decachlorobiphenyl (S)	%	75	30-143	04/25/18 19:54	
Tetrachloro-m-xylene (S)	%	80	62-125	04/25/18 19:54	

LABORATORY CONTROL SAMPLE & LCSD: 2898181

Parameter	Units	2898182							RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits				
4,4'-DDD	ug/L	1	1.0	0.95	104	95	67-125	10	20		
4,4'-DDE	ug/L	1	1.0	0.90	100	90	68-125	11	20		
4,4'-DDT	ug/L	1	0.92	0.83	92	83	66-125	10	20		
Aldrin	ug/L	.5	0.21	0.17	42	34	46-125	21	20	L2,R1	
alpha-BHC	ug/L	.5	0.50	0.45	101	90	66-125	11	20		
alpha-Chlordane	ug/L	.5	0.49	0.43	97	86	72-125	12	20		
beta-BHC	ug/L	.5	0.49	0.45	99	89	72-125	10	20		
delta-BHC	ug/L	.5	0.42	0.37	83	75	37-141	11	20		
Dieldrin	ug/L	1	1.1	1.0	112	100	71-125	11	20		
Endosulfan I	ug/L	.5	0.48	0.43	96	86	69-125	10	20		
Endosulfan II	ug/L	1	1.1	0.98	108	98	73-125	10	20		
Endosulfan sulfate	ug/L	1	0.96	0.87	96	87	63-127	9	20		

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Parameter	Units	2898181		2898182			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Endrin	ug/L	1	1.0	0.92	103	92	72-125	11	20	
Endrin aldehyde	ug/L	1	1.0	0.92	101	92	70-125	10	20	
Endrin ketone	ug/L	1	1.1	0.98	108	98	72-127	10	20	
gamma-BHC (Lindane)	ug/L	.5	0.51	0.45	101	91	69-125	11	20	
gamma-Chlordane	ug/L	.5	0.43	0.38	86	75	64-125	14	20	
Heptachlor	ug/L	.5	0.34	0.28	67	57	54-125	17	20	
Heptachlor epoxide	ug/L	.5	0.50	0.45	101	90	72-125	11	20	
Methoxychlor	ug/L	5	4.6	4.2	92	84	67-127	9	20	
Decachlorobiphenyl (S)	%				80	76	30-143			
Tetrachloro-m-xylene (S)	%				85	70	62-125			

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 533544 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10427644001

METHOD BLANK: 2898185 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/23/18 14:24	
Decachlorobiphenyl (S)	%	105	30-125	04/23/18 14:24	CH
Tetrachloro-m-xylene (S)	%	50	30-125	04/23/18 14:24	

LABORATORY CONTROL SAMPLE & LCSD: 2898186 2898187

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.1	1.5	55	73	47-125	28	20	R1
PCB-1260 (Aroclor 1260)	ug/L	2	1.2	1.7	62	84	54-125	30	20	R1
Decachlorobiphenyl (S)	%				78	103	30-125			CH
Tetrachloro-m-xylene (S)	%				46	60	30-125			

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 533322 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10427644001

METHOD BLANK: 2897016 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
1,2-Dichlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
1,2-Diphenylhydrazine	ug/L	ND	10.0	04/23/18 13:12	
1,3-Dichlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
1,4-Dichlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
1-Methylnaphthalene	ug/L	ND	10.0	04/23/18 13:12	
2,4,5-Trichlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4-Dichlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4-Dimethylphenol	ug/L	ND	50.0	04/23/18 13:12	
2,4-Dinitrophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4-Dinitrotoluene	ug/L	ND	10.0	04/23/18 13:12	
2,6-Dinitrotoluene	ug/L	ND	10.0	04/23/18 13:12	
2-Chloronaphthalene	ug/L	ND	10.0	04/23/18 13:12	
2-Chlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2-Methylnaphthalene	ug/L	ND	10.0	04/23/18 13:12	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/23/18 13:12	
2-Nitroaniline	ug/L	ND	10.0	04/23/18 13:12	
2-Nitrophenol	ug/L	ND	10.0	04/23/18 13:12	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/23/18 13:12	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/23/18 13:12	
3-Nitroaniline	ug/L	ND	10.0	04/23/18 13:12	
4,6-Dinitro-2-methylphenol	ug/L	ND	10.0	04/23/18 13:12	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/23/18 13:12	
4-Chloro-3-methylphenol	ug/L	ND	10.0	04/23/18 13:12	
4-Chloroaniline	ug/L	ND	50.0	04/23/18 13:12	
4-Chlorophenylphenyl ether	ug/L	ND	10.0	04/23/18 13:12	
4-Nitroaniline	ug/L	ND	10.0	04/23/18 13:12	
4-Nitrophenol	ug/L	ND	10.0	04/23/18 13:12	
Acenaphthene	ug/L	ND	10.0	04/23/18 13:12	
Acenaphthylene	ug/L	ND	10.0	04/23/18 13:12	
Anthracene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(a)anthracene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(a)pyrene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(b)fluoranthene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(g,h,i)perylene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(k)fluoranthene	ug/L	ND	10.0	04/23/18 13:12	
bis(2-Chloroethoxy)methane	ug/L	ND	10.0	04/23/18 13:12	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/23/18 13:12	
bis(2-Chloroisopropyl) ether	ug/L	ND	10.0	04/23/18 13:12	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/23/18 13:12	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

METHOD BLANK: 2897016 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Carbazole	ug/L	ND	10.0	04/23/18 13:12	
Chrysene	ug/L	ND	10.0	04/23/18 13:12	
Di-n-butylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Di-n-octylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Dibenz(a,h)anthracene	ug/L	ND	10.0	04/23/18 13:12	
Dibenzofuran	ug/L	ND	10.0	04/23/18 13:12	
Diethylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Dimethylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Fluoranthene	ug/L	ND	10.0	04/23/18 13:12	
Fluorene	ug/L	ND	10.0	04/23/18 13:12	
Hexachloro-1,3-butadiene	ug/L	ND	10.0	04/23/18 13:12	
Hexachlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
Hexachloroethane	ug/L	ND	10.0	04/23/18 13:12	
Indeno(1,2,3-cd)pyrene	ug/L	ND	10.0	04/23/18 13:12	
Isophorone	ug/L	ND	10.0	04/23/18 13:12	
N-Nitroso-di-n-propylamine	ug/L	ND	10.0	04/23/18 13:12	
N-Nitrosodimethylamine	ug/L	ND	10.0	04/23/18 13:12	
N-Nitrosodiphenylamine	ug/L	ND	10.0	04/23/18 13:12	
Naphthalene	ug/L	ND	10.0	04/23/18 13:12	
Nitrobenzene	ug/L	ND	10.0	04/23/18 13:12	
Pentachlorophenol	ug/L	ND	20.0	04/23/18 13:12	
Phenanthrene	ug/L	ND	10.0	04/23/18 13:12	
Phenol	ug/L	ND	10.0	04/23/18 13:12	
Pyrene	ug/L	ND	10.0	04/23/18 13:12	
2,4,6-Tribromophenol (S)	%	100	65-125	04/23/18 13:12	
2-Fluorobiphenyl (S)	%	85	56-125	04/23/18 13:12	
2-Fluorophenol (S)	%	90	55-125	04/23/18 13:12	
Nitrobenzene-d5 (S)	%	87	60-125	04/23/18 13:12	
p-Terphenyl-d14 (S)	%	105	58-125	04/23/18 13:12	
Phenol-d6 (S)	%	91	58-125	04/23/18 13:12	

LABORATORY CONTROL SAMPLE & LCSD: 2897017

Parameter	Units	Spike Conc.	2897018		LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
			LCS Result	LCSD Result						
1,2,4-Trichlorobenzene	ug/L	50	43.4	41.0	87	82	54-125	6	20	
1,2-Dichlorobenzene	ug/L	50	42.4	40.5	85	81	35-125	4	20	
1,2-Diphenylhydrazine	ug/L	50	46.0	44.0	92	88	68-125	4	20	
1,3-Dichlorobenzene	ug/L	50	41.3	40.1	83	80	30-125	3	20	
1,4-Dichlorobenzene	ug/L	50	41.1	40.4	82	81	33-125	2	20	
1-Methylnaphthalene	ug/L	50	45.7	43.8	91	88	67-125	4	20	
2,4,5-Trichlorophenol	ug/L	50	47.5	45.2	95	90	74-125	5	20	
2,4,6-Trichlorophenol	ug/L	50	47.6	46.1	95	92	74-125	3	20	
2,4-Dichlorophenol	ug/L	50	46.2	45.8	92	92	68-125	1	20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

LABORATORY CONTROL SAMPLE & LCSD: 2897017		2897018									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
2,4-Dimethylphenol	ug/L	50	36.7J	33.2J	73	66	33-125		20		
2,4-Dinitrophenol	ug/L	50	44.2	49.6	88	99	30-127	12	20		
2,4-Dinitrotoluene	ug/L	50	56.5	54.7	113	109	75-125	3	20		
2,6-Dinitrotoluene	ug/L	50	52.6	51.2	105	102	75-125	3	20		
2-Chloronaphthalene	ug/L	50	46.9	45.4	94	91	70-125	3	20		
2-Chlorophenol	ug/L	50	42.5	40.8	85	82	61-125	4	20		
2-Methylnaphthalene	ug/L	50	45.8	43.0	92	86	67-125	6	20		
2-Methylphenol(o-Cresol)	ug/L	50	43.3	40.4	87	81	63-125	7	20		
2-Nitroaniline	ug/L	50	47.4	45.8	95	92	73-125	3	20		
2-Nitrophenol	ug/L	50	48.1	46.0	96	92	64-125	4	20		
3&4-Methylphenol(m&p Cresol)	ug/L	50	43.9	42.1	88	84	67-125	4	20		
3,3'-Dichlorobenzidine	ug/L	50	55.6	52.5	111	105	60-125	6	20		
3-Nitroaniline	ug/L	50	55.7	53.3	111	107	73-125	4	20		
4,6-Dinitro-2-methylphenol	ug/L	50	55.3	56.3	111	113	42-127	2	20	2M	
4-Bromophenylphenyl ether	ug/L	50	48.0	46.6	96	93	75-125	3	20		
4-Chloro-3-methylphenol	ug/L	50	49.9	47.0	100	94	75-125	6	20		
4-Chloroaniline	ug/L	50	43.9J	41J	88	82	60-125		20		
4-Chlorophenylphenyl ether	ug/L	50	48.7	47.0	97	94	74-125	4	20		
4-Nitroaniline	ug/L	50	48.4	47.5	97	95	69-125	2	20		
4-Nitrophenol	ug/L	50	46.6	45.7	93	91	62-125	2	20		
Acenaphthene	ug/L	50	47.1	45.3	94	91	74-125	4	20		
Acenaphthylene	ug/L	50	47.1	45.2	94	90	72-125	4	20		
Anthracene	ug/L	50	48.4	46.0	97	92	75-125	5	20		
Benzo(a)anthracene	ug/L	50	49.4	48.5	99	97	75-125	2	20		
Benzo(a)pyrene	ug/L	50	48.6	47.8	97	96	75-125	2	20		
Benzo(b)fluoranthene	ug/L	50	49.8	48.3	100	97	75-125	3	20		
Benzo(g,h,i)perylene	ug/L	50	51.0	49.5	102	99	73-125	3	20		
Benzo(k)fluoranthene	ug/L	50	49.3	48.2	99	96	75-125	2	20		
bis(2-Chloroethoxy)methane	ug/L	50	44.6	42.9	89	86	67-125	4	20		
bis(2-Chloroethyl) ether	ug/L	50	39.9	37.8	80	76	55-125	5	20		
bis(2-Chloroisopropyl) ether	ug/L	50	34.7	33.2	69	66	52-125	5	20	2M	
bis(2-Ethylhexyl)phthalate	ug/L	50	55.2	54.2	110	108	72-129	2	20		
Butylbenzylphthalate	ug/L	50	54.4	51.4	109	103	69-127	6	20		
Carbazole	ug/L	50	50.4	48.2	101	96	75-125	4	20		
Chrysene	ug/L	50	49.9	48.6	100	97	75-125	3	20		
Di-n-butylphthalate	ug/L	50	53.2	50.5	106	101	75-125	5	20		
Di-n-octylphthalate	ug/L	50	56.1	54.8	112	110	69-131	2	20		
Dibenz(a,h)anthracene	ug/L	50	52.1	51.1	104	102	74-125	2	20		
Dibenzofuran	ug/L	50	48.8	46.3	98	93	75-125	5	20		
Diethylphthalate	ug/L	50	50.4	49.0	101	98	75-125	3	20		
Dimethylphthalate	ug/L	50	50.6	49.1	101	98	75-125	3	20		
Fluoranthene	ug/L	50	50.0	48.2	100	96	75-125	4	20		
Fluorene	ug/L	50	47.8	46.5	96	93	75-125	3	20		
Hexachloro-1,3-butadiene	ug/L	50	42.8	41.1	86	82	37-125	4	20		
Hexachlorobenzene	ug/L	50	49.3	47.2	99	94	74-125	4	20		
Hexachloroethane	ug/L	50	42.8	40.0	86	80	30-125	7	20		
Indeno(1,2,3-cd)pyrene	ug/L	50	51.3	50.3	103	101	74-125	2	20		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Parameter	Units	2897017		2897018			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Isophorone	ug/L	50	45.7	42.8	91	86	72-125	7	20	
N-Nitroso-di-n-propylamine	ug/L	50	43.0	42.3	86	85	65-125	2	20	
N-Nitrosodimethylamine	ug/L	50	42.8	39.7	86	79	52-125	7	20	
N-Nitrosodiphenylamine	ug/L	50	49.5	47.5	99	95	75-125	4	20	
Naphthalene	ug/L	50	43.8	41.5	88	83	58-125	5	20	
Nitrobenzene	ug/L	50	43.1	40.2	86	80	64-125	7	20	
Pentachlorophenol	ug/L	50	42.8	40.6	86	81	52-125	5	20	
Phenanthrene	ug/L	50	47.3	45.6	95	91	75-125	4	20	
Phenol	ug/L	50	41.4	40.1	83	80	59-125	3	20	
Pyrene	ug/L	50	50.4	49.0	101	98	75-125	3	20	
2,4,6-Tribromophenol (S)	%				95	91	65-125			
2-Fluorobiphenyl (S)	%				80	74	56-125			
2-Fluorophenol (S)	%				76	72	55-125			
Nitrobenzene-d5 (S)	%				77	72	60-125			
p-Terphenyl-d14 (S)	%				95	92	58-125			
Phenol-d6 (S)	%				76	73	58-125			

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 20900

Analysis Method: EPA 8315A

QC Batch Method: EPA 8315A

Analysis Description: 8315 GCSV Aldehydes

Associated Lab Samples: 10427644001

METHOD BLANK: 83416

Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Formaldehyde	ug/L	ND	100	04/21/18 11:17	

LABORATORY CONTROL SAMPLE: 83417

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	400	358	90	44-176	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 83418

83419

Parameter	Units	10427644001		83419		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Formaldehyde	ug/L	ND	400	400	360	369	87	90	35-167	3	20

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 532917

Analysis Method: Hach 10360 Rev 1.1

QC Batch Method: Hach 10360

Analysis Description: Hach 10360 Rev 1.1, BOD

Associated Lab Samples: 10427644001

METHOD BLANK: 2894166

Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	04/23/18 09:53	B3

LABORATORY CONTROL SAMPLE: 2894168

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	228	115	85-115	B3

SAMPLE DUPLICATE: 2894169

Parameter	Units	10427534001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	ND	ND		20	B2,B3

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 534707	Analysis Method: EPA 1664A OG
QC Batch Method: EPA 1664A OG	Analysis Description: 1664 HEM, Oil and Grease
Associated Lab Samples: 10427644001	

METHOD BLANK: 2905010 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	04/27/18 09:22	

LABORATORY CONTROL SAMPLE: 2905011

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	38.3	96	78-114	

MATRIX SPIKE SAMPLE: 2905012

Parameter	Units	10428294001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	ND	40	34.7	83	78-114	

SAMPLE DUPLICATE: 2905013

Parameter	Units	40167780001 Result	Dup Result	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	1.7J	2.2J		18	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 533083

Analysis Method: EPA 180.1

QC Batch Method: EPA 180.1

Analysis Description: 180.1 Turbidity

Associated Lab Samples: 10427644001

METHOD BLANK: 2895150

Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	04/18/18 15:33	

LABORATORY CONTROL SAMPLE: 2895151

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.2	98	90-110	

SAMPLE DUPLICATE: 2895152

Parameter	Units	10427644001 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	388	386	1	20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 533730	Analysis Method: SM 2540D
QC Batch Method: SM 2540D	Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10427644001	

METHOD BLANK: 2899115 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	04/24/18 09:00	

LABORATORY CONTROL SAMPLE: 2899116

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	96.0	96	80-120	

SAMPLE DUPLICATE: 2899117

Parameter	Units	10427621001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	145	138	5	10	

SAMPLE DUPLICATE: 2899118

Parameter	Units	10427624001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	381	382	0	10	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 534745	Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B	Analysis Description: 4500H+B pH
Associated Lab Samples: 10427644001	

LABORATORY CONTROL SAMPLE: 2905104

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	99	98-102	H6

SAMPLE DUPLICATE: 2905105

Parameter	Units	10427644001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.1	7.0	1	3	H6

SAMPLE DUPLICATE: 2905106

Parameter	Units	10427668001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	3	H6

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 533253 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10427644001

METHOD BLANK: 2896722 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	04/19/18 11:32	
Fluoride	mg/L	ND	0.050	04/19/18 11:32	

LABORATORY CONTROL SAMPLE: 2896723

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.0	96	90-110	
Fluoride	mg/L	1	0.92	92	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896724 2896725

Parameter	Units	10427232002		MS		MSD		% Rec		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec				
Chloride	mg/L	0.32J	12.5	12.5	12.0	12.0	94	93	90-110	0	20		
Fluoride	mg/L	<0.0028	1	1	1.0	0.94	103	94	90-110	9	20		

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 442023

Analysis Method: EPA 300.1

QC Batch Method: EPA 300.1

Analysis Description: 300.1 Oxihalides IC Anions

Associated Lab Samples: 10427644001

METHOD BLANK: 2399126

Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorite	ug/L	ND	5.0	04/22/18 13:44	

LABORATORY CONTROL SAMPLE: 2399127

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	40	39.8	99	85-115	

MATRIX SPIKE SAMPLE: 2399129

Parameter	Units	10427644001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	ND	400	377	94	75-125	

SAMPLE DUPLICATE: 2399128

Parameter	Units	10427644001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorite	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 442024 Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1 Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10427644001

METHOD BLANK: 2399130 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromate	ug/L	ND	1.0	04/22/18 13:44	

LABORATORY CONTROL SAMPLE: 2399131

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	8	8.1	101	85-115	

MATRIX SPIKE SAMPLE: 2399133

Parameter	Units	10427644001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	ND	80	77.2	97	75-125	

SAMPLE DUPLICATE: 2399132

Parameter	Units	10427644001 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromate	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 532952 Analysis Method: SM 3500-Cr B Modified
QC Batch Method: SM 3500-Cr B Modified Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10427644001

METHOD BLANK: 2894297 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	04/18/18 12:38	FS

LABORATORY CONTROL SAMPLE: 2894298

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.21	105	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2894299 2894300

Parameter	Units	10427644001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/L	ND	.2	.2	0.16	0.15	75	73	85-115	3	20	FS,H1, M1

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 140957 Analysis Method: EPA 350.1 rev. 2 (1993)
QC Batch Method: EPA 350.1 rev. 2 (1993) Analysis Description: 350.1 Ammonia Distilled
Associated Lab Samples: 10427644001

METHOD BLANK: 557837 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	04/20/18 07:08	

LABORATORY CONTROL SAMPLE: 557838

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.3	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557839 557840

Parameter	Units	12107304003		557839		557840		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Nitrogen, Ammonia	mg/L	ND	ND	5	5	4.8	5.0	94	99	90-110	5	10

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 533073	Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2	Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 10427644001	

METHOD BLANK: 2894868 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	04/18/18 15:28	FS
Nitrite as N	mg/L	ND	0.020	04/18/18 15:28	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	04/18/18 15:28	FS

LABORATORY CONTROL SAMPLE: 2894869

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	1.0	100	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	1.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2894870 2894871

Parameter	Units	10427644001		2894870		2894871		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Nitrite as N	mg/L	ND	1	1	1.0	1.0	100	90-110	2	20	FS
Nitrogen, NO2 plus NO3	mg/L	0.034	1	1	1.0	1.0	102	90-110	0	20	FS

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 21104 Analysis Method: EPA 9016
QC Batch Method: EPA 9016 Analysis Description: 9016 Free Cyanide
Associated Lab Samples: 10427644001

METHOD BLANK: 84163 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/24/18 17:31	

LABORATORY CONTROL SAMPLE: 84164

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	148	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 84165 84166

Parameter	Units	10427352003		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Cyanide, Free	ug/L	ND	150	150	142	143	95	95	80-120	1	11				

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 534468 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10427644001

METHOD BLANK: 2903673 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/27/18 09:57	

LABORATORY CONTROL SAMPLE: 2903674

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	258	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903675 2903676

Parameter	Units	10428172001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Cyanide	ug/L	10.1	250	250	238	242	91	93	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903677 2903678

Parameter	Units	10428174001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Cyanide	ug/L	10.6	250	250	241	242	92	92	80-120	0	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 533937 Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10427644001

METHOD BLANK: 2900160 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	04/24/18 13:46	

LABORATORY CONTROL SAMPLE: 2900161

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	0.95	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2900162 2900163

Parameter	Units	10427703001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Phosphorus	mg/L	3.9	1	1	5.0	5.0	105	104	80-120	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2900164 2900165

Parameter	Units	10427897001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Phosphorus	mg/L	7.7	1	1	8.4	8.5	76	83	80-120	1	30	M1

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Sample: FD-TT-10 **Lab ID: 10427644001** Collected: 04/17/18 12:15 Received: 04/17/18 17:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	29.2 ± 8.77 (8.78) C:NA T:NA	pCi/L	04/24/18 18:57	12587-46-1	
Gross Beta	EPA 900.0	4.35 ± 4.73 (8.16) C:NA T:NA	pCi/L	04/24/18 18:57	12587-47-2	
Radium-226	EPA 903.1	1.54 ± 0.735 (0.772) C:NA T:95%	pCi/L	04/30/18 11:23	13982-63-3	
Radium-228	EPA 904.0	0.856 ± 0.544 (1.04) C:77% T:68%	pCi/L	04/30/18 14:35	15262-20-1	
Total Radium	Total Radium Calculation	2.40 ± 1.28 (1.81)	pCi/L	05/02/18 13:00	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 295467

Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0

Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 10427644001

METHOD BLANK: 1446536

Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.666 ± 0.451 (1.40) C:NA T:NA	pCi/L	04/24/18 19:40	
Gross Beta	0.326 ± 0.562 (1.25) C:NA T:NA	pCi/L	04/24/18 19:40	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 295478

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 10427644001

METHOD BLANK: 1446554

Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.335 (0.752) C:NA T:89%	pCi/L	04/30/18 11:23	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 295491

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 10427644001

METHOD BLANK: 1446587

Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.147 ± 0.342 (0.760) C:78% T:76%	pCi/L	04/30/18 14:33	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-O Pace Analytical Services - Ormond Beach

PASI-PA Pace Analytical Services - Greensburg

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10427644

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 533263

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

BATCH QUALIFIERS

Batch: 533719

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 533817

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 534052

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 534336

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 534707

[BE] Batch extracted by solid phase extraction (SPE).

Batch: 535186

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 535198

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 535220

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

- 1M Sample was dark brown in color.
- 2M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
- B2 Oxygen usage is less than 2.0 for all dilutions set. The reported value is an estimated less than value and is calculated for the dilution using the most amount of sample.
- B3 The dissolved oxygen depletion of the dilution water blank exceeded 0.2 mg/L.
- CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
- D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
- FS The sample was filtered in the laboratory prior to analysis.
- H1 Analysis conducted outside the EPA method holding time.
- H1 Analysis conducted outside the recognized method holding time.
- H3 Sample was received or analysis requested beyond the recognized method holding time.
- H6 Analysis initiated outside of the 15 minute EPA required holding time.
- L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- R1 RPD value was outside control limits.
- S0 Surrogate recovery outside laboratory control limits.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427644001	FD-TT-10				
10427644001	FD-TT-10	EPA 531.1	444330		
10427644001	FD-TT-10	EPA 547	443429		
10427644001	FD-TT-10	EPA 549.2	442185	EPA 549.2	442515
10427644001	FD-TT-10	EPA 552.3	441812	EPA 552.3	442081
10427644001	FD-TT-10	EPA 8011	534073	EPA 8011	534336
10427644001	FD-TT-10	EPA 8015 Alcohol-Glycol	438905		
10427644001	FD-TT-10	EPA 8015 Alcohol-Glycol	438205		
10427644001	FD-TT-10	EPA Mod. 3510C	533542	EPA 8081B	534052
10427644001	FD-TT-10	EPA Mod. 3510C	533544	EPA 8082A	533719
10427644001	FD-TT-10	EPA 8315A	20900	EPA 8315A	20933
10427644001	FD-TT-10	EPA 8316	21113		
10427644001	FD-TT-10	EPA 200.7	535081	EPA 200.7	535241
10427644001	FD-TT-10	EPA 200.8	535083	EPA 200.8	535198
10427644001	FD-TT-10	EPA 200.8	535082	EPA 200.8	535220
10427644001	FD-TT-10	EPA 245.1	535087	EPA 245.1	535186
10427644001	FD-TT-10	EPA 548.1	441896	EPA 548.1	442399
10427644001	FD-TT-10	EPA 3520	533322	EPA 8270D	533817
10427644001	FD-TT-10	EPA 524.2	533263		
10427644001	FD-TT-10				
10427644001	FD-TT-10	EPA 900.0	295467		
10427644001	FD-TT-10	EPA 903.1	295478		
10427644001	FD-TT-10	EPA 904.0	295491		
10427644001	FD-TT-10	Total Radium Calculation	296799		
10427644001	FD-TT-10	Hach 10360	532917	Hach 10360 Rev 1.1	533230
10427644001	FD-TT-10	EPA 1664A OG	534707		
10427644001	FD-TT-10	EPA 180.1	533083		
10427644001	FD-TT-10	SM 2540D	533730		
10427644001	FD-TT-10	SM 4500-H+B	534745		
10427644001	FD-TT-10	Trivalent Chromium Calculation	535426		
10427644001	FD-TT-10	EPA 300.0	533253		
10427644001	FD-TT-10	EPA 300.1	442023		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427644001	FD-TT-10	EPA 300.1	442024		
10427644001	FD-TT-10	SM 3500-Cr B Modified	532952		
10427644001	FD-TT-10	EPA 350.1			
10427644001	FD-TT-10	EPA 350.1 rev. 2 (1993)	140957	EPA 350.1 rev. 2 (1993)	141065
10427644001	FD-TT-10	EPA 353.2	533073		
10427644001	FD-TT-10	EPA 9016	21104	EPA 9016	21181
10427644001	FD-TT-10	SM 4500-CN-E	534468	SM 4500-CN-E	534565
10427644001	FD-TT-10	SM 4500-P B	533937	SM 4500-P E	533991

REPORT OF LABORATORY ANALYSIS

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WO# 10427644



Minnesota Pollution Control Agency

Chain-of-Custody Form

Work Order Number: 10427644

COC Type: 10427644

Turnaround Time:

COC ID:

FOR LAB USE ONLY

PROJECT/CLIENT INFO

LABORATORY

Facility Code: MPCA - Freeway LF waters Program Code (MDH Lab Only):

Lab Name:

Project Name: MPCA - Freeway LF waters Project Task Code:

Address: 18-00383

Project Manager:

EPIC Profile # 38716

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
Sample=Routine Sample
S-IVP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES
DW=Drinking Water
NW=Non-potable Water
SD=Soil/Solid
WP=Wipe

AR=Air
BL=Biological Material
OT=Other
TS=Tissue

FIELD MATRIX CODES
Ww-Ground=Groundwater
Ws-Surf=Surface Water
QC-BLANK=Artificial Blank Water
Leachate=Leachate Sample

PRESERV.

ANALYSIS

Location Identifier	Sample Type	Date	Time	Start Depth, ft	End Depth, ft	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Lab Sample No.	#
FD-11-10 12-16-9	S	4/17/18	12:15	12'	12'	G	NW	WTF-Ground			41	X LISTA X LISTA B/C	001	1
														2
														3
														4
														5
														6
														7
														8
														9
														10

NW
4/17/18

Sampled By:

Sampler's Signature:

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
<i>Matt R. Pace</i>	4/17/18 1730	<i>Matt R. Pace</i>	4/17/18 1730

= 9.2, 6.0

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	EPA 8270C
PCBs	EPA 8082
PFCs	EPA 537
VOCs	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

** ADD to Parameter List A:

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Harness determination)

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 801.1
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace

Sample Condition Upon Receipt

Client Name: POLLUTION CONTROL Project #: _____

WO# : 10427644
 PM: JMA Due Date: 05/02/18
 CLIENT: ASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No
 Thermometer 151401163 687A9155100842 Type of Ice: Wet Blue None Dry Melted
 Cooler Temp Read (°C): 9.0, 5.8 Cooler Temp Corrected (°C): 9.2, 6.0 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: BT 4/17/18
 USDA Regulated Soil N/A, water sample
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	*2. NO LISTS PROVIDED
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>not</u>	12.
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N Sample # <u>1</u> <u>5/5</u> <u>1/1</u> <u>1/1</u> Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Pace Trip Blank Lot # (if purchased): _____	15.

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: BA W Date: 4/18/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Chain of Custody

WO#: 12107322



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427644 Workorder Name: 18-0383 MPC-Freeway LF Waters Owner Received Date: 4/17/2018 Results Requested By: 5/2/2018

Report To		Subcontract To					Requested Analysis															
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					Nitrogen, unionized ammonia, as N															
Preserved Containers																						
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	H2SO4		LAB USE ONLY														
1	FD-TT-10	PS	4/17/2018 12:15	10427644001	Water	1		X														
2																						
3																						

Transfers					Comments				
Released By	Date/Time	Received By	Date/Time						
<i>[Signature]</i>	4/18/18 17:20	<i>[Signature]</i>	4/18/18 18:15						
CB	4/18/18 22:15	B Mathas	4/19/18 06:45						

Cooler Temperature on Receipt 4.6 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace - Mpls. Project #: _____

NO# : 12-07322
 M: HRZ Due Date: 05/02/18
 CLIENT: PACE M LS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 4.3 Cooler Temp Corrected °C: 4.6 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: 4/18/18 CB 221
 Comments: Bm 4/18/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N
 Project Manager Review: Angela Loisel Date: 4/19/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)


Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN



Workorder: 10427644 Workorder Name: 18-0383 MPC-Freeway LF Waters Owner Received Date: 4/17/2018 Results Requested By: 5/2/2018

Report To		Subcontract To				Requested Analysis									
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600				<p style="text-align: right; font-size: 24pt; font-weight: bold;">WO#: 30250027</p>  <p style="text-align: center; font-weight: bold;">30250027</p>									
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Gross Alpha/Beta	Radium 226	Radium 228	Radium, total	LAB USE ONLY	
						HH:MM									
1	FD-TT-10	PS	4/17/2018 12:15	10427644001	Water	3				X	X	X	X	001	
2															
3															
4															
5															
Transfers	Released By	Date/Time	Received By	Date/Time	Comments										
1	<i>[Signature]</i>	4/15/18 16:10	<i>[Signature]</i>	4-19-18 0930											
2															
3															
Cooler Temperature on Receipt		— °C	Custody Seal <u>Y</u> or <u>N</u>		Received on Ice <u>Y</u> or <u>N</u>			Samples Intact <u>Y</u> or <u>N</u>							

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace MN

Project # 30250027

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 2389

Label	<u>BXH</u>
LIMS Login	<u>BXH</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C
Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>10D1071</u>	<u>BXH 4-19-18</u>
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.	
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.	
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.	
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.	
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.	
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.	
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.	
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.	
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.	
Hex Cr Aqueous Compliance/NPDES sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.	
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.	
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.	
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.	
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<u>pH<2</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				initial when completed: <u>BXH</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.	
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.	
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Rad Aqueous Samples Screened > 0.5 mrem/hr	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	initial when completed: <u>BXH</u>	Date: <u>4-19-18</u>

Client Notification/ Resolution:
 Person Contacted: _____ Date/Time: _____ Contacted By: _____
 Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)
 *PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

WO#: 35387261



35387261

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427644 Workorder Name: 18-0383 MPC-Freeway LF Waters Owner Received Date: 4/17/2018 Results Requested By: 5/2/2018

Report To		Subcontract To				Requested Analysis										
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Ormond Beach 8 East Tower Circle Ormond Beach, FL 32174 Phone (386)672-5668														
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers			Aldicarb / Carbofuran EPA 8318	Bromate/Chlorite EPA 300.1	Chlorine Dioxide	Diquat EPA 519.2	Etothall EPA 548.1	Glyphosate EPA 547	Haloacetic acids, total (HAA5) EPA	LAB USE ONLY
						Other	Unpreserved	NA2S2O3								
1	FD-TT-10	PS	4/17/2018 12:15	10427644001	Water	2	2	2	X	X	X	X	X	X	X	
2																
3																
4																
5																

Transfers					Released By		Date/Time		Received By		Date/Time		Comments	
1					<i>[Signature]</i>	<i>POCC</i>	<i>4/15/18 1620</i>							
2								<i>H. Brooke Pace</i>	<i>4/19/18 1130</i>					
3						<i>T339</i>								

Cooler Temperature on Receipt 2.0 °C Custody Seal or *FB1* Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

WO# : 35387261 **(SCUR)**

Project #
Project Manager:
Client:

PM: ADC **Due Date:** 04/30/18
CLIENT: PACMIN

Date and Initials of person:
Examining contents:
Label: _____
Deliver: _____ *KBI*
pH: _____

Thermometer Used: T339 **Date:** 4/19/18 **Time:** 1130 **Initials:** _____

State of Origin: _____

Cooler #1 Temp.°C 1.7 (Visual) 10.3 (Correction Factor) 2.0 (Actual)
Cooler #2 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #3 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #4 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #5 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #6 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual)

Samples on ice, cooling process has begun
 Samples on ice, cooling process has begun
 Samples on ice, cooling process has begun
 Samples on ice, cooling process has begun
 Samples on ice, cooling process has begun
 Samples on ice, cooling process has begun

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____
Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9832 2390

Custody Seal on Cooler/Box Present: Yes No **Seals intact:** Yes No **Ice:** Wet Blue Dry None

Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (If Yes, complete) **Shorted Date:** _____ **Shorted Time:** _____ **Qty:** _____

Comments:

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Preservation Information: Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	

Client Notification/ Resolution:
Person Contacted: _____ **Date/Time:** _____

Comments/ Resolution (use back for additional comments):

Project Manager Review: _____

Date: _____

WO#: 4611026



4611026

Contracting Laboratory: _____

State Of Origin: MN



Workorder: 10427644

Workorder Name: 18-0383 MPC-Freeway LF Waters

Owner Received Date: 4/17/2018 Results Requested By: 5/2/2018

Report To		Subcontract To					Requested Analysis																														
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Grand Rapids 5560 Corporate Exchange Court Grand Rapids, MI 49512 USA Phone (616)975-4500					<div style="float: right; font-size: 24px; font-weight: bold;">13-1</div> <table border="1" style="width: 100%; height: 100%;"> <tr> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Acrylamide EPA 8316 PDFW</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Cyanide, free SM4500CIG</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Formaldehyde EPA 8315 PGRM</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>										Acrylamide EPA 8316 PDFW	Cyanide, free SM4500CIG	Formaldehyde EPA 8315 PGRM																		
Acrylamide EPA 8316 PDFW	Cyanide, free SM4500CIG	Formaldehyde EPA 8315 PGRM																																			
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers			LAB USE ONLY																												
						Other	Unpreserved																														
1	FD-TT-10	PS	4/17/2018 12:15	10427644001	Water	2	5																														
2																																					
3																																					
4																																					
5																																					
										Comments																											
Transfers	Released By	Date/Time	Received By	Date/Time																																	
1	<i>[Signature]</i>	4/15/18 16:40	<i>[Signature]</i>	4/18/18 4:30																																	
2																																					
3																																					
Cooler Temperature on Receipt		°C	Custody Seal Y or N		Received on Ice Y or N		Samples Intact Y or N																														

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

SAMPLE RECEIVING / LOG-IN CHECKLIST



Client <u>Pace Minnesota</u>	Work Order # <u>4611026</u>
Receipt Record Page/Line # <u>13-1</u>	

Recorded by (initials/date) <u>TS 4/19/18</u>	<input type="checkbox"/> Cooler <input type="checkbox"/> Box <input type="checkbox"/> Other	Qty Received <u>1</u>	<input checked="" type="checkbox"/> IR Gun (#202) Thermometer Used <input type="checkbox"/> Digital Thermometer (#54) <input type="checkbox"/> IR Gun (#402)
--	---	--------------------------	--

Cooler #	Time	Cooler #	Time	Cooler #	Time	Cooler #	Time
<u>None</u>	<u>0831</u>						
Custody Seals: <input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact	
Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None	
Coolant Location: <input checked="" type="checkbox"/> Dispersed <input type="checkbox"/> Top <input type="checkbox"/> Middle <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed <input type="checkbox"/> Top <input type="checkbox"/> Middle <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed <input type="checkbox"/> Top <input type="checkbox"/> Middle <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed <input type="checkbox"/> Top <input type="checkbox"/> Middle <input type="checkbox"/> Bottom	
Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No	
If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative	
Observed °C	Correction Factor °C	Actual °C	Temp Blank	Observed °C	Correction Factor °C	Actual °C	Temp Blank
Sample 1: <u>1.1</u>	<u>1</u>	<u>1.1</u>		Sample 1:			
Sample 2: <u>1.7</u>	<u>1</u>	<u>1.7</u>		Sample 2:			
Sample 3: <u>1.0</u>	<u>1</u>	<u>1.0</u>		Sample 3:			
When above 6 °C take a 3 Sample Average °C:		When above 6 °C take a 3 Sample Average °C:		When above 6 °C take a 3 Sample Average °C:		When above 6 °C take a 3 Sample Average °C:	
<input type="checkbox"/> VOC Trip Blank received?		<input type="checkbox"/> VOC Trip Blank received?		<input type="checkbox"/> VOC Trip Blank received?		<input type="checkbox"/> VOC Trip Blank received?	

If any shaded areas checked, complete Sample Receiving Non-Conformance

Paperwork Received

Yes	No	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Chain of Custody record(s)? If No, Initiated By _____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Received for Lab Signed/Date/Time?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	USDA Soil Documents?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sampling / Field Forms?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other _____

COC Information

Pace COC Other _____

COC ID Numbers: _____

Check COC for Accuracy

Yes	No	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Analysis Requested?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID matches COC?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample Date and Time matches COC?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	All containers indicated are received?

Sample Condition Summary

N/A	Yes	No	
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Broken containers/lids?
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Missing or incomplete labels?
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Illegible information on labels?
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Low volume received?
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Inappropriate or non-Pace containers received?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	VOC vials have headspace?
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Extra sample locations?
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Temperature Blank OR average sample temperature, ≥6° C?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If "Yes" was thermal preservation required?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If "Yes" were ALL samples collected the same day as receipt?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Completed Sample Preservation Verification Form?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Samples chemically preserved correctly?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If "No", add wire tag and fill out Non-Conformance Form?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Received unpreserved Terracore kit?
		<input type="checkbox"/>	If "Yes" unpreserved vials must be frozen

Work Order Not Logged In with Short Hold / Rush

Copies of COC To Lab Areas

Notes

No suble vial.

Yes	No	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Were all samples logged into Epic?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Were all samples labelled?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Were samples placed on scan locations?

Initial / Date : TS 4/19/18



Client <i>Pace Minnesota</i>	Work Order # <i>4611076</i>
Receipt Log # <i>13-1</i>	Completed By (initials/date) <i>RS 4/19/18</i>
Project Manager	

COC ID #										Adjusted by: _____			
										Date: _____			
Container Type	5 (23)		4		13		6		15				
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1	✓	N/A											
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

pH Strip Reagent or Lot #
<input checked="" type="checkbox"/> HC727135
<input type="checkbox"/> Other

Place a check mark in the Received box if pH is acceptable. If pH is not acceptable, document the Received and Adjusted pH values in the appropriate columns (all adjustments must be reviewed by the project manager). Never add more than 2x the default preservation volume (see table below for default volumes). Complete and attach an orange preservation tag to all adjusted samples. A Sample Receiving Non-Conformance Report must be completed if a pH adjustment was required.

Comments:

COC ID #										Adjusted by: _____			
										Date: _____			
Container Type	5 / 23		4		13		6		15				
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1													
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

Container Size (mL)	Default Preservative Volume (mL)
Container Types 5 / 23	NaOH
250	1.3
Container Type 4	H ₂ SO ₄
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H ₂ SO ₄
500	2.5
Container Types 6 / 15	HNO ₃
125	0.7
250	1.25
500	2.5
1000	5.0

Comments:

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427644

Workorder Name: 18-0383 MPC-Freeway LF Waters

Owner Received Date: 4/17/2018

Results Requested By: 5/2/2018

Report To		Subcontract To				Requested Analysis															
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Indianapolis 7726 Moller Road Indianapolis, IN 46268 Phone (317)228-3100				<div style="float: right; text-align: center;">56194851</div>															
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Methyl alcohol/Ethylene alcohol EPA	LAB USE ONLY										
						Unpreserved															
1	FD-TT-10	PS	4/17/2018 12:15	10427644001	Water	1				X	601										
2																					
3																					
4																					
5																					
Transfers										Comments											
Released By	Date/Time	Received By	Date/Time																		
<i>[Signature]</i>	4/15/18	<i>[Signature]</i>	4/15/18																		
Cooler Temperature on Receipt <u>5.10</u> °C		Custody Seal <input checked="" type="checkbox"/> or N			Received on Ice <input checked="" type="checkbox"/> or N			Samples Intact <input checked="" type="checkbox"/> or N													

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50194851 **Date/Time and Initials of person examining contents:** TAR 4/19/20 1440

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 8970 2424

Custody Seal on Cooler/Box Present: Yes No **Seals Intact:** Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F **Ice Type:** Wet Blue None | **Samples collected today and on ice:** Yes No N/A

Cooler Temperature: 5.9/5.6 **Ice Visible in Sample Containers?:** Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C **If temp. is Over 6°C or under 0°C, was the PM Notified?:** Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia?		-	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
Document any containers out of temp.						
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		/	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted. Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Present:	/					/
Chain of Custody Filled Out:	/		Dissolved Metals field filtered?:			/
Short Hold Time Analysis (<72hr)?:			Headspace Wisconsin Sulfide			
Analysis:		/				/
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			/
Rush TAT Requested:		/	Headspace in VOA Vials (>6mm):			/
Containers Intact?:	/		Trip Blank Present?:		-	
Sample Labels Match COC?:	/		Trip Blank Custody Seals?:		/	
Except TCs, which only require sample ID	/					

Comments:

Sample Container Count

W0#: 50194851



50194851

CLIENT: Paos MN

COC PAGE 1 of 1

COC ID# _____

Project # 50194851

Sample Line Item	DC9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	Bulk Kit	Matrix Slr (Soil/Wat Aqueous)	pH <2	pH >9	pH >12	
																		R					
1																		R	DG9U 2				
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
WG9U	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				

Page 73 of 82



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April 28, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414

RE: 18-00383 MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/19/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



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Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Water - MN Project Number: 10427644 Project Manager: Jennifer Anderson
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ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-TT-10 (10427644001)	A181617-01	Water	04/17/2018	04/19/2018

CASE NARRATIVE

Sample Receipt Information:

1 sample was received on 04/19/2018. Sample was received at 4.8 degrees Celsius. Sample was received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Continuing Calibration Verification (CCV):

The LC footnote on sample A181617-01 states that there was a low CCV recovery for prometon. The lower control limit is 80% and the lowest recovery was 71.7%.



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Pace Analytical
1700 Elm Street, Suite 200
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Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427644
Project Manager: Jennifer Anderson

FD-TT-10 (10427644001)

Date Sampled

A181617-01 (Water)

04/17/2018 12:15

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804168

Acetochlor	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	LC
Propachlor	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	

Surrogate: Atrazine-d5		90.7 %		65.1-122	04/19/2018	04/25/2018 14:21	EPA 8270D	
Surrogate: Parathion-d10		117 %		22.3-159	04/19/2018	04/25/2018 14:21	EPA 8270D	
Surrogate: Triphenyl phosphate		147 %		65.2-151	04/19/2018	04/25/2018 14:21	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804192

2,4-D	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:01	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:01	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:01	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:01	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:01	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:01	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/24/2018	04/24/2018 23:01	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:01	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:01	EPA 8151A	

Surrogate: 2,4-D-d5		95.0 %		44.2-121	04/24/2018	04/24/2018 23:01	EPA 8151A	
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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10427644
 Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804168 - EPA 3510C

Blank (A804168-BLK1)

Prepared: 04/19/2018 Analyzed: 04/24/2018 19:13

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>83.6</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>85.3</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.529</i>		<i>ug/L</i>	<i>0.5000</i>		<i>106</i>	<i>65.2-151</i>			

LCS (A804168-BS1)

Prepared: 04/19/2018 Analyzed: 04/24/2018 21:05

Acetochlor	0.954	0.50	ug/L	1.000		95.4	67.5-120			
Alachlor	0.959	0.50	ug/L	1.000		95.9	71.7-120			
Atrazine	0.891	0.50	ug/L	1.000		89.1	72.8-113			
Chlorpyrifos	0.817	0.50	ug/L	1.000		81.7	65.3-119			
Cyanazine	1.01	0.20	ug/L	1.000		101	49.5-140			
Desethylatrazine	0.951	0.50	ug/L	1.000		95.1	66.9-116			
Deisopropylatrazine	0.729	0.50	ug/L	1.000		72.9	44.3-110			
Dimethenamid	0.964	0.50	ug/L	1.000		96.4	63.8-116			
EPTC	0.559	0.50	ug/L	1.000		55.9	41.7-102			
Ethalfuralin	0.538	0.50	ug/L	1.000		53.8	41-127			
Fonofos	0.709	0.50	ug/L	1.000		70.9	59.7-118			
Metolachlor	0.984	0.50	ug/L	1.000		98.4	71.7-122			
Metribuzin	0.911	0.50	ug/L	1.000		91.1	66.6-128			
Pendimethalin	0.946	0.50	ug/L	1.000		94.6	55.5-137			
Phorate	0.577	0.30	ug/L	1.000		57.7	41.2-114			
Prometon	0.958	0.50	ug/L	1.000		95.8	66.3-120			
Propachlor	0.933	0.50	ug/L	1.000		93.3	65.8-119			



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Pace Analytical
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Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427644
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804168 - EPA 3510C

LCS (A804168-BS1)

Prepared: 04/19/2018 Analyzed: 04/24/2018 21:05

Propazine	0.840	0.50	ug/L	1.000		84.0	72-122			
Simazine	0.892	0.50	ug/L	1.000		89.2	72.8-113			
Terbufos	0.514	0.20	ug/L	1.000		51.4	38.6-115			
Triallate	0.622	0.50	ug/L	1.000		62.2	51.4-116			
Trifluralin	0.588	0.50	ug/L	1.000		58.8	46.1-134			
Surrogate: Atrazine-d5	0.451		ug/L	0.5000		90.2	65.1-122			
Surrogate: Parathion-d10	0.495		ug/L	0.5000		99.0	22.3-159			
Surrogate: Triphenyl phosphate	0.534		ug/L	0.5000		107	65.2-151			

Matrix Spike (A804168-MS1)

Source: A181612-06

Prepared: 04/19/2018 Analyzed: 04/24/2018 21:34

Acetochlor	1.09	0.50	ug/L	0.9346	0.0378	113	67.3-128			
Alachlor	2.58	0.50	ug/L	0.9346	1.50	116	58.2-150			
Atrazine	1.25	0.50	ug/L	0.9346	0.324	98.7	70.1-120			
Chlorpyrifos	1.26	0.50	ug/L	0.9346	0.121	122	73.3-118			M
Cyanazine	1.79	0.20	ug/L	0.9346	0.659	121	60.6-140			
Desethylatrazine	1.05	0.50	ug/L	0.9346	0.0617	106	69.7-122			
Deisopropylatrazine	0.867	0.50	ug/L	0.9346	0.246	66.4	48-121			
Dimethenamid	1.16	0.50	ug/L	0.9346	0.0699	117	63.7-123			
EPTC	0.734	0.50	ug/L	0.9346	0.100	67.8	58-109			
Ethalfuralin	0.652	0.50	ug/L	0.9346	ND	69.7	59.3-129			
Fonofos	0.605	0.50	ug/L	0.9346	0.0263	61.9	73.5-108			M
Metolachlor	65.6	0.50	ug/L	0.9346	67.5	NR	40.9-156			M1, E
Metribuzin	1.03	0.50	ug/L	0.9346	0.0606	104	70.9-136			
Pendimethalin	1.35	0.50	ug/L	0.9346	0.0391	141	55.4-155			
Phorate	0.563	0.30	ug/L	0.9346	0.112	48.2	60.2-108			M
Prometon	1.18	0.50	ug/L	0.9346	0.266	97.8	74.7-124			
Propachlor	0.724	0.50	ug/L	0.9346	ND	77.5	72.3-115			
Propazine	1.31	0.50	ug/L	0.9346	0.472	89.1	73.7-124			
Simazine	0.915	0.50	ug/L	0.9346	ND	97.9	74.8-114			
Terbufos	0.564	0.20	ug/L	0.9346	ND	60.4	56.1-114			
Triallate	0.620	0.50	ug/L	0.9346	ND	66.4	65.5-107			
Trifluralin	0.873	0.50	ug/L	0.9346	0.0370	89.5	58-149			
Surrogate: Atrazine-d5	0.443		ug/L	0.4673		94.7	65.1-122			
Surrogate: Parathion-d10	0.528		ug/L	0.4673		113	22.3-159			
Surrogate: Triphenyl phosphate	0.702		ug/L	0.4673		150	65.2-151			

Matrix Spike Dup (A804168-MSD1)

Source: A181612-06

Prepared: 04/19/2018 Analyzed: 04/24/2018 22:02

Acetochlor	1.10	0.50	ug/L	0.9434	0.0378	112	67.3-128	0.205	20	
Alachlor	2.49	0.50	ug/L	0.9434	1.50	106	58.2-150	3.47	20	
Atrazine	1.20	0.50	ug/L	0.9434	0.324	93.2	70.1-120	3.57	20	
Chlorpyrifos	1.25	0.50	ug/L	0.9434	0.121	119	73.3-118	1.32	20	M
Cyanazine	1.75	0.20	ug/L	0.9434	0.659	116	60.6-140	2.18	20	
Desethylatrazine	1.03	0.50	ug/L	0.9434	0.0617	102	69.7-122	2.35	20	
Deisopropylatrazine	0.790	0.50	ug/L	0.9434	0.246	57.7	48-121	9.23	20	



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Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10427644
 Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804168 - EPA 3510C

Matrix Spike Dup (A804168-MSD1)	Source: A181612-06			Prepared: 04/19/2018 Analyzed: 04/24/2018 22:02						
Dimethenamid	1.14	0.50	ug/L	0.9434	0.0699	113	63.7-123	1.98	20	
EPTC	0.759	0.50	ug/L	0.9434	0.100	69.8	58-109	3.38	20	
Ethalfuralin	0.650	0.50	ug/L	0.9434	ND	68.9	59.3-129	0.280	20	
Fonofos	0.581	0.50	ug/L	0.9434	0.0263	58.8	73.5-108	4.15	20	M
Metolachlor	63.8	0.50	ug/L	0.9434	67.5	NR	40.9-156	2.74	20	M1, E
Metribuzin	1.01	0.50	ug/L	0.9434	0.0606	100	70.9-136	2.66	20	
Pendimethalin	1.34	0.50	ug/L	0.9434	0.0391	138	55.4-155	1.06	20	
Phorate	0.583	0.30	ug/L	0.9434	0.112	49.9	60.2-108	3.49	20	M
Prometon	1.15	0.50	ug/L	0.9434	0.266	93.9	74.7-124	2.45	20	
Propachlor	0.706	0.50	ug/L	0.9434	ND	74.8	72.3-115	2.52	20	
Propazine	1.29	0.50	ug/L	0.9434	0.472	86.8	73.7-124	1.08	20	
Simazine	0.862	0.50	ug/L	0.9434	ND	91.4	74.8-114	5.89	20	
Terbufos	0.553	0.20	ug/L	0.9434	ND	58.6	56.1-114	2.07	20	
Triallate	0.606	0.50	ug/L	0.9434	ND	64.2	65.5-107	2.43	20	M
Trifluralin	0.840	0.50	ug/L	0.9434	0.0370	85.1	58-149	3.90	20	
Surrogate: Atrazine-d5	0.431		ug/L	0.4717		91.4	65.1-122			
Surrogate: Parathion-d10	0.485		ug/L	0.4717		103	22.3-159			
Surrogate: Triphenyl phosphate	0.641		ug/L	0.4717		136	65.2-151			



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427644
Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch A804192 - EPA 3510C

Blank (A804192-BLK1)

Prepared: 04/24/2018 Analyzed: 04/25/2018 07:56

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							

Surrogate: 2,4-D-d5

2.11 ug/L 2.016 105 44.2-121

LCS (A804192-BS1)

Prepared: 04/24/2018 Analyzed: 04/25/2018 04:58

2,4-D	1.70	0.50	ug/L	2.000		84.9	64.6-148			
2,4-DB	1.79	0.50	ug/L	2.000		89.7	66.7-143			
2,4,5-T	1.58	0.50	ug/L	2.000		79.1	63.4-133			
2,4,5-TP (Silvex)	1.69	0.50	ug/L	2.000		84.7	63-145			
Bentazon	0.901	0.50	ug/L	1.000		90.1	52.5-139			
Dicamba	1.54	0.50	ug/L	2.000		77.2	55.4-143			
MCPA	1.59	0.30	ug/L	2.000		79.7	33.5-143			
Picloram	0.849	0.50	ug/L	1.000		84.9	47.9-113			
Triclopyr	1.79	0.50	ug/L	2.000		89.7	65.1-141			

Surrogate: 2,4-D-d5

1.66 ug/L 2.016 82.4 44.2-121

LCS Dup (A804192-BSD1)

Prepared: 04/24/2018 Analyzed: 04/25/2018 11:48

2,4-D	1.76	0.50	ug/L	2.000		87.9	64.6-148	3.43	20	
2,4-DB	1.76	0.50	ug/L	2.000		88.1	66.7-143	1.81	20	
2,4,5-T	1.49	0.50	ug/L	2.000		74.4	63.4-133	6.16	20	
2,4,5-TP (Silvex)	1.73	0.50	ug/L	2.000		86.6	63-145	2.29	20	
Bentazon	0.811	0.50	ug/L	1.000		81.1	52.5-139	10.5	20	
Dicamba	1.63	0.50	ug/L	2.000		81.6	55.4-143	5.55	20	
MCPA	1.58	0.30	ug/L	2.000		79.2	33.5-143	0.648	20	
Picloram	0.712	0.50	ug/L	1.000		71.2	47.9-113	17.5	20	
Triclopyr	1.51	0.50	ug/L	2.000		75.4	65.1-141	17.3	20	

Surrogate: 2,4-D-d5

1.77 ug/L 2.016 87.7 44.2-121



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427644
Project Manager: Jennifer Anderson

Notes and Definitions

- M1 Spike recoveries were not evaluated because of elevated levels of the spiked analyte in the parent sample.
- M The matrix spike and/or matrix spike duplicate recovery was outside of the laboratory control limits.
- LC Results may be biased low because of low continuing calibration verification (CCV).
- E The concentration indicated is above the instrument calibration range. This value is an estimated concentration.
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Chain of Custody

A181617



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427644 Workorder Name: 18-0383 MPC-Freeway LF Waters Owner Received Date: 4/17/2018 Results Requested By: 5/2/2018

Report To		Subcontract To			Requested Analysis																																																	
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700			<table border="1"> <tr> <th>Herbicides MDA List II EPA 8151</th> <th>Pesticides MDA List I (8270 pest)</th> <th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th> </tr> <tr> <td>X</td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>										Herbicides MDA List II EPA 8151	Pesticides MDA List I (8270 pest)																			X	X																		
Herbicides MDA List II EPA 8151	Pesticides MDA List I (8270 pest)																																																					
X	X																																																					
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved	Preserved Containers										LAB USE ONLY																																					
1	FD-TT-10	PS	4/17/2018 12:15	10427644001	Water	2														01																																		
2																																																						
3																																																						
4																																																						
5																																																						
Transfers												Comments																																										
Released By	Date/Time	Received By	Date/Time																																																			
<i>[Signature]</i>	4/18/18 1650	<i>[Signature]</i>	4/19/18 10:18																																																			
Cooler Temperature on Receipt 4.8 °C		Custody Seal <input checked="" type="radio"/> Y or <input type="radio"/> N		Received on Ice <input checked="" type="radio"/> Y or <input type="radio"/> N		Samples Intact <input checked="" type="radio"/> Y or <input type="radio"/> N																																																

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274 exp. 7/12/18

Page 82 of 82

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

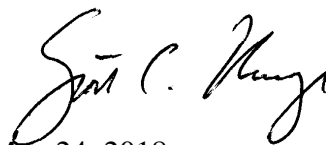
PaceProject#: 10427823
Sample Receipt Date: 04/18/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: N/A

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



May 24, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

May 24, 2018



DISCUSSION

This report presents the results from the analyses performed on two samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 50-67%. All of the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained. In cases where the estimated detection limits (EDLs) were above the standard reporting limits, the EDLs were reported and flagged "A".

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 116%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10427823

Appendix A

Sample Management

WO# 10427823



10427823

Report No....10427823_8290TCDD_DFR

Control Agency		PROJECT/CLIENT INFO				Work Order Number:		COC Type:		Page: 1 of				
Facility Code: MPLA - Freeway LF Solids		Program Code (MDH Lab Only):				Turnaround Time:		COC ID:		LABORATORY				
Project Name: MPLA - Freeway LF Solids		Project Task Code:				Lab Name:		Address: 19-00383		FOR LAB USE ONLY				
Project Manager:						Phone No:		EPIC Profile # 39716		Lab Work Order Sticker				
Potential Hazard?		If yes, add information to Sampler Comments Section												
SAMPLE DETAILS						ANALYSIS REQUESTED								
SAMPLE TYPE CODES			LAB MATRIX CODES			FIELD MATRIX CODES			PRESERV.					
S-RP=Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample			QC-FB=Field Blank Sample QC-FR=Field Replicate Sample QC-TB=Trip Blank Sample			DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe			AR=Air BL=Biological Material OT=Other TS=Tissue			Wt-Ground=Groundwater Wt-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample		
Location Identifier	Sample Type	Date	Time	Start Depth, in feet	End Depth, in feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS REQUESTED	Lab Sample No.	#
2-12 WM	S	4/18/18	9:10	2'	12'	C	SD	WM			13	X X	001	1
2-11 WM	S	4/18/18	12:30	3'	11'	C	SD	WM			13	X X	002	2
2-10.5 WM	S	4/18/18	13:50	2'	10.5'	C	SD	WM			13	X		3
														4
														5
														6
														7
														8
														9
														10
Sampled By: Nate Hibbard						Sampler's Signature: Nate Hibbard			Phone #: 612-214-9086					
Receiving Comments:														
Relinquished By/Affiliation						Date/Time			Accepted By/Affiliation			Date/Time		
(Sampler) Nate Hibbard / Pace						4/18/18 1730			Nate Hibbard / Pace			4/18/18 1730		

1730
T=7.3

Page 5 of 13

Sample Condition Upon Receipt

Client Name:
MPCA

Project #:



Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals intact? Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 7.1 Cooler Temp Corrected (°C): 7.3 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: M.D. 9/18/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	12. <u>No times on samples</u>
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N Sample # _____ Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: [Signature] Date: 04/19/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigaiton Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Litium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately
 half of the samples. To be determined in the field by MPCA staff.

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10427823

Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-TT-14 (2' -12' WM)		
Lab Sample ID	10427823001		
Filename	Y180511A_06		
Injected By	SMT		
Total Amount Extracted	13.5 g	Matrix	Solid
% Moisture	24.2	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	04/18/2018 09:10
ICAL ID	Y180204	Received	04/18/2018 17:30
CCal Filename(s)	Y180510C_16 & Y180511A_17	Extracted	04/24/2018 14:55
Method Blank ID	BLANK-61921	Analyzed	05/11/2018 06:18

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.9 A	2,3,7,8-TCDD-13C	2.00	67
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	120

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

A = Reporting Limit based on signal to noise
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-01 (3'-11' WM)		
Lab Sample ID	10427823002		
Filename	U180505A_06		
Injected By	BAL		
Total Amount Extracted	13.6 g	Matrix	Solid
% Moisture	17.9	Dilution	NA
Dry Weight Extracted	11.2 g	Collected	04/18/2018 12:30
ICAL ID	U180405	Received	04/18/2018 17:30
CCal Filename(s)	U180504B_15 & U180505A_10	Extracted	04/24/2018 14:55
Method Blank ID	BLANK-61921	Analyzed	05/05/2018 09:52

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	2.9 A	2,3,7,8-TCDD-13C	2.00	50
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	54

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

A = Reporting Limit based on signal to noise
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61921	Matrix	Solid
Filename	Y180511A_04	Dilution	NA
Total Amount Extracted	10.1 g	Extracted	04/24/2018 14:55
ICAL ID	Y180204	Analyzed	05/11/2018 04:51
CCal Filename(s)	Y180510C_16 & Y180511A_17	Injected By	SMT

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	59
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	58

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61922	Matrix	Solid
Filename	Y180511A_01	Dilution	NA
Total Amount Extracted	10.0 g	Extracted	04/24/2018 14:55
ICAL ID	Y180204	Analyzed	05/11/2018 02:41
CCal Filename(s)	Y180510C_16 & Y180511A_17	Injected By	SMT
Method Blank ID	BLANK-61921		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.23	116	2,3,7,8-TCDD-13C	2.0	66
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	69

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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May 03, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 18, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Montana Certificate #CERT0103
California Certification #2973
California Certification #2973
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
Montana DHHS Certification #: CERT0102
Minnesota Dept of Health Certification #: 1382680

Nevada DCNR Certification #: MN000372018-1
Wisconsin DNR Certification #: 999446800
North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10427824001	FD-TT-14 (2' -12' WM)	Solid	04/18/18 09:10	04/18/18 17:30
10427824002	FL-TT-01 (3'-11' WM)	Solid	04/18/18 12:30	04/18/18 17:30
10427824003	FL-TT-02 (2'-10.5' WM)	Solid	04/18/18 13:50	04/18/18 17:30

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10427824001	FD-TT-14 (2' -12' WM)	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	JRH	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010C	DM	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	RJS	10	PASI-M		
		EPA 7471	LMW	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	AT1	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8260B	GDM	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10427824002	FL-TT-01 (3'-11' WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M
WI MOD DRO	JRH			2	PASI-M		
WI MOD GRO	AJR			2	PASI-M		
EPA 6010C	DM			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	RJS			10	PASI-M		
EPA 7471	LMW			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	AT1			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8260B	CD2, GDM			72	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
10427824003	FL-TT-02 (2'-10.5' WM)			EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	GDM	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FD-TT-14 (2' -12' WM) **Lab ID:** 10427824001 Collected: 04/18/18 09:10 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	12.4	1	04/25/18 10:56	04/30/18 15:19	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	309-00-2	M6
alpha-BHC	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	319-84-6	M6
beta-BHC	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	319-85-7	M6
delta-BHC	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	58-89-9	M6
Chlordane (Technical)	ND	ug/kg	2200	100	04/19/18 13:04	04/26/18 21:09	57-74-9	
alpha-Chlordane	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	5103-71-9	M6
gamma-Chlordane	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	5103-74-2	M6
4,4'-DDD	ND	ug/kg	439	100	04/19/18 13:04	04/26/18 21:09	72-54-8	M6
4,4'-DDE	ND	ug/kg	439	100	04/19/18 13:04	04/26/18 21:09	72-55-9	
4,4'-DDT	ND	ug/kg	439	100	04/19/18 13:04	04/26/18 21:09	50-29-3	M6
Dieldrin	ND	ug/kg	439	100	04/19/18 13:04	04/26/18 21:09	60-57-1	M6
Endosulfan I	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	959-98-8	
Endosulfan II	ND	ug/kg	439	100	04/19/18 13:04	04/26/18 21:09	33213-65-9	
Endosulfan sulfate	ND	ug/kg	439	100	04/19/18 13:04	04/26/18 21:09	1031-07-8	
Endrin	ND	ug/kg	439	100	04/19/18 13:04	04/26/18 21:09	72-20-8	
Endrin aldehyde	ND	ug/kg	439	100	04/19/18 13:04	04/26/18 21:09	7421-93-4	
Endrin ketone	ND	ug/kg	439	100	04/19/18 13:04	04/26/18 21:09	53494-70-5	M6
Heptachlor	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	76-44-8	M6
Heptachlor epoxide	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	1024-57-3	
Methoxychlor	ND	ug/kg	2200	100	04/19/18 13:04	04/26/18 21:09	72-43-5	
Toxaphene	ND	ug/kg	6590	100	04/19/18 13:04	04/26/18 21:09	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%.	30-150	100	04/19/18 13:04	04/26/18 21:09	877-09-8	2M, D3, S4
Decachlorobiphenyl (S)	0	%.	30-150	100	04/19/18 13:04	04/26/18 21:09	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	43.5	1	04/19/18 13:39	04/23/18 18:52	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	43.5	1	04/19/18 13:39	04/23/18 18:52	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	43.5	1	04/19/18 13:39	04/23/18 18:52	11141-16-5	
PCB-1242 (Aroclor 1242)	2750	ug/kg	218	5	04/19/18 13:39	04/24/18 10:26	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	43.5	1	04/19/18 13:39	04/23/18 18:52	12672-29-6	
PCB-1254 (Aroclor 1254)	546	ug/kg	43.5	1	04/19/18 13:39	04/23/18 18:52	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	43.5	1	04/19/18 13:39	04/23/18 18:52	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	43.5	1	04/19/18 13:39	04/23/18 18:52	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	43.5	1	04/19/18 13:39	04/23/18 18:52	11100-14-4	
PCB, Total	3290	ug/kg	218	5	04/19/18 13:39	04/24/18 10:26	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	101	%.	48-125	1	04/19/18 13:39	04/23/18 18:52	877-09-8	
Decachlorobiphenyl (S)	97	%.	30-134	1	04/19/18 13:39	04/23/18 18:52	2051-24-3	CH

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FD-TT-14 (2' -12' WM) **Lab ID: 10427824001** Collected: 04/18/18 09:10 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	1420	mg/kg	875	20	04/20/18 17:57	04/22/18 13:07		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	20	04/20/18 17:57	04/22/18 13:07	638-68-6	P3,S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	98.5	mg/kg	14.8	1	05/02/18 10:19	05/02/18 14:31		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%.	80-150	1	05/02/18 10:19	05/02/18 14:31	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	7110	mg/kg	12.9	1	04/20/18 05:22	04/23/18 11:48	7429-90-5	
Barium	153	mg/kg	0.65	1	04/20/18 05:22	04/23/18 11:48	7440-39-3	
Boron	99.2	mg/kg	9.7	1	04/20/18 05:22	04/23/18 11:48	7440-42-8	
Copper	78.8	mg/kg	0.65	1	04/20/18 05:22	04/23/18 11:48	7440-50-8	
Iron	31700	mg/kg	16.2	5	04/20/18 05:22	04/23/18 12:58	7439-89-6	
Manganese	408	mg/kg	0.32	1	04/20/18 05:22	04/23/18 11:48	7439-96-5	
Nickel	66.4	mg/kg	1.3	1	04/20/18 05:22	04/23/18 11:48	7440-02-0	
Silver	ND	mg/kg	0.65	1	04/20/18 05:22	04/23/18 11:48	7440-22-4	
Tin	10.9	mg/kg	4.9	1	04/20/18 05:22	04/23/18 11:48	7440-31-5	
Titanium	263	mg/kg	1.6	1	04/20/18 05:22	04/23/18 11:48	7440-32-6	
Zinc	205	mg/kg	1.3	1	04/20/18 05:22	04/23/18 11:48	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	10	mg/kg	0.25	1	04/25/18 09:25	04/26/18 03:37	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.3	mg/kg	0.65	20	04/20/18 06:41	04/21/18 05:03	7440-36-0	
Arsenic	12.7	mg/kg	0.65	20	04/20/18 06:41	04/21/18 05:03	7440-38-2	
Beryllium	1.4	mg/kg	0.26	20	04/20/18 06:41	04/21/18 05:03	7440-41-7	
Cadmium	2.2	mg/kg	0.10	20	04/20/18 06:41	04/21/18 05:03	7440-43-9	
Cobalt	8.9	mg/kg	0.65	20	04/20/18 06:41	04/21/18 05:03	7440-48-4	
Lead	137	mg/kg	0.13	20	04/20/18 06:41	04/21/18 05:03	7439-92-1	
Lithium	7.9	mg/kg	0.65	20	04/20/18 06:41	04/21/18 05:03	7439-93-2	
Selenium	2.8	mg/kg	0.65	20	04/20/18 06:41	04/21/18 05:03	7782-49-2	
Strontium	70.2	mg/kg	0.65	20	04/20/18 06:41	04/21/18 05:03	7440-24-6	
Vanadium	63.1	mg/kg	1.3	20	04/20/18 06:41	04/21/18 05:03	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.27	mg/kg	0.023	1	04/20/18 04:53	04/22/18 16:33	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	24.2	%	0.10	1		04/24/18 13:49		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: **FD-TT-14 (2' -12' WM)** Lab ID: **10427824001** Collected: 04/18/18 09:10 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	208-96-8	
Anthracene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	120-12-7	
Benzo(a)anthracene	19200	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	56-55-3	
Benzo(a)pyrene	13400	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	50-32-8	
Benzo(b)fluoranthene	13900	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	101-55-3	
Butylbenzylphthalate	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	85-68-7	
Carbazole	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	59-50-7	
4-Chloroaniline	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	108-60-1	
2-Chloronaphthalene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	91-58-7	
2-Chlorophenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	7005-72-3	
Chrysene	19100	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	53-70-3	
Dibenzofuran	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	120-83-2	
Diethylphthalate	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	105-67-9	
Dimethylphthalate	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	131-11-3	
Di-n-butylphthalate	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	56000	5	04/19/18 19:31	04/26/18 00:28	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	606-20-2	
Di-n-octylphthalate	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	122-66-7	
bis(2-Ethylhexyl)phthalate	18400	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	117-81-7	
Fluoranthene	31300	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	206-44-0	
Fluorene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	87-68-3	
Hexachlorobenzene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	118-74-1	
Hexachloroethane	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	193-39-5	
Isophorone	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	78-59-1	
1-Methylnaphthalene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	90-12-0	
2-Methylnaphthalene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FD-TT-14 (2' -12' WM) **Lab ID: 10427824001** Collected: 04/18/18 09:10 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	21700	5	04/19/18 19:31	04/26/18 00:28		
Naphthalene	12200	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	91-20-3	
2-Nitroaniline	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	88-74-4	
3-Nitroaniline	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	99-09-2	
4-Nitroaniline	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	100-01-6	
Nitrobenzene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	88-95-3	
2-Nitrophenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	88-75-5	
4-Nitrophenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	86-30-6	
Pentachlorophenol	ND	ug/kg	22100	5	04/19/18 19:31	04/26/18 00:28	87-86-5	
Phenanthrene	36800	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	85-01-8	
Phenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	108-95-2	
Pyrene	44500	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%	43-125	5	04/19/18 19:31	04/26/18 00:28	4165-60-0	D3,P3, S4
2-Fluorobiphenyl (S)	0	%	30-132	5	04/19/18 19:31	04/26/18 00:28	321-60-8	S4
p-Terphenyl-d14 (S)	0	%	62-125	5	04/19/18 19:31	04/26/18 00:28	1718-51-0	S4
Phenol-d6 (S)	0	%	48-125	5	04/19/18 19:31	04/26/18 00:28	13127-88-3	S4
2-Fluorophenol (S)	0	%	40-125	5	04/19/18 19:31	04/26/18 00:28	367-12-4	S4
2,4,6-Tribromophenol (S)	0	%	60-125	5	04/19/18 19:31	04/26/18 00:28	118-79-6	S4
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	39700	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	83-32-9	
Acenaphthylene	390	ug/kg	65.9	5	04/19/18 18:12	04/20/18 18:30	208-96-8	
Anthracene	30700	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	120-12-7	
Benzo(a)anthracene	30500	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	56-55-3	
Benzo(a)pyrene	25600	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	50-32-8	
Benzo(b)fluoranthene	32200	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	205-99-2	
Benzo(g,h,i)perylene	12800	ug/kg	659	50	04/19/18 18:12	04/23/18 20:09	191-24-2	
Benzo(k)fluoranthene	11200	ug/kg	659	50	04/19/18 18:12	04/23/18 20:09	207-08-9	
Chrysene	23700	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	218-01-9	
Dibenz(a,h)anthracene	3390	ug/kg	659	50	04/19/18 18:12	04/23/18 20:09	53-70-3	
Fluoranthene	79500	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	206-44-0	
Fluorene	37300	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	86-73-7	
Indeno(1,2,3-cd)pyrene	11300	ug/kg	659	50	04/19/18 18:12	04/23/18 20:09	193-39-5	
Naphthalene	14700	ug/kg	659	50	04/19/18 18:12	04/23/18 20:09	91-20-3	
Phenanthrene	104000	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	85-01-8	
Pyrene	60300	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	129-00-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FD-TT-14 (2' -12' WM) **Lab ID:** 10427824001 Collected: 04/18/18 09:10 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
2-Fluorobiphenyl (S)	52	%	42-125	5	04/19/18 18:12	04/20/18 18:30	321-60-8	D3
p-Terphenyl-d14 (S)	93	%	57-125	5	04/19/18 18:12	04/20/18 18:30	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1320	1	04/29/18 13:40	04/29/18 22:34	67-64-1	
Allyl chloride	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	107-05-1	L2
Benzene	ND	ug/kg	26.4	1	04/29/18 13:40	04/29/18 22:34	71-43-2	
Bromobenzene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	108-86-1	
Bromochloromethane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	74-97-5	
Bromodichloromethane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	75-27-4	
Bromoform	ND	ug/kg	659	1	04/29/18 13:40	04/29/18 22:34	75-25-2	
Bromomethane	ND	ug/kg	659	1	04/29/18 13:40	04/29/18 22:34	74-83-9	
2-Butanone (MEK)	ND	ug/kg	330	1	04/29/18 13:40	04/29/18 22:34	78-93-3	
n-Butylbenzene	542	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	104-51-8	
sec-Butylbenzene	343	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	135-98-8	
tert-Butylbenzene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	98-06-6	
Carbon tetrachloride	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	56-23-5	
Chlorobenzene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	108-90-7	
Chloroethane	ND	ug/kg	659	1	04/29/18 13:40	04/29/18 22:34	75-00-3	
Chloroform	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	67-66-3	
Chloromethane	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	74-87-3	
2-Chlorotoluene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	95-49-8	
4-Chlorotoluene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	659	1	04/29/18 13:40	04/29/18 22:34	96-12-8	
Dibromochloromethane	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	106-93-4	
Dibromomethane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	74-95-3	
1,2-Dichlorobenzene	169	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	541-73-1	
1,4-Dichlorobenzene	194	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	75-71-8	
1,1-Dichloroethane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	75-34-3	
1,2-Dichloroethane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	107-06-2	
1,1-Dichloroethene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	156-60-5	
Dichlorofluoromethane	ND	ug/kg	659	1	04/29/18 13:40	04/29/18 22:34	75-43-4	
1,2-Dichloropropane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	78-87-5	
1,3-Dichloropropane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	142-28-9	
2,2-Dichloropropane	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	594-20-7	
1,1-Dichloropropene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	60-29-7	
Ethylbenzene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	100-41-4	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FD-TT-14 (2' -12' WM) **Lab ID: 10427824001** Collected: 04/18/18 09:10 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Hexachloro-1,3-butadiene	ND	ug/kg	330	1	04/29/18 13:40	04/29/18 22:34	87-68-3	
Isopropylbenzene (Cumene)	243	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	98-82-8	
p-Isopropyltoluene	70.5	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	99-87-6	
Methylene Chloride	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	75-09-2	L2
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	330	1	04/29/18 13:40	04/29/18 22:34	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	1634-04-4	
Naphthalene	6210	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	91-20-3	
n-Propylbenzene	468	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	103-65-1	
Styrene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	79-34-5	
Tetrachloroethene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	127-18-4	
Tetrahydrofuran	ND	ug/kg	2640	1	04/29/18 13:40	04/29/18 22:34	109-99-9	
Toluene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	79-00-5	
Trichloroethene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	79-01-6	
Trichlorofluoromethane	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	76-13-1	
1,2,4-Trimethylbenzene	471	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	108-67-8	
Vinyl chloride	ND	ug/kg	26.4	1	04/29/18 13:40	04/29/18 22:34	75-01-4	
Xylene (Total)	ND	ug/kg	198	1	04/29/18 13:40	04/29/18 22:34	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%	75-125	1	04/29/18 13:40	04/29/18 22:34	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	04/29/18 13:40	04/29/18 22:34	2037-26-5	
4-Bromofluorobenzene (S)	107	%	75-125	1	04/29/18 13:40	04/29/18 22:34	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	25.7	10	04/28/18 10:35	05/01/18 10:57	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	10.0	mg/kg	1.0	1		05/03/18 07:26	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.62	mg/kg	0.53	1	04/25/18 11:00	04/25/18 13:40	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.99	1	04/25/18 14:45	04/26/18 03:08	16984-48-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-01 (3'-11' WM) **Lab ID: 10427824002** Collected: 04/18/18 12:30 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.6	1	04/25/18 10:56	04/30/18 15:26	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	309-00-2	
alpha-BHC	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	319-84-6	
beta-BHC	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	319-85-7	
delta-BHC	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	58-89-9	
Chlordane (Technical)	ND	ug/kg	1010	50	04/19/18 13:04	04/27/18 00:30	57-74-9	
alpha-Chlordane	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	5103-71-9	
gamma-Chlordane	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	5103-74-2	
4,4'-DDD	ND	ug/kg	202	50	04/19/18 13:04	04/27/18 00:30	72-54-8	
4,4'-DDE	ND	ug/kg	202	50	04/19/18 13:04	04/27/18 00:30	72-55-9	
4,4'-DDT	ND	ug/kg	202	50	04/19/18 13:04	04/27/18 00:30	50-29-3	
Dieldrin	ND	ug/kg	202	50	04/19/18 13:04	04/27/18 00:30	60-57-1	
Endosulfan I	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	959-98-8	
Endosulfan II	ND	ug/kg	202	50	04/19/18 13:04	04/27/18 00:30	33213-65-9	
Endosulfan sulfate	ND	ug/kg	202	50	04/19/18 13:04	04/27/18 00:30	1031-07-8	
Endrin	ND	ug/kg	202	50	04/19/18 13:04	04/27/18 00:30	72-20-8	
Endrin aldehyde	ND	ug/kg	202	50	04/19/18 13:04	04/27/18 00:30	7421-93-4	
Endrin ketone	ND	ug/kg	202	50	04/19/18 13:04	04/27/18 00:30	53494-70-5	
Heptachlor	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	76-44-8	
Heptachlor epoxide	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	1024-57-3	
Methoxychlor	ND	ug/kg	1010	50	04/19/18 13:04	04/27/18 00:30	72-43-5	
Toxaphene	ND	ug/kg	3040	50	04/19/18 13:04	04/27/18 00:30	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%.	30-150	50	04/19/18 13:04	04/27/18 00:30	877-09-8	1M, D3, S4
Decachlorobiphenyl (S)	0	%.	30-150	50	04/19/18 13:04	04/27/18 00:30	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	12672-29-6	
PCB-1254 (Aroclor 1254)	125	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	11100-14-4	
PCB, Total	125	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	68	%.	48-125	1	04/19/18 13:39	04/23/18 19:40	877-09-8	
Decachlorobiphenyl (S)	126	%.	30-134	1	04/19/18 13:39	04/23/18 19:40	2051-24-3	CH

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-01 (3'-11' WM) Lab ID: 10427824002 Collected: 04/18/18 12:30 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS		Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO						
WDRO C10-C28	889	mg/kg	536	10	04/20/18 17:57	04/22/18 14:19		T6
Surrogates								
n-Triacontane (S)	0	%	50-150	10	04/20/18 17:57	04/22/18 14:19	638-68-6	P3,S4
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil						
Gasoline Range Organics	ND	mg/kg	13.1	1	05/02/18 10:19	05/02/18 12:53		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	05/02/18 10:19	05/02/18 12:53	98-08-8	
6010C MET ICP		Analytical Method: EPA 6010C Preparation Method: EPA 3050						
Aluminum	4360	mg/kg	11.5	1	04/20/18 05:22	04/23/18 11:51	7429-90-5	
Barium	636	mg/kg	0.57	1	04/20/18 05:22	04/23/18 11:51	7440-39-3	
Boron	9.0	mg/kg	8.6	1	04/20/18 05:22	04/23/18 11:51	7440-42-8	
Copper	20.7	mg/kg	0.57	1	04/20/18 05:22	04/23/18 11:51	7440-50-8	
Iron	9410	mg/kg	2.9	1	04/20/18 05:22	04/23/18 11:51	7439-89-6	
Manganese	402	mg/kg	0.29	1	04/20/18 05:22	04/23/18 11:51	7439-96-5	
Nickel	10.9	mg/kg	1.1	1	04/20/18 05:22	04/23/18 11:51	7440-02-0	
Silver	ND	mg/kg	0.57	1	04/20/18 05:22	04/23/18 11:51	7440-22-4	
Tin	8.6	mg/kg	4.3	1	04/20/18 05:22	04/23/18 11:51	7440-31-5	
Titanium	196	mg/kg	1.4	1	04/20/18 05:22	04/23/18 11:51	7440-32-6	
Zinc	412	mg/kg	1.1	1	04/20/18 05:22	04/23/18 11:51	7440-66-6	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3050B						
Chromium	4.0	mg/kg	0.22	1	04/25/18 09:25	04/26/18 04:06	7440-47-3	N2
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	ND	mg/kg	0.58	20	04/20/18 06:41	04/21/18 05:07	7440-36-0	
Arsenic	5.4	mg/kg	0.58	20	04/20/18 06:41	04/21/18 05:07	7440-38-2	
Beryllium	0.34	mg/kg	0.23	20	04/20/18 06:41	04/21/18 05:07	7440-41-7	
Cadmium	0.61	mg/kg	0.093	20	04/20/18 06:41	04/21/18 05:07	7440-43-9	
Cobalt	8.0	mg/kg	0.58	20	04/20/18 06:41	04/21/18 05:07	7440-48-4	
Lead	275	mg/kg	0.12	20	04/20/18 06:41	04/21/18 05:07	7439-92-1	
Lithium	5.3	mg/kg	0.58	20	04/20/18 06:41	04/21/18 05:07	7439-93-2	
Selenium	0.89	mg/kg	0.58	20	04/20/18 06:41	04/21/18 05:07	7782-49-2	
Strontium	44.3	mg/kg	0.58	20	04/20/18 06:41	04/21/18 05:07	7440-24-6	
Vanadium	24.8	mg/kg	1.2	20	04/20/18 06:41	04/21/18 05:07	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.38	mg/kg	0.021	1	04/20/18 04:53	04/22/18 16:35	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	17.9	%	0.10	1		04/24/18 13:49		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	2310	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-01 (3'-11' WM) **Lab ID: 10427824002** Collected: 04/18/18 12:30 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	208-96-8	
Anthracene	5340	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	120-12-7	
Benzo(a)anthracene	14800	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	56-55-3	
Benzo(a)pyrene	13200	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	50-32-8	
Benzo(b)fluoranthene	17100	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	205-99-2	
Benzo(g,h,i)perylene	9010	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	191-24-2	
Benzo(k)fluoranthene	6680	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	101-55-3	
Butylbenzylphthalate	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	85-68-7	
Carbazole	2920	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	59-50-7	
4-Chloroaniline	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	108-60-1	
2-Chloronaphthalene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	91-58-7	
2-Chlorophenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	7005-72-3	
Chrysene	15000	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	53-70-3	
Dibenzofuran	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	120-83-2	
Diethylphthalate	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	105-67-9	
Dimethylphthalate	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	131-11-3	
Di-n-butylphthalate	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	10300	5	04/19/18 19:31	04/26/18 00:56	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	606-20-2	
Di-n-octylphthalate	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	117-81-7	
Fluoranthene	29100	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	206-44-0	
Fluorene	2660	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	87-68-3	
Hexachlorobenzene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	118-74-1	
Hexachloroethane	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	67-72-1	
Indeno(1,2,3-cd)pyrene	7810	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	193-39-5	
Isophorone	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	78-59-1	
1-Methylnaphthalene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	90-12-0	
2-Methylnaphthalene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-01 (3'-11' WM) **Lab ID: 10427824002** Collected: 04/18/18 12:30 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

2-Methylphenol(o-Cresol)	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	4010	5	04/19/18 19:31	04/26/18 00:56		
Naphthalene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	91-20-3	
2-Nitroaniline	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	88-74-4	
3-Nitroaniline	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	99-09-2	
4-Nitroaniline	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	100-01-6	
Nitrobenzene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	98-95-3	
2-Nitrophenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	88-75-5	
4-Nitrophenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	86-30-6	
Pentachlorophenol	ND	ug/kg	4070	5	04/19/18 19:31	04/26/18 00:56	87-86-5	
Phenanthrene	20000	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	85-01-8	
Phenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	108-95-2	
Pyrene	27800	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	51	%	43-125	5	04/19/18 19:31	04/26/18 00:56	4165-60-0	D3
2-Fluorobiphenyl (S)	56	%	30-132	5	04/19/18 19:31	04/26/18 00:56	321-60-8	
p-Terphenyl-d14 (S)	73	%	62-125	5	04/19/18 19:31	04/26/18 00:56	1718-51-0	
Phenol-d6 (S)	55	%	48-125	5	04/19/18 19:31	04/26/18 00:56	13127-88-3	
2-Fluorophenol (S)	54	%	40-125	5	04/19/18 19:31	04/26/18 00:56	367-12-4	
2,4,6-Tribromophenol (S)	54	%	60-125	5	04/19/18 19:31	04/26/18 00:56	118-79-6	S5

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	1740	ug/kg	60.7	5	04/19/18 18:12	04/20/18 18:51	83-32-9	
Acenaphthylene	308	ug/kg	60.7	5	04/19/18 18:12	04/20/18 18:51	208-96-8	
Anthracene	3890	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	120-12-7	
Benzo(a)anthracene	11100	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	56-55-3	
Benzo(a)pyrene	10700	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	50-32-8	
Benzo(b)fluoranthene	14600	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	205-99-2	
Benzo(g,h,i)perylene	6720	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	191-24-2	
Benzo(k)fluoranthene	4760	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	207-08-9	
Chrysene	10000	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	218-01-9	
Dibenz(a,h)anthracene	1630	ug/kg	60.7	5	04/19/18 18:12	04/20/18 18:51	53-70-3	
Fluoranthene	23800	ug/kg	1210	100	04/19/18 18:12	04/24/18 13:32	206-44-0	
Fluorene	1910	ug/kg	60.7	5	04/19/18 18:12	04/20/18 18:51	86-73-7	
Indeno(1,2,3-cd)pyrene	5960	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	193-39-5	
Naphthalene	617	ug/kg	60.7	5	04/19/18 18:12	04/20/18 18:51	91-20-3	
Phenanthrene	15800	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	85-01-8	
Pyrene	18000	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	81	%	42-125	5	04/19/18 18:12	04/20/18 18:51	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-01 (3'-11' WM) **Lab ID: 10427824002** Collected: 04/18/18 12:30 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	86	%	57-125	5	04/19/18 18:12	04/20/18 18:51	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1320	1	04/29/18 13:40	04/29/18 22:51	67-64-1	
Allyl chloride	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	107-05-1	L2
Benzene	ND	ug/kg	26.5	1	04/29/18 13:40	04/29/18 22:51	71-43-2	
Bromobenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	108-86-1	
Bromochloromethane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	74-97-5	
Bromodichloromethane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	75-27-4	
Bromoform	ND	ug/kg	662	1	04/29/18 13:40	04/29/18 22:51	75-25-2	
Bromomethane	ND	ug/kg	662	1	04/29/18 13:40	04/29/18 22:51	74-83-9	
2-Butanone (MEK)	ND	ug/kg	331	1	04/29/18 13:40	04/29/18 22:51	78-93-3	
n-Butylbenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	104-51-8	
sec-Butylbenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	135-98-8	
tert-Butylbenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	98-06-6	
Carbon tetrachloride	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	56-23-5	
Chlorobenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	108-90-7	
Chloroethane	ND	ug/kg	662	1	04/29/18 13:40	04/29/18 22:51	75-00-3	
Chloroform	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	67-66-3	
Chloromethane	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	74-87-3	
2-Chlorotoluene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	95-49-8	
4-Chlorotoluene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	662	1	04/29/18 13:40	04/29/18 22:51	96-12-8	
Dibromochloromethane	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	106-93-4	
Dibromomethane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	75-71-8	
1,1-Dichloroethane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	75-34-3	
1,2-Dichloroethane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	107-06-2	
1,1-Dichloroethene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	156-60-5	
Dichlorofluoromethane	ND	ug/kg	662	1	04/29/18 13:40	04/29/18 22:51	75-43-4	
1,2-Dichloropropane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	78-87-5	
1,3-Dichloropropane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	142-28-9	
2,2-Dichloropropane	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	594-20-7	
1,1-Dichloropropene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	60-29-7	
Ethylbenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	331	1	04/29/18 13:40	04/29/18 22:51	87-68-3	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-01 (3'-11' WM) **Lab ID: 10427824002** Collected: 04/18/18 12:30 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	98-82-8	
p-Isopropyltoluene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	99-87-6	
Methylene Chloride	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	75-09-2	L2
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	331	1	04/29/18 13:40	04/29/18 22:51	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	1634-04-4	
Naphthalene	272	ug/kg	265	1	04/29/18 13:40	05/01/18 23:11	91-20-3	
n-Propylbenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	103-65-1	
Styrene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	79-34-5	
Tetrachloroethene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	127-18-4	
Tetrahydrofuran	ND	ug/kg	2650	1	04/29/18 13:40	04/29/18 22:51	109-99-9	
Toluene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	79-00-5	
Trichloroethene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	79-01-6	
Trichlorofluoromethane	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	108-67-8	
Vinyl chloride	ND	ug/kg	26.5	1	04/29/18 13:40	04/29/18 22:51	75-01-4	
Xylene (Total)	ND	ug/kg	199	1	04/29/18 13:40	04/29/18 22:51	1330-20-7	
m&p-Xylene	ND	ug/kg	132	1	04/29/18 13:40	04/29/18 22:51	179601-23-1	
o-Xylene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%	75-125	1	04/29/18 13:40	04/29/18 22:51	17060-07-0	
Toluene-d8 (S)	94	%	75-125	1	04/29/18 13:40	04/29/18 22:51	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125	1	04/29/18 13:40	04/29/18 22:51	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	24.7	10	04/28/18 10:35	05/01/18 10:58	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	4.0	mg/kg	1.0	1		05/03/18 07:26	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.61	mg/kg	0.31	1	04/25/18 11:00	04/25/18 13:41	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.99	1	04/25/18 14:45	04/26/18 02:10	16984-48-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-02 (2'-10.5' WM) **Lab ID:** 10427824003 Collected: 04/18/18 13:50 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	14.9	1	04/25/18 10:56	04/30/18 15:33	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	309-00-2	
alpha-BHC	ND	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	319-84-6	
beta-BHC	ND	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	319-85-7	
delta-BHC	ND	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	319-86-8	
gamma-BHC (Lindane)	67.4	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	58-89-9	
Chlordane (Technical)	ND	ug/kg	270	10	04/19/18 13:04	04/26/18 22:41	57-74-9	
alpha-Chlordane	67.0	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	5103-71-9	
gamma-Chlordane	37.0	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	5103-74-2	
4,4'-DDD	92.0	ug/kg	53.9	10	04/19/18 13:04	04/26/18 22:41	72-54-8	
4,4'-DDE	70.3	ug/kg	53.9	10	04/19/18 13:04	04/26/18 22:41	72-55-9	
4,4'-DDT	100	ug/kg	53.9	10	04/19/18 13:04	04/26/18 22:41	50-29-3	
Dieldrin	ND	ug/kg	53.9	10	04/19/18 13:04	04/26/18 22:41	60-57-1	
Endosulfan I	ND	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	959-98-8	
Endosulfan II	ND	ug/kg	53.9	10	04/19/18 13:04	04/26/18 22:41	33213-65-9	
Endosulfan sulfate	ND	ug/kg	53.9	10	04/19/18 13:04	04/26/18 22:41	1031-07-8	
Endrin	ND	ug/kg	53.9	10	04/19/18 13:04	04/26/18 22:41	72-20-8	
Endrin aldehyde	ND	ug/kg	53.9	10	04/19/18 13:04	04/26/18 22:41	7421-93-4	
Endrin ketone	ND	ug/kg	53.9	10	04/19/18 13:04	04/26/18 22:41	53494-70-5	
Heptachlor	ND	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	76-44-8	
Heptachlor epoxide	ND	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	1024-57-3	
Methoxychlor	ND	ug/kg	270	10	04/19/18 13:04	04/26/18 22:41	72-43-5	
Toxaphene	ND	ug/kg	810	10	04/19/18 13:04	04/26/18 22:41	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	10	04/19/18 13:04	04/26/18 22:41	877-09-8	3M, D4, S4
Decachlorobiphenyl (S)	0	%	30-150	10	04/19/18 13:04	04/26/18 22:41	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	53.3	1	04/19/18 13:39	04/23/18 19:08	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	53.3	1	04/19/18 13:39	04/23/18 19:08	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	53.3	1	04/19/18 13:39	04/23/18 19:08	11141-16-5	
PCB-1242 (Aroclor 1242)	3780	ug/kg	267	5	04/19/18 13:39	04/24/18 10:42	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	53.3	1	04/19/18 13:39	04/23/18 19:08	12672-29-6	
PCB-1254 (Aroclor 1254)	929	ug/kg	53.3	1	04/19/18 13:39	04/23/18 19:08	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	53.3	1	04/19/18 13:39	04/23/18 19:08	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	53.3	1	04/19/18 13:39	04/23/18 19:08	37324-23-5	
PCB-1268 (Aroclor 1268)	277	ug/kg	53.3	1	04/19/18 13:39	04/23/18 19:08	11100-14-4	
PCB, Total	4990	ug/kg	267	5	04/19/18 13:39	04/24/18 10:42	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	62	%	48-125	1	04/19/18 13:39	04/23/18 19:08	877-09-8	
Decachlorobiphenyl (S)	99	%	30-134	1	04/19/18 13:39	04/23/18 19:08	2051-24-3	CH

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

Sample: FL-TT-02 (2'-10.5' WM) **Lab ID: 10427824003** Collected: 04/18/18 13:50 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	2300	mg/kg	1190	100	04/20/18 17:57	04/22/18 13:29		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	100	04/20/18 17:57	04/22/18 13:29	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	40.2	mg/kg	23.0	1	05/02/18 10:19	05/02/18 14:55		
Surrogates								
a,a,a-Trifluorotoluene (S)	97	%.	80-150	1	05/02/18 10:19	05/02/18 14:55	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	14900	mg/kg	15.7	1	04/20/18 05:22	04/23/18 11:53	7429-90-5	
Barium	443	mg/kg	0.79	1	04/20/18 05:22	04/23/18 11:53	7440-39-3	
Boron	234	mg/kg	11.8	1	04/20/18 05:22	04/23/18 11:53	7440-42-8	
Copper	280	mg/kg	0.79	1	04/20/18 05:22	04/23/18 11:53	7440-50-8	
Iron	107000	mg/kg	98.4	25	04/20/18 05:22	04/23/18 13:05	7439-89-6	
Manganese	994	mg/kg	2.0	5	04/20/18 05:22	04/23/18 13:01	7439-96-5	
Nickel	39.1	mg/kg	1.6	1	04/20/18 05:22	04/23/18 11:53	7440-02-0	
Silver	0.82	mg/kg	0.79	1	04/20/18 05:22	04/23/18 11:53	7440-22-4	
Tin	52.3	mg/kg	5.9	1	04/20/18 05:22	04/23/18 11:53	7440-31-5	
Titanium	313	mg/kg	2.0	1	04/20/18 05:22	04/23/18 11:53	7440-32-6	
Zinc	1890	mg/kg	1.6	1	04/20/18 05:22	04/23/18 11:53	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	29.0	mg/kg	0.30	1	04/25/18 09:25	04/26/18 04:10	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	6.4	mg/kg	0.77	20	04/20/18 06:41	04/21/18 05:12	7440-36-0	
Arsenic	26.8	mg/kg	0.77	20	04/20/18 06:41	04/21/18 05:12	7440-38-2	
Beryllium	0.69	mg/kg	0.31	20	04/20/18 06:41	04/21/18 05:12	7440-41-7	
Cadmium	7.0	mg/kg	0.12	20	04/20/18 06:41	04/21/18 05:12	7440-43-9	
Cobalt	10.4	mg/kg	0.77	20	04/20/18 06:41	04/21/18 05:12	7440-48-4	
Lead	611	mg/kg	0.15	20	04/20/18 06:41	04/21/18 05:12	7439-92-1	
Lithium	6.0	mg/kg	0.77	20	04/20/18 06:41	04/21/18 05:12	7439-93-2	
Selenium	2.8	mg/kg	0.77	20	04/20/18 06:41	04/21/18 05:12	7782-49-2	
Strontium	114	mg/kg	0.77	20	04/20/18 06:41	04/21/18 05:12	7440-24-6	
Vanadium	44.3	mg/kg	1.5	20	04/20/18 06:41	04/21/18 05:12	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.82	mg/kg	0.029	1	04/20/18 04:53	04/22/18 16:37	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	38.3	%	0.10	1		04/24/18 13:49		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	83-32-9	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-02 (2'-10.5' WM) **Lab ID: 10427824003** Collected: 04/18/18 13:50 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	208-96-8	
Anthracene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	120-12-7	
Benzo(a)anthracene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	56-55-3	
Benzo(a)pyrene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	101-55-3	
Butylbenzylphthalate	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	85-68-7	
Carbazole	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	59-50-7	
4-Chloroaniline	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	108-60-1	
2-Chloronaphthalene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	91-58-7	
2-Chlorophenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	7005-72-3	
Chrysene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	53-70-3	
Dibenzofuran	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	120-83-2	
Diethylphthalate	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	105-67-9	
Dimethylphthalate	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	131-11-3	
Di-n-butylphthalate	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2750	1	04/19/18 19:31	04/25/18 23:59	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	606-20-2	
Di-n-octylphthalate	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	122-66-7	
bis(2-Ethylhexyl)phthalate	27300	ug/kg	2670	5	04/19/18 19:31	04/26/18 16:11	117-81-7	
Fluoranthene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	206-44-0	
Fluorene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	87-68-3	
Hexachlorobenzene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	118-74-1	
Hexachloroethane	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	193-39-5	
Isophorone	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	78-59-1	
1-Methylnaphthalene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	90-12-0	
2-Methylnaphthalene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-02 (2'-10.5' WM) Lab ID: 10427824003 Collected: 04/18/18 13:50 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1070	1	04/19/18 19:31	04/25/18 23:59		
Naphthalene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	91-20-3	
2-Nitroaniline	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	88-74-4	
3-Nitroaniline	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	99-09-2	
4-Nitroaniline	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	100-01-6	
Nitrobenzene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	98-95-3	
2-Nitrophenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	88-75-5	
4-Nitrophenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	86-30-6	
Pentachlorophenol	ND	ug/kg	1090	1	04/19/18 19:31	04/25/18 23:59	87-86-5	
Phenanthrene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	85-01-8	
Phenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	108-95-2	
Pyrene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	59	%	43-125	1	04/19/18 19:31	04/25/18 23:59	4165-60-0	
2-Fluorobiphenyl (S)	56	%	30-132	1	04/19/18 19:31	04/25/18 23:59	321-60-8	
p-Terphenyl-d14 (S)	83	%	62-125	1	04/19/18 19:31	04/25/18 23:59	1718-51-0	
Phenol-d6 (S)	64	%	48-125	1	04/19/18 19:31	04/25/18 23:59	13127-88-3	
2-Fluorophenol (S)	65	%	40-125	1	04/19/18 19:31	04/25/18 23:59	367-12-4	
2,4,6-Tribromophenol (S)	67	%	60-125	1	04/19/18 19:31	04/25/18 23:59	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	83-32-9	
Acenaphthylene	ND	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	208-96-8	
Anthracene	ND	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	120-12-7	
Benzo(a)anthracene	179	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	56-55-3	
Benzo(a)pyrene	112	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	50-32-8	
Benzo(b)fluoranthene	209	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	207-08-9	
Chrysene	228	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	53-70-3	
Fluoranthene	394	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	206-44-0	
Fluorene	101	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	193-39-5	
Naphthalene	109	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	91-20-3	
Phenanthrene	332	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	85-01-8	
Pyrene	344	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	88	%	42-125	5	04/19/18 18:12	04/20/18 19:12	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-02 (2'-10.5' WM) **Lab ID: 10427824003** Collected: 04/18/18 13:50 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	92	%	57-125	5	04/19/18 18:12	04/20/18 19:12	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	2110	1	04/29/18 13:40	04/29/18 23:24	67-64-1	
Allyl chloride	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	107-05-1	L2
Benzene	54.0	ug/kg	42.3	1	04/29/18 13:40	04/29/18 23:24	71-43-2	
Bromobenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	108-86-1	
Bromochloromethane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	74-97-5	
Bromodichloromethane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	75-27-4	
Bromoform	ND	ug/kg	1060	1	04/29/18 13:40	04/29/18 23:24	75-25-2	
Bromomethane	ND	ug/kg	1060	1	04/29/18 13:40	04/29/18 23:24	74-83-9	
2-Butanone (MEK)	ND	ug/kg	528	1	04/29/18 13:40	04/29/18 23:24	78-93-3	
n-Butylbenzene	106	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	104-51-8	
sec-Butylbenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	135-98-8	
tert-Butylbenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	98-06-6	
Carbon tetrachloride	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	56-23-5	
Chlorobenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	108-90-7	
Chloroethane	ND	ug/kg	1060	1	04/29/18 13:40	04/29/18 23:24	75-00-3	
Chloroform	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	67-66-3	
Chloromethane	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	74-87-3	
2-Chlorotoluene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	95-49-8	
4-Chlorotoluene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1060	1	04/29/18 13:40	04/29/18 23:24	96-12-8	
Dibromochloromethane	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	106-93-4	
Dibromomethane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	541-73-1	
1,4-Dichlorobenzene	255	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	75-71-8	
1,1-Dichloroethane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	75-34-3	
1,2-Dichloroethane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	107-06-2	
1,1-Dichloroethene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1060	1	04/29/18 13:40	04/29/18 23:24	75-43-4	
1,2-Dichloropropane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	78-87-5	
1,3-Dichloropropane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	142-28-9	
2,2-Dichloropropane	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	594-20-7	
1,1-Dichloropropene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	60-29-7	
Ethylbenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	528	1	04/29/18 13:40	04/29/18 23:24	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-02 (2'-10.5' WM) **Lab ID: 10427824003** Collected: 04/18/18 13:50 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	110	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	98-82-8	
p-Isopropyltoluene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	99-87-6	
Methylene Chloride	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	75-09-2	L2
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	528	1	04/29/18 13:40	04/29/18 23:24	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	1634-04-4	
Naphthalene	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	91-20-3	
n-Propylbenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	103-65-1	
Styrene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	79-34-5	
Tetrachloroethene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	127-18-4	
Tetrahydrofuran	ND	ug/kg	4230	1	04/29/18 13:40	04/29/18 23:24	109-99-9	
Toluene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	79-00-5	
Trichloroethene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	79-01-6	
Trichlorofluoromethane	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	108-67-8	
Vinyl chloride	ND	ug/kg	42.3	1	04/29/18 13:40	04/29/18 23:24	75-01-4	
Xylene (Total)	ND	ug/kg	317	1	04/29/18 13:40	04/29/18 23:24	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%	75-125	1	04/29/18 13:40	04/29/18 23:24	17060-07-0	
Toluene-d8 (S)	94	%	75-125	1	04/29/18 13:40	04/29/18 23:24	2037-26-5	
4-Bromofluorobenzene (S)	91	%	75-125	1	04/29/18 13:40	04/29/18 23:24	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	31.8	10	04/28/18 10:35	05/01/18 10:58	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	29.0	mg/kg	1.0	1		05/03/18 07:26	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.78	mg/kg	0.60	1	04/25/18 11:00	04/25/18 13:42	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.98	1	04/25/18 14:45	04/26/18 01:50	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

QC Batch: 141683 Analysis Method: EPA 1630 (1998)
QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 560161 Matrix: Solid
Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.05	04/30/18 13:39	N3

METHOD BLANK: 560162 Matrix: Solid
Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	2.98	04/30/18 13:46	N3

METHOD BLANK: 560163 Matrix: Solid
Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.04	04/30/18 13:53	N3

LABORATORY CONTROL SAMPLE: 560164

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	104	119	115	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 560165 560166

Parameter	Units	10427354001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	357	357	354	388	99	108	65-135	9	35	N3

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 535145 Analysis Method: WI MOD GRO
 QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
 Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2910764 Matrix: Solid
 Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	05/02/18 11:15	
a,a,a-Trifluorotoluene (S)	%	99	80-150	05/02/18 11:15	

LABORATORY CONTROL SAMPLE & LCSD: 2907780

2907781

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	40.4	41.9	81	84	80-120	4	20	
a,a,a-Trifluorotoluene (S)	%				99	99	80-150			

MATRIX SPIKE SAMPLE: 2910759

Parameter	Units	10427824002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	ND	56.5	67.3	119	80-120	
a,a,a-Trifluorotoluene (S)	%				98	80-150	

SAMPLE DUPLICATE: 2910758

Parameter	Units	10428096003 Result	Dup Result	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	4.6J		20	
a,a,a-Trifluorotoluene (S)	%	99	99	3		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

QC Batch: 533419 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2897699 Matrix: Solid
Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.018	04/22/18 15:58	

LABORATORY CONTROL SAMPLE: 2897700

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.48	0.53	110	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897701 2897702

Parameter	Units	10426879001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Mercury	mg/kg	<0.018	.47	.5	0.48	0.46	103	93	80-120	4	20				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

QC Batch: 533415 Analysis Method: EPA 6010C
QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2897683 Matrix: Solid
Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	10.0	04/23/18 10:48	
Barium	mg/kg	ND	0.50	04/23/18 10:48	
Boron	mg/kg	ND	7.5	04/23/18 10:48	
Copper	mg/kg	ND	0.50	04/23/18 10:48	
Iron	mg/kg	ND	2.5	04/23/18 10:48	
Manganese	mg/kg	ND	0.25	04/23/18 10:48	
Nickel	mg/kg	ND	1.0	04/23/18 10:48	
Silver	mg/kg	ND	0.50	04/23/18 10:48	
Tin	mg/kg	ND	3.8	04/23/18 10:48	
Titanium	mg/kg	ND	1.2	04/23/18 10:48	
Zinc	mg/kg	ND	1.0	04/23/18 10:48	

LABORATORY CONTROL SAMPLE: 2897684

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	1000	997	100	80-120	
Barium	mg/kg	50	51.0	102	80-120	
Boron	mg/kg	50	46.7	93	80-120	
Copper	mg/kg	50	49.1	98	80-120	
Iron	mg/kg	1000	1010	101	80-120	
Manganese	mg/kg	50	50.9	102	80-120	
Nickel	mg/kg	50	49.8	100	80-120	
Silver	mg/kg	25	23.5	94	80-120	
Tin	mg/kg	50	49.4	99	80-120	
Titanium	mg/kg	50	49.8	100	80-120	
Zinc	mg/kg	50	48.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897685 2897686

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427793001 Result	Spike Conc.	Spike Conc.	Result						
Aluminum	mg/kg	34800	990	952	35400	35400	64	61	75-125	0	20 P6
Barium	mg/kg	1320	49.5	47.6	1320	1320	-1	0	75-125	0	20 P6
Boron	mg/kg	43.3	49.5	47.6	87.4	85.7	89	89	75-125	2	20
Copper	mg/kg	2140	49.5	47.6	2090	2100	-85	-66	75-125	1	20 P6
Iron	mg/kg	31500	990	952	31000	31000	-51	-51	75-125	0	20 P6
Manganese	mg/kg	8040	49.5	47.6	7800	8030	-469	-22	75-125	3	20 P6
Nickel	mg/kg	113	49.5	47.6	148	147	70	71	75-125	1	20 M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Parameter	Units	2897685		2897686		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10427793001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Silver	mg/kg	18.5	24.8	23.8	48.7	49.0	122	128	75-125	1	20	M1	
Tin	mg/kg	94.8	49.5	47.6	127	127	66	67	75-125	1	20	M1	
Titanium	mg/kg	1650	49.5	47.6	1620	1690	-64	67	75-125	4	20	P6	
Zinc	mg/kg	1960	49.5	47.6	1950	1930	-21	-53	75-125	1	20	P6	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 438855 Analysis Method: EPA 6020
QC Batch Method: EPA 3050B Analysis Description: 6020 MET
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2027873 Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.19	04/26/18 02:38	N2

LABORATORY CONTROL SAMPLE: 2027874

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.7	3.9	106	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027875 2027876

Parameter	Units	2027875		2027876		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427642001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chromium	mg/kg	5.4	4.87	4.87	7.0	6.1	34	15	75-125	14	20 M0, N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 533412 Analysis Method: EPA 6020A
QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2897671 Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.48	04/21/18 02:51	
Arsenic	mg/kg	ND	0.48	04/21/18 02:51	
Beryllium	mg/kg	ND	0.19	04/21/18 02:51	
Cadmium	mg/kg	ND	0.076	04/21/18 02:51	
Cobalt	mg/kg	ND	0.48	04/21/18 02:51	
Lead	mg/kg	ND	0.095	04/23/18 17:49	
Lithium	mg/kg	ND	0.48	04/21/18 02:51	
Selenium	mg/kg	ND	0.48	04/21/18 02:51	
Strontium	mg/kg	ND	0.48	04/21/18 02:51	
Vanadium	mg/kg	ND	0.95	04/21/18 02:51	

LABORATORY CONTROL SAMPLE: 2897672

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	47.6	47.6	100	80-120	
Arsenic	mg/kg	47.6	47.9	101	80-120	
Beryllium	mg/kg	47.6	47.3	99	80-120	
Cadmium	mg/kg	47.6	47.1	99	80-120	
Cobalt	mg/kg	47.6	49.3	104	80-120	
Lead	mg/kg	47.6	48.7	102	80-120	
Lithium	mg/kg	47.6	45.4	95	80-120	
Selenium	mg/kg	47.6	47.6	100	80-120	
Strontium	mg/kg	47.6	47.2	99	80-120	
Vanadium	mg/kg	47.6	47.7	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897673 2897674

Parameter	Units	10427861001		2897673		2897674		% Rec	% Rec	% Rec	Max	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Result					
Antimony	mg/kg	0.59	49.5	48.5	21.6	20.0	42	40	75-125	8	20	M6
Arsenic	mg/kg	18.4	49.5	48.5	70.6	64.2	105	94	75-125	9	20	
Beryllium	mg/kg	0.60	49.5	48.5	46.4	44.0	92	90	75-125	5	20	
Cadmium	mg/kg	0.45	49.5	48.5	51.2	46.6	103	95	75-125	9	20	
Cobalt	mg/kg	6.1	49.5	48.5	59.2	53.9	107	99	75-125	9	20	
Lead	mg/kg	39.8	49.5	48.5	87.6	85.0	97	93	75-125	3	20	
Lithium	mg/kg	11.0	49.5	48.5	55.2	54.2	89	89	75-125	2	20	
Selenium	mg/kg	1.0	49.5	48.5	49.9	46.1	99	93	75-125	8	20	
Strontium	mg/kg	136	49.5	48.5	199	177	127	85	75-125	11	20	M6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2897673		2897674									
Parameter	Units	10427861001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
Vanadium	mg/kg	22.3	49.5	48.5	76.0	68.8	108	96	75-125	10	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 534034

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10427824001, 10427824002, 10427824003

SAMPLE DUPLICATE: 2901166

Parameter	Units	10428311003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	13.7	14.8	8	30	

SAMPLE DUPLICATE: 2901255

Parameter	Units	10427906006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.4	21.5	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 534992 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2906940 Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	05/02/18 19:07	
1,1,1-Trichloroethane	ug/kg	ND	50.0	05/02/18 19:07	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	05/02/18 19:07	
1,1,2-Trichloroethane	ug/kg	ND	50.0	05/02/18 19:07	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	05/02/18 19:07	
1,1-Dichloroethane	ug/kg	ND	50.0	05/02/18 19:07	
1,1-Dichloroethene	ug/kg	ND	50.0	05/02/18 19:07	
1,1-Dichloropropene	ug/kg	ND	50.0	05/02/18 19:07	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	05/02/18 19:07	
1,2,3-Trichloropropane	ug/kg	ND	200	05/02/18 19:07	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	05/02/18 19:07	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	05/02/18 19:07	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	05/02/18 19:07	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	05/02/18 19:07	
1,2-Dichlorobenzene	ug/kg	ND	50.0	05/02/18 19:07	
1,2-Dichloroethane	ug/kg	ND	50.0	05/02/18 19:07	
1,2-Dichloropropane	ug/kg	ND	50.0	05/02/18 19:07	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	05/02/18 19:07	
1,3-Dichlorobenzene	ug/kg	ND	50.0	05/02/18 19:07	
1,3-Dichloropropane	ug/kg	ND	50.0	05/02/18 19:07	
1,4-Dichlorobenzene	ug/kg	ND	50.0	05/02/18 19:07	
2,2-Dichloropropane	ug/kg	ND	200	05/02/18 19:07	
2-Butanone (MEK)	ug/kg	ND	250	05/02/18 19:07	
2-Chlorotoluene	ug/kg	ND	50.0	05/02/18 19:07	
4-Chlorotoluene	ug/kg	ND	50.0	05/02/18 19:07	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	05/02/18 19:07	
Acetone	ug/kg	ND	1000	05/02/18 19:07	
Allyl chloride	ug/kg	ND	200	05/02/18 19:07	
Benzene	ug/kg	ND	20.0	05/02/18 19:07	
Bromobenzene	ug/kg	ND	50.0	05/02/18 19:07	
Bromochloromethane	ug/kg	ND	50.0	05/02/18 19:07	
Bromodichloromethane	ug/kg	ND	50.0	05/02/18 19:07	
Bromoform	ug/kg	ND	500	05/02/18 19:07	MN
Bromomethane	ug/kg	ND	500	05/02/18 19:07	
Carbon tetrachloride	ug/kg	ND	50.0	05/02/18 19:07	
Chlorobenzene	ug/kg	ND	50.0	05/02/18 19:07	
Chloroethane	ug/kg	ND	500	05/02/18 19:07	
Chloroform	ug/kg	ND	50.0	05/02/18 19:07	
Chloromethane	ug/kg	ND	200	05/02/18 19:07	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	05/02/18 19:07	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	05/02/18 19:07	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

METHOD BLANK: 2906940 Matrix: Solid
Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	05/02/18 19:07	
Dibromomethane	ug/kg	ND	50.0	05/02/18 19:07	
Dichlorodifluoromethane	ug/kg	ND	200	05/02/18 19:07	
Dichlorofluoromethane	ug/kg	ND	500	05/02/18 19:07	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	05/02/18 19:07	
Ethylbenzene	ug/kg	ND	50.0	05/02/18 19:07	
Hexachloro-1,3-butadiene	ug/kg	ND	250	05/02/18 19:07	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	05/02/18 19:07	
m&p-Xylene	ug/kg	ND	100	05/02/18 19:07	
Methyl-tert-butyl ether	ug/kg	ND	50.0	05/02/18 19:07	
Methylene Chloride	ug/kg	ND	200	05/02/18 19:07	
n-Butylbenzene	ug/kg	ND	50.0	05/02/18 19:07	
n-Propylbenzene	ug/kg	ND	50.0	05/02/18 19:07	
Naphthalene	ug/kg	ND	200	05/02/18 19:07	
o-Xylene	ug/kg	ND	50.0	05/02/18 19:07	
p-Isopropyltoluene	ug/kg	ND	50.0	05/02/18 19:07	
sec-Butylbenzene	ug/kg	ND	50.0	05/02/18 19:07	
Styrene	ug/kg	ND	50.0	05/02/18 19:07	
tert-Butylbenzene	ug/kg	ND	50.0	05/02/18 19:07	
Tetrachloroethene	ug/kg	ND	50.0	05/02/18 19:07	
Tetrahydrofuran	ug/kg	ND	2000	05/02/18 19:07	
Toluene	ug/kg	ND	50.0	05/02/18 19:07	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	05/02/18 19:07	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	05/02/18 19:07	
Trichloroethene	ug/kg	ND	50.0	05/02/18 19:07	
Trichlorofluoromethane	ug/kg	ND	200	05/02/18 19:07	
Vinyl chloride	ug/kg	ND	20.0	05/02/18 19:07	
Xylene (Total)	ug/kg	ND	150	05/02/18 19:07	
1,2-Dichloroethane-d4 (S)	%	97	75-125	05/02/18 19:07	
4-Bromofluorobenzene (S)	%	98	75-125	05/02/18 19:07	
Toluene-d8 (S)	%	96	75-125	05/02/18 19:07	

LABORATORY CONTROL SAMPLE & LCSD: 2906941

Parameter	Units	2906942		LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result						
1,1,1,2-Tetrachloroethane	ug/kg	1000	854	85	98	59-125	14	20	
1,1,1-Trichloroethane	ug/kg	1000	942	94	112	59-125	18	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	721	72	82	58-125	13	20	
1,1,2-Trichloroethane	ug/kg	1000	784	78	88	64-125	12	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	744	74	92	65-125	22	20	R1
1,1-Dichloroethane	ug/kg	1000	717	72	82	63-125	13	20	
1,1-Dichloroethene	ug/kg	1000	748	75	89	59-125	18	20	
1,1-Dichloropropene	ug/kg	1000	893	89	98	64-125	9	20	
1,2,3-Trichlorobenzene	ug/kg	1000	766	77	80	55-126	4	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

LABORATORY CONTROL SAMPLE & LCS: 2906941

2906942

Parameter	Units	Spike Conc.	LCS Result	LCS Result	LCS % Rec	LCS % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,3-Trichloropropane	ug/kg	1000	816	921	82	92	62-125	12	20	
1,2,4-Trichlorobenzene	ug/kg	1000	737	788	74	79	62-125	7	20	
1,2,4-Trimethylbenzene	ug/kg	1000	745	842	75	84	59-125	12	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	1950	2150	78	86	54-125	10	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	851	949	85	95	64-125	11	20	
1,2-Dichlorobenzene	ug/kg	1000	787	855	79	86	63-125	8	20	
1,2-Dichloroethane	ug/kg	1000	724	850	72	85	57-125	16	20	
1,2-Dichloropropane	ug/kg	1000	689	795	69	79	67-125	14	20	
1,3,5-Trimethylbenzene	ug/kg	1000	794	878	79	88	59-125	10	20	
1,3-Dichlorobenzene	ug/kg	1000	762	832	76	83	64-125	9	20	
1,3-Dichloropropane	ug/kg	1000	726	849	73	85	64-125	16	20	
1,4-Dichlorobenzene	ug/kg	1000	753	848	75	85	63-125	12	20	
2,2-Dichloropropane	ug/kg	1000	783	872	78	87	37-126	11	20	
2-Butanone (MEK)	ug/kg	5000	3350	3680	67	74	48-125	9	20	
2-Chlorotoluene	ug/kg	1000	762	851	76	85	62-125	11	20	
4-Chlorotoluene	ug/kg	1000	731	860	73	86	63-125	16	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	3210	3620	64	72	52-135	12	20	
Acetone	ug/kg	5000	4840	5150	97	103	65-125	6	20	
Allyl chloride	ug/kg	1000	512	624	51	62	52-125	20	20	L2
Benzene	ug/kg	1000	786	858	79	86	61-125	9	20	
Bromobenzene	ug/kg	1000	809	901	81	90	64-125	11	20	
Bromochloromethane	ug/kg	1000	843	905	84	91	65-125	7	20	
Bromodichloromethane	ug/kg	1000	824	930	82	93	57-125	12	20	
Bromoform	ug/kg	1000	748	929	75	93	57-125	22	20	R1
Bromomethane	ug/kg	1000	794	803	79	80	60-125	1	20	
Carbon tetrachloride	ug/kg	1000	919	1080	92	108	58-125	16	20	
Chlorobenzene	ug/kg	1000	754	871	75	87	66-125	14	20	
Chloroethane	ug/kg	1000	793	928	79	93	62-125	16	20	
Chloroform	ug/kg	1000	826	895	83	90	59-125	8	20	
Chloromethane	ug/kg	1000	538	572	54	57	50-125	6	20	
cis-1,2-Dichloroethene	ug/kg	1000	831	918	83	92	61-125	10	20	
cis-1,3-Dichloropropene	ug/kg	1000	784	885	78	88	61-125	12	20	
Dibromochloromethane	ug/kg	1000	788	875	79	88	60-125	10	20	
Dibromomethane	ug/kg	1000	821	937	82	94	69-125	13	20	
Dichlorodifluoromethane	ug/kg	1000	623	629	62	63	38-125	1	20	
Dichlorofluoromethane	ug/kg	1000	1000	867	100	87	67-125	15	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	1250	1420	125	142	60-125	13	20	L3,SS
Ethylbenzene	ug/kg	1000	802	917	80	92	62-125	13	20	
Hexachloro-1,3-butadiene	ug/kg	1000	830	890	83	89	56-125	7	20	
Isopropylbenzene (Cumene)	ug/kg	1000	851	946	85	95	65-125	11	20	
m&p-Xylene	ug/kg	2000	1510	1730	75	87	61-125	14	20	
Methyl-tert-butyl ether	ug/kg	1000	709	852	71	85	59-125	18	20	
Methylene Chloride	ug/kg	1000	627	817	63	82	64-125	26	20	L2,R1
n-Butylbenzene	ug/kg	1000	770	856	77	86	59-125	11	20	
n-Propylbenzene	ug/kg	1000	763	851	76	85	61-125	11	20	
Naphthalene	ug/kg	1000	747	841	75	84	53-125	12	20	
o-Xylene	ug/kg	1000	776	886	78	89	61-125	13	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

LABORATORY CONTROL SAMPLE & LCSD: 2906941

Parameter	Units	2906942		LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result								
p-Isopropyltoluene	ug/kg	1000	777	910	78	91	63-125	16	20		
sec-Butylbenzene	ug/kg	1000	789	879	79	88	62-125	11	20		
Styrene	ug/kg	1000	812	911	81	91	66-125	12	20		
tert-Butylbenzene	ug/kg	1000	773	873	77	87	64-125	12	20		
Tetrachloroethene	ug/kg	1000	850	952	85	95	67-125	11	20		
Tetrahydrofuran	ug/kg	10000	10800	11700	108	117	62-125	7	20		
Toluene	ug/kg	1000	727	832	73	83	61-125	14	20		
trans-1,2-Dichloroethene	ug/kg	1000	774	938	77	94	64-125	19	20		
trans-1,3-Dichloropropene	ug/kg	1000	785	908	79	91	56-125	14	20		
Trichloroethene	ug/kg	1000	825	958	83	96	67-125	15	20		
Trichlorofluoromethane	ug/kg	1000	1090	1130	109	113	65-125	3	20		
Vinyl chloride	ug/kg	1000	632	686	63	69	57-125	8	20		
Xylene (Total)	ug/kg	3000	2280	2620	76	87	62-125	14	20		
1,2-Dichloroethane-d4 (S)	%				95	99	75-125				
4-Bromofluorobenzene (S)	%				96	99	75-125				
Toluene-d8 (S)	%				98	98	75-125				

MATRIX SPIKE SAMPLE: 2906943

Parameter	Units	10429482001		MS Result	MS % Rec	% Rec Limits	Qualifiers
		Result	Spike Conc.				
1,1,1,2-Tetrachloroethane	ug/kg	ND	1000	1300	130	64-146	
1,1,1-Trichloroethane	ug/kg	ND	1000	1430	143	56-148	
1,1,2,2-Tetrachloroethane	ug/kg	ND	1000	1230	123	36-150	
1,1,2-Trichloroethane	ug/kg	ND	1000	1260	125	67-148	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	1000	1110	111	60-142	
1,1-Dichloroethane	ug/kg	ND	1000	1210	121	57-140	
1,1-Dichloroethene	ug/kg	ND	1000	1100	109	59-139	
1,1-Dichloropropene	ug/kg	ND	1000	1320	132	61-142	
1,2,3-Trichlorobenzene	ug/kg	ND	1000	1120	112	69-150	
1,2,3-Trichloropropane	ug/kg	ND	1000	1250	125	64-150	
1,2,4-Trichlorobenzene	ug/kg	ND	1000	1180	118	71-149	
1,2,4-Trimethylbenzene	ug/kg	ND	1000	1170	117	67-149	
1,2-Dibromo-3-chloropropane	ug/kg	ND	2500	2930	117	61-150	
1,2-Dibromoethane (EDB)	ug/kg	ND	1000	1310	131	67-147	
1,2-Dichlorobenzene	ug/kg	ND	1000	1220	122	70-142	
1,2-Dichloroethane	ug/kg	ND	1000	1110	111	58-132	
1,2-Dichloropropane	ug/kg	ND	1000	1090	109	64-144	
1,3,5-Trimethylbenzene	ug/kg	ND	1000	1270	127	71-146	
1,3-Dichlorobenzene	ug/kg	ND	1000	1170	117	71-142	
1,3-Dichloropropane	ug/kg	ND	1000	1180	118	68-140	
1,4-Dichlorobenzene	ug/kg	ND	1000	1170	117	68-142	
2,2-Dichloropropane	ug/kg	ND	1000	1180	118	34-150	
2-Butanone (MEK)	ug/kg	ND	5010	5840	117	51-150	
2-Chlorotoluene	ug/kg	ND	1000	1270	127	66-144	
4-Chlorotoluene	ug/kg	ND	1000	1200	120	66-140	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

MATRIX SPIKE SAMPLE: 2906943		10429482001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	5010	4950	99	63-150	
Acetone	ug/kg	ND	5010	7870	157	54-150	M1
Allyl chloride	ug/kg	ND	1000	790	79	53-135	
Benzene	ug/kg	ND	1000	1210	121	65-135	
Bromobenzene	ug/kg	ND	1000	1330	133	71-141	
Bromochloromethane	ug/kg	ND	1000	1290	129	62-145	
Bromodichloromethane	ug/kg	ND	1000	1240	124	59-148	
Bromoform	ug/kg	ND	1000	1200	120	57-145	
Bromomethane	ug/kg	ND	1000	1050	105	51-129	
Carbon tetrachloride	ug/kg	ND	1000	1390	139	55-144	
Chlorobenzene	ug/kg	ND	1000	1180	118	70-142	
Chloroethane	ug/kg	ND	1000	1170	116	61-135	
Chloroform	ug/kg	ND	1000	1250	124	58-135	
Chloromethane	ug/kg	ND	1000	732	73	37-125	
cis-1,2-Dichloroethene	ug/kg	ND	1000	1290	129	60-138	
cis-1,3-Dichloropropene	ug/kg	ND	1000	1200	120	62-142	
Dibromochloromethane	ug/kg	ND	1000	1180	118	65-141	
Dibromomethane	ug/kg	ND	1000	1270	127	72-150	
Dichlorodifluoromethane	ug/kg	ND	1000	751	75	30-125	
Dichlorofluoromethane	ug/kg	ND	1000	1410	141	62-148	
Diethyl ether (Ethyl ether)	ug/kg	ND	1000	2080	207	62-135	M0,SS
Ethylbenzene	ug/kg	ND	1000	1230	123	72-138	
Hexachloro-1,3-butadiene	ug/kg	ND	1000	1330	133	38-150	
Isopropylbenzene (Cumene)	ug/kg	ND	1000	1270	127	75-148	
m&p-Xylene	ug/kg	ND	2000	2320	116	74-142	
Methyl-tert-butyl ether	ug/kg	ND	1000	1050	105	63-139	
Methylene Chloride	ug/kg	ND	1000	988	99	58-135	
n-Butylbenzene	ug/kg	ND	1000	1210	121	63-150	
n-Propylbenzene	ug/kg	ND	1000	1270	126	70-146	
Naphthalene	ug/kg	ND	1000	1160	116	63-150	
o-Xylene	ug/kg	ND	1000	1190	119	74-141	
p-Isopropyltoluene	ug/kg	ND	1000	1260	126	72-150	
sec-Butylbenzene	ug/kg	ND	1000	1200	120	66-150	
Styrene	ug/kg	ND	1000	1270	127	72-146	
tert-Butylbenzene	ug/kg	ND	1000	1220	122	71-148	
Tetrachloroethene	ug/kg	ND	1000	1300	130	70-150	
Tetrahydrofuran	ug/kg	ND	10000	16600	165	62-150	M1
Toluene	ug/kg	ND	1000	1150	115	65-142	
trans-1,2-Dichloroethene	ug/kg	ND	1000	1120	112	55-141	
trans-1,3-Dichloropropene	ug/kg	ND	1000	1200	120	57-147	
Trichloroethene	ug/kg	ND	1000	1270	127	62-150	
Trichlorofluoromethane	ug/kg	ND	1000	1560	156	51-150	M1
Vinyl chloride	ug/kg	ND	1000	881	88	45-132	
Xylene (Total)	ug/kg	ND	3000	3520	117	75-140	
1,2-Dichloroethane-d4 (S)	%				97	75-125	
4-Bromofluorobenzene (S)	%				105	75-125	
Toluene-d8 (S)	%				100	75-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

SAMPLE DUPLICATE: 2906944

Parameter	Units	10427824002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,1-Trichloroethane	ug/kg	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,2-Trichloroethane	ug/kg	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	ND		30	
1,1-Dichloroethane	ug/kg	ND	ND		30	
1,1-Dichloroethene	ug/kg	ND	ND		30	
1,1-Dichloropropene	ug/kg	ND	ND		30	
1,2,3-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,3-Trichloropropane	ug/kg	ND	ND		30	
1,2,4-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,4-Trimethylbenzene	ug/kg	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/kg	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	ND		30	
1,2-Dichlorobenzene	ug/kg	ND	ND		30	
1,2-Dichloroethane	ug/kg	ND	ND		30	
1,2-Dichloropropane	ug/kg	ND	ND		30	
1,3,5-Trimethylbenzene	ug/kg	ND	ND		30	
1,3-Dichlorobenzene	ug/kg	ND	ND		30	
1,3-Dichloropropane	ug/kg	ND	ND		30	
1,4-Dichlorobenzene	ug/kg	ND	ND		30	
2,2-Dichloropropane	ug/kg	ND	ND		30	
2-Butanone (MEK)	ug/kg	ND	ND		30	
2-Chlorotoluene	ug/kg	ND	ND		30	
4-Chlorotoluene	ug/kg	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND		30	
Acetone	ug/kg	ND	ND		30	
Allyl chloride	ug/kg	ND	ND		30	
Benzene	ug/kg	ND	ND		30	
Bromobenzene	ug/kg	ND	ND		30	
Bromochloromethane	ug/kg	ND	ND		30	
Bromodichloromethane	ug/kg	ND	ND		30	
Bromoform	ug/kg	ND	ND		30	
Bromomethane	ug/kg	ND	ND		30	
Carbon tetrachloride	ug/kg	ND	ND		30	
Chlorobenzene	ug/kg	ND	ND		30	
Chloroethane	ug/kg	ND	ND		30	
Chloroform	ug/kg	ND	ND		30	
Chloromethane	ug/kg	ND	ND		30	
cis-1,2-Dichloroethene	ug/kg	ND	ND		30	
cis-1,3-Dichloropropene	ug/kg	ND	ND		30	
Dibromochloromethane	ug/kg	ND	ND		30	
Dibromomethane	ug/kg	ND	ND		30	
Dichlorodifluoromethane	ug/kg	ND	ND		30	
Dichlorofluoromethane	ug/kg	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/kg	ND	ND		30	
Ethylbenzene	ug/kg	ND	ND		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

SAMPLE DUPLICATE: 2906944

Parameter	Units	10427824002 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	ND	ND		30	
Isopropylbenzene (Cumene)	ug/kg	ND	ND		30	
m&p-Xylene	ug/kg	ND	ND		30	
Methyl-tert-butyl ether	ug/kg	ND	ND		30	
Methylene Chloride	ug/kg	ND	ND		30	
n-Butylbenzene	ug/kg	ND	ND		30	
n-Propylbenzene	ug/kg	ND	ND		30	
Naphthalene	ug/kg	272	295	8	30	
o-Xylene	ug/kg	ND	ND		30	
p-Isopropyltoluene	ug/kg	ND	ND		30	
sec-Butylbenzene	ug/kg	ND	ND		30	
Styrene	ug/kg	ND	ND		30	
tert-Butylbenzene	ug/kg	ND	ND		30	
Tetrachloroethene	ug/kg	ND	ND		30	
Tetrahydrofuran	ug/kg	ND	ND		30	
Toluene	ug/kg	ND	ND		30	
trans-1,2-Dichloroethene	ug/kg	ND	ND		30	
trans-1,3-Dichloropropene	ug/kg	ND	ND		30	
Trichloroethene	ug/kg	ND	ND		30	
Trichlorofluoromethane	ug/kg	ND	ND		30	
Vinyl chloride	ug/kg	ND	ND		30	
Xylene (Total)	ug/kg	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	98	97	11		
4-Bromofluorobenzene (S)	%	99	93	17		
Toluene-d8 (S)	%	94	96	9		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 533317 Analysis Method: EPA 8081B
QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2896992 Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/26/18 20:33	
4,4'-DDE	ug/kg	ND	3.3	04/26/18 20:33	
4,4'-DDT	ug/kg	ND	3.3	04/26/18 20:33	
Aldrin	ug/kg	ND	1.7	04/26/18 20:33	
alpha-BHC	ug/kg	ND	1.7	04/26/18 20:33	
alpha-Chlordane	ug/kg	ND	1.7	04/26/18 20:33	
beta-BHC	ug/kg	ND	1.7	04/26/18 20:33	
Chlordane (Technical)	ug/kg	ND	16.7	04/26/18 20:33	
delta-BHC	ug/kg	ND	1.7	04/26/18 20:33	
Dieldrin	ug/kg	ND	3.3	04/26/18 20:33	
Endosulfan I	ug/kg	ND	1.7	04/26/18 20:33	
Endosulfan II	ug/kg	ND	3.3	04/26/18 20:33	
Endosulfan sulfate	ug/kg	ND	3.3	04/26/18 20:33	
Endrin	ug/kg	ND	3.3	04/26/18 20:33	
Endrin aldehyde	ug/kg	ND	3.3	04/26/18 20:33	
Endrin ketone	ug/kg	ND	3.3	04/26/18 20:33	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/26/18 20:33	
gamma-Chlordane	ug/kg	ND	1.7	04/26/18 20:33	
Heptachlor	ug/kg	ND	1.7	04/26/18 20:33	
Heptachlor epoxide	ug/kg	ND	1.7	04/26/18 20:33	
Methoxychlor	ug/kg	ND	16.7	04/26/18 20:33	
Toxaphene	ug/kg	ND	50.0	04/26/18 20:33	
Decachlorobiphenyl (S)	%	98	30-150	04/26/18 20:33	
Tetrachloro-m-xylene (S)	%	105	30-150	04/26/18 20:33	

LABORATORY CONTROL SAMPLE: 2896993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	35.6	107	62-127	
4,4'-DDE	ug/kg	33.3	34.8	104	66-125	
4,4'-DDT	ug/kg	33.3	31.8	96	67-128	
Aldrin	ug/kg	16.7	16.5	99	66-125	
alpha-BHC	ug/kg	16.7	17.5	105	64-125	
alpha-Chlordane	ug/kg	16.7	16.7	100	68-125	
beta-BHC	ug/kg	16.7	16.8	101	69-125	
delta-BHC	ug/kg	16.7	14.3	86	42-133	
Dieldrin	ug/kg	33.3	37.3	112	69-126	
Endosulfan I	ug/kg	16.7	16.0	96	63-125	
Endosulfan II	ug/kg	33.3	35.8	107	69-125	
Endosulfan sulfate	ug/kg	33.3	31.8	95	56-137	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

LABORATORY CONTROL SAMPLE: 2896993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	34.5	103	69-125	
Endrin aldehyde	ug/kg	33.3	34.0	102	65-125	
Endrin ketone	ug/kg	33.3	36.0	108	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	17.4	104	67-125	
gamma-Chlordane	ug/kg	16.7	15.3	92	63-125	
Heptachlor	ug/kg	16.7	16.5	99	69-125	
Heptachlor epoxide	ug/kg	16.7	17.0	102	68-125	
Methoxychlor	ug/kg	167	160	96	65-134	
Decachlorobiphenyl (S)	%			100	30-150	
Tetrachloro-m-xylene (S)	%			107	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896994 2896995

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427824001 Result	Spike Conc.	Spike Conc.	MS Result						
4,4'-DDD	ug/kg	ND	43.8	43.8	79J	92J	180	210	56-125	20	M6
4,4'-DDE	ug/kg	ND	43.8	43.8	61.7J	61.2J	141	140	32-150	20	
4,4'-DDT	ug/kg	ND	43.8	43.8	ND	105J	49	239	60-132	20	M6
Aldrin	ug/kg	ND	21.9	21.9	29.1J	43.3J	133	198	56-125	20	M6
alpha-BHC	ug/kg	ND	21.9	21.9	30.3J	25.5J	138	116	54-136	20	M6
alpha-Chlordane	ug/kg	ND	21.9	21.9	43.8J	97.5J	200	445	54-133	20	M6
beta-BHC	ug/kg	ND	21.9	21.9	ND	69.2J	190	315	30-150	20	M6
delta-BHC	ug/kg	ND	21.9	21.9	21.3J	19.8J	97	90	45-145	20	
Dieldrin	ug/kg	ND	43.8	43.8	67.4J	76.3J	154	174	47-150	20	M6
Endosulfan I	ug/kg	ND	21.9	21.9	23.9J	22.6J	109	103	35-145	20	
Endosulfan II	ug/kg	ND	43.8	43.8	53.3J	50.6J	122	115	50-147	20	
Endosulfan sulfate	ug/kg	ND	43.8	43.8	44.3J	43.8J	101	100	54-132	20	
Endrin	ug/kg	ND	43.8	43.8	49.3J	39.3J	113	90	62-125	20	
Endrin aldehyde	ug/kg	ND	43.8	43.8	48.2J	49.1J	110	112	33-150	20	
Endrin ketone	ug/kg	ND	43.8	43.8	83.8J	97.2J	191	222	56-144	20	M6
gamma-BHC (Lindane)	ug/kg	ND	21.9	21.9	26.3J	27.8J	120	127	63-125	20	M6
gamma-Chlordane	ug/kg	ND	21.9	21.9	43.3J	88.3J	198	403	45-132	20	M6
Heptachlor	ug/kg	ND	21.9	21.9	33.4J	24.2J	152	110	51-142	20	M6
Heptachlor epoxide	ug/kg	ND	21.9	21.9	27.4J	27J	125	123	50-142	20	
Methoxychlor	ug/kg	ND	219	219	261J	243J	119	111	58-139	20	
Decachlorobiphenyl (S)	%						0	0	30-150		S4
Tetrachloro-m-xylene (S)	%						0	0	30-150		2M, D3, S4

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 533330 Analysis Method: EPA 8082A
QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2897062 Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/23/18 17:02	
Decachlorobiphenyl (S)	%	125	30-134	04/23/18 17:02	CH
Tetrachloro-m-xylene (S)	%	88	48-125	04/23/18 17:02	

LABORATORY CONTROL SAMPLE: 2897063

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	502	75	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	549	82	62-125	
Decachlorobiphenyl (S)	%			126	30-134	CH
Tetrachloro-m-xylene (S)	%			88	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897064 2897065

Parameter	Units	10427642001		2897065		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
PCB-1016 (Aroclor 1016)	ug/kg	ND	853	852	783	92	101	30-150	9	30	
PCB-1260 (Aroclor 1260)	ug/kg	ND	853	852	757	89	88	30-138	1	30	
Decachlorobiphenyl (S)	%					110	108	30-134			CH
Tetrachloro-m-xylene (S)	%					78	75	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 533315

Analysis Method: EPA 8270D

QC Batch Method: EPA 3550

Analysis Description: 8270D Solid MSSV

Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2896984

Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/23/18 16:07	
1,2-Dichlorobenzene	ug/kg	ND	330	04/23/18 16:07	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/23/18 16:07	
1,3-Dichlorobenzene	ug/kg	ND	330	04/23/18 16:07	
1,4-Dichlorobenzene	ug/kg	ND	330	04/23/18 16:07	
1-Methylnaphthalene	ug/kg	ND	330	04/23/18 16:07	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/23/18 16:07	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/23/18 16:07	
2,4-Dichlorophenol	ug/kg	ND	330	04/23/18 16:07	
2,4-Dimethylphenol	ug/kg	ND	330	04/23/18 16:07	
2,4-Dinitrophenol	ug/kg	ND	330	04/23/18 16:07	
2,4-Dinitrotoluene	ug/kg	ND	330	04/23/18 16:07	
2,6-Dinitrotoluene	ug/kg	ND	330	04/23/18 16:07	
2-Chloronaphthalene	ug/kg	ND	330	04/23/18 16:07	
2-Chlorophenol	ug/kg	ND	330	04/23/18 16:07	
2-Methylnaphthalene	ug/kg	ND	330	04/23/18 16:07	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/23/18 16:07	
2-Nitroaniline	ug/kg	ND	330	04/23/18 16:07	
2-Nitrophenol	ug/kg	ND	330	04/23/18 16:07	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/23/18 16:07	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/23/18 16:07	
3-Nitroaniline	ug/kg	ND	330	04/23/18 16:07	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/23/18 16:07	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/23/18 16:07	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/23/18 16:07	
4-Chloroaniline	ug/kg	ND	330	04/23/18 16:07	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/23/18 16:07	
4-Nitroaniline	ug/kg	ND	330	04/23/18 16:07	
4-Nitrophenol	ug/kg	ND	330	04/23/18 16:07	
Acenaphthene	ug/kg	ND	330	04/23/18 16:07	
Acenaphthylene	ug/kg	ND	330	04/23/18 16:07	
Anthracene	ug/kg	ND	330	04/23/18 16:07	
Benzo(a)anthracene	ug/kg	ND	330	04/23/18 16:07	
Benzo(a)pyrene	ug/kg	ND	330	04/23/18 16:07	
Benzo(b)fluoranthene	ug/kg	ND	330	04/23/18 16:07	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/23/18 16:07	
Benzo(k)fluoranthene	ug/kg	ND	330	04/23/18 16:07	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/23/18 16:07	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/23/18 16:07	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/23/18 16:07	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/23/18 16:07	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

METHOD BLANK: 2896984 Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/23/18 16:07	
Carbazole	ug/kg	ND	330	04/23/18 16:07	
Chrysene	ug/kg	ND	330	04/23/18 16:07	
Di-n-butylphthalate	ug/kg	ND	330	04/23/18 16:07	
Di-n-octylphthalate	ug/kg	ND	330	04/23/18 16:07	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/23/18 16:07	
Dibenzofuran	ug/kg	ND	330	04/23/18 16:07	
Diethylphthalate	ug/kg	ND	330	04/23/18 16:07	
Dimethylphthalate	ug/kg	ND	330	04/23/18 16:07	
Fluoranthene	ug/kg	ND	330	04/23/18 16:07	
Fluorene	ug/kg	ND	330	04/23/18 16:07	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/23/18 16:07	
Hexachlorobenzene	ug/kg	ND	330	04/23/18 16:07	
Hexachloroethane	ug/kg	ND	330	04/23/18 16:07	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/23/18 16:07	
Isophorone	ug/kg	ND	330	04/23/18 16:07	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/23/18 16:07	
N-Nitrosodimethylamine	ug/kg	ND	330	04/23/18 16:07	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/23/18 16:07	
Naphthalene	ug/kg	ND	330	04/23/18 16:07	
Nitrobenzene	ug/kg	ND	330	04/23/18 16:07	
Pentachlorophenol	ug/kg	ND	670	04/23/18 16:07	
Phenanthrene	ug/kg	ND	330	04/23/18 16:07	
Phenol	ug/kg	ND	330	04/23/18 16:07	
Pyrene	ug/kg	ND	330	04/23/18 16:07	
2,4,6-Tribromophenol (S)	%	69	60-125	04/23/18 16:07	
2-Fluorobiphenyl (S)	%	67	30-132	04/23/18 16:07	
2-Fluorophenol (S)	%	64	40-125	04/23/18 16:07	
Nitrobenzene-d5 (S)	%	63	43-125	04/23/18 16:07	
p-Terphenyl-d14 (S)	%	79	62-125	04/23/18 16:07	
Phenol-d6 (S)	%	63	48-125	04/23/18 16:07	

LABORATORY CONTROL SAMPLE: 2896985

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1210	73	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1230	74	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1300	78	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1230	74	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1220	73	39-125	
1-Methylnaphthalene	ug/kg	1670	1320	79	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1340	81	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1310	79	61-125	
2,4-Dichlorophenol	ug/kg	1670	1370	82	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

LABORATORY CONTROL SAMPLE: 2896985

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1280	77	51-125	
2,4-Dinitrophenol	ug/kg	1670	1130	68	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1550	93	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1470	88	63-125	
2-Chloronaphthalene	ug/kg	1670	1310	79	61-125	
2-Chlorophenol	ug/kg	1670	1230	74	46-125	
2-Methylnaphthalene	ug/kg	1670	1290	77	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1240	74	50-125	
2-Nitroaniline	ug/kg	1670	1350	81	61-125	
2-Nitrophenol	ug/kg	1670	1340	80	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1290	77	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1370	82	47-125	
3-Nitroaniline	ug/kg	1670	1370	82	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1540J	93	30-141	4M
4-Bromophenylphenyl ether	ug/kg	1670	1340	81	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1420	85	64-125	
4-Chloroaniline	ug/kg	1670	1080	65	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1350	81	64-125	
4-Nitroaniline	ug/kg	1670	1330	80	59-125	
4-Nitrophenol	ug/kg	1670	1240	75	54-125	
Acenaphthene	ug/kg	1670	1310	79	62-125	
Acenaphthylene	ug/kg	1670	1330	80	61-125	
Anthracene	ug/kg	1670	1350	81	66-125	
Benzo(a)anthracene	ug/kg	1670	1430	86	69-125	
Benzo(a)pyrene	ug/kg	1670	1410	85	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1440	87	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1450	87	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1400	84	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1230	74	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1130	68	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	978	59	37-125	4M
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1600	96	69-131	
Butylbenzylphthalate	ug/kg	1670	1550	93	69-129	
Carbazole	ug/kg	1670	1430	86	66-125	
Chrysene	ug/kg	1670	1410	85	68-125	
Di-n-butylphthalate	ug/kg	1670	1520	91	69-125	
Di-n-octylphthalate	ug/kg	1670	1640	98	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1480	89	64-125	
Dibenzofuran	ug/kg	1670	1380	83	65-125	
Diethylphthalate	ug/kg	1670	1420	85	67-125	
Dimethylphthalate	ug/kg	1670	1420	85	67-125	
Fluoranthene	ug/kg	1670	1410	85	66-125	
Fluorene	ug/kg	1670	1370	82	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1190	71	40-125	
Hexachlorobenzene	ug/kg	1670	1370	82	62-125	
Hexachloroethane	ug/kg	1670	1190	72	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1450	87	64-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

LABORATORY CONTROL SAMPLE: 2896985

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1260	76	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1220	73	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1330	80	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1410	85	65-125	
Naphthalene	ug/kg	1670	1240	74	48-125	
Nitrobenzene	ug/kg	1670	1200	72	48-125	
Pentachlorophenol	ug/kg	1670	1120	67	41-125	
Phenanthrene	ug/kg	1670	1350	81	66-125	
Phenol	ug/kg	1670	1210	73	46-125	
Pyrene	ug/kg	1670	1460	88	69-125	
2,4,6-Tribromophenol (S)	%			76	60-125	
2-Fluorobiphenyl (S)	%			68	30-132	
2-Fluorophenol (S)	%			61	40-125	
Nitrobenzene-d5 (S)	%			59	43-125	
p-Terphenyl-d14 (S)	%			82	62-125	
Phenol-d6 (S)	%			63	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896986 2896987

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10427642001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,2,4-Trichlorobenzene	ug/kg	ND	2130	2140	1630	1720	77	81	30-127	5	30	
1,2-Dichlorobenzene	ug/kg	ND	2130	2140	1610	1550	76	73	30-125	3	30	
1,2-Diphenylhydrazine	ug/kg	ND	2130	2140	1560	1800	73	84	30-150	15	30	
1,3-Dichlorobenzene	ug/kg	ND	2130	2140	1570	1470	74	69	30-125	7	30	
1,4-Dichlorobenzene	ug/kg	ND	2130	2140	1570	1500	74	70	30-125	5	30	
1-Methylnaphthalene	ug/kg	ND	2130	2140	1740	1900	81	89	42-125	9	30	
2,4,5-Trichlorophenol	ug/kg	ND	2130	2140	1690	1950	80	91	30-150	14	30	
2,4,6-Trichlorophenol	ug/kg	ND	2130	2140	1750	1990	82	93	30-150	13	30	
2,4-Dichlorophenol	ug/kg	ND	2130	2140	1820	1980	85	93	30-135	8	30	
2,4-Dimethylphenol	ug/kg	ND	2130	2140	1770	1930	83	90	30-148	9	30	
2,4-Dinitrophenol	ug/kg	ND	2130	2140	ND	ND	0	0	30-125		30	M1
2,4-Dinitrotoluene	ug/kg	ND	2130	2140	1630	1760	77	82	30-150	7	30	
2,6-Dinitrotoluene	ug/kg	ND	2130	2140	1630	1820	77	85	30-150	11	30	
2-Chloronaphthalene	ug/kg	ND	2130	2140	1700	1930	80	90	30-138	13	30	
2-Chlorophenol	ug/kg	ND	2130	2140	1680	1720	79	80	30-130	2	30	
2-Methylnaphthalene	ug/kg	ND	2130	2140	1700	1860	79	87	46-125	9	30	
2-Methylphenol(o-Cresol)	ug/kg	ND	2130	2140	1720	1840	81	86	30-133	6	30	
2-Nitroaniline	ug/kg	ND	2130	2140	1830	2180	86	102	30-150	17	30	
2-Nitrophenol	ug/kg	ND	2130	2140	1360	1410	64	66	30-134	4	30	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	2130	2140	1740	1870	82	88	30-138	7	30	
3,3'-Dichlorobenzidine	ug/kg	ND	2130	2140	1780	1880	84	88	30-149	5	30	
3-Nitroaniline	ug/kg	ND	2130	2140	1680	1930	79	91	30-150	14	30	
4,6-Dinitro-2-methylphenol	ug/kg	ND	2130	2140	259J	ND	12	0	30-133		30	4M, M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896986												2896987											
Parameter	Units	MS		MSD		MS		MSD		% Rec		Max		Qual									
		10427642001	Spike	Spike	MS	MSD	MS	MSD	% Rec	% Rec	Limits	RPD	RPD										
4-Bromophenylphenyl ether	ug/kg	ND	2130	2140	1750	1930	82	90	44-125	9	30												
4-Chloro-3-methylphenol	ug/kg	ND	2130	2140	1910	2070	90	97	30-150	8	30												
4-Chloroaniline	ug/kg	ND	2130	2140	996	1070	47	50	30-125	7	30												
4-Chlorophenylphenyl ether	ug/kg	ND	2130	2140	1710	1990	81	93	44-125	15	30												
4-Nitroaniline	ug/kg	ND	2130	2140	1850	2240	87	105	30-150	19	30												
4-Nitrophenol	ug/kg	ND	2130	2140	1520	1800	71	84	30-150	17	30												
Acenaphthene	ug/kg	ND	2130	2140	1610	1840	73	84	40-125	13	30												
Acenaphthylene	ug/kg	ND	2130	2140	1690	1910	79	90	30-150	13	30												
Anthracene	ug/kg	ND	2130	2140	1760	1990	77	88	30-150	13	30												
Benzo(a)anthracene	ug/kg	ND	2130	2140	2080	2270	85	94	30-150	9	30												
Benzo(a)pyrene	ug/kg	ND	2130	2140	1990	2290	81	95	30-150	14	30												
Benzo(b)fluoranthene	ug/kg	ND	2130	2140	2120	2370	83	95	30-150	11	30												
Benzo(g,h,i)perylene	ug/kg	ND	2130	2140	1920	2210	82	95	30-150	14	30												
Benzo(k)fluoranthene	ug/kg	ND	2130	2140	1940	2190	84	95	30-150	12	30												
bis(2-Chloroethoxy)methane	ug/kg	ND	2130	2140	1670	1760	78	83	30-134	6	30												
bis(2-Chloroethyl) ether	ug/kg	ND	2130	2140	1590	1570	75	74	30-125	1	30												
bis(2-Chloroisopropyl) ether	ug/kg	ND	2130	2140	1300	1290	61	61	30-125	0	30	4M											
bis(2-Ethylhexyl)phthalate	ug/kg	ND	2130	2140	2220	2540	98	113	30-150	14	30												
Butylbenzylphthalate	ug/kg	ND	2130	2140	2110	2580	97	119	30-150	20	30												
Carbazole	ug/kg	ND	2130	2140	1800	2040	82	93	41-125	12	30												
Chrysene	ug/kg	ND	2130	2140	2040	2290	83	95	30-150	11	30												
Di-n-butylphthalate	ug/kg	ND	2130	2140	1880	2150	88	101	30-150	14	30												
Di-n-octylphthalate	ug/kg	ND	2130	2140	2090	2370	98	111	30-150	13	30												
Dibenz(a,h)anthracene	ug/kg	ND	2130	2140	1870	2110	88	99	30-150	12	30												
Dibenzofuran	ug/kg	ND	2130	2140	1720	1980	80	92	45-125	14	30												
Diethylphthalate	ug/kg	ND	2130	2140	1760	2070	83	97	30-150	16	30												
Dimethylphthalate	ug/kg	ND	2130	2140	1800	2040	85	96	30-150	12	30												
Fluoranthene	ug/kg	565	2130	2140	2230	2380	78	85	30-150	7	30												
Fluorene	ug/kg	ND	2130	2140	1710	1950	78	89	30-150	13	30												
Hexachloro-1,3-butadiene	ug/kg	ND	2130	2140	1600	1620	75	76	30-128	2	30												
Hexachlorobenzene	ug/kg	ND	2130	2140	1760	1950	83	91	30-150	10	30												
Hexachloroethane	ug/kg	ND	2130	2140	642	673	30	32	30-125	5	30												
Indeno(1,2,3-cd)pyrene	ug/kg	ND	2130	2140	1930	2210	84	97	30-150	14	30												
Isophorone	ug/kg	ND	2130	2140	1650	1750	78	82	30-140	6	30												
N-Nitroso-di-n-propylamine	ug/kg	ND	2130	2140	1610	1670	76	78	30-147	3	30												
N-Nitrosodimethylamine	ug/kg	ND	2130	2140	1640	1450	77	68	30-125	12	30												
N-Nitrosodiphenylamine	ug/kg	ND	2130	2140	1810	2020	85	94	30-150	11	30												
Naphthalene	ug/kg	ND	2130	2140	1660	1730	78	81	44-125	4	30												
Nitrobenzene	ug/kg	ND	2130	2140	1600	1640	75	77	30-136	2	30												
Pentachlorophenol	ug/kg	ND	2130	2140	1430	1530	67	72	30-150	7	30												
Phenanthrene	ug/kg	ND	2130	2140	1800	2050	67	79	30-150	13	30												
Phenol	ug/kg	ND	2130	2140	1600	1720	75	81	30-129	7	30												
Pyrene	ug/kg	511	2130	2140	2370	2530	87	95	30-150	7	30												
2,4,6-Tribromophenol (S)	%						69	80	60-125														
2-Fluorobiphenyl (S)	%						49	53	30-132														
2-Fluorophenol (S)	%						63	59	40-125														

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Parameter	Units	2896986		2896987		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Nitrobenzene-d5 (S)	%.	10427642001				57	54	43-125			
p-Terphenyl-d14 (S)	%.					76	86	62-125			
Phenol-d6 (S)	%.					64	65	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 533341 Analysis Method: EPA 8270D by SIM
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
 Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2897115 Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/20/18 12:15	
Acenaphthylene	ug/kg	ND	10.0	04/20/18 12:15	
Anthracene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(a)anthracene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(a)pyrene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/20/18 12:15	
Chrysene	ug/kg	ND	10.0	04/20/18 12:15	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/20/18 12:15	
Fluoranthene	ug/kg	ND	10.0	04/20/18 12:15	
Fluorene	ug/kg	ND	10.0	04/20/18 12:15	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/20/18 12:15	
Naphthalene	ug/kg	ND	10.0	04/20/18 12:15	
Phenanthrene	ug/kg	ND	10.0	04/20/18 12:15	
Pyrene	ug/kg	ND	10.0	04/20/18 12:15	
2-Fluorobiphenyl (S)	%	72	42-125	04/20/18 12:15	
p-Terphenyl-d14 (S)	%	88	57-125	04/20/18 12:15	

LABORATORY CONTROL SAMPLE: 2897116

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	25.3	76	52-125	
Acenaphthylene	ug/kg	33.3	24.9	75	50-125	
Anthracene	ug/kg	33.3	26.9	81	65-125	
Benzo(a)anthracene	ug/kg	33.3	29.0	87	60-125	
Benzo(a)pyrene	ug/kg	33.3	27.9	84	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	30.3	91	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	29.6	89	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	30.6	92	67-125	
Chrysene	ug/kg	33.3	30.1	90	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	30.5	92	63-125	
Fluoranthene	ug/kg	33.3	29.5	88	75-125	
Fluorene	ug/kg	33.3	25.5	77	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	30.0	90	63-125	
Naphthalene	ug/kg	33.3	24.8	75	49-125	
Phenanthrene	ug/kg	33.3	27.8	83	65-125	
Pyrene	ug/kg	33.3	28.2	85	64-125	
2-Fluorobiphenyl (S)	%			76	42-125	
p-Terphenyl-d14 (S)	%			89	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Parameter	Units	2897117		2897118		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Acenaphthene	ug/kg	49.1	46	46.2	130	103	177	117	30-125	24	30 M1
Acenaphthylene	ug/kg	ND	46	46.2	37.4	38.8	81	84	30-133	4	30
Anthracene	ug/kg	94.1	46	46.2	96.2	163	4	149	30-150	51	30 M1,R1
Benzo(a)anthracene	ug/kg	660	46	46.2	111	85.5	-1190	-1250	30-150	25	30 M1
Benzo(a)pyrene	ug/kg	680	46	46.2	109	79.9	-1240	-1300	30-150	31	30 M1,R1
Benzo(b)fluoranthene	ug/kg	879	46	46.2	138	101	-1610	-1690	30-150	31	30 M1,R1
Benzo(g,h,i)perylene	ug/kg	358	46	46.2	81.6	66.3	-599	-632	30-150	21	30 M1
Benzo(k)fluoranthene	ug/kg	293	46	46.2	75.1	59.2	-473	-507	30-150	24	30 M1
Chrysene	ug/kg	570	46	46.2	112	101	-996	-1020	30-150	10	30 M1
Dibenz(a,h)anthracene	ug/kg	88.8	46	46.2	49.0	45.5	-86	-94	30-131	7	30 M1
Fluoranthene	ug/kg	1040	46	46.2	241	169	-1720	-1880	30-150	35	30 M1,R1
Fluorene	ug/kg	43.3	46	46.2	96.7	112	116	148	30-147	14	30 M1
Indeno(1,2,3-cd)pyrene	ug/kg	308	46	46.2	71.6	62.1	-514	-534	30-150	14	30 M1
Naphthalene	ug/kg	106	46	46.2	222	190	252	182	30-131	16	30 M1
Phenanthrene	ug/kg	318	46	46.2	240	256	-169	-135	30-150	6	30 M1
Pyrene	ug/kg	872	46	46.2	191	139	-1480	-1590	30-150	32	30 M1,R1
2-Fluorobiphenyl (S)	%.						81	83	42-125		
p-Terphenyl-d14 (S)	%.						82	90	57-125		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 533572 Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS

Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2898368 Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	04/22/18 12:39	
n-Triacontane (S)	%.	115	50-150	04/22/18 12:39	

LABORATORY CONTROL SAMPLE & LCSD: 2898369 2898370

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	86.0	86.0	107	107	70-120	0	20	
n-Triacontane (S)	%.				115	119	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

QC Batch: 439502 Analysis Method: EPA 7196A
QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2030883 Matrix: Solid
Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	05/01/18 10:56	

LABORATORY CONTROL SAMPLE: 2030884

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	994	907	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2030886 2030887

Parameter	Units	60268827001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	1240	1220	1210	1170	98	95	75-125	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2030888 2030889

Parameter	Units	60268827001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	49.7	49.1	40.0	37.2	81	76	75-125	7	20	

SAMPLE DUPLICATE: 2030885

Parameter	Units	50195327001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 286937 Analysis Method: EPA 9012
QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 1678360 Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/25/18 13:16	

LABORATORY CONTROL SAMPLE: 1678361

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.1	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1678362 1678363

Parameter	Units	10427642001		1678362		1678363		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Cyanide	mg/kg	0.52	3.72	3.72	4.0	4.1	93	97	80-120	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1678364 1678365

Parameter	Units	10428096003		1678364		1678365		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Cyanide	mg/kg	0.45	2.7	2.6	3.5	2.7	112	87	80-120	25	20	M0,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

QC Batch: 141337 Analysis Method: EPA 9056A
QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 559083 Matrix: Solid
Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	1.0	04/25/18 23:33	

LABORATORY CONTROL SAMPLE: 559082

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	49.8	55.2	111	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559084 559085

Parameter	Units	10427642003 Result	559084		559085		% Rec	MSD	% Rec	MSD	% Rec	Limits	RPD	Max RPD	Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result									
Fluoride	mg/kg	ND	49.3	49.7	34.2	29.5	69	59	80-120	15	20	M1			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559086 559087

Parameter	Units	10427642001 Result	559086		559087		% Rec	MSD	% Rec	MSD	% Rec	Limits	RPD	Max RPD	Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result									
Fluoride	mg/kg	ND	50.5	49.3	21.2	19.1	42	39	80-120	10	20	M1			

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth

PASI-G Pace Analytical Services - Green Bay

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10427824

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

ANALYTE QUALIFIERS

1M Sample was black in color and slightly viscous. Sample was centrifuged and decanted prior to analysis.

2M Sample was black in color and viscous. Sample was centrifuged and decanted prior to analysis.

3M Sample was dark brown in color.

4M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

D4 Sample was diluted due to the presence of high levels of target analytes.

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

ANALYTE QUALIFIERS

- L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
- L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.
- N2 The lab does not hold NELAC/TNI accreditation for this parameter.
- N3 Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
- P3 Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
- P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
- R1 RPD value was outside control limits.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.
- S5 Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
- SS This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.
- T6 High boiling point hydrocarbons are present in the sample.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427824001	FD-TT-14 (2' -12' WM)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427824002	FL-TT-01 (3'-11' WM)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427824001	FD-TT-14 (2' -12' WM)	EPA 3550	533317	EPA 8081B	534051
10427824002	FL-TT-01 (3'-11' WM)	EPA 3550	533317	EPA 8081B	534051
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 3550	533317	EPA 8081B	534051
10427824001	FD-TT-14 (2' -12' WM)	EPA 3550	533330	EPA 8082A	533720
10427824002	FL-TT-01 (3'-11' WM)	EPA 3550	533330	EPA 8082A	533720
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 3550	533330	EPA 8082A	533720
10427824001	FD-TT-14 (2' -12' WM)	WI MOD DRO	533572	WI MOD DRO	533638
10427824002	FL-TT-01 (3'-11' WM)	WI MOD DRO	533572	WI MOD DRO	533638
10427824003	FL-TT-02 (2'-10.5' WM)	WI MOD DRO	533572	WI MOD DRO	533638
10427824001	FD-TT-14 (2' -12' WM)	EPA 5030 Medium Soil	535145	WI MOD GRO	535423
10427824002	FL-TT-01 (3'-11' WM)	EPA 5030 Medium Soil	535145	WI MOD GRO	535423
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 5030 Medium Soil	535145	WI MOD GRO	535423
10427824001	FD-TT-14 (2' -12' WM)	EPA 3050	533415	EPA 6010C	533499
10427824002	FL-TT-01 (3'-11' WM)	EPA 3050	533415	EPA 6010C	533499
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 3050	533415	EPA 6010C	533499
10427824001	FD-TT-14 (2' -12' WM)	EPA 3050B	438855	EPA 6020	439080
10427824002	FL-TT-01 (3'-11' WM)	EPA 3050B	438855	EPA 6020	439080
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 3050B	438855	EPA 6020	439080
10427824001	FD-TT-14 (2' -12' WM)	EPA 3050	533412	EPA 6020A	533510
10427824002	FL-TT-01 (3'-11' WM)	EPA 3050	533412	EPA 6020A	533510
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 3050	533412	EPA 6020A	533510
10427824001	FD-TT-14 (2' -12' WM)	EPA 7471	533419	EPA 7471	533655
10427824002	FL-TT-01 (3'-11' WM)	EPA 7471	533419	EPA 7471	533655
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 7471	533419	EPA 7471	533655
10427824001	FD-TT-14 (2' -12' WM)	ASTM D2974	534034		
10427824002	FL-TT-01 (3'-11' WM)	ASTM D2974	534034		
10427824003	FL-TT-02 (2'-10.5' WM)	ASTM D2974	534034		
10427824001	FD-TT-14 (2' -12' WM)	EPA 3550	533315	EPA 8270D	533819
10427824002	FL-TT-01 (3'-11' WM)	EPA 3550	533315	EPA 8270D	533819
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 3550	533315	EPA 8270D	533819
10427824001	FD-TT-14 (2' -12' WM)	EPA 3550	533341	EPA 8270D by SIM	533540
10427824002	FL-TT-01 (3'-11' WM)	EPA 3550	533341	EPA 8270D by SIM	533540
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 3550	533341	EPA 8270D by SIM	533540
10427824001	FD-TT-14 (2' -12' WM)	EPA 5035/5030B	534992	EPA 8260B	535296
10427824002	FL-TT-01 (3'-11' WM)	EPA 5035/5030B	534992	EPA 8260B	535296
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 5035/5030B	534992	EPA 8260B	535296
10427824001	FD-TT-14 (2' -12' WM)	EPA 3060A	439502	EPA 7196A	439771
10427824002	FL-TT-01 (3'-11' WM)	EPA 3060A	439502	EPA 7196A	439771
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 3060A	439502	EPA 7196A	439771

REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427824001	FD-TT-14 (2' -12' WM)	Trivalent Chromium Calculation	440373		
10427824002	FL-TT-01 (3'-11' WM)	Trivalent Chromium Calculation	440373		
10427824003	FL-TT-02 (2'-10.5' WM)	Trivalent Chromium Calculation	440373		
10427824001	FD-TT-14 (2' -12' WM)	EPA 9012A	286937	EPA 9012	286958
10427824002	FL-TT-01 (3'-11' WM)	EPA 9012A	286937	EPA 9012	286958
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 9012A	286937	EPA 9012	286958
10427824001	FD-TT-14 (2' -12' WM)	EPA 300.0	141337	EPA 9056A	141349
10427824002	FL-TT-01 (3'-11' WM)	EPA 300.0	141337	EPA 9056A	141349
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 300.0	141337	EPA 9056A	141349

REPORT OF LABORATORY ANALYSIS

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WO# 10427824



10427824

Minnesota Pollution Control Agency		Work Order Number:				COC Type:				Page: 1 of				
PROJECT/CLIENT INFO		Turnaround Time:				COC ID:				FOR LAB USE ONLY				
LABORATORY		Lab Name:				Address:				Lab Work Order Sticker				
Facility Code:	MPCA - Freeway LF Solids				Program Code (MDH Lab Only):									
Project Name:	MPCA - Freeway LF Solids				Project Task Code:					19-00383				
Project Manager:									EPIC Profile #39716					
Potential Hazard?	If yes, add information to Sampler Comments Section								Phone No:					
SAMPLE DETAILS						ANALYSIS REQUESTED								
SAMPLE TYPE CODES		QC-FB=Field Blank Sample		LAE MATRIX CODES		FIELD MATRIX CODES		PRESERV.						
S-Routine Sample		QC-FR=Field Replicate Sample		DW=Drinking Water		GW=Ground=Groundwater		ANALYSIS						
S-TVP=Integrated Vertical Profile Sample		QC-TB=Trip Blank Sample		NW=Non-potable Water		SW=Surf=Surface Water		SEE ATTACHED						
S-Sample				AR=Air		QC-BLANK=Artificial Blank Water		FOR SOILS/WASTE						
S-CWOP=Composite Sample				BL=Biological Material		Leachate=Leachate Sample		(-DISSIN)						
				SD=Soil/Solid				+ DISSIN						
				WP=Wipe										
Location Identifier	Sample Type	Date	Time	Start Depth, in Feet	End Depth, in Feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Lab Sample No.	#
EP-11-14 (2-12 WM)	S	4/18/18	9:10	2'	12'	C	SD	WM			13	X	001	1
EP-11-01 (2-11 WM)	S	4/18/18	12:30	3'	11'	C	SD	WM			13	X	002	2
EP-11-02 (2-10.5 WM)	S	4/18/18	13:50	2'	10.5'	C	SD	WM			13	X	003	3
														4
														5
														6
														7
														8
														9
														10
Sampled By: Nate Hibbard				Sampler's Signature: <i>Nate Hibbard</i>				Phone #: 612-214-9066						
Receiving Comments:														
Relinquished By/Affiliation						Date/Time			Accepted By/Affiliation				Date/Time	
(Sampler) <i>Nate Hibbard / Pace</i>						4/18/18 1730			<i>[Signature]</i> Pa-ee				4/18/18 1730	
T=7.3														

Sample Condition Upon Receipt	Client Name: <u>MPCA</u>	Project #: WO# : 10427824
Courier: <input type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input type="checkbox"/> Client <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Pace <input type="checkbox"/> SpeeDee <input type="checkbox"/> Other: _____		PH: JMA Due Date: 05/03/18 CLIENT: PASI-MNFLD
Tracking Number: _____		

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer 151401163 G87A9155100842 **Type of Ice:** Wet Blue None Dry Melted

Cooler Temp Read (°C): 7.1 **Cooler Temp Corrected (°C):** 7.3 **Biological Tissue Frozen?** Yes No N/A
 Temp should be above freezing to 6°C **Correction Factor:** +0.2 **Date and Initials of Person Examining Contents:** MD 4/18/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. <u>No times on samples</u>
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature] **Date:** 04/19/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (needed for Cr III calc)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Chain of Custody

WO#: 12107384



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Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427824 Workorder Name: 18-00383 MPCA-Freeway LF Solid Owner Received Date: 4/18/2018 Results Requested By: 5/3/2018

Report To		Subcontract To				Requested Analysis																									
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042				Total Fluoride by 9056																									
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix											Unpreserved	Preserved Containers			LAB USE ONLY											
1	FD-TT-14 (2' -12' WM)	PS	4/18/2018 09:10	10427824001	Solid											1															
2	FL-TT-01 (3'-11' WM)	PS	4/18/2018 12:30	10427824002	Solid											1															
3	FL-TT-02 (2'-10.5' WM)	PS	4/18/2018 13:50	10427824003	Solid											1															
4																															
5																															
Transfers												Comments																			
Transfers	Released By	Date/Time	Received By	Date/Time																											
1	<i>Gary Ford</i>	<i>4/19/18 17:10</i>	<i>B. Mathews</i>	<i>4-19-18 19:30</i>																											
2	<i>R. Clark</i>	<i>4-20-18 0:30</i>	<i>B. Mathews</i>	<i>4/20/18 0645</i>																											
3																															
Cooler Temperature on Receipt		Custody Seal		Received on Ice		Samples Intact																									
5.4 °C		☑ or N		☑ or N		☑ or N																									

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:
Sample Condition Upon Receipt Form
 Document No.:
 F-VM-C-001-Rev.10

Document Revised: 15Mar2016
 Page 1 of 1
 Issuing Authority:
 Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Pace MN

Project #: **WO# : 12107384**
 PM: HRZ Due Date: 05/02/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 5.1 Cooler Temp Corrected °C: 5.4 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: 10.3 Date and Initials of Person Examining Contents: 4-20-18 DC

Comments: Brn 4/20/18


Chain of Custody Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Cavin Jones Date: 4/20/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 31Jan2018
	Document No.: F-GB-C-031-rev.06	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace MN
Courier: CS Logistics Fed Ex Speedee UPS Waltco
 Client Pace Other: _____

Tracking #: 1697357


Custody Seal on Cooler/Box Present: yes no **Seals intact:** yes no
Custody Seal on Samples Present: yes no **Seals intact:** yes no

Packing Material: Bubble Wrap Bubble Bags None Other
Thermometer Used: SR - 66 **Type of Ice:** Wet Blue Dry None

Cooler Temperature: Uncorr: 3 ICorr: 3.5 Samples on ice, cooling process has begun

Temp Blank Present: yes no **Biological Tissue is Frozen:** yes no

Temp should be above freezing to 6°C.
 Biota Samples may be received at ≤ 0°C.

Project #: **WO#: 40167737**

 40167737

Person examining contents:
 Date: 4/20/18
 Initials: RS

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>IRWU RS 4/20/18</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
-Pace IR Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>002+003 no collect times on client labels RS 4/20/18</u>
-Includes date/time/ID/Analysis Matrix: <u>S</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: If checked, see attached form for additional comments
 Person Contacted: _____ Date/Time: _____
 Comments/ Resolution: _____

Project Manager Review: Cee Date: 4/20/18

Chain of Custody

WO#: 12107384

Page 68 of 83

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

PM: HRZ

Due Date: 05/04/18

CLIENT: PACE MPLS

Workorder: 10427824

Workorder Name: 18-00383 MPCA-Freeway LF Solid

Owner Received Date: 4/18/2018 Requested By: 5/3/2018

Report To		Subcontract To				Requested Analysis																		
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Duluth 4730 Oneota St. Duluth, MN 55807 Phone (218)727-6380																						
						Preserved Containers					Methyl Mercury by 1630					LAB USE ONLY								
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved																		
1	FD-TT-14 (2' -12' WM)	PS	4/18/2018 09:10	10427824001	Solid	1																		
2	FL-TT-01 (3'-11' WM)	PS	4/18/2018 12:30	10427824002	Solid	1																		
3	FL-TT-02 (2'-10.5' WM)	PS	4/18/2018 13:50	10427824003	Solid	1																		
4																								
5																								
															Comments									
Transfers	Released By	Date/Time	Received By	Date/Time																				
1	<i>[Signature]</i>	4/19/18 17:20	<i>[Signature]</i>	4-19-18 19:30																				
2	<i>[Signature]</i>	4-19-18 22:15	<i>[Signature]</i>	4/20/18 08:00																				
3																								
Cooler Temperature on Receipt		4.0 °C	Custody Seal		Y or N	Received on Ice		Y or N	Samples Intact			Y or N												

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: PACE MPLS Project #: _____

WO#: 12107384

PM: HRZ Due Date: 05/04/18

CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 01339252/1710 IR-1 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 4.0 Cooler Temp Corrected °C: 4.0 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6°C Correction Factor: 0.0 Date and Initials of Person Examining Contents: 4/20/18 *[Signature]*

If temperature is ≤0°C, is there evidence of ice formation? Yes No NA

	Comments:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation will be checked and documented in the pH logbook. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____ Date: _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50194907

Date/Time and Initials of person examining contents: JH 4-20-18 953

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 0832 2530

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 120456ABCDEF Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 2.2/2.5 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

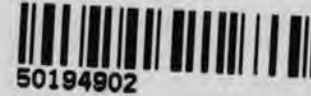
All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		<input checked="" type="checkbox"/>	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			<input checked="" type="checkbox"/>
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		<input checked="" type="checkbox"/>	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <small>JH 4-20-18</small>	Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <small>JH 4-20-18</small>	Dissolved Metals field filtered?:			<input checked="" type="checkbox"/>
Short Hold Time Analysis (<72hr)? Analysis:		<input checked="" type="checkbox"/>	Headspace Wisconsin Sulfide			<input checked="" type="checkbox"/>
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	<u>Present</u>	<u>Absent</u>	<input checked="" type="checkbox"/>
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			<input checked="" type="checkbox"/>
Rush TAT Requested:		<input checked="" type="checkbox"/>	Headspace in VOA Vials (>6mm):			<input checked="" type="checkbox"/>
Containers Intact?:	<input checked="" type="checkbox"/>		Trip Blank Present?:		<input checked="" type="checkbox"/>	
Sample Labels Match COC?: Except TCs, which only require sample ID	<input checked="" type="checkbox"/>		Trip Blank Custody Seals?:		<input checked="" type="checkbox"/>	

Comments:

Sample Container Count

WO#: 50194902



CLIENT: Pace MN

COC PAGE ___ of ___

COC ID# _____

Project # 50194902

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	Bul Kit	R	Matrix (Soil/W Aqueo)	pH <2	pH >9	pH >1
1																				SL			
2																				SL			
3																				SL			
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
WG9U	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				

Page 72 of 83



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April 28, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Solid - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/20/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427824
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-TT-14 (2'-12' WM) (10427824001)	A181624-01	Solid	04/18/2018	04/20/2018
FL-TT-01 (3'-11' WM) (10427824002)	A181624-02	Solid	04/18/2018	04/20/2018
FL-TT-02 (2'-10.5' WM) (10427824003)	A181624-03	Solid	04/18/2018	04/20/2018

CASE NARRATIVE

Sample Receipt Information:

3 samples were received on 04/20/2018. Samples were received at 2.3 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.



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Pace Analytical
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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427824
 Project Manager: Jennifer Anderson

FL-TT-01 (3'-11' WM) (10427824002)
A181624-02 (Solid)

Date Sampled
 04/18/2018 12:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804178

2,4-D	ND	0.10	mg/kg dry	1	04/22/2018	04/22/2018 21:59	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/22/2018	04/22/2018 21:59	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/22/2018	04/22/2018 21:59	EPA 8321B	
2,4,5-TP	0.20	0.10	mg/kg dry	1	04/22/2018	04/22/2018 21:59	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/22/2018	04/22/2018 21:59	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/22/2018	04/22/2018 21:59	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/22/2018	04/22/2018 21:59	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/22/2018	04/22/2018 21:59	EPA 8321B	
Triclopyr	0.18	0.10	mg/kg dry	1	04/22/2018	04/22/2018 21:59	EPA 8321B	
<i>Surrogate: DCAA</i>		88.3 %	70.8-116		04/22/2018	04/22/2018 21:59	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	80.3	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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Pace Analytical
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 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427824
 Project Manager: Jennifer Anderson

FL-TT-02 (2'-10.5' WM) (10427824003)

A181624-03 (Solid)

Date Sampled
 04/18/2018 13:50

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804178

2,4-D	0.43	0.10	mg/kg dry	1	04/22/2018	04/23/2018 04:41	EPA 8321B	P
2,4-DB	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 04:41	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 05:24	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 04:41	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 04:41	EPA 8321B	
Dicamba	0.23	0.10	mg/kg dry	1	04/22/2018	04/23/2018 04:41	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 04:41	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 04:41	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 04:41	EPA 8321B	
<i>Surrogate: DCAA</i>		<i>70.8 %</i>	<i>70.8-116</i>		<i>04/22/2018</i>	<i>04/23/2018 04:41</i>	<i>EPA 8321B</i>	

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	41.5	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427824
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804178 - EPA 3570

Blank (A804178-BLK1)										
Prepared: 04/22/2018 Analyzed: 04/22/2018 20:52										
2,4-D	ND	0.10	mg/kg wet							
2,4-D [2C]	ND	0.10	mg/kg wet							
2,4-DB	ND	0.10	mg/kg wet							
2,4-DB [2C]	ND	0.10	mg/kg wet							
2,4,5-T	ND	0.10	mg/kg wet							
2,4,5-T [2C]	ND	0.10	mg/kg wet							
2,4,5-TP	ND	0.10	mg/kg wet							
2,4,5-TP [2C]	ND	0.10	mg/kg wet							
Bentazon	ND	0.10	mg/kg wet							
Bentazon [2C]	ND	0.10	mg/kg wet							
Dicamba	ND	0.10	mg/kg wet							
Dicamba [2C]	ND	0.10	mg/kg wet							
MCPA	ND	0.10	mg/kg wet							
MCPA [2C]	ND	0.10	mg/kg wet							
Picloram	ND	0.10	mg/kg wet							
Picloram [2C]	ND	0.10	mg/kg wet							
Triclopyr	ND	0.10	mg/kg wet							
Triclopyr [2C]	ND	0.10	mg/kg wet							
<hr/>										
Surrogate: DCAA	19.9		mg/kg wet	20.00		99.7	70.8-116			
Surrogate: DCAA [2C]	17.9		mg/kg wet	20.00		89.4	62.3-114			

LCS (A804178-BS1)										
Prepared: 04/22/2018 Analyzed: 04/22/2018 19:45										
2,4-D	1.89	0.10	mg/kg wet	2.000		94.5	81.6-107			
2,4-D [2C]	1.73	0.10	mg/kg wet	2.000		86.5	71.8-120			
2,4-DB	1.77	0.10	mg/kg wet	2.000		88.7	76.4-107			
2,4-DB [2C]	1.66	0.10	mg/kg wet	2.000		82.9	62.2-129			
2,4,5-T	1.96	0.10	mg/kg wet	2.000		98.0	81.2-110			
2,4,5-T [2C]	1.87	0.10	mg/kg wet	2.000		93.6	70.6-125			
2,4,5-TP	1.86	0.10	mg/kg wet	2.000		92.8	79.1-106			
2,4,5-TP [2C]	1.74	0.10	mg/kg wet	2.000		86.9	68.2-118			
Bentazon	1.02	0.10	mg/kg wet	1.000		102	82.5-119			
Bentazon [2C]	0.877	0.10	mg/kg wet	1.000		87.7	73.3-125			
Dicamba	1.93	0.10	mg/kg wet	2.000		96.3	85.1-108			
Dicamba [2C]	1.83	0.10	mg/kg wet	2.000		91.4	71.4-115			
Picloram	0.978	0.10	mg/kg wet	1.000		97.8	86.1-106			
Picloram [2C]	0.846	0.10	mg/kg wet	1.000		84.6	74.5-114			
Triclopyr	1.86	0.10	mg/kg wet	2.000		92.9	78.6-106			
Triclopyr [2C]	1.71	0.10	mg/kg wet	2.000		85.6	69.4-118			
<hr/>										
Surrogate: DCAA	19.8		mg/kg wet	20.00		98.9	70.8-116			
Surrogate: DCAA [2C]	18.3		mg/kg wet	20.00		91.7	62.3-114			

LCS (A804178-BS2)										
Prepared: 04/22/2018 Analyzed: 04/22/2018 18:37										
MCPA	2.14	0.10	mg/kg wet	2.000		107	79.4-116			
MCPA [2C]	1.92	0.10	mg/kg wet	2.000		95.9	77-123			



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Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427824
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804178 - EPA 3570

LCS (A804178-BS2)

Prepared: 04/22/2018 Analyzed: 04/22/2018 18:37

Surrogate: DCAA	19.9		mg/kg wet	20.00		99.4	70.8-116			
Surrogate: DCAA [2C]	20.2		mg/kg wet	20.00		101	62.3-114			

Matrix Spike (A804178-MS1)

Source: A181624-02

Prepared: 04/22/2018 Analyzed: 04/22/2018 23:06

2,4-D	2.05	0.10	mg/kg dry	2.490	ND	82.5	71.4-105			
2,4-D [2C]	1.94	0.10	mg/kg dry	2.490	0.220	69.1	50.5-123			
2,4-DB	1.91	0.10	mg/kg dry	2.490	0.0501	74.6	46.4-117			
2,4-DB [2C]	1.76	0.10	mg/kg dry	2.490	0.252	60.6	44.5-121			
2,4,5-T	2.16	0.10	mg/kg dry	2.490	ND	86.8	66.2-110			
2,4,5-T [2C]	1.87	0.10	mg/kg dry	2.490	ND	75.2	43.6-126			
2,4,5-TP	2.01	0.10	mg/kg dry	2.490	0.199	72.7	52.4-114			
2,4,5-TP [2C]	1.61	0.10	mg/kg dry	2.490	0.219	55.8	47.6-117			
Bentazon	1.13	0.10	mg/kg dry	1.245	ND	91.0	61.5-117			
Bentazon [2C]	1.20	0.10	mg/kg dry	1.245	ND	96.2	50.7-127			
Dicamba	1.71	0.10	mg/kg dry	2.490	ND	68.7	48.4-111			
Dicamba [2C]	1.86	0.10	mg/kg dry	2.490	0.290	63.1	43.3-108			
Picloram	0.654	0.10	mg/kg dry	1.245	ND	52.6	26.7-110			
Picloram [2C]	0.505	0.10	mg/kg dry	1.245	ND	40.6	10.8-110			
Triclopyr	2.16	0.10	mg/kg dry	2.490	0.182	79.6	56-113			
Triclopyr [2C]	1.70	0.10	mg/kg dry	2.490	0.211	60.0	47.9-120			
Surrogate: DCAA	21.6		mg/kg dry	24.89		86.8	70.8-116			
Surrogate: DCAA [2C]	20.6		mg/kg dry	24.89		82.8	62.3-114			

Matrix Spike (A804178-MS2)

Source: A181624-02

Prepared: 04/22/2018 Analyzed: 04/23/2018 01:20

MCPA	2.29	0.10	mg/kg dry	2.490	ND	92.0	74.2-114			
MCPA [2C]	2.16	0.10	mg/kg dry	2.490	ND	86.7	60.9-122			
Surrogate: DCAA	21.5		mg/kg dry	24.89		86.2	70.8-116			
Surrogate: DCAA [2C]	22.0		mg/kg dry	24.89		88.3	62.3-114			

Matrix Spike Dup (A804178-MSD1)

Source: A181624-02

Prepared: 04/22/2018 Analyzed: 04/23/2018 00:13

2,4-D	2.10	0.10	mg/kg dry	2.490	ND	84.3	71.4-105	2.19	20	
2,4-D [2C]	2.24	0.10	mg/kg dry	2.490	0.220	81.2	50.5-123	14.4	20	
2,4-DB	1.94	0.10	mg/kg dry	2.490	0.0501	76.1	46.4-117	1.91	20	
2,4-DB [2C]	1.82	0.10	mg/kg dry	2.490	0.252	63.2	44.5-121	3.63	20	
2,4,5-T	2.13	0.10	mg/kg dry	2.490	ND	85.4	66.2-110	1.61	20	
2,4,5-T [2C]	1.69	0.10	mg/kg dry	2.490	ND	67.7	43.6-126	10.5	20	
2,4,5-TP	1.97	0.10	mg/kg dry	2.490	0.199	71.0	52.4-114	2.17	20	
2,4,5-TP [2C]	1.69	0.10	mg/kg dry	2.490	0.219	59.2	47.6-117	5.02	20	
Bentazon	1.13	0.10	mg/kg dry	1.245	ND	90.5	61.5-117	0.559	20	
Bentazon [2C]	1.21	0.10	mg/kg dry	1.245	ND	96.9	50.7-127	0.794	20	
Dicamba	1.70	0.10	mg/kg dry	2.490	ND	68.5	48.4-111	0.297	20	
Dicamba [2C]	2.04	0.10	mg/kg dry	2.490	0.290	70.2	43.3-108	9.07	20	
Picloram	0.591	0.10	mg/kg dry	1.245	ND	47.5	26.7-110	10.2	20	
Picloram [2C]	0.569	0.10	mg/kg dry	1.245	ND	45.7	10.8-110	11.8	20	



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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427824
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804178 - EPA 3570

Matrix Spike Dup (A804178-MSD1)		Source: A181624-02			Prepared: 04/22/2018 Analyzed: 04/23/2018 00:13					
Triclopyr	2.16	0.10	mg/kg dry	2.490	0.182	79.6	56-113	0.0287	20	
Triclopyr [2C]	2.10	0.10	mg/kg dry	2.490	0.211	76.0	47.9-120	20.9	20	X
Surrogate: DCAA	21.7		mg/kg dry	24.89		87.1	70.8-116			
Surrogate: DCAA [2C]	20.6		mg/kg dry	24.89		82.8	62.3-114			
Matrix Spike Dup (A804178-MSD2)		Source: A181624-02			Prepared: 04/22/2018 Analyzed: 04/23/2018 02:27					
MCPA	2.35	0.10	mg/kg dry	2.490	ND	94.2	74.2-114	2.42	20	
MCPA [2C]	2.47	0.10	mg/kg dry	2.490	ND	99.2	60.9-122	13.5	20	
Surrogate: DCAA	21.5		mg/kg dry	24.89		86.3	70.8-116			
Surrogate: DCAA [2C]	23.4		mg/kg dry	24.89		94.0	62.3-114			



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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427824
 Project Manager: Jennifer Anderson

Classical Chemistry Parameters - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804195 - % Solids

Duplicate (A804195-DUP1)	Source: A181708-01	Prepared: 04/25/2018	Analyzed: 04/27/2018 09:07
% Solids	79.2	0.00 % by Weight	79.6
			0.516
			20



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Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427824
Project Manager: Jennifer Anderson

Notes and Definitions

- X Precision for the matrix spike duplicate, laboratory control sample duplicate or lab duplicate was outside of control limits.
- P The difference in the concentrations between the primary and confirmation column was > 40%.
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

May 12, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 18, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
California Certification #2973
Alaska Certification UST-107
Montana Certificate #CERT0103
California Certification #2973
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad

Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

Pennsylvania Certification IDs

KY WW Permit #: KY0098221	Ohio EPA Rad Approval: #41249
KY WW Permit #: KY0000221	Oregon/TNI Certification #: PA200002-010
Louisiana DHH/TNI Certification #: LA180012	Pennsylvania/TNI Certification #: 65-00282
Louisiana DEQ/TNI Certification #: 4086	Puerto Rico Certification #: PA01457
Maine Certification #: 2017020	Rhode Island Certification #: 65-00282
Maryland Certification #: 308	South Dakota Certification
Massachusetts Certification #: M-PA1457	Tennessee Certification #: 02867
Michigan/PADEP Certification #: 9991	Texas/TNI Certification #: T104704188-17-3
Missouri Certification #: 235	Utah/TNI Certification #: PA014572017-9
Montana Certification #: Cert0082	USDA Soil Permit #: P330-17-00091
Nebraska Certification #: NE-OS-29-14	Vermont Dept. of Health: ID# VT-0282
Nevada Certification #: PA014572018-1	Virgin Island/PADEP Certification
New Hampshire/TNI Certification #: 297617	Virginia/VELAP Certification #: 9526
New Jersey/TNI Certification #: PA051	Washington Certification #: C868
New Mexico Certification #: PA01457	West Virginia DEP Certification #: 143
New York/TNI Certification #: 10888	West Virginia DHHR Certification #: 9964C
North Carolina Certification #: 42706	Wisconsin Approve List for Rad
North Dakota Certification #: R-190	Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174	Nebraska Certification: NE-OS-28-14
Alabama Certification #: 41320	Nevada Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216	New Hampshire Certification #: 2958
Delaware Certification: FL NELAC Reciprocity	New Jersey Certification #: FL022
Florida Certification #: E83079	New York Certification #: 11608
Georgia Certification #: 955	North Carolina Environmental Certificate #: 667
Guam Certification: FL NELAC Reciprocity	North Carolina Certification #: 12710
Hawaii Certification: FL NELAC Reciprocity	Oklahoma Certification #: D9947
Illinois Certification #: 200068	Pennsylvania Certification #: 68-00547
Indiana Certification: FL NELAC Reciprocity	Puerto Rico Certification #: FL01264
Kansas Certification #: E-10383	South Carolina Certification: #96042001
Kentucky Certification #: 90050	Tennessee Certification #: TN02974
Louisiana Certification #: FL NELAC Reciprocity	Texas Certification: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007	US Virgin Islands Certification: FL NELAC Reciprocity
Maryland Certification: #346	Virginia Environmental Certification #: 460165
Michigan Certification #: 9911	Wyoming Certification: FL NELAC Reciprocity
Mississippi Certification: FL NELAC Reciprocity	West Virginia Certification #: 9962C
Missouri Certification #: 236	Wisconsin Certification #: 399079670
Montana Certification #: Cert 0074	Wyoming (EPA Region 8): FL NELAC Reciprocity

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512	New York State Department of Health, Serial #57971 and 57972
Minnesota Department of Health, Certificate #1385941	North Carolina Division of Water Resources, Certificate #659
Arkansas Department of Environmental Quality, Certificate #17-046-0	Virginia Department of General Services, Certificate #9028
Georgia Environmental Protection Division, Stipulation	Wisconsin Department of Natural Resources, Laboratory #999472650
Illinois Environmental Protection Agency, Certificate #004325	U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278
Michigan Department of Environmental Quality, Laboratory #0034	

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

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SAMPLE SUMMARY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10427826001	FL-TT-02	Water	04/18/18 15:15	04/18/18 17:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10427826001	FL-TT-02	EPA 531.1	AC1	3	PASI-O
		EPA 547	AC1	1	PASI-O
		EPA 549.2	AC1	2	PASI-O
		EPA 552.3	MMB	7	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 548.1	LAJ	1	PASI-O
		EPA 8270D	AT1	72	PASI-M
		EPA 524.2	AEZ	4	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NEG	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-CIO2	AGS	1	PASI-O
		SM 4500-H+B	KEO	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	AR3	2	PASI-M
		EPA 300.1	CMB	1	PASI-O
		EPA 300.1	CMB	1	PASI-O
SM 3500-Cr B Modified	JFP	1	PASI-M		
EPA 350.1	CLJ	1	PASI-V		
EPA 350.1	DMB	1	PASI-V		
EPA 353.2	JFP	3	PASI-M		

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

Sample: FL-TT-02	Lab ID: 10427826001	Collected: 04/18/18 15:15	Received: 04/18/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data								
Analytical Method:								
Field pH	5.9		0.10	1		04/18/18 15:15		
Field Temperature	3.6		0.50	1		04/18/18 15:15		
531.1 HPLC Carbamates								
Analytical Method: EPA 531.1								
Aldicarb	ND	ug/L	2.0	1		05/05/18 19:51	116-06-3	
Carbofuran	ND	ug/L	2.0	1		05/05/18 19:51	1563-66-2	
Surrogates								
BDMC (S)	104	%	80-120	1		05/05/18 19:51		
547 HPLC Glyphosate								
Analytical Method: EPA 547								
Glyphosate	ND	ug/L	6.0	1		04/28/18 03:45		
549.2 HPLC Paraquat Diquat								
Analytical Method: EPA 549.2 Preparation Method: EPA 549.2								
Diquat	ND	ug/L	0.40	1	04/24/18 23:10	04/25/18 13:12	85-00-7	
Paraquat	ND	ug/L	0.40	1	04/24/18 23:10	04/25/18 13:12	1910-42-5	
552.3 Haloacetic Acids								
Analytical Method: EPA 552.3 Preparation Method: EPA 552.3								
Dibromoacetic Acid	ND	ug/L	1.0	1	04/24/18 00:54	04/26/18 09:06	631-64-1	M1
Dichloroacetic Acid	ND	ug/L	1.0	1	04/24/18 00:54	04/26/18 09:06	79-43-6	
Haloacetic Acids (Total)	5.0	ug/L	1.0	1	04/24/18 00:54	04/26/18 09:06		
Monobromoacetic Acid	ND	ug/L	1.0	1	04/24/18 00:54	04/26/18 09:06	79-08-3	
Monochloroacetic Acid	5.0	ug/L	1.0	1	04/24/18 00:54	04/26/18 09:06	79-11-8	M1
Trichloroacetic Acid	ND	ug/L	1.0	1	04/24/18 00:54	04/26/18 09:06	76-03-9	
Surrogates								
2,3-Dibromopropanoic Acid (S)	128	%	70-130	1	04/24/18 00:54	04/26/18 09:06	600-05-5	
8011 GCS EDB and DBCP								
Analytical Method: EPA 8011 Preparation Method: EPA 8011								
1,2-Dibromo-3-chloropropane	ND	ug/L	0.010	1	04/24/18 14:16	04/25/18 01:31	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.010	1	04/24/18 14:16	04/25/18 01:31	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	112	%	30-150	1	04/24/18 14:16	04/25/18 01:31	460-00-4	
8015M Alcohols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	mg/L	5.0	1		04/25/18 16:08	67-56-1	
8015M Glycols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/23/18 16:36	107-21-1	
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	309-00-2	L2
alpha-BHC	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	319-84-6	
beta-BHC	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	319-85-7	
delta-BHC	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	58-89-9	
Chlordane (Technical)	ND	ug/L	5.1	10	04/20/18 13:40	04/25/18 23:34	57-74-9	
alpha-Chlordane	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	5103-71-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Sample: FL-TT-02	Lab ID: 10427826001	Collected: 04/18/18 15:15	Received: 04/18/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
gamma-Chlordane	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	5103-74-2	
4,4'-DDD	ND	ug/L	1.0	10	04/20/18 13:40	04/25/18 23:34	72-54-8	
4,4'-DDE	ND	ug/L	1.0	10	04/20/18 13:40	04/25/18 23:34	72-55-9	
4,4'-DDT	ND	ug/L	1.0	10	04/20/18 13:40	04/25/18 23:34	50-29-3	
Dieldrin	ND	ug/L	1.0	10	04/20/18 13:40	04/25/18 23:34	60-57-1	
Endosulfan I	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	959-98-8	
Endosulfan II	ND	ug/L	1.0	10	04/20/18 13:40	04/25/18 23:34	33213-65-9	
Endosulfan sulfate	ND	ug/L	1.0	10	04/20/18 13:40	04/25/18 23:34	1031-07-8	
Endrin	ND	ug/L	1.0	10	04/20/18 13:40	04/25/18 23:34	72-20-8	
Endrin aldehyde	ND	ug/L	1.0	10	04/20/18 13:40	04/25/18 23:34	7421-93-4	
Endrin ketone	ND	ug/L	1.0	10	04/20/18 13:40	04/25/18 23:34	53494-70-5	
Heptachlor	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	76-44-8	
Heptachlor epoxide	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	1024-57-3	
Methoxychlor	ND	ug/L	5.1	10	04/20/18 13:40	04/25/18 23:34	72-43-5	
Toxaphene	ND	ug/L	15.4	10	04/20/18 13:40	04/25/18 23:34	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	62-125	10	04/20/18 13:40	04/25/18 23:34	877-09-8	1M, D3, S4
Decachlorobiphenyl (S)	0	%	30-143	10	04/20/18 13:40	04/25/18 23:34	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:11	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:11	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:11	11141-16-5	
PCB-1242 (Aroclor 1242)	27.7	ug/L	1.0	10	04/20/18 13:39	04/24/18 08:51	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:11	12672-29-6	
PCB-1254 (Aroclor 1254)	3.8	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:11	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:11	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:11	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:11	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	52	%	30-125	1	04/20/18 13:39	04/23/18 15:11	877-09-8	
Decachlorobiphenyl (S)	55	%	30-125	1	04/20/18 13:39	04/23/18 15:11	2051-24-3	CH
8315A GCSV Aldehydes								
Analytical Method: EPA 8315A Preparation Method: EPA 8315A								
Formaldehyde	ND	ug/L	100	1	04/20/18 11:17	04/21/18 11:47	50-00-0	
8316 W GCSV Acrylamide								
Analytical Method: EPA 8316								
Acrylamide	ND	ug/L	20.0	1		04/24/18 11:51	79-06-1	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	04/23/18 14:49	04/25/18 17:57	7429-90-5	
Barium, Dissolved	494	ug/L	10.0	1	04/23/18 14:49	04/25/18 17:57	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 17:57	7440-50-8	
Manganese, Dissolved	985	ug/L	5.0	1	04/23/18 14:49	04/25/18 17:57	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/23/18 14:49	04/25/18 17:57	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 17:57	7440-22-4	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Sample: FL-TT-02	Lab ID: 10427826001	Collected: 04/18/18 15:15	Received: 04/18/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Tin, Dissolved	ND	ug/L	75.0	1	04/23/18 14:49	04/25/18 17:57	7440-31-5	
Zinc, Dissolved	ND	ug/L	20.0	1	04/23/18 14:49	04/25/18 17:57	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	58.0	ug/L	2.5	5	04/20/18 10:29	04/20/18 17:01	7440-47-3	
Total Hardness by 2340B	674000	ug/L	35200	250	04/20/18 10:29	04/20/18 17:04		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	0.58	ug/L	0.50	1	04/23/18 14:28	04/25/18 09:01	7440-36-0	
Arsenic, Dissolved	7.3	ug/L	0.50	1	04/23/18 14:28	04/25/18 09:01	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/23/18 14:28	04/25/18 09:01	7440-41-7	
Boron, Dissolved	536	ug/L	100	20	04/23/18 14:28	04/24/18 19:42	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/23/18 14:28	04/25/18 09:01	7440-43-9	
Chromium, Dissolved	1.3	ug/L	0.50	1	04/23/18 14:28	04/25/18 09:01	7440-47-3	
Cobalt, Dissolved	3.2	ug/L	0.50	1	04/23/18 14:28	04/25/18 09:01	7440-48-4	
Lead, Dissolved	0.71	ug/L	0.10	1	04/23/18 14:28	04/25/18 09:01	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/25/18 09:01	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/23/18 14:28	04/25/18 09:01	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/25/18 09:01	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	04/23/18 14:28	04/25/18 09:01	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:07	7439-97-6	
548.1 GCS Endothall								
Analytical Method: EPA 548.1 Preparation Method: EPA 548.1								
Endothall	ND	ug/L	9.0	1	04/24/18 08:48	04/25/18 09:18		
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Phenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	108-95-2	
bis(2-Chloroethyl) ether	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	111-44-4	
2-Chlorophenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	95-57-8	
1,3-Dichlorobenzene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	106-46-7	
1,2-Dichlorobenzene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	95-50-1	
2-Methylphenol(o-Cresol)	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	95-48-7	
bis(2-Chloroisopropyl) ether	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	108-60-1	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.6	1	04/19/18 14:59	04/23/18 19:06		
N-Nitroso-di-n-propylamine	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	621-64-7	
Hexachloroethane	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	67-72-1	
Nitrobenzene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	98-95-3	
Isophorone	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	78-59-1	
2-Nitrophenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	88-75-5	
2,4-Dimethylphenol	ND	ug/L	51.5	1	04/19/18 14:59	04/23/18 19:06	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	111-91-1	
2,4-Dichlorophenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	120-82-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Sample: FL-TT-02		Lab ID: 10427826001	Collected: 04/18/18 15:15	Received: 04/18/18 17:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Naphthalene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	91-20-3	
4-Chloroaniline	ND	ug/L	51.5	1	04/19/18 14:59	04/23/18 19:06	106-47-8	
Hexachloro-1,3-butadiene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	87-68-3	
4-Chloro-3-methylphenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	59-50-7	
2-Methylnaphthalene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	91-57-6	
2,4,6-Trichlorophenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	88-06-2	
2,4,5-Trichlorophenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	95-95-4	
2-Chloronaphthalene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	91-58-7	
2-Nitroaniline	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	88-74-4	
Dimethylphthalate	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	131-11-3	
Acenaphthylene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	208-96-8	
2,6-Dinitrotoluene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	606-20-2	
3-Nitroaniline	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	99-09-2	
Acenaphthene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	83-32-9	
2,4-Dinitrophenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	51-28-5	
4-Nitrophenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	100-02-7	
Dibenzofuran	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	132-64-9	
2,4-Dinitrotoluene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	121-14-2	
Diethylphthalate	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	84-66-2	
4-Chlorophenylphenyl ether	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	7005-72-3	
Fluorene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	86-73-7	
4-Nitroaniline	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	100-01-6	
4,6-Dinitro-2-methylphenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	534-52-1	
N-Nitrosodiphenylamine	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	86-30-6	
4-Bromophenylphenyl ether	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	101-55-3	
Hexachlorobenzene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	118-74-1	
Pentachlorophenol	ND	ug/L	20.6	1	04/19/18 14:59	04/23/18 19:06	87-86-5	
Phenanthrene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	85-01-8	
Anthracene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	120-12-7	
Di-n-butylphthalate	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	84-74-2	
Fluoranthene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	206-44-0	
Pyrene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	129-00-0	
Butylbenzylphthalate	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/L	51.5	1	04/19/18 14:59	04/23/18 19:06	91-94-1	
Benzo(a)anthracene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	56-55-3	
Chrysene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	218-01-9	
bis(2-Ethylhexyl)phthalate	13.8	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	117-81-7	
Di-n-octylphthalate	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	117-84-0	
Benzo(b)fluoranthene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	205-99-2	
Benzo(k)fluoranthene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	207-08-9	
Benzo(a)pyrene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	50-32-8	
Indeno(1,2,3-cd)pyrene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	193-39-5	
Dibenz(a,h)anthracene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	53-70-3	
Benzo(g,h,i)perylene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	191-24-2	
N-Nitrosodimethylamine	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	62-75-9	
1,2-Diphenylhydrazine	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	122-66-7	
Carbazole	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	86-74-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Sample: FL-TT-02	Lab ID: 10427826001	Collected: 04/18/18 15:15	Received: 04/18/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
1-Methylnaphthalene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	90-12-0	
Surrogates								
Nitrobenzene-d5 (S)	71	%.	60-125	1	04/19/18 14:59	04/23/18 19:06	4165-60-0	
2-Fluorobiphenyl (S)	75	%.	56-125	1	04/19/18 14:59	04/23/18 19:06	321-60-8	
p-Terphenyl-d14 (S)	69	%.	58-125	1	04/19/18 14:59	04/23/18 19:06	1718-51-0	
Phenol-d6 (S)	74	%.	58-125	1	04/19/18 14:59	04/23/18 19:06	13127-88-3	
2-Fluorophenol (S)	70	%.	55-125	1	04/19/18 14:59	04/23/18 19:06	367-12-4	
2,4,6-Tribromophenol (S)	91	%.	65-125	1	04/19/18 14:59	04/23/18 19:06	118-79-6	
524.2 MSV								
Analytical Method: EPA 524.2								
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/19/18 16:02		
Surrogates								
4-Bromofluorobenzene (S)	98	%.	75-125	1		04/19/18 16:02	460-00-4	
Toluene-d8 (S)	94	%.	75-125	1		04/19/18 16:02	2037-26-5	
1,2-Dichloroethane-d4 (S)	101	%.	75-125	1		04/19/18 16:02	17060-07-0	
Field Data								
Analytical Method:								
Field pH	5.9	Std. Units		1		04/18/18 15:15		
Field Temperature	3.6	deg C		1		04/18/18 15:15		
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	21.6	mg/L	20.0	10	04/19/18 13:35	04/24/18 10:06		
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	4.9	1		04/30/18 10:26		
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	620	NTU	15.0	50		04/19/18 10:57		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	518	mg/L	20.0	1		04/24/18 16:10		
4500CIO2 Chlorine Dioxide								
Analytical Method: SM 4500-CIO2								
Chlorine Dioxide	ND	mg/L	0.10	1		04/25/18 13:31		H6
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	6.3	Std. Units	0.10	1		04/27/18 11:20		H6
Trivalent Chromium Calculation								
Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	0.058	mg/L	0.010	1		04/24/18 15:01		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	15.2	mg/L	1.2	1		04/19/18 18:19	16887-00-6	
Fluoride	0.053	mg/L	0.050	1		04/19/18 18:19	16984-48-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Sample: FL-TT-02	Lab ID: 10427826001	Collected: 04/18/18 15:15	Received: 04/18/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.1 Oxihalide IC Anions 14d	Analytical Method: EPA 300.1							
Chlorite	ND	ug/L	500	100		04/25/18 06:34		D3,M6
300.1 Oxihalide IC Anions 28d	Analytical Method: EPA 300.1							
Bromate	ND	ug/L	10.0	10		04/24/18 14:44	15541-45-4	D3
Chromium, Hexavalent	Analytical Method: SM 3500-Cr B Modified							
Chromium, Hexavalent	ND	mg/L	0.010	1		04/19/18 10:10		FS,M1
350.1 Ammonia, Unionized	Analytical Method: EPA 350.1							
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		05/02/18 09:49		
350.1 Ammonia, Undistilled	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	10.6	mg/L	0.50	5		04/24/18 11:20	7664-41-7	
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrate as N	ND	mg/L	0.020	1		04/20/18 14:05	14797-55-8	FS
Nitrite as N	0.039	mg/L	0.020	1		04/20/18 14:05	14797-65-0	FS
Nitrogen, NO2 plus NO3	0.038	mg/L	0.020	1		04/20/18 14:05		FS
9016 Cyanide, Free	Analytical Method: EPA 9016 Preparation Method: EPA 9016							
Cyanide, Free	ND	ug/L	5.0	1	04/24/18 16:40	04/24/18 17:43		
SM4500CN-E Cyanide	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E							
Cyanide	22.0	ug/L	10.0	1	04/26/18 11:59	04/27/18 10:15	57-12-5	
SM4500P-E, Total Phosphorus	Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B							
Phosphorus	0.29	mg/L	0.050	1	04/26/18 09:33	04/27/18 12:16	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 444330	Analysis Method: EPA 531.1
QC Batch Method: EPA 531.1	Analysis Description: 531.1 HPLC Carbamate
Associated Lab Samples: 10427826001	

METHOD BLANK: 2409910 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aldicarb	ug/L	ND	2.0	05/05/18 01:44	
Carbofuran	ug/L	ND	2.0	05/05/18 01:44	
BDMC (S)	%	107	80-120	05/05/18 01:44	

LABORATORY CONTROL SAMPLE: 2409911

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aldicarb	ug/L	10	9.9	99	80-120	
Carbofuran	ug/L	10	11.2	112	80-120	
BDMC (S)	%			105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2409912 2409913

Parameter	Units	60268261001 Result	MS		MSD		MS		MSD		% Rec Limits	Max	
			Spike Conc.	MS Result	MSD Result	% Rec	% Rec	RPD	RPD	Qual			
Aldicarb	ug/L	ND	10	10	8.2	8.0	82	80	80-120	2	20	H3	
Carbofuran	ug/L	ND	10	10	9.6	8.6	96	86	80-120	11	20	H3	
BDMC (S)	%						100	106	80-120				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 443433 Analysis Method: EPA 547
QC Batch Method: EPA 547 Analysis Description: 547 HPLC Glyphosate
Associated Lab Samples: 10427826001

METHOD BLANK: 2405647 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Glyphosate	ug/L	ND	6.0	04/28/18 01:40	

LABORATORY CONTROL SAMPLE: 2405648

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Glyphosate	ug/L	50	49.4	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2405649 2405650

Parameter	Units	35388467001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	4.2U	50	50	47.5	47.7	95	95	80-120	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2405651 2405652

Parameter	Units	35387317003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	<4.2	50	50	52.0	53.2	104	106	80-120	2	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 438905 Analysis Method: EPA 8015 Alcohol-Glycol

QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified

Associated Lab Samples: 10427826001

METHOD BLANK: 2027992 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methanol	mg/L	ND	5.0	04/25/18 14:17	

LABORATORY CONTROL SAMPLE: 2027993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methanol	mg/L	50	46.8	94	79-111	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027994 2027995

Parameter	Units	2027994		2027995		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10428032001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result					
Methanol	mg/L	ND	50	50	47.1	51.9	91	101	43-138	10 20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 438205 Analysis Method: EPA 8015 Alcohol-Glycol

QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified

Associated Lab Samples: 10427826001

METHOD BLANK: 2024704 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylene glycol	mg/L	ND	5.0	04/23/18 14:09	

LABORATORY CONTROL SAMPLE: 2024705

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylene glycol	mg/L	25	29.3	117	55-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026734 2026735

Parameter	Units	50194690001 Result	MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
			Spike Conc.	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec			
Ethylene glycol	mg/L	ND	25	25	21.9	24.7	87	99	38-154	12	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 21113	Analysis Method: EPA 8316
QC Batch Method: EPA 8316	Analysis Description: 8316 W GCSV Acrylamide
Associated Lab Samples: 10427826001	

METHOD BLANK: 84170 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acrylamide	ug/L	ND	20.0	04/24/18 11:22	

LABORATORY CONTROL SAMPLE: 84171

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acrylamide	ug/L	1000	1000	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 84172 84173

Parameter	Units	10428032004		MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec					
Acrylamide	ug/L	ND	1000	1000	1000	1000	921	1040	92	104	78-135	12	16	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 533449	Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1	Analysis Description: 245.1 Mercury - Dissolved
Associated Lab Samples: 10427826001	

METHOD BLANK: 2897827 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	04/23/18 17:53	

LABORATORY CONTROL SAMPLE & LCSD: 2897828 2897829

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury, Dissolved	ug/L	5	4.9	4.8	98	96	85-115	3	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 533435 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10427826001

METHOD BLANK: 2897770 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/25/18 17:32	
Barium, Dissolved	ug/L	ND	10.0	04/25/18 17:32	
Copper, Dissolved	ug/L	ND	10.0	04/25/18 17:32	
Manganese, Dissolved	ug/L	ND	5.0	04/25/18 17:32	
Nickel, Dissolved	ug/L	ND	20.0	04/25/18 17:32	
Silver, Dissolved	ug/L	ND	10.0	04/25/18 17:32	
Tin, Dissolved	ug/L	ND	75.0	04/25/18 17:32	
Zinc, Dissolved	ug/L	ND	20.0	04/25/18 17:32	

LABORATORY CONTROL SAMPLE: 2897771

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20700	103	85-115	
Barium, Dissolved	ug/L	1000	1040	104	85-115	
Copper, Dissolved	ug/L	1000	986	99	85-115	
Manganese, Dissolved	ug/L	1000	1050	105	85-115	
Nickel, Dissolved	ug/L	1000	1060	106	85-115	
Silver, Dissolved	ug/L	500	503	101	85-115	
Tin, Dissolved	ug/L	1000	1040	104	85-115	
Zinc, Dissolved	ug/L	1000	1070	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897772 2897773

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427742001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	21200	21400	106	107	70-130	1	30
Barium, Dissolved	ug/L	95.0	1000	1000	1130	1140	104	104	70-130	1	30
Copper, Dissolved	ug/L	ND	1000	1000	1000	1010	100	101	70-130	1	30
Manganese, Dissolved	ug/L	ND	1000	1000	1040	1050	104	105	70-130	1	30
Nickel, Dissolved	ug/L	ND	1000	1000	1020	1020	102	102	70-130	1	30
Silver, Dissolved	ug/L	ND	500	500	509	514	102	103	70-130	1	30
Tin, Dissolved	ug/L	ND	1000	1000	1040	1050	104	105	70-130	1	30
Zinc, Dissolved	ug/L	36.2	1000	1000	1070	1070	103	104	70-130	1	30

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

MATRIX SPIKE SAMPLE: 2898920		10428032004	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Aluminum, Dissolved	ug/L	358	20000	22100	109	70-130	
Barium, Dissolved	ug/L	607	1000	1630	102	70-130	
Copper, Dissolved	ug/L	ND	1000	1020	102	70-130	
Manganese, Dissolved	ug/L	902	1000	1940	103	70-130	
Nickel, Dissolved	ug/L	ND	1000	1030	102	70-130	
Silver, Dissolved	ug/L	ND	500	515	103	70-130	
Tin, Dissolved	ug/L	ND	1000	1040	104	70-130	
Zinc, Dissolved	ug/L	ND	1000	1030	102	70-130	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 533161 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10427826001

METHOD BLANK: 2896376 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	0.50	04/20/18 15:51	

LABORATORY CONTROL SAMPLE: 2896377

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	100	111	111	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896378 2896379

Parameter	Units	30249372002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium	ug/L	9.4	100	100	118	121	108	112	70-130	3	20	

MATRIX SPIKE SAMPLE: 2897736

Parameter	Units	30249394002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	17.6	100	129	111	70-130	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 533428 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10427826001

METHOD BLANK: 2897737 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Arsenic, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Beryllium, Dissolved	ug/L	ND	0.20	04/25/18 08:49	
Boron, Dissolved	ug/L	ND	5.0	04/25/18 08:49	
Cadmium, Dissolved	ug/L	ND	0.080	04/25/18 08:49	
Chromium, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Cobalt, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Lead, Dissolved	ug/L	ND	0.10	04/25/18 08:49	
Selenium, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Thallium, Dissolved	ug/L	ND	0.10	04/25/18 08:49	
Uranium-238, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Vanadium, Dissolved	ug/L	ND	1.0	04/25/18 08:49	

LABORATORY CONTROL SAMPLE: 2897738

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	99.4	99	85-115	
Arsenic, Dissolved	ug/L	100	99.4	99	85-115	
Beryllium, Dissolved	ug/L	100	107	107	85-115	
Boron, Dissolved	ug/L	100	104	104	85-115	
Cadmium, Dissolved	ug/L	100	99.0	99	85-115	
Chromium, Dissolved	ug/L	100	101	101	85-115	
Cobalt, Dissolved	ug/L	100	102	102	85-115	
Lead, Dissolved	ug/L	100	105	105	85-115	
Selenium, Dissolved	ug/L	100	103	103	85-115	
Thallium, Dissolved	ug/L	100	103	103	85-115	
Uranium-238, Dissolved	ug/L	100	101	101	85-115	
Vanadium, Dissolved	ug/L	100	99.6	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897739 2897740

Parameter	Units	10427867001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Antimony, Dissolved	ug/L	0.0029 mg/L	100	110	100	108	107	105	70-130	2	20	
Arsenic, Dissolved	ug/L	ND	100	112	100	109	111	109	70-130	2	20	
Beryllium, Dissolved	ug/L	ND	100	107	100	104	107	104	70-130	3	20	
Boron, Dissolved	ug/L	32.5	100	137	100	133	104	101	70-130	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897739												2897740	
Parameter	Units	10427867001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual		
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD			
Cadmium, Dissolved	ug/L	ND	100	100	102	101	102	101	70-130	2	20		
Chromium, Dissolved	ug/L	ND	100	100	109	107	109	107	70-130	2	20		
Cobalt, Dissolved	ug/L	3.7	100	100	108	106	104	103	70-130	1	20		
Lead, Dissolved	ug/L	ND	100	100	105	103	105	103	70-130	3	20		
Selenium, Dissolved	ug/L	0.00058 mg/L	100	100	114	111	113	110	70-130	2	20		
Thallium, Dissolved	ug/L	ND	100	100	104	100	104	100	70-130	4	20		
Uranium-238, Dissolved	ug/L	10.3	100	100	118	116	108	106	70-130	2	20		
Vanadium, Dissolved	ug/L	ND	100	100	110	108	110	108	70-130	2	20		

MATRIX SPIKE SAMPLE: 2897741									
Parameter	Units	10427767003	Spike	MS	MS	% Rec	Qualifiers		
		Result	Conc.	Result	% Rec	Limits			
Antimony, Dissolved	ug/L	ND	100	105	105	70-130			
Arsenic, Dissolved	ug/L	ND	100	106	106	70-130			
Beryllium, Dissolved	ug/L	ND	100	115	115	70-130			
Boron, Dissolved	ug/L	11.5	100	124	113	70-130			
Cadmium, Dissolved	ug/L	ND	100	104	104	70-130			
Chromium, Dissolved	ug/L	ND	100	109	109	70-130			
Cobalt, Dissolved	ug/L	ND	100	110	110	70-130			
Lead, Dissolved	ug/L	ND	100	110	110	70-130			
Selenium, Dissolved	ug/L	ND	100	109	109	70-130			
Thallium, Dissolved	ug/L	ND	100	109	109	70-130			
Uranium-238, Dissolved	ug/L	ND	100	108	108	70-130			
Vanadium, Dissolved	ug/L	ND	100	107	107	70-130			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 533263 Analysis Method: EPA 524.2
QC Batch Method: EPA 524.2 Analysis Description: 524.2 MSV
Associated Lab Samples: 10427826001

METHOD BLANK: 2896754 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	ND	4.0	04/19/18 12:52	
1,2-Dichloroethane-d4 (S)	%	100	75-125	04/19/18 12:52	
4-Bromofluorobenzene (S)	%	96	75-125	04/19/18 12:52	
Toluene-d8 (S)	%	95	75-125	04/19/18 12:52	

LABORATORY CONTROL SAMPLE & LCSD: 2896755

Parameter	Units	2897075		LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result						
Total Trihalomethanes (Calc.)	ug/L	80	79.9	77.2	100	96	70-130	3	20
1,2-Dichloroethane-d4 (S)	%				100	100	75-125		
4-Bromofluorobenzene (S)	%				96	97	75-125		
Toluene-d8 (S)	%				96	97	75-125		

MATRIX SPIKE SAMPLE: 2897077

Parameter	Units	10427761007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,2-Dichloroethane-d4 (S)	%				100	75-125	
4-Bromofluorobenzene (S)	%				97	75-125	
Toluene-d8 (S)	%				96	75-125	

SAMPLE DUPLICATE: 2897076

Parameter	Units	60268271001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2-Dichloroethane-d4 (S)	%	102	102	0		
4-Bromofluorobenzene (S)	%	98	95	3		
Toluene-d8 (S)	%	95	96	0		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 442244 Analysis Method: EPA 548.1
QC Batch Method: EPA 548.1 Analysis Description: 548 GCS Endothall
Associated Lab Samples: 10427826001

METHOD BLANK: 2399870 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Endothall	ug/L	ND	9.0	04/25/18 07:43	

LABORATORY CONTROL SAMPLE: 2399871

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	50	55.6	111	64-137	

LABORATORY CONTROL SAMPLE: 2399872

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	9	7.7J	85	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2400302 2400303

Parameter	Units	35387642002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endothall	ug/L	4.3U	50	50	34.7	42.5	69	85	64-137	20	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2401760 2401761

Parameter	Units	35387858001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endothall	ug/L	4.3U	50	50	43.1	33.6	86	67	64-137	25	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 442497 Analysis Method: EPA 549.2
QC Batch Method: EPA 549.2 Analysis Description: 549 HPLC Paraquat Diquat
Associated Lab Samples: 10427826001

METHOD BLANK: 2400903 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diquat	ug/L	ND	0.40	04/25/18 12:31	
Paraquat	ug/L	ND	0.40	04/25/18 12:31	

LABORATORY CONTROL SAMPLE: 2400904

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	2	1.8	92	70-130	
Paraquat	ug/L	2	1.7	85	70-130	

LABORATORY CONTROL SAMPLE: 2400905

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	.4	0.59	147	50-150	
Paraquat	ug/L	.4	0.42	105	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2401428 2401429

Parameter	Units	35387355001 Result	MS Spike Conc.	MSD Spike Conc.	2401428		2401429		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Diquat	ug/L	<0.30	2	2	2.0	1.9	98	93	70-130	6	30	
Paraquat	ug/L	<0.30	2	2	1.8	1.6	90	82	70-130	9	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2401430 2401431

Parameter	Units	35387355002 Result	MS Spike Conc.	MSD Spike Conc.	2401430		2401431		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Diquat	ug/L	<0.30	2	2	2.1	2.1	103	107	70-130	4	30	
Paraquat	ug/L	<0.30	2	2	1.9	1.9	94	93	70-130	2	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 442194 Analysis Method: EPA 552.3
 QC Batch Method: EPA 552.3 Analysis Description: 5523 Haloacetic Acids
 Associated Lab Samples: 10427826001

METHOD BLANK: 2399650 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromoacetic Acid	ug/L	ND	1.0	04/26/18 00:24	
Dichloroacetic Acid	ug/L	ND	1.0	04/26/18 00:24	
Haloacetic Acids (Total)	ug/L	ND	1.0	04/26/18 00:24	
Monobromoacetic Acid	ug/L	ND	1.0	04/26/18 00:24	
Monochloroacetic Acid	ug/L	ND	1.0	04/26/18 00:24	
Trichloroacetic Acid	ug/L	ND	1.0	04/26/18 00:24	
2,3-Dibromopropanoic Acid (S)	%	120	70-130	04/26/18 00:24	

LABORATORY CONTROL SAMPLE: 2399651

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromoacetic Acid	ug/L	10	11.9	119	70-130	
Dichloroacetic Acid	ug/L	10	10.4	104	70-130	
Haloacetic Acids (Total)	ug/L	50	53.8	108	70-130	
Monobromoacetic Acid	ug/L	10	10.6	106	70-130	
Monochloroacetic Acid	ug/L	10	10.2	102	70-130	
Trichloroacetic Acid	ug/L	10	10.6	106	70-130	
2,3-Dibromopropanoic Acid (S)	%			123	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2400101 2400102

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		2074668001 Result	Spike Conc.	Spike Conc.	MS Result						
Dibromoacetic Acid	ug/L	ND	10	10	11.0	13.1	105	126	70-130	17	30
Dichloroacetic Acid	ug/L	1.1	10	10	12.4	11.9	113	108	70-130	4	30
Haloacetic Acids (Total)	ug/L	1.5	50	50	58.6	59.2	114	115	70-130	1	30
Monobromoacetic Acid	ug/L	ND	10	10	11.7	11.0	117	110	70-130	6	30
Monochloroacetic Acid	ug/L	ND	10	10	12.6	12.3	126	123	70-130	3	30
Trichloroacetic Acid	ug/L	ND	10	10	10.9	11.0	109	110	70-130	1	30
2,3-Dibromopropanoic Acid (S)	%						106	116	70-130		30

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2400103 2400104

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427826001 Result	Spike Conc.	Spike Conc.	MS Result						
Dibromoacetic Acid	ug/L	ND	10	10	12.6	13.1	126	131	70-130	4	30 M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Parameter	Units	2400103		2400104		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result								
Dichloroacetic Acid	ug/L	ND	10	10	11.9	11.5	119	115	70-130	3	30		
Haloacetic Acids (Total)	ug/L	5.0	50	50	59.8	57.9	110	106	70-130	3	30		
Monobromoacetic Acid	ug/L	ND	10	10	11.4	10.7	114	107	70-130	7	30		
Monochloroacetic Acid	ug/L	5.0	10	10	11.8	10.2	68	52	70-130	15	30	M1	
Trichloroacetic Acid	ug/L	ND	10	10	12.1	12.3	121	123	70-130	2	30		
2,3-Dibromopropanoic Acid (S)	%						98	111	70-130		30		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 534073	Analysis Method: EPA 8011
QC Batch Method: EPA 8011	Analysis Description: GCS 8011 EDB DBCP
Associated Lab Samples: 10427826001	

METHOD BLANK: 2901365 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	ND	0.010	04/24/18 22:05	
1,2-Dibromoethane (EDB)	ug/L	ND	0.010	04/24/18 22:05	
4-Bromofluorobenzene (S)	%.	102	30-150	04/24/18 22:05	

LABORATORY CONTROL SAMPLE & LCSD: 2901366

Parameter	Units	2901367								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	.11	0.10	0.097	95	89	60-140	7	20	
1,2-Dibromoethane (EDB)	ug/L	.11	0.11	0.10	100	94	60-140	6	20	
4-Bromofluorobenzene (S)	%.				107	106	30-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 533542 Analysis Method: EPA 8081B
QC Batch Method: EPA Mod. 3510C Analysis Description: 8081B GCS Pesticides
Associated Lab Samples: 10427826001

METHOD BLANK: 2898180 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/25/18 19:54	
4,4'-DDE	ug/L	ND	0.10	04/25/18 19:54	
4,4'-DDT	ug/L	ND	0.10	04/25/18 19:54	
Aldrin	ug/L	ND	0.050	04/25/18 19:54	
alpha-BHC	ug/L	ND	0.050	04/25/18 19:54	
alpha-Chlordane	ug/L	ND	0.050	04/25/18 19:54	
beta-BHC	ug/L	ND	0.050	04/25/18 19:54	
Chlordane (Technical)	ug/L	ND	0.50	04/25/18 19:54	
delta-BHC	ug/L	ND	0.050	04/25/18 19:54	
Dieldrin	ug/L	ND	0.10	04/25/18 19:54	
Endosulfan I	ug/L	ND	0.050	04/25/18 19:54	
Endosulfan II	ug/L	ND	0.10	04/25/18 19:54	
Endosulfan sulfate	ug/L	ND	0.10	04/25/18 19:54	
Endrin	ug/L	ND	0.10	04/25/18 19:54	
Endrin aldehyde	ug/L	ND	0.10	04/25/18 19:54	
Endrin ketone	ug/L	ND	0.10	04/25/18 19:54	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/25/18 19:54	
gamma-Chlordane	ug/L	ND	0.050	04/25/18 19:54	
Heptachlor	ug/L	ND	0.050	04/25/18 19:54	
Heptachlor epoxide	ug/L	ND	0.050	04/25/18 19:54	
Methoxychlor	ug/L	ND	0.50	04/25/18 19:54	
Toxaphene	ug/L	ND	1.5	04/25/18 19:54	
Decachlorobiphenyl (S)	%	75	30-143	04/25/18 19:54	
Tetrachloro-m-xylene (S)	%	80	62-125	04/25/18 19:54	

LABORATORY CONTROL SAMPLE & LCSD: 2898181

Parameter	Units	2898182							RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits				
4,4'-DDD	ug/L	1	1.0	0.95	104	95	67-125	10	20		
4,4'-DDE	ug/L	1	1.0	0.90	100	90	68-125	11	20		
4,4'-DDT	ug/L	1	0.92	0.83	92	83	66-125	10	20		
Aldrin	ug/L	.5	0.21	0.17	42	34	46-125	21	20	L2,R1	
alpha-BHC	ug/L	.5	0.50	0.45	101	90	66-125	11	20		
alpha-Chlordane	ug/L	.5	0.49	0.43	97	86	72-125	12	20		
beta-BHC	ug/L	.5	0.49	0.45	99	89	72-125	10	20		
delta-BHC	ug/L	.5	0.42	0.37	83	75	37-141	11	20		
Dieldrin	ug/L	1	1.1	1.0	112	100	71-125	11	20		
Endosulfan I	ug/L	.5	0.48	0.43	96	86	69-125	10	20		
Endosulfan II	ug/L	1	1.1	0.98	108	98	73-125	10	20		
Endosulfan sulfate	ug/L	1	0.96	0.87	96	87	63-127	9	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Parameter	Units	2898181		2898182			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Endrin	ug/L	1	1.0	0.92	103	92	72-125	11	20	
Endrin aldehyde	ug/L	1	1.0	0.92	101	92	70-125	10	20	
Endrin ketone	ug/L	1	1.1	0.98	108	98	72-127	10	20	
gamma-BHC (Lindane)	ug/L	.5	0.51	0.45	101	91	69-125	11	20	
gamma-Chlordane	ug/L	.5	0.43	0.38	86	75	64-125	14	20	
Heptachlor	ug/L	.5	0.34	0.28	67	57	54-125	17	20	
Heptachlor epoxide	ug/L	.5	0.50	0.45	101	90	72-125	11	20	
Methoxychlor	ug/L	5	4.6	4.2	92	84	67-127	9	20	
Decachlorobiphenyl (S)	%.				80	76	30-143			
Tetrachloro-m-xylene (S)	%.				85	70	62-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 533544	Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C	Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10427826001	

METHOD BLANK: 2898185 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/23/18 14:24	
Decachlorobiphenyl (S)	%	105	30-125	04/23/18 14:24	CH
Tetrachloro-m-xylene (S)	%	50	30-125	04/23/18 14:24	

Parameter	Units	2898186		2898187		% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec				
PCB-1016 (Aroclor 1016)	ug/L	2	1.1	1.5	55	73	47-125	28	20 R1
PCB-1260 (Aroclor 1260)	ug/L	2	1.2	1.7	62	84	54-125	30	20 R1
Decachlorobiphenyl (S)	%				78	103	30-125		CH
Tetrachloro-m-xylene (S)	%				46	60	30-125		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 533322 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10427826001

METHOD BLANK: 2897016 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
1,2-Dichlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
1,2-Diphenylhydrazine	ug/L	ND	10.0	04/23/18 13:12	
1,3-Dichlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
1,4-Dichlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
1-Methylnaphthalene	ug/L	ND	10.0	04/23/18 13:12	
2,4,5-Trichlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4-Dichlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4-Dimethylphenol	ug/L	ND	50.0	04/23/18 13:12	
2,4-Dinitrophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4-Dinitrotoluene	ug/L	ND	10.0	04/23/18 13:12	
2,6-Dinitrotoluene	ug/L	ND	10.0	04/23/18 13:12	
2-Chloronaphthalene	ug/L	ND	10.0	04/23/18 13:12	
2-Chlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2-Methylnaphthalene	ug/L	ND	10.0	04/23/18 13:12	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/23/18 13:12	
2-Nitroaniline	ug/L	ND	10.0	04/23/18 13:12	
2-Nitrophenol	ug/L	ND	10.0	04/23/18 13:12	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/23/18 13:12	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/23/18 13:12	
3-Nitroaniline	ug/L	ND	10.0	04/23/18 13:12	
4,6-Dinitro-2-methylphenol	ug/L	ND	10.0	04/23/18 13:12	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/23/18 13:12	
4-Chloro-3-methylphenol	ug/L	ND	10.0	04/23/18 13:12	
4-Chloroaniline	ug/L	ND	50.0	04/23/18 13:12	
4-Chlorophenylphenyl ether	ug/L	ND	10.0	04/23/18 13:12	
4-Nitroaniline	ug/L	ND	10.0	04/23/18 13:12	
4-Nitrophenol	ug/L	ND	10.0	04/23/18 13:12	
Acenaphthene	ug/L	ND	10.0	04/23/18 13:12	
Acenaphthylene	ug/L	ND	10.0	04/23/18 13:12	
Anthracene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(a)anthracene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(a)pyrene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(b)fluoranthene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(g,h,i)perylene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(k)fluoranthene	ug/L	ND	10.0	04/23/18 13:12	
bis(2-Chloroethoxy)methane	ug/L	ND	10.0	04/23/18 13:12	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/23/18 13:12	
bis(2-Chloroisopropyl) ether	ug/L	ND	10.0	04/23/18 13:12	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/23/18 13:12	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

METHOD BLANK: 2897016 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Carbazole	ug/L	ND	10.0	04/23/18 13:12	
Chrysene	ug/L	ND	10.0	04/23/18 13:12	
Di-n-butylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Di-n-octylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Dibenz(a,h)anthracene	ug/L	ND	10.0	04/23/18 13:12	
Dibenzofuran	ug/L	ND	10.0	04/23/18 13:12	
Diethylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Dimethylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Fluoranthene	ug/L	ND	10.0	04/23/18 13:12	
Fluorene	ug/L	ND	10.0	04/23/18 13:12	
Hexachloro-1,3-butadiene	ug/L	ND	10.0	04/23/18 13:12	
Hexachlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
Hexachloroethane	ug/L	ND	10.0	04/23/18 13:12	
Indeno(1,2,3-cd)pyrene	ug/L	ND	10.0	04/23/18 13:12	
Isophorone	ug/L	ND	10.0	04/23/18 13:12	
N-Nitroso-di-n-propylamine	ug/L	ND	10.0	04/23/18 13:12	
N-Nitrosodimethylamine	ug/L	ND	10.0	04/23/18 13:12	
N-Nitrosodiphenylamine	ug/L	ND	10.0	04/23/18 13:12	
Naphthalene	ug/L	ND	10.0	04/23/18 13:12	
Nitrobenzene	ug/L	ND	10.0	04/23/18 13:12	
Pentachlorophenol	ug/L	ND	20.0	04/23/18 13:12	
Phenanthrene	ug/L	ND	10.0	04/23/18 13:12	
Phenol	ug/L	ND	10.0	04/23/18 13:12	
Pyrene	ug/L	ND	10.0	04/23/18 13:12	
2,4,6-Tribromophenol (S)	%	100	65-125	04/23/18 13:12	
2-Fluorobiphenyl (S)	%	85	56-125	04/23/18 13:12	
2-Fluorophenol (S)	%	90	55-125	04/23/18 13:12	
Nitrobenzene-d5 (S)	%	87	60-125	04/23/18 13:12	
p-Terphenyl-d14 (S)	%	105	58-125	04/23/18 13:12	
Phenol-d6 (S)	%	91	58-125	04/23/18 13:12	

LABORATORY CONTROL SAMPLE & LCSD: 2897017

Parameter	Units	Spike Conc.	2897018		LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
			LCS Result	LCSD Result						
1,2,4-Trichlorobenzene	ug/L	50	43.4	41.0	87	82	54-125	6	20	
1,2-Dichlorobenzene	ug/L	50	42.4	40.5	85	81	35-125	4	20	
1,2-Diphenylhydrazine	ug/L	50	46.0	44.0	92	88	68-125	4	20	
1,3-Dichlorobenzene	ug/L	50	41.3	40.1	83	80	30-125	3	20	
1,4-Dichlorobenzene	ug/L	50	41.1	40.4	82	81	33-125	2	20	
1-Methylnaphthalene	ug/L	50	45.7	43.8	91	88	67-125	4	20	
2,4,5-Trichlorophenol	ug/L	50	47.5	45.2	95	90	74-125	5	20	
2,4,6-Trichlorophenol	ug/L	50	47.6	46.1	95	92	74-125	3	20	
2,4-Dichlorophenol	ug/L	50	46.2	45.8	92	92	68-125	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

LABORATORY CONTROL SAMPLE & LCSD: 2897017		2897018									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
2,4-Dimethylphenol	ug/L	50	36.7J	33.2J	73	66	33-125		20		
2,4-Dinitrophenol	ug/L	50	44.2	49.6	88	99	30-127	12	20		
2,4-Dinitrotoluene	ug/L	50	56.5	54.7	113	109	75-125	3	20		
2,6-Dinitrotoluene	ug/L	50	52.6	51.2	105	102	75-125	3	20		
2-Chloronaphthalene	ug/L	50	46.9	45.4	94	91	70-125	3	20		
2-Chlorophenol	ug/L	50	42.5	40.8	85	82	61-125	4	20		
2-Methylnaphthalene	ug/L	50	45.8	43.0	92	86	67-125	6	20		
2-Methylphenol(o-Cresol)	ug/L	50	43.3	40.4	87	81	63-125	7	20		
2-Nitroaniline	ug/L	50	47.4	45.8	95	92	73-125	3	20		
2-Nitrophenol	ug/L	50	48.1	46.0	96	92	64-125	4	20		
3&4-Methylphenol(m&p Cresol)	ug/L	50	43.9	42.1	88	84	67-125	4	20		
3,3'-Dichlorobenzidine	ug/L	50	55.6	52.5	111	105	60-125	6	20		
3-Nitroaniline	ug/L	50	55.7	53.3	111	107	73-125	4	20		
4,6-Dinitro-2-methylphenol	ug/L	50	55.3	56.3	111	113	42-127	2	20	2M	
4-Bromophenylphenyl ether	ug/L	50	48.0	46.6	96	93	75-125	3	20		
4-Chloro-3-methylphenol	ug/L	50	49.9	47.0	100	94	75-125	6	20		
4-Chloroaniline	ug/L	50	43.9J	41J	88	82	60-125		20		
4-Chlorophenylphenyl ether	ug/L	50	48.7	47.0	97	94	74-125	4	20		
4-Nitroaniline	ug/L	50	48.4	47.5	97	95	69-125	2	20		
4-Nitrophenol	ug/L	50	46.6	45.7	93	91	62-125	2	20		
Acenaphthene	ug/L	50	47.1	45.3	94	91	74-125	4	20		
Acenaphthylene	ug/L	50	47.1	45.2	94	90	72-125	4	20		
Anthracene	ug/L	50	48.4	46.0	97	92	75-125	5	20		
Benzo(a)anthracene	ug/L	50	49.4	48.5	99	97	75-125	2	20		
Benzo(a)pyrene	ug/L	50	48.6	47.8	97	96	75-125	2	20		
Benzo(b)fluoranthene	ug/L	50	49.8	48.3	100	97	75-125	3	20		
Benzo(g,h,i)perylene	ug/L	50	51.0	49.5	102	99	73-125	3	20		
Benzo(k)fluoranthene	ug/L	50	49.3	48.2	99	96	75-125	2	20		
bis(2-Chloroethoxy)methane	ug/L	50	44.6	42.9	89	86	67-125	4	20		
bis(2-Chloroethyl) ether	ug/L	50	39.9	37.8	80	76	55-125	5	20		
bis(2-Chloroisopropyl) ether	ug/L	50	34.7	33.2	69	66	52-125	5	20	2M	
bis(2-Ethylhexyl)phthalate	ug/L	50	55.2	54.2	110	108	72-129	2	20		
Butylbenzylphthalate	ug/L	50	54.4	51.4	109	103	69-127	6	20		
Carbazole	ug/L	50	50.4	48.2	101	96	75-125	4	20		
Chrysene	ug/L	50	49.9	48.6	100	97	75-125	3	20		
Di-n-butylphthalate	ug/L	50	53.2	50.5	106	101	75-125	5	20		
Di-n-octylphthalate	ug/L	50	56.1	54.8	112	110	69-131	2	20		
Dibenz(a,h)anthracene	ug/L	50	52.1	51.1	104	102	74-125	2	20		
Dibenzofuran	ug/L	50	48.8	46.3	98	93	75-125	5	20		
Diethylphthalate	ug/L	50	50.4	49.0	101	98	75-125	3	20		
Dimethylphthalate	ug/L	50	50.6	49.1	101	98	75-125	3	20		
Fluoranthene	ug/L	50	50.0	48.2	100	96	75-125	4	20		
Fluorene	ug/L	50	47.8	46.5	96	93	75-125	3	20		
Hexachloro-1,3-butadiene	ug/L	50	42.8	41.1	86	82	37-125	4	20		
Hexachlorobenzene	ug/L	50	49.3	47.2	99	94	74-125	4	20		
Hexachloroethane	ug/L	50	42.8	40.0	86	80	30-125	7	20		
Indeno(1,2,3-cd)pyrene	ug/L	50	51.3	50.3	103	101	74-125	2	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Parameter	Units	2897017		2897018			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Isophorone	ug/L	50	45.7	42.8	91	86	72-125	7	20	
N-Nitroso-di-n-propylamine	ug/L	50	43.0	42.3	86	85	65-125	2	20	
N-Nitrosodimethylamine	ug/L	50	42.8	39.7	86	79	52-125	7	20	
N-Nitrosodiphenylamine	ug/L	50	49.5	47.5	99	95	75-125	4	20	
Naphthalene	ug/L	50	43.8	41.5	88	83	58-125	5	20	
Nitrobenzene	ug/L	50	43.1	40.2	86	80	64-125	7	20	
Pentachlorophenol	ug/L	50	42.8	40.6	86	81	52-125	5	20	
Phenanthrene	ug/L	50	47.3	45.6	95	91	75-125	4	20	
Phenol	ug/L	50	41.4	40.1	83	80	59-125	3	20	
Pyrene	ug/L	50	50.4	49.0	101	98	75-125	3	20	
2,4,6-Tribromophenol (S)	%				95	91	65-125			
2-Fluorobiphenyl (S)	%				80	74	56-125			
2-Fluorophenol (S)	%				76	72	55-125			
Nitrobenzene-d5 (S)	%				77	72	60-125			
p-Terphenyl-d14 (S)	%				95	92	58-125			
Phenol-d6 (S)	%				76	73	58-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 20900 Analysis Method: EPA 8315A
QC Batch Method: EPA 8315A Analysis Description: 8315 GCSV Aldehydes
Associated Lab Samples: 10427826001

METHOD BLANK: 83416 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Formaldehyde	ug/L	ND	100	04/21/18 11:17	

LABORATORY CONTROL SAMPLE: 83417

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	400	358	90	44-176	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 83418 83419

Parameter	Units	10427644001		MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Formaldehyde	ug/L	ND	400	400	400	360	369	87	90	35-167	3	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 533231

Analysis Method: Hach 10360 Rev 1.1

QC Batch Method: Hach 10360

Analysis Description: Hach 10360 Rev 1.1, BOD

Associated Lab Samples: 10427826001

METHOD BLANK: 2896595

Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	04/24/18 09:35	

LABORATORY CONTROL SAMPLE: 2896597

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	227	115	85-115	

SAMPLE DUPLICATE: 2896598

Parameter	Units	10427695001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	608	660	8	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch:	535040	Analysis Method:	EPA 1664A OG
QC Batch Method:	EPA 1664A OG	Analysis Description:	1664 HEM, Oil and Grease
Associated Lab Samples:	10427826001		

METHOD BLANK: 2907049 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	04/30/18 10:26	

LABORATORY CONTROL SAMPLE: 2907050

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	35.4	88	78-114	

MATRIX SPIKE SAMPLE: 2907051

Parameter	Units	40167949002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	138	37.4	172	91	78-114	

SAMPLE DUPLICATE: 2907052

Parameter	Units	40167949003 Result	Dup Result	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	51.2	37.1	32	18	D6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 533246	Analysis Method: EPA 180.1
QC Batch Method: EPA 180.1	Analysis Description: 180.1 Turbidity
Associated Lab Samples: 10427826001	

METHOD BLANK: 2896682 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	04/19/18 10:52	

LABORATORY CONTROL SAMPLE: 2896683

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.5	103	90-110	

SAMPLE DUPLICATE: 2896684

Parameter	Units	10427826001 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	620	715	14	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 533988

Analysis Method: SM 2540D

QC Batch Method: SM 2540D

Analysis Description: 2540D Total Suspended Solids

Associated Lab Samples: 10427826001

METHOD BLANK: 2900534

Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	04/24/18 16:10	

LABORATORY CONTROL SAMPLE: 2900535

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	92.0	92	80-120	

SAMPLE DUPLICATE: 2900536

Parameter	Units	10427930005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	107	105	2	10	

SAMPLE DUPLICATE: 2900537

Parameter	Units	10427930006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	13.0	14.0	7	10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 442752	Analysis Method: SM 4500-CIO2
QC Batch Method: SM 4500-CIO2	Analysis Description: 4500CIO2 Chlorine Dioxide
Associated Lab Samples: 10427826001	

METHOD BLANK: 2402049 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorine Dioxide	mg/L	ND	0.10	04/25/18 13:30	H6

LABORATORY CONTROL SAMPLE: 2402050

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorine Dioxide	mg/L	2.5	2.3	95	90-110	H6

SAMPLE DUPLICATE: 2402051

Parameter	Units	10427276001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	1.6	1.6	1	20	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 534745	Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B	Analysis Description: 4500H+B pH
Associated Lab Samples: 10427826001	

LABORATORY CONTROL SAMPLE: 2905104

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	99	98-102	H6

SAMPLE DUPLICATE: 2905105

Parameter	Units	10427644001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.1	7.0	1	3	H6

SAMPLE DUPLICATE: 2905106

Parameter	Units	10427668001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	3	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 533253 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10427826001

METHOD BLANK: 2896722 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	04/19/18 11:32	
Fluoride	mg/L	ND	0.050	04/19/18 11:32	

LABORATORY CONTROL SAMPLE: 2896723

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.0	96	90-110	
Fluoride	mg/L	1	0.92	92	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896724 2896725

Parameter	Units	10427232002		2896724		2896725		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Chloride	mg/L	0.32J	12.5	12.5	12.0	12.0	94	93	0	20	
Fluoride	mg/L	<0.0028	1	1	1.0	0.94	103	94	9	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 442384	Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1	Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10427826001	

METHOD BLANK: 2400473 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorite	ug/L	ND	5.0	04/24/18 13:17	

LABORATORY CONTROL SAMPLE: 2400474

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	40	38.8	97	85-115	

MATRIX SPIKE SAMPLE: 2400476

Parameter	Units	10427826001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	ND	4000	2770	69	75-125	M6

SAMPLE DUPLICATE: 2400475

Parameter	Units	10427826001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorite	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 442385 Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1 Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10427826001

METHOD BLANK: 2400477 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromate	ug/L	ND	1.0	04/24/18 13:17	

LABORATORY CONTROL SAMPLE: 2400478

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	8	7.7	96	85-115	

MATRIX SPIKE SAMPLE: 2400480

Parameter	Units	10427826001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	ND	80	82.3	103	75-125	

SAMPLE DUPLICATE: 2400479

Parameter	Units	10427826001 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromate	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 533227 Analysis Method: SM 3500-Cr B Modified
QC Batch Method: SM 3500-Cr B Modified Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10427826001

METHOD BLANK: 2896588 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	04/19/18 10:10	FS

LABORATORY CONTROL SAMPLE: 2896589

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.21	104	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896590 2896591

Parameter	Units	10427826001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/L	ND	.2	.2	.0049J	.006J	1	1	85-115		20	FS,M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 141158 Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 Analysis Description: 350.1 Ammonia Undistilled
Associated Lab Samples: 10427826001

METHOD BLANK: 558442 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	04/24/18 10:34	

LABORATORY CONTROL SAMPLE: 558443

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	2	2.0	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 558444 558445

Parameter	Units	12107404003 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Nitrogen, Ammonia	mg/L	ND	2	2	2.0	2.0	98	98	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 558446 558447

Parameter	Units	12107406003 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Nitrogen, Ammonia	mg/L	ND	2	2	2.0	2.0	98	99	90-110	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch:	533564	Analysis Method:	EPA 353.2
QC Batch Method:	EPA 353.2	Analysis Description:	353.2 Nitrate + Nitrite, preserved
Associated Lab Samples:	10427826001		

METHOD BLANK: 2898336 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	04/20/18 14:00	FS
Nitrite as N	mg/L	ND	0.020	04/20/18 14:00	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	04/20/18 14:00	FS

LABORATORY CONTROL SAMPLE: 2898337

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	1.0	100	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	0.98	98	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898338 2898339

Parameter	Units	10428032002		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Nitrite as N	mg/L	0.027	1	1	0.90	0.92	87	89	90-110	2	20	FS,M1	
Nitrogen, NO2 plus NO3	mg/L	0.11	1	1	0.92	0.95	81	85	90-110	4	20	FS,M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 21104

Analysis Method: EPA 9016

QC Batch Method: EPA 9016

Analysis Description: 9016 Free Cyanide

Associated Lab Samples: 10427826001

METHOD BLANK: 84163

Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/24/18 17:31	

LABORATORY CONTROL SAMPLE: 84164

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	148	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 84165

84166

Parameter	Units	10427352003		84166		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Cyanide, Free	ug/L	ND	150	150	142	143	95	95	80-120	1	11

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 534468 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10427826001

METHOD BLANK: 2903673 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/27/18 09:57	

LABORATORY CONTROL SAMPLE: 2903674

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	258	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903675 2903676

Parameter	Units	10428172001 Result	MS		MSD		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result							
Cyanide	ug/L	10.1	250	250	238	242	91	93	80-120	1	30		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903677 2903678

Parameter	Units	10428174001 Result	MS		MSD		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result							
Cyanide	ug/L	10.6	250	250	241	242	92	92	80-120	0	30		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 534444 Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10427826001

METHOD BLANK: 2903593 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	04/27/18 12:18	

LABORATORY CONTROL SAMPLE: 2903594

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	1.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903595 2903596

Parameter	Units	10428297001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Phosphorus	mg/L	0.068	1	1	1.0	1.1	98	101	80-120	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903597 2903598

Parameter	Units	10428298001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Phosphorus	mg/L	0.098	1	1	1.1	1.1	99	100	80-120	1	30	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Sample: FL-TT-02 **Lab ID: 10427826001** Collected: 04/18/18 15:15 Received: 04/18/18 17:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	7.56 ± 2.61 (2.75) C:NA T:NA	pCi/L	05/07/18 18:53	12587-46-1	
Gross Beta	EPA 900.0	9.79 ± 3.19 (4.31) C:NA T:NA	pCi/L	05/07/18 18:53	12587-47-2	
Radium-226	EPA 903.1	0.343 ± 0.357 (0.531) C:NA T:88%	pCi/L	05/07/18 21:44	13982-63-3	
Radium-228	EPA 904.0	1.46 ± 0.878 (1.64) C:49% T:65%	pCi/L	05/10/18 15:16	15262-20-1	
Total Radium	Total Radium Calculation	1.80 ± 1.24 (2.17)	pCi/L	05/11/18 11:36	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 295999

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 10427826001

METHOD BLANK: 1449093

Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.502 ± 0.361 (0.697) C:84% T:77%	pCi/L	05/10/18 15:19	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 295983

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 10427826001

METHOD BLANK: 1449055

Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.112 ± 0.312 (0.605) C:NA T:94%	pCi/L	05/07/18 21:03	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch:	296837	Analysis Method:	EPA 900.0
QC Batch Method:	EPA 900.0	Analysis Description:	900.0 Gross Alpha/Beta
Associated Lab Samples:	10427826001		

METHOD BLANK:	1452799	Matrix:	Water
Associated Lab Samples:	10427826001		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.190 ± 0.373 (1.32) C:NA T:NA	pCi/L	05/08/18 08:26	
Gross Beta	-0.136 ± 0.558 (1.49) C:NA T:NA	pCi/L	05/08/18 08:26	

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REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-O Pace Analytical Services - Ormond Beach

PASI-PA Pace Analytical Services - Greensburg

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10427826

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 533263

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

BATCH QUALIFIERS

Batch: 533719

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 533817

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 533882

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 534052

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 534336

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 535040

[BE] Batch extracted by solid phase extraction (SPE).

ANALYTE QUALIFIERS

1M Sample was brown in color.

2M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

D6 The precision between the sample and sample duplicate exceeded laboratory control limits.

FS The sample was filtered in the laboratory prior to analysis.

H3 Sample was received or analysis requested beyond the recognized method holding time.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

R1 RPD value was outside control limits.

S4 Surrogate recovery not evaluated against control limits due to sample dilution.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427826001	FL-TT-02				
10427826001	FL-TT-02	EPA 531.1	444330		
10427826001	FL-TT-02	EPA 547	443433		
10427826001	FL-TT-02	EPA 549.2	442497	EPA 549.2	442774
10427826001	FL-TT-02	EPA 552.3	442194	EPA 552.3	442372
10427826001	FL-TT-02	EPA 8011	534073	EPA 8011	534336
10427826001	FL-TT-02	EPA 8015 Alcohol-Glycol	438905		
10427826001	FL-TT-02	EPA 8015 Alcohol-Glycol	438205		
10427826001	FL-TT-02	EPA Mod. 3510C	533542	EPA 8081B	534052
10427826001	FL-TT-02	EPA Mod. 3510C	533544	EPA 8082A	533719
10427826001	FL-TT-02	EPA 8315A	20900	EPA 8315A	20933
10427826001	FL-TT-02	EPA 8316	21113		
10427826001	FL-TT-02	EPA 200.7	533435	EPA 200.7	534229
10427826001	FL-TT-02	EPA 200.8	533161	EPA 200.8	533533
10427826001	FL-TT-02	EPA 200.8	533428	EPA 200.8	533889
10427826001	FL-TT-02	EPA 245.1	533449	EPA 245.1	533882
10427826001	FL-TT-02	EPA 548.1	442244	EPA 548.1	442522
10427826001	FL-TT-02	EPA 3520	533322	EPA 8270D	533817
10427826001	FL-TT-02	EPA 524.2	533263		
10427826001	FL-TT-02				
10427826001	FL-TT-02	EPA 900.0	296837		
10427826001	FL-TT-02	EPA 903.1	295983		
10427826001	FL-TT-02	EPA 904.0	295999		
10427826001	FL-TT-02	Total Radium Calculation	298015		
10427826001	FL-TT-02	Hach 10360	533231	Hach 10360 Rev 1.1	533509
10427826001	FL-TT-02	EPA 1664A OG	535040		
10427826001	FL-TT-02	EPA 180.1	533246		
10427826001	FL-TT-02	SM 2540D	533988		
10427826001	FL-TT-02	SM 4500-CIO2	442752		
10427826001	FL-TT-02	SM 4500-H+B	534745		
10427826001	FL-TT-02	Trivalent Chromium Calculation	534084		
10427826001	FL-TT-02	EPA 300.0	533253		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427826001	FL-TT-02	EPA 300.1	442384		
10427826001	FL-TT-02	EPA 300.1	442385		
10427826001	FL-TT-02	SM 3500-Cr B Modified	533227		
10427826001	FL-TT-02	EPA 350.1			
10427826001	FL-TT-02	EPA 350.1	141158		
10427826001	FL-TT-02	EPA 353.2	533564		
10427826001	FL-TT-02	EPA 9016	21104	EPA 9016	21181
10427826001	FL-TT-02	SM 4500-CN-E	534468	SM 4500-CN-E	534565
10427826001	FL-TT-02	SM 4500-P B	534444	SM 4500-P E	534526

REPORT OF LABORATORY ANALYSIS

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WO# 10427826




10427826

Body Form		Work Order Number:	COC Type:	Page: 1 of										
Turnaround Time:		COC ID:		FOR LAB USE ONLY										
FACILITY/CLIENT INFO		LABORATORY												
Facility Code:	MPLA - Free way LF Water	Program Code (MDH Lab Only):	Lab Name:											
Project Name:	MPLA - Free way LF Water	Project Task Code:	Address:	18-00383										
Project Manager:			EPIC Profile #38716											
Potential Hazard?	If yes, add information to Sampler Comments Section	Phone No:												
SAMPLE DETAILS														
SAMPLE TYPE CODES		LAB MATRIX CODES		ANALYSIS REQUESTED										
Sample=Routine Sample S-IV=Integrated Vertical Profile Sample S-CWOP=Composite Sample		DW=Drinking Water NW=Non-potable Water SS=Soil/Solid WP=Wipe AR=Air BL=Biological Material OT=Other TS=Tissue		W=Ground=Groundwater SW=Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample										
Location Identifier	Sample Type	Date	Time	Start Depth, in feet	End Depth, in feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Coats	ANALYSIS	Lab Sample No.	#
FL-TT-02	S	4/18/18	15:18	10	10.5	G	NW	WFF Ground			41	List A List B,C	001	1

NW in 4/18/18														
Sampled By: Nate Hubbard														
Sampler's Signature: Nate Hubbard														
Phone #: 612-214-8066														
Receiving Comments:														
Relinquished By/Affiliation				Date/Time				Accepted By/ Affiliation				Date/Time		
(Sampler) Nate Hubbard / Pace				4/18/18 1730				MPLA Pace				4/18/18 1730		

Lab Work Order Sticker

1730
T=5.6
6.2

	Document Name: Sample Condition Upon Receipt Form	Document Revised: 14Dec2017 Page 1 of 2
	Document No.: F-MN-L-213-rev.22	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: MPCA

Project #:

WO# : 10427826

PM: JMA Due Date: 05/03/18
CLIENT PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 Type of Ice: Wet Blue None Dry Melted
 Used: G87A9155100842

Cooler Temp Read (°C): 5.4, 6.0 Cooler Temp Corrected (°C): 5.6, 6.2 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: MD 4/18/18

USDA Regulated Soil N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	12. <u>No time on samples</u>
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A Exceptions: <u>VOA</u> , Coliform, TOC/DOC, <u>Oil and Grease</u> , DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input checked="" type="checkbox"/> Y Sample # <u>1</u> ; <u>5/5</u> <u>1/1</u> <u>1/1</u>
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Pace Trip Blank Lot # (if purchased): _____	15.

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review:

[Signature]

Date: 04/19/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals - Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury - Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	EPA 8270C
PCBs	EPA 8082
PFCs	EPA 537
VOCs	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

**** ADD to Parameter List A:**

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Harness determination)

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMs)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace

Chain of Custody

WO# 10427826



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427826 Workorder Name: 18-00383 MPCA-Freeway LF Water Owner Received Date: 4/18/2018 Results Requested By: 5/3/2018

Report To		Subcontract To					Requested Analysis													
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					Nitrogen, unionized ammonia, as N													
							LAB USE ONLY													
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Nitrogen, unionized ammonia, as N										
						H2SO4														
1	FL-TT-02	PS	4/18/2018 15:15	10427826001	Water	1				X										
2																				
3																				
4																				
5																				
Transfers										Comments										
Released By	Date/Time	Received By	Date/Time																	
<i>Mark Pae</i>	<i>4/19/18 15:10</i>	<i>Mark Pae</i>	<i>4/19/18 15:10</i>	returning volume to MPLS																
<i>Mark Pae</i>	<i>4/20/18 0:30</i>	<i>Mark Pae</i>	<i>4/20/18 0:30</i>																	
<i>Mark Pae</i>	<i>4-25-18</i>	<i>Mark Pae</i>	<i>4/25/18 18:30</i>																	
Cooler Temperature on Receipt <i>5.4</i> °C		Custody Seal <input checked="" type="checkbox"/> or N		Received on Ice <input checked="" type="checkbox"/> or N		Samples Intact <input checked="" type="checkbox"/> or N														

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

T= 3.4

Sample Condition Upon Receipt

Client Name: Pace MP1s

Project #:

WO# : 10427826

PM: JMA

Due Date: 05/03/18

CLIENT: **PASI-MNFLD**

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 687A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 3.6 Cooler Temp Corrected (°C): 3.6 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: none Date and Initials of Person Examining Contents: ms 4/25/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7. <u>Return Samples</u>
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>Wt</u>	12.
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? <input type="checkbox"/> Y <input type="checkbox"/> N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1</u>
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Head-space in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):	

CLIENT NOTIFICATION/RESOLUTION:

Person Contacted: _____ Date/Time: _____ Field Data Acquired? Yes No
 Comments/Resolution: _____

Project Manager Review: J. Anderson

Date: 04/26/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Chain of Custody

WO#: 12107380



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427826 Workorder Name: 18-00383 MPCA-Freeway LF Water Owner Received Date: 4/18/2018 Results Requested By: 5/3/2018

Report To	Subcontract To	Requested Analysis											
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451	Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042												
						Preserved Containers					Nitrogen, unionized ammonia, as N	LAB USE ONLY	
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	H2SO4							
1	FL-TT-02	PS	4/18/2018 15:15	10427826001	Water	1						X	
2													
3													
4													
5													

						Comments
Transfers	Released By	Date/Time	Received By	Date/Time		
1	<i>[Signature]</i>	4/19/18 17:10	<i>[Signature]</i>	4/19/18 19:30		
2	<i>[Signature]</i>	4/20/18 0:30	B Mathew	4/20/18 06:45		
3						
Cooler Temperature on Receipt		5.4 °C	Custody Seal	<input checked="" type="checkbox"/> or N	Received on Ice	<input checked="" type="checkbox"/> or N
					Samples Intact	<input checked="" type="checkbox"/> or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

WO#: 12107380
 PM: HRZ Due Date: 05/02/18
 CLIENT: PACE MPLS

Sample Condition Upon Receipt

Client Name: Pace MN Project #:

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Optional: Proj. Due Date: _____ Proj. Name: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 5.1 Cooler Temp Corrected °C: 5.4 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 5°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: 4-20-18 DC

Comments: Bom 4/20/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers
Sample Labels Match COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Carrin Fern Date: 4/20/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427826 Workorder Name: 18-00383 MPCA-Freeway LF Water Owner Received Date: 4/18/2018 Results Requested By: 5/3/2018

Report To		Subcontract To						Requested Analysis																																								
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Ormond Beach 8 East Tower Circle Ormond Beach, FL 32174 Phone (386)672-5668																																														
								<table border="1"> <thead> <tr> <th colspan="10">Preserved Containers</th> <th rowspan="2">Aldicarb / Carbofuran EPA 8318</th> <th rowspan="2">Bromate/Chlorite EPA 300.1</th> <th rowspan="2">Chlorine Dioxide</th> <th rowspan="2">Diquat EPA 549.2</th> <th rowspan="2">Enothall EPA 548.1</th> <th rowspan="2">Glyphosate EPA 547</th> <th rowspan="2">Haloacetic acids, total (HAA5) EPA</th> <th colspan="4">LAB USE ONLY</th> </tr> <tr> <th>Other</th> <th>Unpreserved</th> <th>NA2S2O3</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> </table>										Preserved Containers										Aldicarb / Carbofuran EPA 8318	Bromate/Chlorite EPA 300.1	Chlorine Dioxide	Diquat EPA 549.2	Enothall EPA 548.1	Glyphosate EPA 547	Haloacetic acids, total (HAA5) EPA	LAB USE ONLY				Other	Unpreserved	NA2S2O3							
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Other	Unpreserved	NA2S2O3																																														
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other	Unpreserved	NA2S2O3																																								
1	FL-TT-02	PS	4/18/2018 15:15	10427826001	Water	3	2	4						X	X	X	X	X	X	X																												
2																																																
3																																																
4																																																
5																																																
																Comments																																
Transfers	Released By	Date/Time	Received By	Date/Time																																												
1	<i>Jim York</i>	4/19/18 15:30	<i>Sheep Pace</i>	4/20/18 11:05																																												
2																																																
3																																																
Cooler Temperature on Receipt		2.1 °C	Custody Seal		X	or N		Received on Ice		X	or N		Samples Intact				X	or N																														

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

WO#: 35387603



35387603



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project # WO# : 35387603
Project Manager: PM: ADC **Due Date:** 05/01/18
Client: CLIENT: PACMIN

Date and Initials of person:
 Examining contents: _____
 Label: AKB
 Deliver: _____
 pH: _____

Thermometer Used: T338 Date: 4/20/18 Time: 1105 Initials: KBI

State of Origin: _____

- | | |
|---|--|
| Cooler #1 Temp. °C <u>2.1</u> (Visual) <u>0</u> (Correction Factor) <u>2.1</u> (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #2 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #3 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #4 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #5 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #6 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____
 Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9832 2460

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No Ice: Wet Blue Dry None

Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (If Yes, complete) Shorted Date: _____ Shorted Time: _____ Qty: _____

Comments:

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Preservation Information: Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	

Client Notification/ Resolution:
 Person Contacted: _____ Date/Time: _____

Comments/ Resolution (use back for additional comments):

Project Manager Review: Aaron Crump

Date: 04/20/18

SAMPLE RECEIVING / LOG-IN CHECKLIST



Client: <u>Pace</u>	Work Order #:
Receipt Record Page/Line #	

Recorded by (Initials/date): <u>WC 4.20.18</u>	<input checked="" type="checkbox"/> Cooler <input type="checkbox"/> Box <input type="checkbox"/> Other	Qty Received: <u>1</u>	<input checked="" type="checkbox"/> IR Gun (#202) <input type="checkbox"/> Digital Thermometer (#54) <input type="checkbox"/> IR Gun (#402)
---	--	---------------------------	---

Cooler #	Time	Cooler #	Time	Cooler #	Time	Cooler #	Time	
<u>Pace</u>	<u>10:15</u>							
Custody Seals: <input type="checkbox"/> None <input checked="" type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		
Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		
Coolant Location: <input checked="" type="checkbox"/> Dispersed <input type="checkbox"/> Top <input type="checkbox"/> Middle <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed <input type="checkbox"/> Top <input type="checkbox"/> Middle <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed <input type="checkbox"/> Top <input type="checkbox"/> Middle <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed <input type="checkbox"/> Top <input type="checkbox"/> Middle <input type="checkbox"/> Bottom		
Temp Blank Present: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		
If Present, Temperature Blank Location is: <input checked="" type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		
Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C	Actual °C
Temp Blank: <u>23</u>	-	<u>23</u>						
Sample 1: <u>40</u>	-	<u>40</u>						
Sample 2: <u>28</u>	-	<u>28</u>						
Sample 3: <u>3.7</u>	-	<u>3.7</u>						
When above 6 °C take a 3 Sample Average °C:			When above 6 °C take a 3 Sample Average °C:			When above 6 °C take a 3 Sample Average °C:		
<input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> VOC Trip Blank received?		

If any shaded areas checked, complete Sample Receiving Non-Conformance

<p>Paperwork Received</p> <p>Yes No</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> Chain of Custody record(s)? If No, Initiated By _____</p> <p><input checked="" type="checkbox"/> Received for Lab Signed/Date/Time?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> USDA Soil Documents?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> Sampling / Field Forms?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> Other _____</p> <p>COC Information</p> <p><input checked="" type="checkbox"/> Pace COC <input type="checkbox"/> Other _____</p> <p>COC ID Numbers:</p>	<p>Check Sample Preservation</p> <p>N/A Yes No</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Temperature Blank OR average sample temperature, ≥6° C?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> If "Yes" was thermal preservation required?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> If "Yes" were ALL samples collected the same day as receipt?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Completed Sample Preservation Verification Form?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Samples chemically preserved correctly?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> If "No", add wire tag and fill out Non-Conformance Form?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Received unpreserved TerraCore kit?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> If "Yes" unpreserved vials must be frozen</p>
<p>Check COC for Accuracy</p> <p>Yes No</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> Analysis Requested?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> Sample ID matches COC?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> Sample Date and Time matches COC?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> All containers indicated are received?</p>	<p>Work Order Not Logged In with Short Hold / Rush</p> <p><input type="checkbox"/> Copies of COC To Lab Areas</p>
<p>Sample Condition Summary</p> <p>N/A Yes No</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> Broken containers/lids?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> Missing or incomplete labels?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> Illegible information on labels?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> Low volume received?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> Inappropriate or non-Pace containers received?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> VOC vials have headspace?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> Extra sample locations?</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> Containers not listed on COC?</p>	<p>Notes</p> <p>Yes No</p> <p><input type="checkbox"/> <input type="checkbox"/> Were all samples logged into Epic?</p> <p><input type="checkbox"/> <input type="checkbox"/> Were all samples labelled?</p> <p><input type="checkbox"/> <input type="checkbox"/> Were samples placed on scan locations?</p>
<p>Initial / Date :</p>	



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50194900

Date/Time and Initials of person examining contents: JH 4-20-18 451

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 2530

Custody Seal on Cooler/Box Present: Yes No **Seals Intact:** Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F **Ice Type:** Wet Blue None | **Samples collected today and on ice:** Yes No N/A

Cooler Temperature: 2/2/2/5 **Ice Visible in Sample Containers?:** Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C **If temp. is Over 6°C or under 0°C, was the PM Notified?:** Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		X	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			X
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		X	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			X
Chain of Custody Present:	X		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	X		Dissolved Metals field filtered?:			X
Short Hold Time Analysis (<72hr)?: Analysis:		X	Headspace Wisconsin Sulfide			
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			X
Rush TAT Requested:		X	Headspace in VOA Vials (>6mm):			X
Containers Intact?:	X		Trip Blank Present?:		X	
Sample Labels Match COC?: Except TCs, which only require sample ID	X		Trip Blank Custody Seals?:		X	

Comments:

Sample Container Count

WO#: 50194900



50194900

CLIENT: Pace MN

COC PAGE ___ of ___

COC ID# _____

Project # 50194900

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	Bulk Kit	Matrix SI/ (Soil/Wat Aqueous	pH <2	pH >9	pH >12			
																		R							
1																		R	VG9H 3	wt					
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
VGGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
VGGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
VGGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				


Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427826 Workorder Name: 18-00383 MPCA-Freeway LF Water Owner Received Date: 4/18/2018 Results Requested By: 5/3/2018

Report To		Subcontract To		Requested Analysis										
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600		<div style="text-align: right; font-size: 24pt; font-weight: bold;">WO# : 30250246</div>  <div style="text-align: right; font-weight: bold;">30250246</div>										
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Gross Alpha/Beta	Radium 226	Radium 228	Radium, total	LAB USE ONLY
						HNO3								
1	FL-TT-02	PS	4/18/2018 15:15	10427826001	Water	3				X	X	X	X	001
2														
3														
4														
5														
Transfers										Comments				
Released By	Date/Time	Received By	Date/Time											
<i>Wingfield</i>	<i>4/19/18 15:35</i>	<i>POC</i>	<i>4/20/18 12:15</i>											
Cooler Temperature on Receipt <u> </u> °C Custody Seal Y or <u>N</u> Received on Ice Y or <u>N</u> Samples Intact <u>Y</u> or N														

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt

30250246

Pace Analytical

Client Name: Pace MN

Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 3470

Label	<u>DS</u>
LIMS Login	<u>BSH</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used NA Type of Ice: Wet Blue None

Cooler Temperature _____ Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C
Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>DS 4-20-18</u>
	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:	/			4.
Sample Labels match COC:	/			5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):	/			7.
Rush Turn Around Time Requested:	/			8.
Sufficient Volume:	/			9.
Correct Containers Used:	/			10.
-Pace Containers Used:	/			
Containers Intact:	/			11.
Orthophosphate field filtered			/	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.
Organic Samples checked for dechlorination:			/	14.
Filtered volume received for Dissolved tests			/	15.
All containers have been checked for preservation.	/			16.
All containers needing preservation are found to be in compliance with EPA recommendation.	/			<u>pH < 2</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>BSH</u> Date/time of preservation: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):			/	17.
Trip Blank Present:	/			18.
Trip Blank Custody Seals Present	/			
Rad Aqueous Samples Screened > 0.5 mrem/hr	/			Initial when completed: <u>BSH</u> Date: <u>4-20-18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

May 03, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414

RE: 18-00383 MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/20/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kari-Ann Killian For Jessica Esser
Project Manager

Certification List

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



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1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427826
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FL-TT-02 (10427826001)	A181622-01	Water	04/18/2018	04/20/2018

CASE NARRATIVE

Sample Receipt Information:

1 sample was received on 04/20/2018. Sample was received at 2.3 degrees Celsius. Sample was received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Sample Preparation:

Sample A181622-01 had to be run at a dilution factor of 1:2 for the MDA List 1 analysis, due to the sample matrix. The reporting limits have been raised accordingly and the sample is reported to the limit of detection.

Continuing Calibration Verification (CCV):

The LC footnote on sample A181622-01 states that there was a low CCV recovery for prometon. The lower control limit is 80% and the lowest recovery was 79.4%.

Surrogates:

The S qualifier on sample A181622-01 indicates that the triphenyl phosphate surrogate recovery was above acceptance criteria. Since the recovery was high and the sample was a non-detect for the associated analysis, data is deemed acceptable.

Matrix Spike / Matrix Spike Duplicates (MS/MSDs):

The M and M1 qualifier on chlorpyrifos and metolachlor for batch A804174 indicates a MS/MSD quality control exceedance. This failure could indicate an issue with sample heterogeneity. The parent sample for this quality control exceedance was not from this work order.



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 Project Number: 10427826
 Project Manager: Jennifer Anderson

FL-TT-02 (10427826001)

Date Sampled

A181622-01 (Water)

04/18/2018 15:15

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804174

Acetochlor	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Alachlor	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Atrazine	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Chlorpyrifos	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Cyanazine	ND	0.40	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Desethylatrazine	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Deisopropylatrazine	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Dimethenamid	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
EPTC	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Ethalfuralin	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Fonofos	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Metolachlor	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Metribuzin	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Pendimethalin	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Phorate	ND	0.60	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Prometon	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	LC
Propachlor	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Propazine	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Simazine	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Terbufos	ND	0.40	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Triallate	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Trifluralin	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Surrogate: Atrazine-d5		77.4 %		65.1-122	04/20/2018	04/30/2018 17:45	EPA 8270D	
Surrogate: Parathion-d10		126 %		22.3-159	04/20/2018	04/30/2018 17:45	EPA 8270D	
Surrogate: Triphenyl phosphate		826 %		65.2-151	04/20/2018	04/30/2018 17:45	EPA 8270D	S

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804192

2,4-D	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:37	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:37	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:37	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:37	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:37	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:37	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/24/2018	04/24/2018 23:37	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:37	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:37	EPA 8151A	
Surrogate: 2,4-D-d5		85.8 %		44.2-121	04/24/2018	04/24/2018 23:37	EPA 8151A	



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Project Number: 10427826
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804174 - EPA 3510C

Blank (A804174-BLK1)

Prepared: 04/20/2018 Analyzed: 04/30/2018 16:21

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>92.4</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>83.0</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.557</i>		<i>ug/L</i>	<i>0.5000</i>		<i>111</i>	<i>65.2-151</i>			

LCS (A804174-BS1)

Prepared: 04/20/2018 Analyzed: 04/28/2018 15:32

Acetochlor	1.02	0.50	ug/L	1.000		102	67.5-120			
Alachlor	1.05	0.50	ug/L	1.000		105	71.7-120			
Atrazine	0.998	0.50	ug/L	1.000		99.8	72.8-113			
Chlorpyrifos	1.03	0.50	ug/L	1.000		103	65.3-119			
Cyanazine	1.19	0.20	ug/L	1.000		119	49.5-140			
Desethylatrazine	1.04	0.50	ug/L	1.000		104	66.9-116			
Deisopropylatrazine	0.849	0.50	ug/L	1.000		84.9	44.3-110			
Dimethenamid	1.05	0.50	ug/L	1.000		105	63.8-116			
EPTC	0.850	0.50	ug/L	1.000		85.0	41.7-102			
Ethalfuralin	0.769	0.50	ug/L	1.000		76.9	41-127			
Fonofos	0.917	0.50	ug/L	1.000		91.7	59.7-118			
Metolachlor	1.09	0.50	ug/L	1.000		109	71.7-122			
Metribuzin	1.02	0.50	ug/L	1.000		102	66.6-128			
Pendimethalin	1.03	0.50	ug/L	1.000		103	55.5-137			
Phorate	0.855	0.30	ug/L	1.000		85.5	41.2-114			
Prometon	1.07	0.50	ug/L	1.000		107	66.3-120			
Propachlor	0.998	0.50	ug/L	1.000		99.8	65.8-119			



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Project Number: 10427826
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804174 - EPA 3510C

LCS (A804174-BS1)

Prepared: 04/20/2018 Analyzed: 04/28/2018 15:32

Propazine	1.05	0.50	ug/L	1.000		105	72-122			
Simazine	1.03	0.50	ug/L	1.000		103	72.8-113			
Terbufos	0.828	0.20	ug/L	1.000		82.8	38.6-115			
Triallate	0.899	0.50	ug/L	1.000		89.9	51.4-116			
Trifluralin	0.839	0.50	ug/L	1.000		83.9	46.1-134			
Surrogate: Atrazine-d5	0.482		ug/L	0.5000		96.3	65.1-122			
Surrogate: Parathion-d10	0.534		ug/L	0.5000		107	22.3-159			
Surrogate: Triphenyl phosphate	0.581		ug/L	0.5000		116	65.2-151			

Matrix Spike (A804174-MS1)

Source: A181619-03

Prepared: 04/20/2018 Analyzed: 05/01/2018 16:48

Acetochlor	2.09	0.50	ug/L	1.000	1.07	102	67.3-128			
Alachlor	1.23	0.50	ug/L	1.000	0.277	95.7	58.2-150			
Atrazine	1.95	0.50	ug/L	1.000	0.910	104	70.1-120			
Chlorpyrifos	1.21	0.50	ug/L	1.000	ND	121	73.3-118			M
Cyanazine	1.28	0.20	ug/L	1.000	ND	128	60.6-140			
Desethylatrazine	1.14	0.50	ug/L	1.000	ND	114	69.7-122			
Deisopropylatrazine	1.03	0.50	ug/L	1.000	ND	103	48-121			
Dimethenamid	3.43	0.50	ug/L	1.000	2.24	119	63.7-123			
EPTC	0.962	0.50	ug/L	1.000	0.103	85.8	58-109			
Ethalfluralin	0.903	0.50	ug/L	1.000	ND	90.3	59.3-129			
Fonofos	0.925	0.50	ug/L	1.000	ND	92.5	73.5-108			
Metolachlor	50.9	5.0	ug/L	1.000	58.9	NR	40.9-156			M1, D
Metribuzin	1.10	0.50	ug/L	1.000	ND	110	70.9-136			
Pendimethalin	1.18	0.50	ug/L	1.000	ND	118	55.4-155			
Phorate	0.988	0.30	ug/L	1.000	ND	98.8	60.2-108			
Prometon	1.13	0.50	ug/L	1.000	ND	113	74.7-124			
Propachlor	1.01	0.50	ug/L	1.000	ND	101	72.3-115			
Propazine	1.11	0.50	ug/L	1.000	ND	111	73.7-124			
Simazine	1.03	0.50	ug/L	1.000	ND	103	74.8-114			
Terbufos	0.932	0.20	ug/L	1.000	ND	93.2	56.1-114			
Triallate	0.986	0.50	ug/L	1.000	ND	98.6	65.5-107			
Trifluralin	0.948	0.50	ug/L	1.000	ND	94.8	58-149			
Surrogate: Atrazine-d5	0.449		ug/L	0.5000		89.8	65.1-122			
Surrogate: Parathion-d10	0.533		ug/L	0.5000		107	22.3-159			
Surrogate: Triphenyl phosphate	0.636		ug/L	0.5000		127	65.2-151			

Matrix Spike Dup (A804174-MSD1)

Source: A181619-03

Prepared: 04/20/2018 Analyzed: 05/01/2018 17:16

Acetochlor	2.09	0.50	ug/L	1.031	1.07	99.0	67.3-128	0.180	20	
Alachlor	1.28	0.50	ug/L	1.031	0.277	97.5	58.2-150	3.85	20	
Atrazine	1.82	0.50	ug/L	1.031	0.910	88.5	70.1-120	6.56	20	
Chlorpyrifos	1.23	0.50	ug/L	1.031	ND	119	73.3-118	1.49	20	M
Cyanazine	1.39	0.20	ug/L	1.031	ND	135	60.6-140	8.46	20	
Desethylatrazine	1.22	0.50	ug/L	1.031	ND	118	69.7-122	6.69	20	
Deisopropylatrazine	1.05	0.50	ug/L	1.031	ND	102	48-121	2.03	20	



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Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804174 - EPA 3510C

Matrix Spike Dup (A804174-MSD1)	Source: A181619-03			Prepared: 04/20/2018 Analyzed: 05/01/2018 17:16						
Dimethenamid	3.45	0.50	ug/L	1.031	2.24	117	63.7-123	0.391	20	
EPTC	0.954	0.50	ug/L	1.031	0.103	82.5	58-109	0.808	20	
Ethalfuralin	0.903	0.50	ug/L	1.031	ND	87.6	59.3-129	0.00355	20	
Fonofos	0.926	0.50	ug/L	1.031	ND	89.8	73.5-108	0.0398	20	
Metolachlor	51.9	5.0	ug/L	1.031	58.9	NR	40.9-156	1.98	20	M1, D
Metribuzin	1.14	0.50	ug/L	1.031	ND	111	70.9-136	3.58	20	
Pendimethalin	1.27	0.50	ug/L	1.031	ND	123	55.4-155	7.17	20	
Phorate	1.00	0.30	ug/L	1.031	ND	97.4	60.2-108	1.56	20	
Prometon	1.19	0.50	ug/L	1.031	ND	116	74.7-124	5.59	20	
Propachlor	1.04	0.50	ug/L	1.031	ND	101	72.3-115	3.66	20	
Propazine	1.08	0.50	ug/L	1.031	ND	105	73.7-124	2.72	20	
Simazine	1.11	0.50	ug/L	1.031	ND	107	74.8-114	7.16	20	
Terbufos	0.936	0.20	ug/L	1.031	ND	90.8	56.1-114	0.443	20	
Triallate	0.967	0.50	ug/L	1.031	ND	93.8	65.5-107	1.99	20	
Trifluralin	0.968	0.50	ug/L	1.031	ND	93.9	58-149	2.05	20	
<i>Surrogate: Atrazine-d5</i>	<i>0.494</i>		<i>ug/L</i>	<i>0.5155</i>		<i>95.7</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.579</i>		<i>ug/L</i>	<i>0.5155</i>		<i>112</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.647</i>		<i>ug/L</i>	<i>0.5155</i>		<i>126</i>	<i>65.2-151</i>			



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Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804192 - EPA 3510C

Blank (A804192-BLK1)

Prepared: 04/24/2018 Analyzed: 04/25/2018 07:56

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							

Surrogate: 2,4-D-d5

2.11 ug/L 2.016 105 44.2-121

LCS (A804192-BS1)

Prepared: 04/24/2018 Analyzed: 04/25/2018 04:58

2,4-D	1.70	0.50	ug/L	2.000		84.9	64.6-148			
2,4-DB	1.79	0.50	ug/L	2.000		89.7	66.7-143			
2,4,5-T	1.58	0.50	ug/L	2.000		79.1	63.4-133			
2,4,5-TP (Silvex)	1.69	0.50	ug/L	2.000		84.7	63-145			
Bentazon	0.901	0.50	ug/L	1.000		90.1	52.5-139			
Dicamba	1.54	0.50	ug/L	2.000		77.2	55.4-143			
MCPA	1.59	0.30	ug/L	2.000		79.7	33.5-143			
Picloram	0.849	0.50	ug/L	1.000		84.9	47.9-113			
Triclopyr	1.79	0.50	ug/L	2.000		89.7	65.1-141			

Surrogate: 2,4-D-d5

1.66 ug/L 2.016 82.4 44.2-121

LCS Dup (A804192-BSD1)

Prepared: 04/24/2018 Analyzed: 04/25/2018 11:48

2,4-D	1.76	0.50	ug/L	2.000		87.9	64.6-148	3.43	20	
2,4-DB	1.76	0.50	ug/L	2.000		88.1	66.7-143	1.81	20	
2,4,5-T	1.49	0.50	ug/L	2.000		74.4	63.4-133	6.16	20	
2,4,5-TP (Silvex)	1.73	0.50	ug/L	2.000		86.6	63-145	2.29	20	
Bentazon	0.811	0.50	ug/L	1.000		81.1	52.5-139	10.5	20	
Dicamba	1.63	0.50	ug/L	2.000		81.6	55.4-143	5.55	20	
MCPA	1.58	0.30	ug/L	2.000		79.2	33.5-143	0.648	20	
Picloram	0.712	0.50	ug/L	1.000		71.2	47.9-113	17.5	20	
Triclopyr	1.51	0.50	ug/L	2.000		75.4	65.1-141	17.3	20	

Surrogate: 2,4-D-d5

1.77 ug/L 2.016 87.7 44.2-121



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Notes and Definitions

- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- M1 Spike recoveries were not evaluated because of elevated levels of the spiked analyte in the parent sample.
- M The matrix spike and/or matrix spike duplicate recovery was outside of the laboratory control limits.
- LC Results may be biased low because of low continuing calibration verification (CCV).
- D Data reported from a dilution
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Chain of Custody

A181622



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427826 Workorder Name: 18-00383 MPCA-Freeway LF Water Owner Received Date: 4/18/2018 Results Requested By: 5/3/2018

Report To				Subcontract To				Requested Analysis											
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451				Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700				Herbicides MDA List II Pesticides MDA List I (8270 pest)											

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Herbicides MDA List II	Pesticides MDA List I (8270 pest)	LAB USE ONLY
						Unpreserved							
1	FL-TT-02	PS	4/18/2018 15:15	10427826001	Water	2					X	X	01
2													
3													
4													
5													

Transfers					Released By		Date/Time	Received By		Date/Time	Comments
1					<i>[Signature]</i>		4/19/18 1620	<i>[Signature]</i>	4/20/18		
2									10:08		
3											

Cooler Temperature on Receipt 2.3 °C Custody Seal (Y) or N Received on Ice (Y) or N Samples Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274 exp 7/12/18

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

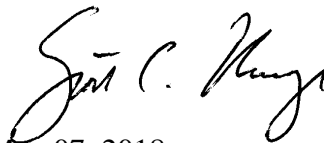
PaceProject#: 10427828
Sample Receipt Date: 04/18/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



May 07, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

May 7, 2018

DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of PACE Minnesota Field. The sample was analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration points and a nominal 1-liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The sample was received above the recommended temperature range of 0-6 degrees Celsius.

The isotopically-labeled TCDD internal standard in the sample extract was recovered at 81%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 102-107% with a relative percent difference of 4.8%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE	MN002
Arkansas	88-0680	New York (NEL	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10427828

Appendix A

Sample Management

WO# 10427828



10427828

Report No.....10427828_1613TCDD_DFR

Chain-of-Custody Form

Work Order Number:

COC Type:

Page: 1 of

Turnaround Time:

COC ID:

FOR LAB USE ONLY

Minnesota Pollution Control Agency

PROJECT/CLIENT INFO

LABORATORY

Facility Code: MPLA - Free way LF water

Program Code (MDH Lab Only):

Lab Name:

Project Name: MPLA - Free way LF water

Project Task Code:

Address:

18-00383
EPIC Profile #38716

Project Manager:

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample=Routine Sample
S-VP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
NWP=Non-potable Water
SD=Soil/Solid
WP=Wipe

AR=Air
BL=Biological Material
OT=Other
TS=Tissue

FIELD MATRIX CODES

Wt-Ground=Groundwater
Wt-Surf=Surface Water
QC-BLANK=Artificial Blank Water
Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, feet	End Depth, feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Coats	ANALYSIS	Lab Sample No.	#	
FL-TT-02	S	4/18/18	15:15:10		10.5	G	NW	Wt-Ground			41	LIST A X	LIST B/C X	001	1
															2
															3
															4
															5
															6
															7
															8
															9
															10

NW
4/18/18

Sampled By: Nate Hubbard

Sampler's Signature: Nate Hubbard

Phone #: 612-214-8066

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
(Sampler) Nate Hubbard / Pace	4/18/18 1730	W. Pace	4/18/18 1730

1730
T=5.6
6.2

Sample Condition Upon Receipt

Client Name: MPCA

Project #:

WO# : 10427828
 PH: SC/1 Due Date: 05/03/18
 CLIENT PARI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 G87A9155100842
 Used: 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 5.4, 6.0 Cooler Temp Corrected (°C): 5.6, 6.2 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: MD 4/19/18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	12. <u>No time on sample</u>
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N Sample # Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Pace Trip Blank Lot # (if purchased): _____	15.

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: Received during cool down phase.

Project Manager Review:

[Signature]

Date: 04/19/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10427828

Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-02		
Lab Sample ID	10427828001		
Filename	U180504B_12		
Injected By	BAL		
Total Amount Extracted	520 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	04/18/2018 15:15
ICAL ID	U180405	Received	04/18/2018 17:30
CCal Filename(s)	U180504A_16	Extracted	04/19/2018 15:10
Method Blank ID	BLANK-61838	Analyzed	05/05/2018 02:42

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	81
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	78

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61838	Matrix	Water
Filename	U180423B_07	Dilution	NA
Total Amount Extracted	1010 mL	Extracted	04/19/2018 15:10
ICAL ID	U180405	Analyzed	04/23/2018 16:10
CCal Filename(s)	U180423B_01	Injected By	SMT

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	64

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61839	Matrix	Water
Filename	U180423B_13	Dilution	NA
Total Amount Extracted	969 mL	Extracted	04/19/2018 15:10
ICAL ID	U180405	Analyzed	04/23/2018 20:58
CCal Filename	U180423B_01	Injected By	SMT
Method Blank ID	BLANK-61838		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	10	7.3	14.6	102
2,3,7,8-TCDD-37Cl4	10	6.4	3.7	15.8	64
2,3,7,8-TCDD-13C	100	63	25.0	141.0	63

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61840	Matrix	Water
Filename	U180423B_14	Dilution	NA
Total Amount Extracted	1020 mL	Extracted	04/19/2018 15:10
ICAL ID	U180405	Analyzed	04/23/2018 21:46
CCal Filename	U180423B_01	Injected By	SMT
Method Blank ID	BLANK-61838		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	11	7.3	14.6	107
2,3,7,8-TCDD-37Cl4	10	8.1	3.7	15.8	81
2,3,7,8-TCDD-13C	100	80	25.0	141.0	80

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61839
 Spike 1 Filename U180423B_13

Spike 2 ID LCSD-61840
 Spike 2 Filename U180423B_14

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	102	107	4.8

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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May 17, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 20, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
California Certification #2973
Alaska Certification UST-107
Montana Certificate #CERT0103
California Certification #2973
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad

Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Pennsylvania Certification IDs

KY WW Permit #: KY0098221	Ohio EPA Rad Approval: #41249
KY WW Permit #: KY0000221	Oregon/TNI Certification #: PA200002-010
Louisiana DHH/TNI Certification #: LA180012	Pennsylvania/TNI Certification #: 65-00282
Louisiana DEQ/TNI Certification #: 4086	Puerto Rico Certification #: PA01457
Maine Certification #: 2017020	Rhode Island Certification #: 65-00282
Maryland Certification #: 308	South Dakota Certification
Massachusetts Certification #: M-PA1457	Tennessee Certification #: 02867
Michigan/PADEP Certification #: 9991	Texas/TNI Certification #: T104704188-17-3
Missouri Certification #: 235	Utah/TNI Certification #: PA014572017-9
Montana Certification #: Cert0082	USDA Soil Permit #: P330-17-00091
Nebraska Certification #: NE-OS-29-14	Vermont Dept. of Health: ID# VT-0282
Nevada Certification #: PA014572018-1	Virgin Island/PADEP Certification
New Hampshire/TNI Certification #: 297617	Virginia/VELAP Certification #: 9526
New Jersey/TNI Certification #: PA051	Washington Certification #: C868
New Mexico Certification #: PA01457	West Virginia DEP Certification #: 143
New York/TNI Certification #: 10888	West Virginia DHHR Certification #: 9964C
North Carolina Certification #: 42706	Wisconsin Approve List for Rad
North Dakota Certification #: R-190	Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174	Nebraska Certification: NE-OS-28-14
Alabama Certification #: 41320	Nevada Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216	New Hampshire Certification #: 2958
Delaware Certification: FL NELAC Reciprocity	New Jersey Certification #: FL022
Florida Certification #: E83079	New York Certification #: 11608
Georgia Certification #: 955	North Carolina Environmental Certificate #: 667
Guam Certification: FL NELAC Reciprocity	North Carolina Certification #: 12710
Hawaii Certification: FL NELAC Reciprocity	Oklahoma Certification #: D9947
Illinois Certification #: 200068	Pennsylvania Certification #: 68-00547
Indiana Certification: FL NELAC Reciprocity	Puerto Rico Certification #: FL01264
Kansas Certification #: E-10383	South Carolina Certification: #96042001
Kentucky Certification #: 90050	Tennessee Certification #: TN02974
Louisiana Certification #: FL NELAC Reciprocity	Texas Certification: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007	US Virgin Islands Certification: FL NELAC Reciprocity
Maryland Certification: #346	Virginia Environmental Certification #: 460165
Michigan Certification #: 9911	Wyoming Certification: FL NELAC Reciprocity
Mississippi Certification: FL NELAC Reciprocity	West Virginia Certification #: 9962C
Missouri Certification #: 236	Wisconsin Certification #: 399079670
Montana Certification #: Cert 0074	Wyoming (EPA Region 8): FL NELAC Reciprocity

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512	New York State Department of Health, Serial #57971 and 57972
Minnesota Department of Health, Certificate #1385941	North Carolina Division of Water Resources, Certificate #659
Arkansas Department of Environmental Quality, Certificate #17-046-0	Virginia Department of General Services, Certificate #9028
Georgia Environmental Protection Division, Stipulation	Wisconsin Department of Natural Resources, Laboratory #999472650
Illinois Environmental Protection Agency, Certificate #004325	U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278
Michigan Department of Environmental Quality, Laboratory #0034	

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10428032001	FL-TT-03	Water	04/19/18 09:30	04/20/18 08:30
10428032002	FL-TT-04	Water	04/19/18 13:00	04/20/18 08:30
10428032003	FL-TT-05	Water	04/19/18 15:45	04/20/18 08:30
10428032004	FL-TT-07	Water	04/19/18 18:03	04/20/18 08:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10428032001	FL-TT-03	EPA 531.1	WFH	3	PASI-O
		EPA 547	AC1	1	PASI-O
		EPA 549.2	AC1	2	PASI-O
		EPA 552.3	MMB	7	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	8	PASI-M
		EPA 200.8	RJS	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 548.1	LAJ	1	PASI-O
		EPA 8270D	AT1	72	PASI-M
		EPA 524.2	AEZ	4	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NJV	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-ClO2	AGS	1	PASI-O
		SM 4500-H+B	KEO	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	AR3, KEO	2	PASI-M
		EPA 300.1	CMB	1	PASI-O
		EPA 300.1	CMD	1	PASI-O
SM 3500-Cr B Modified	JFP	1	PASI-M		
EPA 350.1	CLJ	1	PASI-V		
EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
EPA 353.2	JFP	3	PASI-M		

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10428032002	FL-TT-04	EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M
		EPA 547	AC1	1	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	8	PASI-M
		EPA 200.8	RJS	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 524.2	AEZ	4	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NEG	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-CIO2	AGS	1	PASI-O
		SM 4500-H+B	KEO	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	AR3, KEO	2	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
EPA 353.2	JFP	3	PASI-M		
EPA 9016	AMM	1	PASI-GRMI		
SM 4500-CN-E	DCL	1	PASI-M		
SM 4500-P E	DCL	1	PASI-M		

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10428032003	FL-TT-05	EPA 531.1	WFH	3	PASI-O
		EPA 547	AC1	1	PASI-O
		EPA 549.2	AC1	2	PASI-O
		EPA 552.3	MMB	7	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	8	PASI-M
		EPA 200.8	RJS	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 548.1	LAJ	1	PASI-O
		EPA 8270D	AT1	72	PASI-M
		EPA 524.2	AEZ	4	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NEG	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-CIO2	AGS	1	PASI-O
		SM 4500-H+B	KEO	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	AR3, KEO	2	PASI-M
		EPA 300.1	CMB	1	PASI-O
		EPA 300.1	CMD	1	PASI-O
SM 3500-Cr B Modified	JFP	1	PASI-M		
EPA 350.1	CLJ	1	PASI-V		
EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
EPA 353.2	JFP	3	PASI-M		

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10428032004	FL-TT-07	EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M
		EPA 547	AC1	1	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	8	PASI-M
		EPA 200.8	RJS	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 548.1	LAJ	1	PASI-O
		EPA 8270D	AT1	72	PASI-M
		EPA 524.2	AEZ	4	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NEG	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-CIO2	AGS	1	PASI-O
		SM 4500-H+B	KEO	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	AR3, KEO	2	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
EPA 350.1	CLJ	1	PASI-V		
EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
EPA 353.2	JFP	3	PASI-M		
EPA 9016	AMM	1	PASI-GRMI		
SM 4500-CN-E	DCL	1	PASI-M		

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 4500-P E	DCL	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-03	Lab ID: 10428032001	Collected: 04/19/18 09:30	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data								
Analytical Method:								
Field pH	5.6		0.10	1		04/19/18 09:30		
Field Temperature	9.5		0.50	1		04/19/18 09:30		
531.1 HPLC Carbamates								
Analytical Method: EPA 531.1								
Aldicarb	ND	ug/L	2.0	1		05/09/18 23:00	116-06-3	
Carbofuran	ND	ug/L	2.0	1		05/09/18 23:00	1563-66-2	
Surrogates								
BDMC (S)	94	%	80-120	1		05/09/18 23:00		
547 HPLC Glyphosate								
Analytical Method: EPA 547								
Glyphosate	ND	ug/L	6.0	1		05/01/18 04:47		
549.2 HPLC Paraquat Diquat								
Analytical Method: EPA 549.2 Preparation Method: EPA 549.2								
Diquat	ND	ug/L	0.40	1	04/24/18 23:10	04/25/18 14:33	85-00-7	
Paraquat	ND	ug/L	0.40	1	04/24/18 23:10	04/25/18 14:33	1910-42-5	
552.3 Haloacetic Acids								
Analytical Method: EPA 552.3 Preparation Method: EPA 552.3								
Dibromoacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:14	631-64-1	
Dichloroacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:14	79-43-6	
Haloacetic Acids (Total)	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:14		
Monobromoacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:14	79-08-3	
Monochloroacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:14	79-11-8	
Trichloroacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:14	76-03-9	
Surrogates								
2,3-Dibromopropanoic Acid (S)	122	%	70-130	1	04/29/18 11:44	05/01/18 16:14	600-05-5	
8011 GCS EDB and DBCP								
Analytical Method: EPA 8011 Preparation Method: EPA 8011								
1,2-Dibromo-3-chloropropane	ND	ug/L	0.0098	1	04/24/18 14:16	04/25/18 01:57	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.0098	1	04/24/18 14:16	04/25/18 01:57	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	114	%.	30-150	1	04/24/18 14:16	04/25/18 01:57	460-00-4	
8015M Alcohols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	mg/L	5.0	1		04/25/18 14:45	67-56-1	
8015M Glycols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/27/18 15:39	107-21-1	
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	309-00-2	L2
alpha-BHC	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	319-84-6	
beta-BHC	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	319-85-7	
delta-BHC	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	58-89-9	
Chlordane (Technical)	ND	ug/L	2.9	5	04/20/18 13:40	04/25/18 23:52	57-74-9	
alpha-Chlordane	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	5103-71-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-03	Lab ID: 10428032001	Collected: 04/19/18 09:30	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
gamma-Chlordane	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	5103-74-2	
4,4'-DDD	ND	ug/L	0.57	5	04/20/18 13:40	04/25/18 23:52	72-54-8	
4,4'-DDE	ND	ug/L	0.57	5	04/20/18 13:40	04/25/18 23:52	72-55-9	
4,4'-DDT	ND	ug/L	0.57	5	04/20/18 13:40	04/25/18 23:52	50-29-3	
Dieldrin	ND	ug/L	0.57	5	04/20/18 13:40	04/25/18 23:52	60-57-1	
Endosulfan I	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	959-98-8	
Endosulfan II	ND	ug/L	0.57	5	04/20/18 13:40	04/25/18 23:52	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.57	5	04/20/18 13:40	04/25/18 23:52	1031-07-8	
Endrin	ND	ug/L	0.57	5	04/20/18 13:40	04/25/18 23:52	72-20-8	
Endrin aldehyde	ND	ug/L	0.57	5	04/20/18 13:40	04/25/18 23:52	7421-93-4	
Endrin ketone	ND	ug/L	0.57	5	04/20/18 13:40	04/25/18 23:52	53494-70-5	
Heptachlor	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	76-44-8	
Heptachlor epoxide	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	1024-57-3	
Methoxychlor	ND	ug/L	2.9	5	04/20/18 13:40	04/25/18 23:52	72-43-5	
Toxaphene	ND	ug/L	8.6	5	04/20/18 13:40	04/25/18 23:52	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	81	%.	62-125	5	04/20/18 13:40	04/25/18 23:52	877-09-8	2M, D3
Decachlorobiphenyl (S)	50	%.	30-143	5	04/20/18 13:40	04/25/18 23:52	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.11	1	04/20/18 13:39	04/23/18 15:27	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.11	1	04/20/18 13:39	04/23/18 15:27	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.11	1	04/20/18 13:39	04/23/18 15:27	11141-16-5	
PCB-1242 (Aroclor 1242)	2.0	ug/L	0.11	1	04/20/18 13:39	04/23/18 15:27	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.11	1	04/20/18 13:39	04/23/18 15:27	12672-29-6	
PCB-1254 (Aroclor 1254)	0.18	ug/L	0.11	1	04/20/18 13:39	04/23/18 15:27	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.11	1	04/20/18 13:39	04/23/18 15:27	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.11	1	04/20/18 13:39	04/23/18 15:27	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.11	1	04/20/18 13:39	04/23/18 15:27	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	57	%.	30-125	1	04/20/18 13:39	04/23/18 15:27	877-09-8	
Decachlorobiphenyl (S)	57	%.	30-125	1	04/20/18 13:39	04/23/18 15:27	2051-24-3	CH
8315A GCSV Aldehydes								
Analytical Method: EPA 8315A Preparation Method: EPA 8315A								
Formaldehyde	ND	ug/L	100	1	04/24/18 10:57	04/26/18 13:13	50-00-0	H3
8316 W GCSV Acrylamide								
Analytical Method: EPA 8316								
Acrylamide	ND	ug/L	20.0	1		04/24/18 12:01	79-06-1	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	04/23/18 14:49	04/25/18 18:05	7429-90-5	
Barium, Dissolved	333	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:05	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:05	7440-50-8	
Manganese, Dissolved	1120	ug/L	5.0	1	04/23/18 14:49	04/25/18 18:05	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:05	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:05	7440-22-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-03		Lab ID: 10428032001	Collected: 04/19/18 09:30	Received: 04/20/18 08:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Tin, Dissolved	ND	ug/L	75.0	1	04/23/18 14:49	04/25/18 18:05	7440-31-5	
Zinc, Dissolved	28.3	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:05	7440-66-6	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Chromium	4.4	ug/L	2.5	5	04/23/18 10:35	04/24/18 20:04	7440-47-3	
Total Hardness by 2340B	411000	ug/L	1410	10	04/23/18 10:35	04/25/18 15:33		
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:53	7440-36-0	
Arsenic, Dissolved	1.8	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:53	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/23/18 14:28	04/24/18 20:53	7440-41-7	
Boron, Dissolved	295	ug/L	5.0	1	04/23/18 14:28	04/24/18 20:53	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/23/18 14:28	04/24/18 20:53	7440-43-9	
Chromium, Dissolved	1.2	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:53	7440-47-3	
Cobalt, Dissolved	1.7	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:53	7440-48-4	
Lead, Dissolved	0.56	ug/L	0.10	1	04/23/18 14:28	04/24/18 01:22	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:53	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/23/18 14:28	04/24/18 20:53	7440-28-0	
Uranium-238, Dissolved	0.69	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:53	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	04/23/18 14:28	04/24/18 20:53	7440-62-2	
245.1 Mercury, Dissolved		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:09	7439-97-6	
548.1 GCS Endothall		Analytical Method: EPA 548.1 Preparation Method: EPA 548.1						
Endothall	ND	ug/L	9.0	1	04/25/18 08:26	04/27/18 09:29		IO
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Phenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	108-95-2	
bis(2-Chloroethyl) ether	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	111-44-4	
2-Chlorophenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	95-57-8	
1,3-Dichlorobenzene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	106-46-7	
1,2-Dichlorobenzene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	95-50-1	
2-Methylphenol(o-Cresol)	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	95-48-7	
bis(2-Chloroisopropyl) ether	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	108-60-1	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	22.7	1	04/23/18 14:40	05/03/18 18:40		
N-Nitroso-di-n-propylamine	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	621-64-7	
Hexachloroethane	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	67-72-1	
Nitrobenzene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	98-95-3	
Isophorone	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	78-59-1	
2-Nitrophenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	88-75-5	
2,4-Dimethylphenol	ND	ug/L	56.8	1	04/23/18 14:40	05/03/18 18:40	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	111-91-1	
2,4-Dichlorophenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	120-82-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-03		Lab ID: 10428032001	Collected: 04/19/18 09:30	Received: 04/20/18 08:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Naphthalene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	91-20-3	
4-Chloroaniline	ND	ug/L	56.8	1	04/23/18 14:40	05/03/18 18:40	106-47-8	
Hexachloro-1,3-butadiene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	87-68-3	
4-Chloro-3-methylphenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	59-50-7	
2-Methylnaphthalene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	91-57-6	
2,4,6-Trichlorophenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	88-06-2	
2,4,5-Trichlorophenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	95-95-4	
2-Chloronaphthalene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	91-58-7	
2-Nitroaniline	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	88-74-4	
Dimethylphthalate	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	131-11-3	
Acenaphthylene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	208-96-8	
2,6-Dinitrotoluene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	606-20-2	
3-Nitroaniline	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	99-09-2	
Acenaphthene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	83-32-9	
2,4-Dinitrophenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	51-28-5	L2
4-Nitrophenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	100-02-7	
Dibenzofuran	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	132-64-9	
2,4-Dinitrotoluene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	121-14-2	
Diethylphthalate	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	84-66-2	
4-Chlorophenylphenyl ether	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	7005-72-3	
Fluorene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	86-73-7	
4-Nitroaniline	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	100-01-6	
4,6-Dinitro-2-methylphenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	534-52-1	L2
N-Nitrosodiphenylamine	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	86-30-6	
4-Bromophenylphenyl ether	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	101-55-3	
Hexachlorobenzene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	118-74-1	
Pentachlorophenol	ND	ug/L	22.7	1	04/23/18 14:40	05/03/18 18:40	87-86-5	
Phenanthrene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	85-01-8	
Anthracene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	120-12-7	
Di-n-butylphthalate	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	84-74-2	
Fluoranthene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	206-44-0	
Pyrene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	129-00-0	
Butylbenzylphthalate	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/L	56.8	1	04/23/18 14:40	05/03/18 18:40	91-94-1	
Benzo(a)anthracene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	56-55-3	
Chrysene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	218-01-9	
bis(2-Ethylhexyl)phthalate	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	117-81-7	
Di-n-octylphthalate	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	117-84-0	
Benzo(b)fluoranthene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	205-99-2	
Benzo(k)fluoranthene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	207-08-9	
Benzo(a)pyrene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	50-32-8	
Indeno(1,2,3-cd)pyrene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	193-39-5	
Dibenz(a,h)anthracene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	53-70-3	
Benzo(g,h,i)perylene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	191-24-2	
N-Nitrosodimethylamine	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	62-75-9	
1,2-Diphenylhydrazine	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	122-66-7	
Carbazole	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	86-74-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-03	Lab ID: 10428032001	Collected: 04/19/18 09:30	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
1-Methylnaphthalene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	90-12-0	
Surrogates								
Nitrobenzene-d5 (S)	77	%.	60-125	1	04/23/18 14:40	05/03/18 18:40	4165-60-0	
2-Fluorobiphenyl (S)	73	%.	56-125	1	04/23/18 14:40	05/03/18 18:40	321-60-8	
p-Terphenyl-d14 (S)	75	%.	58-125	1	04/23/18 14:40	05/03/18 18:40	1718-51-0	
Phenol-d6 (S)	77	%.	58-125	1	04/23/18 14:40	05/03/18 18:40	13127-88-3	
2-Fluorophenol (S)	74	%.	55-125	1	04/23/18 14:40	05/03/18 18:40	367-12-4	
2,4,6-Tribromophenol (S)	80	%.	65-125	1	04/23/18 14:40	05/03/18 18:40	118-79-6	
524.2 MSV								
Analytical Method: EPA 524.2								
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/24/18 15:06		
Surrogates								
4-Bromofluorobenzene (S)	98	%.	75-125	1		04/24/18 15:06	460-00-4	
Toluene-d8 (S)	95	%.	75-125	1		04/24/18 15:06	2037-26-5	
1,2-Dichloroethane-d4 (S)	97	%.	75-125	1		04/24/18 15:06	17060-07-0	
Field Data								
Analytical Method:								
Field pH	5.6	Std. Units		1		04/19/18 09:30		
Field Temperature	9.5	deg C		1		04/19/18 09:30		
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	11.2	mg/L	6.0	3	04/20/18 13:55	04/25/18 13:44		B4
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	5.4	1		05/02/18 11:26		
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	156	NTU	6.0	20		04/20/18 11:53		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	130	mg/L	10.0	1		04/25/18 13:32		
4500ClO2 Chlorine Dioxide								
Analytical Method: SM 4500-ClO2								
Chlorine Dioxide	0.83	mg/L	0.10	1		04/25/18 13:31		H6
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	6.8	Std. Units	0.10	1		04/27/18 11:26		H6
Trivalent Chromium Calculation								
Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	ND	mg/L	0.010	1		05/01/18 16:04		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	11.9	mg/L	1.2	1		04/26/18 07:55	16887-00-6	
Fluoride	0.077	mg/L	0.050	1		05/03/18 18:18	16984-48-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

Sample: FL-TT-03		Lab ID: 10428032001		Collected: 04/19/18 09:30	Received: 04/20/18 08:30	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.1 Oxihalide IC Anions 14d		Analytical Method: EPA 300.1						
Chlorite	ND	ug/L	1000	200		04/27/18 13:26		D3
300.1 Oxihalide IC Anions 28d		Analytical Method: EPA 300.1						
Bromate	ND	ug/L	10.0	10		04/26/18 02:56	15541-45-4	D3
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		04/20/18 13:48		FS,H1
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		05/02/18 09:51		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	5.0	mg/L	0.10	1	04/26/18 14:30	04/27/18 13:40	7664-41-7	
353.2 Nitrate + Nitrite		Analytical Method: EPA 353.2						
Nitrate as N	0.022	mg/L	0.020	1		04/20/18 13:53	14797-55-8	FS
Nitrite as N	0.031	mg/L	0.020	1		04/20/18 13:53	14797-65-0	A
Nitrogen, NO2 plus NO3	0.054	mg/L	0.020	1		04/20/18 13:53		FS
9016 Cyanide, Free		Analytical Method: EPA 9016 Preparation Method: EPA 9016						
Cyanide, Free	ND	ug/L	5.0	1	04/27/18 18:40	04/27/18 20:08		
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	10.0	1	04/26/18 11:59	04/27/18 10:18	57-12-5	
SM4500P-E, Total Phosphorus		Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B						
Phosphorus	ND	mg/L	0.10	1	05/01/18 10:14	05/02/18 08:07	7723-14-0	

Sample: FL-TT-04		Lab ID: 10428032002		Collected: 04/19/18 13:00	Received: 04/20/18 08:30	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Field pH	5.9		0.10	1		04/19/18 13:00		
Field Temperature	10.6		0.50	1		04/19/18 13:00		
547 HPLC Glyphosate		Analytical Method: EPA 547						
Glyphosate	ND	ug/L	6.0	1		05/01/18 05:03		M1
8011 GCS EDB and DBCP		Analytical Method: EPA 8011 Preparation Method: EPA 8011						
1,2-Dibromo-3-chloropropane	ND	ug/L	0.0098	1	04/24/18 14:16	04/25/18 02:23	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.0098	1	04/24/18 14:16	04/25/18 02:23	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	114	%	30-150	1	04/24/18 14:16	04/25/18 02:23	460-00-4	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-04	Lab ID: 10428032002	Collected: 04/19/18 13:00	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M Alcohols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	mg/L	5.0	1		04/25/18 15:13	67-56-1	
8015M Glycols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/27/18 15:49	107-21-1	
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	309-00-2	L2
alpha-BHC	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	319-84-6	
beta-BHC	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	319-85-7	
delta-BHC	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	58-89-9	
Chlordane (Technical)	ND	ug/L	2.6	5	04/20/18 13:40	04/26/18 00:11	57-74-9	
alpha-Chlordane	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	5103-71-9	
gamma-Chlordane	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	5103-74-2	
4,4'-DDD	ND	ug/L	0.51	5	04/20/18 13:40	04/26/18 00:11	72-54-8	
4,4'-DDE	ND	ug/L	0.51	5	04/20/18 13:40	04/26/18 00:11	72-55-9	
4,4'-DDT	ND	ug/L	0.51	5	04/20/18 13:40	04/26/18 00:11	50-29-3	
Dieldrin	ND	ug/L	0.51	5	04/20/18 13:40	04/26/18 00:11	60-57-1	
Endosulfan I	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	959-98-8	
Endosulfan II	ND	ug/L	0.51	5	04/20/18 13:40	04/26/18 00:11	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.51	5	04/20/18 13:40	04/26/18 00:11	1031-07-8	
Endrin	ND	ug/L	0.51	5	04/20/18 13:40	04/26/18 00:11	72-20-8	
Endrin aldehyde	ND	ug/L	0.51	5	04/20/18 13:40	04/26/18 00:11	7421-93-4	
Endrin ketone	ND	ug/L	0.51	5	04/20/18 13:40	04/26/18 00:11	53494-70-5	
Heptachlor	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	76-44-8	
Heptachlor epoxide	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	1024-57-3	
Methoxychlor	ND	ug/L	2.6	5	04/20/18 13:40	04/26/18 00:11	72-43-5	
Toxaphene	ND	ug/L	7.7	5	04/20/18 13:40	04/26/18 00:11	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	75	%	62-125	5	04/20/18 13:40	04/26/18 00:11	877-09-8	2M, D3
Decachlorobiphenyl (S)	43	%	30-143	5	04/20/18 13:40	04/26/18 00:11	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:43	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:43	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:43	11141-16-5	
PCB-1242 (Aroclor 1242)	1.3	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:43	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:43	12672-29-6	
PCB-1254 (Aroclor 1254)	0.17	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:43	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:43	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:43	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:43	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	59	%	30-125	1	04/20/18 13:39	04/23/18 15:43	877-09-8	
Decachlorobiphenyl (S)	56	%	30-125	1	04/20/18 13:39	04/23/18 15:43	2051-24-3	CH

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-04	Lab ID: 10428032002	Collected: 04/19/18 13:00	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8315A GCSV Aldehydes								
Analytical Method: EPA 8315A Preparation Method: EPA 8315A								
Formaldehyde	ND	ug/L	100	1	04/24/18 10:57	04/26/18 13:18	50-00-0	H3
8316 W GCSV Acrylamide								
Analytical Method: EPA 8316								
Acrylamide	ND	ug/L	20.0	1		04/24/18 12:10	79-06-1	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	04/23/18 14:49	04/25/18 18:08	7429-90-5	
Barium, Dissolved	465	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:08	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:08	7440-50-8	
Manganese, Dissolved	1030	ug/L	5.0	1	04/23/18 14:49	04/25/18 18:08	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:08	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:08	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/23/18 14:49	04/25/18 18:08	7440-31-5	
Zinc, Dissolved	155	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:08	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	19.5	ug/L	2.5	5	04/23/18 10:35	04/24/18 20:08	7440-47-3	
Total Hardness by 2340B	479000	ug/L	1410	10	04/23/18 10:35	04/25/18 15:37		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	1.5	ug/L	0.50	1	04/23/18 14:28	04/24/18 21:32	7440-36-0	
Arsenic, Dissolved	3.7	ug/L	0.50	1	04/23/18 14:28	04/24/18 21:32	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/23/18 14:28	04/24/18 21:32	7440-41-7	
Boron, Dissolved	1090	ug/L	100	20	04/23/18 14:28	04/24/18 21:04	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/23/18 14:28	04/24/18 21:32	7440-43-9	
Chromium, Dissolved	0.96	ug/L	0.50	1	04/23/18 14:28	04/24/18 21:32	7440-47-3	
Cobalt, Dissolved	3.6	ug/L	0.50	1	04/23/18 14:28	04/24/18 21:32	7440-48-4	
Lead, Dissolved	10.9	ug/L	0.10	1	04/23/18 14:28	04/24/18 01:25	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 21:32	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/23/18 14:28	04/24/18 21:32	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 21:32	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	04/23/18 14:28	04/24/18 21:32	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:16	7439-97-6	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Phenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	108-95-2	
bis(2-Chloroethyl) ether	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	111-44-4	
2-Chlorophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	95-57-8	
1,3-Dichlorobenzene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	106-46-7	
1,2-Dichlorobenzene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	95-50-1	
2-Methylphenol(o-Cresol)	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	95-48-7	
bis(2-Chloroisopropyl) ether	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	108-60-1	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.3	1	04/23/18 14:40	05/03/18 19:09		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-04	Lab ID: 10428032002	Collected: 04/19/18 13:00	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
N-Nitroso-di-n-propylamine	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	621-64-7	
Hexachloroethane	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	67-72-1	
Nitrobenzene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	98-95-3	
Isophorone	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	78-59-1	
2-Nitrophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	88-75-5	
2,4-Dimethylphenol	ND	ug/L	50.8	1	04/23/18 14:40	05/03/18 19:09	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	111-91-1	
2,4-Dichlorophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	120-82-1	
Naphthalene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	91-20-3	
4-Chloroaniline	ND	ug/L	50.8	1	04/23/18 14:40	05/03/18 19:09	106-47-8	
Hexachloro-1,3-butadiene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	87-68-3	
4-Chloro-3-methylphenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	59-50-7	
2-Methylnaphthalene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	91-57-6	
2,4,6-Trichlorophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	88-06-2	
2,4,5-Trichlorophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	95-95-4	
2-Chloronaphthalene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	91-58-7	
2-Nitroaniline	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	88-74-4	
Dimethylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	131-11-3	
Acenaphthylene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	208-96-8	
2,6-Dinitrotoluene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	606-20-2	
3-Nitroaniline	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	99-09-2	
Acenaphthene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	83-32-9	
2,4-Dinitrophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	51-28-5	L2
4-Nitrophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	100-02-7	
Dibenzofuran	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	132-64-9	
2,4-Dinitrotoluene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	121-14-2	
Diethylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	84-66-2	
4-Chlorophenylphenyl ether	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	7005-72-3	
Fluorene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	86-73-7	
4-Nitroaniline	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	100-01-6	
4,6-Dinitro-2-methylphenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	534-52-1	L2
N-Nitrosodiphenylamine	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	86-30-6	
4-Bromophenylphenyl ether	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	101-55-3	
Hexachlorobenzene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	118-74-1	
Pentachlorophenol	ND	ug/L	20.3	1	04/23/18 14:40	05/03/18 19:09	87-86-5	
Phenanthrene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	85-01-8	
Anthracene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	120-12-7	
Di-n-butylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	84-74-2	
Fluoranthene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	206-44-0	
Pyrene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	129-00-0	
Butylbenzylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/L	50.8	1	04/23/18 14:40	05/03/18 19:09	91-94-1	
Benzo(a)anthracene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	56-55-3	
Chrysene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	218-01-9	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	117-81-7	
Di-n-octylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	117-84-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-04	Lab ID: 10428032002	Collected: 04/19/18 13:00	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Benzo(b)fluoranthene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	205-99-2	
Benzo(k)fluoranthene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	207-08-9	
Benzo(a)pyrene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	50-32-8	
Indeno(1,2,3-cd)pyrene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	193-39-5	
Dibenz(a,h)anthracene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	53-70-3	
Benzo(g,h,i)perylene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	191-24-2	
N-Nitrosodimethylamine	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	62-75-9	
1,2-Diphenylhydrazine	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	122-66-7	
Carbazole	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	86-74-8	
1-Methylnaphthalene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	90-12-0	
Surrogates								
Nitrobenzene-d5 (S)	69	%.	60-125	1	04/23/18 14:40	05/03/18 19:09	4165-60-0	
2-Fluorobiphenyl (S)	65	%.	56-125	1	04/23/18 14:40	05/03/18 19:09	321-60-8	
p-Terphenyl-d14 (S)	76	%.	58-125	1	04/23/18 14:40	05/03/18 19:09	1718-51-0	
Phenol-d6 (S)	71	%.	58-125	1	04/23/18 14:40	05/03/18 19:09	13127-88-3	
2-Fluorophenol (S)	66	%.	55-125	1	04/23/18 14:40	05/03/18 19:09	367-12-4	
2,4,6-Tribromophenol (S)	85	%.	65-125	1	04/23/18 14:40	05/03/18 19:09	118-79-6	
524.2 MSV								
Analytical Method: EPA 524.2								
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/24/18 15:30		
Surrogates								
4-Bromofluorobenzene (S)	99	%.	75-125	1		04/24/18 15:30	460-00-4	
Toluene-d8 (S)	95	%.	75-125	1		04/24/18 15:30	2037-26-5	
1,2-Dichloroethane-d4 (S)	99	%.	75-125	1		04/24/18 15:30	17060-07-0	
Field Data								
Analytical Method:								
Field pH	5.9	Std. Units		1		04/19/18 13:00		
Field Temperature	10.6	deg C		1		04/19/18 13:00		
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	ND	mg/L	20.0	10	04/20/18 13:55	04/25/18 13:48		B4
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	4.8	1		05/02/18 11:26		
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	246	NTU	6.0	20		04/20/18 11:55		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	249	mg/L	10.0	1		04/25/18 13:32		
4500ClO2 Chlorine Dioxide								
Analytical Method: SM 4500-ClO2								
Chlorine Dioxide	0.88	mg/L	0.10	1		04/25/18 13:31		H6
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	6.7	Std. Units	0.10	1		04/27/18 11:26		H6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-04		Lab ID: 10428032002	Collected: 04/19/18 13:00	Received: 04/20/18 08:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	0.020	mg/L	0.010	1		05/01/18 16:04		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	109	mg/L	2.4	2		04/26/18 13:06	16887-00-6	
Fluoride	0.17	mg/L	0.050	1		05/03/18 18:33	16984-48-8	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		04/20/18 13:48		FS,H1
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		05/02/18 09:52		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	7.8	mg/L	0.10	1	04/26/18 14:30	04/27/18 13:36	7664-41-7	
353.2 Nitrate + Nitrite		Analytical Method: EPA 353.2						
Nitrate as N	0.080	mg/L	0.020	1		04/20/18 13:54	14797-55-8	FS
Nitrite as N	0.027	mg/L	0.020	1		04/20/18 13:54	14797-65-0	FS,M1
Nitrogen, NO2 plus NO3	0.11	mg/L	0.020	1		04/20/18 13:54		FS,M1
9016 Cyanide, Free		Analytical Method: EPA 9016 Preparation Method: EPA 9016						
Cyanide, Free	ND	ug/L	5.0	1	04/27/18 18:40	04/27/18 20:08		
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	10.0	1	04/26/18 11:59	04/27/18 10:19	57-12-5	
SM4500P-E, Total Phosphorus		Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B						
Phosphorus	0.12	mg/L	0.10	1	05/01/18 10:14	05/02/18 08:08	7723-14-0	

Sample: FL-TT-05		Lab ID: 10428032003	Collected: 04/19/18 15:45	Received: 04/20/18 08:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Field pH	6.3		0.10	1		04/19/18 15:45		
Field Temperature	8.5		0.50	1		04/19/18 15:45		
531.1 HPLC Carbamates		Analytical Method: EPA 531.1						
Aldicarb	ND	ug/L	2.0	1		05/09/18 23:48	116-06-3	
Carbofuran	ND	ug/L	2.0	1		05/09/18 23:48	1563-66-2	
Surrogates								
BDMC (S)	86	%	80-120	1		05/09/18 23:48		

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-05	Lab ID: 10428032003	Collected: 04/19/18 15:45	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
547 HPLC Glyphosate								
Analytical Method: EPA 547								
Glyphosate	ND	ug/L	6.0	1		05/01/18 05:18		
549.2 HPLC Paraquat Diquat								
Analytical Method: EPA 549.2 Preparation Method: EPA 549.2								
Diquat	ND	ug/L	0.40	1	04/24/18 23:10	04/25/18 14:39	85-00-7	
Paraquat	ND	ug/L	0.40	1	04/24/18 23:10	04/25/18 14:39	1910-42-5	
552.3 Haloacetic Acids								
Analytical Method: EPA 552.3 Preparation Method: EPA 552.3								
Dibromoacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:56	631-64-1	
Dichloroacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:56	79-43-6	
Haloacetic Acids (Total)	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:56		
Monobromoacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:56	79-08-3	
Monochloroacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:56	79-11-8	
Trichloroacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:56	76-03-9	
Surrogates								
2,3-Dibromopropanoic Acid (S)	117	%	70-130	1	04/29/18 11:44	05/01/18 16:56	600-05-5	
8011 GCS EDB and DBCP								
Analytical Method: EPA 8011 Preparation Method: EPA 8011								
1,2-Dibromo-3-chloropropane	ND	ug/L	0.010	1	04/24/18 14:16	04/25/18 02:49	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.010	1	04/24/18 14:16	04/25/18 02:49	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	114	%	30-150	1	04/24/18 14:16	04/25/18 02:49	460-00-4	
8015M Alcohols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	mg/L	5.0	1		04/25/18 15:22	67-56-1	
8015M Glycols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/27/18 15:58	107-21-1	
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	309-00-2	L2
alpha-BHC	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	319-84-6	
beta-BHC	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	319-85-7	
delta-BHC	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	58-89-9	
Chlordane (Technical)	ND	ug/L	2.6	5	04/20/18 13:40	04/26/18 00:29	57-74-9	
alpha-Chlordane	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	5103-71-9	
gamma-Chlordane	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	5103-74-2	
4,4'-DDD	ND	ug/L	0.52	5	04/20/18 13:40	04/26/18 00:29	72-54-8	
4,4'-DDE	ND	ug/L	0.52	5	04/20/18 13:40	04/26/18 00:29	72-55-9	
4,4'-DDT	ND	ug/L	0.52	5	04/20/18 13:40	04/26/18 00:29	50-29-3	
Dieldrin	ND	ug/L	0.52	5	04/20/18 13:40	04/26/18 00:29	60-57-1	
Endosulfan I	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	959-98-8	
Endosulfan II	ND	ug/L	0.52	5	04/20/18 13:40	04/26/18 00:29	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.52	5	04/20/18 13:40	04/26/18 00:29	1031-07-8	
Endrin	ND	ug/L	0.52	5	04/20/18 13:40	04/26/18 00:29	72-20-8	
Endrin aldehyde	ND	ug/L	0.52	5	04/20/18 13:40	04/26/18 00:29	7421-93-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-05	Lab ID: 10428032003	Collected: 04/19/18 15:45	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Endrin ketone	ND	ug/L	0.52	5	04/20/18 13:40	04/26/18 00:29	53494-70-5	
Heptachlor	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	76-44-8	
Heptachlor epoxide	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	1024-57-3	
Methoxychlor	ND	ug/L	2.6	5	04/20/18 13:40	04/26/18 00:29	72-43-5	
Toxaphene	ND	ug/L	7.7	5	04/20/18 13:40	04/26/18 00:29	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	81	%	62-125	5	04/20/18 13:40	04/26/18 00:29	877-09-8	2M, D3
Decachlorobiphenyl (S)	55	%	30-143	5	04/20/18 13:40	04/26/18 00:29	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:58	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:58	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:58	11141-16-5	
PCB-1242 (Aroclor 1242)	3.8	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:58	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:58	12672-29-6	
PCB-1254 (Aroclor 1254)	0.19	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:58	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:58	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:58	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:58	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	60	%	30-125	1	04/20/18 13:39	04/23/18 15:58	877-09-8	
Decachlorobiphenyl (S)	71	%	30-125	1	04/20/18 13:39	04/23/18 15:58	2051-24-3	CH
8315A GCSV Aldehydes								
Analytical Method: EPA 8315A Preparation Method: EPA 8315A								
Formaldehyde	ND	ug/L	100	1	04/24/18 10:57	04/26/18 13:23	50-00-0	H3
8316 W GCSV Acrylamide								
Analytical Method: EPA 8316								
Acrylamide	ND	ug/L	20.0	1		04/24/18 12:20	79-06-1	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	04/23/18 14:49	04/25/18 18:11	7429-90-5	
Barium, Dissolved	250	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:11	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:11	7440-50-8	
Manganese, Dissolved	749	ug/L	5.0	1	04/23/18 14:49	04/25/18 18:11	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:11	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:11	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/23/18 14:49	04/25/18 18:11	7440-31-5	
Zinc, Dissolved	97.3	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:11	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	11.6	ug/L	2.5	5	04/23/18 10:35	04/25/18 15:52	7440-47-3	
Total Hardness by 2340B	303000	ug/L	705	5	04/23/18 10:35	04/25/18 15:52		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	0.58	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:58	7440-36-0	
Arsenic, Dissolved	3.4	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:58	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-05		Lab ID: 10428032003	Collected: 04/19/18 15:45	Received: 04/20/18 08:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Beryllium, Dissolved	ND	ug/L	0.20	1	04/23/18 14:28	04/24/18 20:58	7440-41-7	
Boron, Dissolved	406	ug/L	5.0	1	04/23/18 14:28	04/24/18 20:58	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/23/18 14:28	04/24/18 20:58	7440-43-9	
Chromium, Dissolved	0.69	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:58	7440-47-3	
Cobalt, Dissolved	4.5	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:58	7440-48-4	
Lead, Dissolved	1.6	ug/L	0.10	1	04/23/18 14:28	04/24/18 01:28	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:58	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/23/18 14:28	04/24/18 20:58	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:58	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	04/23/18 14:28	04/24/18 20:58	7440-62-2	
245.1 Mercury, Dissolved		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:19	7439-97-6	
548.1 GCS Endothall		Analytical Method: EPA 548.1 Preparation Method: EPA 548.1						
Endothall	ND	ug/L	9.0	1	04/25/18 08:26	04/27/18 09:41		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Phenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	108-95-2	
bis(2-Chloroethyl) ether	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	111-44-4	
2-Chlorophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	95-57-8	
1,3-Dichlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	106-46-7	
1,2-Dichlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	95-50-1	
2-Methylphenol(o-Cresol)	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	95-48-7	
bis(2-Chloroisopropyl) ether	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	108-60-1	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.6	1	04/23/18 14:40	05/03/18 19:37		
N-Nitroso-di-n-propylamine	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	621-64-7	
Hexachloroethane	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	67-72-1	
Nitrobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	98-95-3	
Isophorone	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	78-59-1	
2-Nitrophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	88-75-5	
2,4-Dimethylphenol	ND	ug/L	51.5	1	04/23/18 14:40	05/03/18 19:37	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	111-91-1	
2,4-Dichlorophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	120-82-1	
Naphthalene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	91-20-3	
4-Chloroaniline	ND	ug/L	51.5	1	04/23/18 14:40	05/03/18 19:37	106-47-8	
Hexachloro-1,3-butadiene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	87-68-3	
4-Chloro-3-methylphenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	59-50-7	
2-Methylnaphthalene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	91-57-6	
2,4,6-Trichlorophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	88-06-2	
2,4,5-Trichlorophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	95-95-4	
2-Chloronaphthalene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	91-58-7	
2-Nitroaniline	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	88-74-4	
Dimethylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	131-11-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-05		Lab ID: 10428032003		Collected: 04/19/18 15:45		Received: 04/20/18 08:30		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520							
Acenaphthylene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	208-96-8		
2,6-Dinitrotoluene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	606-20-2		
3-Nitroaniline	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	99-09-2		
Acenaphthene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	83-32-9		
2,4-Dinitrophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	51-28-5	L2	
4-Nitrophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	100-02-7		
Dibenzofuran	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	132-64-9		
2,4-Dinitrotoluene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	121-14-2		
Diethylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	84-66-2		
4-Chlorophenylphenyl ether	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	7005-72-3		
Fluorene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	86-73-7		
4-Nitroaniline	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	100-01-6		
4,6-Dinitro-2-methylphenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	534-52-1	L2	
N-Nitrosodiphenylamine	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	86-30-6		
4-Bromophenylphenyl ether	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	101-55-3		
Hexachlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	118-74-1		
Pentachlorophenol	ND	ug/L	20.6	1	04/23/18 14:40	05/03/18 19:37	87-86-5		
Phenanthrene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	85-01-8		
Anthracene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	120-12-7		
Di-n-butylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	84-74-2		
Fluoranthene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	206-44-0		
Pyrene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	129-00-0		
Butylbenzylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	85-68-7		
3,3'-Dichlorobenzidine	ND	ug/L	51.5	1	04/23/18 14:40	05/03/18 19:37	91-94-1		
Benzo(a)anthracene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	56-55-3		
Chrysene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	218-01-9		
bis(2-Ethylhexyl)phthalate	264	ug/L	20.6	2	04/23/18 14:40	05/04/18 14:46	117-81-7		
Di-n-octylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	117-84-0		
Benzo(b)fluoranthene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	205-99-2		
Benzo(k)fluoranthene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	207-08-9		
Benzo(a)pyrene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	50-32-8		
Indeno(1,2,3-cd)pyrene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	193-39-5		
Dibenz(a,h)anthracene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	53-70-3		
Benzo(g,h,i)perylene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	191-24-2		
N-Nitrosodimethylamine	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	62-75-9		
1,2-Diphenylhydrazine	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	122-66-7		
Carbazole	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	86-74-8		
1-Methylnaphthalene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	90-12-0		
Surrogates									
Nitrobenzene-d5 (S)	76	%	60-125	1	04/23/18 14:40	05/03/18 19:37	4165-60-0		
2-Fluorobiphenyl (S)	73	%	56-125	1	04/23/18 14:40	05/03/18 19:37	321-60-8		
p-Terphenyl-d14 (S)	81	%	58-125	1	04/23/18 14:40	05/03/18 19:37	1718-51-0		
Phenol-d6 (S)	81	%	58-125	1	04/23/18 14:40	05/03/18 19:37	13127-88-3		
2-Fluorophenol (S)	77	%	55-125	1	04/23/18 14:40	05/03/18 19:37	367-12-4		
2,4,6-Tribromophenol (S)	91	%	65-125	1	04/23/18 14:40	05/03/18 19:37	118-79-6		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-05	Lab ID: 10428032003	Collected: 04/19/18 15:45	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
524.2 MSV	Analytical Method: EPA 524.2							
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/24/18 15:53		
Surrogates								
4-Bromofluorobenzene (S)	99	%	75-125	1		04/24/18 15:53	460-00-4	
Toluene-d8 (S)	95	%	75-125	1		04/24/18 15:53	2037-26-5	
1,2-Dichloroethane-d4 (S)	97	%	75-125	1		04/24/18 15:53	17060-07-0	
Field Data	Analytical Method:							
Field pH	6.3	Std. Units		1		04/19/18 15:45		
Field Temperature	8.5	deg C		1		04/19/18 15:45		
Hach 10360 Rev 1.1 BOD	Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360							
BOD, 5 day	15.9	mg/L	6.0	3	04/20/18 13:55	04/25/18 13:55		B4
1664 HEM, Oil and Grease	Analytical Method: EPA 1664A OG							
Oil and Grease	ND	mg/L	4.9	1		05/02/18 11:26		
180.1 Turbidity	Analytical Method: EPA 180.1							
Turbidity	196	NTU	6.0	20		04/20/18 11:59		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	184	mg/L	10.0	1		04/25/18 13:32		
4500ClO2 Chlorine Dioxide	Analytical Method: SM 4500-CIO2							
Chlorine Dioxide	1.5	mg/L	0.10	1		04/25/18 13:31		H6
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	6.8	Std. Units	0.10	1		04/27/18 11:27		H6
Trivalent Chromium Calculation	Analytical Method: Trivalent Chromium Calculation							
Chromium, Trivalent	0.012	mg/L	0.010	1		05/01/18 16:04		
300.0 IC Anions	Analytical Method: EPA 300.0							
Chloride	37.1	mg/L	1.2	1		04/26/18 08:25	16887-00-6	
Fluoride	0.13	mg/L	0.050	1		05/03/18 18:48	16984-48-8	
300.1 Oxihalide IC Anions 14d	Analytical Method: EPA 300.1							
Chlorite	ND	ug/L	1000	200		04/27/18 15:37		D3
300.1 Oxihalide IC Anions 28d	Analytical Method: EPA 300.1							
Bromate	ND	ug/L	10.0	10		04/26/18 05:07	15541-45-4	D3
Chromium, Hexavalent	Analytical Method: SM 3500-Cr B Modified							
Chromium, Hexavalent	ND	mg/L	0.010	1		04/20/18 13:48		FS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-05		Lab ID: 10428032003	Collected: 04/19/18 15:45	Received: 04/20/18 08:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		05/02/18 09:53		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	4.5	mg/L	0.10	1	04/26/18 14:30	04/27/18 13:38	7664-41-7	
353.2 Nitrate + Nitrite		Analytical Method: EPA 353.2						
Nitrate as N	0.076	mg/L	0.020	1		04/20/18 13:58	14797-55-8	FS
Nitrite as N	ND	mg/L	0.020	1		04/20/18 13:58	14797-65-0	FS
Nitrogen, NO ₂ plus NO ₃	0.094	mg/L	0.020	1		04/20/18 13:58		FS
9016 Cyanide, Free		Analytical Method: EPA 9016 Preparation Method: EPA 9016						
Cyanide, Free	ND	ug/L	5.0	1	04/27/18 18:40	04/27/18 20:09		
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	10.0	1	04/26/18 11:59	04/27/18 10:23	57-12-5	
SM4500P-E, Total Phosphorus		Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B						
Phosphorus	ND	mg/L	0.10	1	05/01/18 10:14	05/02/18 08:08	7723-14-0	

Sample: FL-TT-07		Lab ID: 10428032004	Collected: 04/19/18 18:03	Received: 04/20/18 08:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Field pH	6.2		0.10	1		04/19/18 18:03		
Field Temperature	6.0		0.50	1		04/19/18 18:03		
547 HPLC Glyphosate		Analytical Method: EPA 547						
Glyphosate	ND	ug/L	6.0	1		05/01/18 05:34		
8011 GCS EDB and DBCP		Analytical Method: EPA 8011 Preparation Method: EPA 8011						
1,2-Dibromo-3-chloropropane	ND	ug/L	0.010	1	04/24/18 14:16	04/25/18 03:15	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.010	1	04/24/18 14:16	04/25/18 03:15	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	117	%	30-150	1	04/24/18 14:16	04/25/18 03:15	460-00-4	
8015M Alcohols in water		Analytical Method: EPA 8015 Alcohol-Glycol						
Methanol	ND	mg/L	5.0	1		04/25/18 15:31	67-56-1	
8015M Glycols in water		Analytical Method: EPA 8015 Alcohol-Glycol						
Ethylene glycol	ND	mg/L	5.0	1		04/27/18 16:07	107-21-1	
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C						
Aldrin	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	309-00-2	L2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-07	Lab ID: 10428032004	Collected: 04/19/18 18:03	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C						
alpha-BHC	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	319-84-6	
beta-BHC	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	319-85-7	
delta-BHC	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	58-89-9	
Chlordane (Technical)	ND	ug/L	0.53	1	04/20/18 13:40	04/25/18 20:49	57-74-9	
alpha-Chlordane	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	5103-71-9	
gamma-Chlordane	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	5103-74-2	
4,4'-DDD	ND	ug/L	0.11	1	04/20/18 13:40	04/25/18 20:49	72-54-8	
4,4'-DDE	ND	ug/L	0.11	1	04/20/18 13:40	04/25/18 20:49	72-55-9	
4,4'-DDT	ND	ug/L	0.11	1	04/20/18 13:40	04/25/18 20:49	50-29-3	
Dieldrin	ND	ug/L	0.11	1	04/20/18 13:40	04/25/18 20:49	60-57-1	
Endosulfan I	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	959-98-8	
Endosulfan II	ND	ug/L	0.11	1	04/20/18 13:40	04/25/18 20:49	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.11	1	04/20/18 13:40	04/25/18 20:49	1031-07-8	
Endrin	ND	ug/L	0.11	1	04/20/18 13:40	04/25/18 20:49	72-20-8	
Endrin aldehyde	ND	ug/L	0.11	1	04/20/18 13:40	04/25/18 20:49	7421-93-4	
Endrin ketone	ND	ug/L	0.11	1	04/20/18 13:40	04/25/18 20:49	53494-70-5	
Heptachlor	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	76-44-8	
Heptachlor epoxide	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	1024-57-3	
Methoxychlor	ND	ug/L	0.53	1	04/20/18 13:40	04/25/18 20:49	72-43-5	
Toxaphene	ND	ug/L	1.6	1	04/20/18 13:40	04/25/18 20:49	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	83	%	62-125	1	04/20/18 13:40	04/25/18 20:49	877-09-8	
Decachlorobiphenyl (S)	28	%	30-143	1	04/20/18 13:40	04/25/18 20:49	2051-24-3	3M, S0
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 16:14	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 16:14	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 16:14	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 16:14	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 16:14	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 16:14	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 16:14	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 16:14	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 16:14	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	55	%	30-125	1	04/20/18 13:39	04/23/18 16:14	877-09-8	
Decachlorobiphenyl (S)	63	%	30-125	1	04/20/18 13:39	04/23/18 16:14	2051-24-3	CH
8315A GCSV Aldehydes		Analytical Method: EPA 8315A Preparation Method: EPA 8315A						
Formaldehyde	ND	ug/L	100	1	04/24/18 10:57	04/26/18 13:28	50-00-0	H3
8316 W GCSV Acrylamide		Analytical Method: EPA 8316						
Acrylamide	ND	ug/L	20.0	1		04/24/18 12:30	79-06-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-07	Lab ID: 10428032004	Collected: 04/19/18 18:03	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	358	ug/L	200	1	04/23/18 14:49	04/25/18 18:13	7429-90-5	
Barium, Dissolved	607	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:13	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:13	7440-50-8	
Manganese, Dissolved	902	ug/L	5.0	1	04/23/18 14:49	04/25/18 18:13	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:13	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:13	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/23/18 14:49	04/25/18 18:13	7440-31-5	
Zinc, Dissolved	ND	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:13	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	1.6	ug/L	0.50	1	04/23/18 10:35	04/25/18 15:56	7440-47-3	
Total Hardness by 2340B	632000	ug/L	2820	20	04/23/18 10:35	04/25/18 16:01		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:39	7440-36-0	
Arsenic, Dissolved	1.4	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:39	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/23/18 14:28	04/24/18 01:39	7440-41-7	
Boron, Dissolved	1610	ug/L	100	20	04/23/18 14:28	04/24/18 21:12	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/23/18 14:28	04/24/18 01:39	7440-43-9	
Chromium, Dissolved	0.90	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:39	7440-47-3	
Cobalt, Dissolved	1.5	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:39	7440-48-4	
Lead, Dissolved	0.54	ug/L	0.10	1	04/23/18 14:28	04/24/18 01:39	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:39	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/23/18 14:28	04/24/18 01:39	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:39	7440-61-1	
Vanadium, Dissolved	1.2	ug/L	1.0	1	04/23/18 14:28	04/24/18 01:39	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:21	7439-97-6	
548.1 GCS Endothall								
Analytical Method: EPA 548.1 Preparation Method: EPA 548.1								
Endothall	ND	ug/L	9.0	1	04/25/18 08:26	04/26/18 19:00		
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Phenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	108-95-2	
bis(2-Chloroethyl) ether	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	111-44-4	
2-Chlorophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	95-57-8	
1,3-Dichlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	106-46-7	
1,2-Dichlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	95-50-1	
2-Methylphenol(o-Cresol)	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	95-48-7	
bis(2-Chloroisopropyl) ether	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	108-60-1	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.5	1	04/23/18 14:40	05/03/18 20:06		
N-Nitroso-di-n-propylamine	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	621-64-7	
Hexachloroethane	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	67-72-1	
Nitrobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	98-95-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-07	Lab ID: 10428032004	Collected: 04/19/18 18:03	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Isophorone	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	78-59-1	
2-Nitrophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	88-75-5	
2,4-Dimethylphenol	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:06	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	111-91-1	
2,4-Dichlorophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	120-82-1	
Naphthalene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	91-20-3	
4-Chloroaniline	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:06	106-47-8	
Hexachloro-1,3-butadiene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	87-68-3	
4-Chloro-3-methylphenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	59-50-7	
2-Methylnaphthalene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	91-57-6	
2,4,6-Trichlorophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	88-06-2	
2,4,5-Trichlorophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	95-95-4	
2-Chloronaphthalene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	91-58-7	
2-Nitroaniline	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	88-74-4	
Dimethylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	131-11-3	
Acenaphthylene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	208-96-8	
2,6-Dinitrotoluene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	606-20-2	
3-Nitroaniline	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	99-09-2	
Acenaphthene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	83-32-9	
2,4-Dinitrophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	51-28-5	L2
4-Nitrophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	100-02-7	
Dibenzofuran	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	132-64-9	
2,4-Dinitrotoluene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	121-14-2	
Diethylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	84-66-2	
4-Chlorophenylphenyl ether	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	7005-72-3	
Fluorene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	86-73-7	
4-Nitroaniline	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	100-01-6	
4,6-Dinitro-2-methylphenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	534-52-1	L2
N-Nitrosodiphenylamine	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	86-30-6	
4-Bromophenylphenyl ether	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	101-55-3	
Hexachlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	118-74-1	
Pentachlorophenol	ND	ug/L	20.5	1	04/23/18 14:40	05/03/18 20:06	87-86-5	
Phenanthrene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	85-01-8	
Anthracene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	120-12-7	
Di-n-butylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	84-74-2	
Fluoranthene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	206-44-0	
Pyrene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	129-00-0	
Butylbenzylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:06	91-94-1	
Benzo(a)anthracene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	56-55-3	
Chrysene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	218-01-9	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	117-81-7	
Di-n-octylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	117-84-0	
Benzo(b)fluoranthene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	205-99-2	
Benzo(k)fluoranthene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	207-08-9	
Benzo(a)pyrene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	50-32-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

Sample: FL-TT-07	Lab ID: 10428032004	Collected: 04/19/18 18:03	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Indeno(1,2,3-cd)pyrene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	193-39-5	
Dibenz(a,h)anthracene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	53-70-3	
Benzo(g,h,i)perylene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	191-24-2	
N-Nitrosodimethylamine	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	62-75-9	
1,2-Diphenylhydrazine	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	122-66-7	
Carbazole	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	86-74-8	
1-Methylnaphthalene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	90-12-0	
Surrogates								
Nitrobenzene-d5 (S)	67	%	60-125	1	04/23/18 14:40	05/03/18 20:06	4165-60-0	
2-Fluorobiphenyl (S)	62	%	56-125	1	04/23/18 14:40	05/03/18 20:06	321-60-8	
p-Terphenyl-d14 (S)	77	%	58-125	1	04/23/18 14:40	05/03/18 20:06	1718-51-0	
Phenol-d6 (S)	69	%	58-125	1	04/23/18 14:40	05/03/18 20:06	13127-88-3	
2-Fluorophenol (S)	65	%	55-125	1	04/23/18 14:40	05/03/18 20:06	367-12-4	
2,4,6-Tribromophenol (S)	80	%	65-125	1	04/23/18 14:40	05/03/18 20:06	118-79-6	
524.2 MSV		Analytical Method: EPA 524.2						
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/24/18 16:17		
Surrogates								
4-Bromofluorobenzene (S)	100	%	75-125	1		04/24/18 16:17	460-00-4	
Toluene-d8 (S)	92	%	75-125	1		04/24/18 16:17	2037-26-5	
1,2-Dichloroethane-d4 (S)	98	%	75-125	1		04/24/18 16:17	17060-07-0	
Field Data		Analytical Method:						
Field pH	6.2	Std. Units		1		04/19/18 18:03		
Field Temperature	6.0	deg C		1		04/19/18 18:03		
Hach 10360 Rev 1.1 BOD		Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360						
BOD, 5 day	ND	mg/L	20.0	10	04/20/18 13:55	04/25/18 13:57		B4
1664 HEM, Oil and Grease		Analytical Method: EPA 1664A OG						
Oil and Grease	ND	mg/L	5.0	1		05/02/18 11:26		
180.1 Turbidity		Analytical Method: EPA 180.1						
Turbidity	152	NTU	3.0	10		04/20/18 12:00		
2540D Total Suspended Solids		Analytical Method: SM 2540D						
Total Suspended Solids	95.0	mg/L	10.0	1		04/25/18 13:32		
4500ClO2 Chlorine Dioxide		Analytical Method: SM 4500-ClO2						
Chlorine Dioxide	ND	mg/L	0.10	1		04/25/18 13:31		H6
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	6.7	Std. Units	0.10	1		04/27/18 11:28		H6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-07	Lab ID: 10428032004	Collected: 04/19/18 18:03	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Trivalent Chromium Calculation	Analytical Method: Trivalent Chromium Calculation							
Chromium, Trivalent	ND	mg/L	0.010	1		05/01/18 16:04		
300.0 IC Anions	Analytical Method: EPA 300.0							
Chloride	47.6	mg/L	1.2	1		04/26/18 08:40	16887-00-6	
Fluoride	0.085	mg/L	0.050	1		05/03/18 19:03	16984-48-8	
Chromium, Hexavalent	Analytical Method: SM 3500-Cr B Modified							
Chromium, Hexavalent	ND	mg/L	0.010	1		04/20/18 13:48		FS,M1
350.1 Ammonia, Unionized	Analytical Method: EPA 350.1							
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		05/02/18 09:54		
350.1 Ammonia, Distilled	Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)							
Nitrogen, Ammonia	9.7	mg/L	0.10	1	04/26/18 14:30	04/27/18 13:39	7664-41-7	
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrate as N	0.34	mg/L	0.020	1		04/20/18 13:59	14797-55-8	FS
Nitrite as N	0.056	mg/L	0.020	1		04/20/18 13:59	14797-65-0	FS
Nitrogen, NO2 plus NO3	0.40	mg/L	0.020	1		04/20/18 13:59		FS
9016 Cyanide, Free	Analytical Method: EPA 9016 Preparation Method: EPA 9016							
Cyanide, Free	ND	ug/L	5.0	1	04/27/18 18:40	04/27/18 20:10		
SM4500CN-E Cyanide	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E							
Cyanide	ND	ug/L	10.0	1	04/26/18 11:59	04/27/18 10:23	57-12-5	
SM4500P-E, Total Phosphorus	Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B							
Phosphorus	ND	mg/L	0.10	1	05/01/18 10:14	05/02/18 08:09	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 445530

Analysis Method: EPA 531.1

QC Batch Method: EPA 531.1

Analysis Description: 531.1 HPLC Carbamate

Associated Lab Samples: 10428032001, 10428032003

METHOD BLANK: 2416175

Matrix: Water

Associated Lab Samples: 10428032001, 10428032003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aldicarb	ug/L	ND	2.0	05/09/18 11:12	
Carbofuran	ug/L	ND	2.0	05/09/18 11:12	
BDMC (S)	%	98	80-120	05/09/18 11:12	

LABORATORY CONTROL SAMPLE: 2416176

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aldicarb	ug/L	10	10.3	103	80-120	
Carbofuran	ug/L	10	9.3	93	80-120	
BDMC (S)	%			121	80-120	S0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2416177 2416178

Parameter	Units	92381611002 Result	MS		MSD		MS		MSD		% Rec Limits	Max		Qual
			Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec	RPD		RPD		
Aldicarb	ug/L	ND	10	10	10	7.6	10.7	76	107	80-120	33	20	M1,R1	
Carbofuran	ug/L	ND	10	10	10	7.5	11.5	75	115	80-120	42	20	M1,R1	
BDMC (S)	%							64	139	80-120			S0	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 443841 Analysis Method: EPA 547
QC Batch Method: EPA 547 Analysis Description: 547 HPLC Glyphosate
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2407686 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Glyphosate	ug/L	ND	6.0	05/01/18 00:53	

LABORATORY CONTROL SAMPLE: 2407687

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Glyphosate	ug/L	50	53.0	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2407688 2407689

Parameter	Units	35388339006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	4.2U	50	50	49.8	52.1	100	104	80-120	4	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2407690 2407691

Parameter	Units	10428032002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	ND	50	50	ND	ND	0	0	80-120		30	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 438905 Analysis Method: EPA 8015 Alcohol-Glycol

QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2027992 Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methanol	mg/L	ND	5.0	04/25/18 14:17	

LABORATORY CONTROL SAMPLE: 2027993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methanol	mg/L	50	46.8	94	79-111	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027994 2027995

Parameter	Units	2027994		2027995		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Max RPD	Qual
		10428032001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Methanol	mg/L	ND	50	50	47.1	51.9	91	101	43-138	10	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 438816 Analysis Method: EPA 8015 Alcohol-Glycol

QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2027761

Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylene glycol	mg/L	ND	5.0	04/26/18 14:21	

LABORATORY CONTROL SAMPLE: 2027762

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylene glycol	mg/L	25	19.5	78	55-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2030951

2030952

Parameter	Units	50195437002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Ethylene glycol	mg/L	ND	25	25	30.7	29.5	113	108	38-154	4	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 21113

Analysis Method: EPA 8316

QC Batch Method: EPA 8316

Analysis Description: 8316 W GCSV Acrylamide

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 84170

Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acrylamide	ug/L	ND	20.0	04/24/18 11:22	

LABORATORY CONTROL SAMPLE: 84171

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acrylamide	ug/L	1000	1000	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 84172

84173

Parameter	Units	10428032004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Acrylamide	ug/L	ND	1000	1000	921	1040	92	104	78-135	12	16	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 533449

Analysis Method: EPA 245.1

QC Batch Method: EPA 245.1

Analysis Description: 245.1 Mercury - Dissolved

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2897827

Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	04/23/18 17:53	

LABORATORY CONTROL SAMPLE & LCSD: 2897828

2897829

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury, Dissolved	ug/L	5	4.9	4.8	98	96	85-115	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 533435

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 MET Dissolved

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2897770

Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/25/18 17:32	
Barium, Dissolved	ug/L	ND	10.0	04/25/18 17:32	
Copper, Dissolved	ug/L	ND	10.0	04/25/18 17:32	
Manganese, Dissolved	ug/L	ND	5.0	04/25/18 17:32	
Nickel, Dissolved	ug/L	ND	20.0	04/25/18 17:32	
Silver, Dissolved	ug/L	ND	10.0	04/25/18 17:32	
Tin, Dissolved	ug/L	ND	75.0	04/25/18 17:32	
Zinc, Dissolved	ug/L	ND	20.0	04/25/18 17:32	

LABORATORY CONTROL SAMPLE: 2897771

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20700	103	85-115	
Barium, Dissolved	ug/L	1000	1040	104	85-115	
Copper, Dissolved	ug/L	1000	986	99	85-115	
Manganese, Dissolved	ug/L	1000	1050	105	85-115	
Nickel, Dissolved	ug/L	1000	1060	106	85-115	
Silver, Dissolved	ug/L	500	503	101	85-115	
Tin, Dissolved	ug/L	1000	1040	104	85-115	
Zinc, Dissolved	ug/L	1000	1070	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897772 2897773

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427742001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	21200	21400	106	107	70-130	1	30
Barium, Dissolved	ug/L	95.0	1000	1000	1130	1140	104	104	70-130	1	30
Copper, Dissolved	ug/L	ND	1000	1000	1000	1010	100	101	70-130	1	30
Manganese, Dissolved	ug/L	ND	1000	1000	1040	1050	104	105	70-130	1	30
Nickel, Dissolved	ug/L	ND	1000	1000	1020	1020	102	102	70-130	1	30
Silver, Dissolved	ug/L	ND	500	500	509	514	102	103	70-130	1	30
Tin, Dissolved	ug/L	ND	1000	1000	1040	1050	104	105	70-130	1	30
Zinc, Dissolved	ug/L	36.2	1000	1000	1070	1070	103	104	70-130	1	30

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

MATRIX SPIKE SAMPLE: 2898920		10428032004	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Aluminum, Dissolved	ug/L	358	20000	22100	109	70-130	
Barium, Dissolved	ug/L	607	1000	1630	102	70-130	
Copper, Dissolved	ug/L	ND	1000	1020	102	70-130	
Manganese, Dissolved	ug/L	902	1000	1940	103	70-130	
Nickel, Dissolved	ug/L	ND	1000	1030	102	70-130	
Silver, Dissolved	ug/L	ND	500	515	103	70-130	
Tin, Dissolved	ug/L	ND	1000	1040	104	70-130	
Zinc, Dissolved	ug/L	ND	1000	1030	102	70-130	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 533691 Analysis Method: EPA 200.8

QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2898992 Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	0.50	04/24/18 18:12	

LABORATORY CONTROL SAMPLE: 2898993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	100	99.9	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898994 2898995

Parameter	Units	10428058001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Chromium	ug/L	0.77	100	100	101	104	100	103	70-130	2	20				

MATRIX SPIKE SAMPLE: 2898996

Parameter	Units	10428098002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	<0.50	100	99.4	99	70-130	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 533428 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
 Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2897737 Matrix: Water
 Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Arsenic, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Beryllium, Dissolved	ug/L	ND	0.20	04/25/18 08:49	
Boron, Dissolved	ug/L	ND	5.0	04/25/18 08:49	
Cadmium, Dissolved	ug/L	ND	0.080	04/25/18 08:49	
Chromium, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Cobalt, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Lead, Dissolved	ug/L	ND	0.10	04/25/18 08:49	
Selenium, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Thallium, Dissolved	ug/L	ND	0.10	04/25/18 08:49	
Uranium-238, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Vanadium, Dissolved	ug/L	ND	1.0	04/25/18 08:49	

LABORATORY CONTROL SAMPLE: 2897738

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	99.4	99	85-115	
Arsenic, Dissolved	ug/L	100	99.4	99	85-115	
Beryllium, Dissolved	ug/L	100	107	107	85-115	
Boron, Dissolved	ug/L	100	104	104	85-115	
Cadmium, Dissolved	ug/L	100	99.0	99	85-115	
Chromium, Dissolved	ug/L	100	101	101	85-115	
Cobalt, Dissolved	ug/L	100	102	102	85-115	
Lead, Dissolved	ug/L	100	105	105	85-115	
Selenium, Dissolved	ug/L	100	103	103	85-115	
Thallium, Dissolved	ug/L	100	103	103	85-115	
Uranium-238, Dissolved	ug/L	100	101	101	85-115	
Vanadium, Dissolved	ug/L	100	99.6	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897739 2897740

Parameter	Units	10427867001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Spike Conc.						
Antimony, Dissolved	ug/L	0.0029 mg/L	100	110	108	107	105	70-130	2	20		
Arsenic, Dissolved	ug/L	ND	100	112	109	111	109	70-130	2	20		
Beryllium, Dissolved	ug/L	ND	100	107	104	107	104	70-130	3	20		
Boron, Dissolved	ug/L	32.5	100	137	133	104	101	70-130	2	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897739												2897740	
Parameter	Units	10427867001	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual		
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD			
Cadmium, Dissolved	ug/L	ND	100	100	102	101	102	101	70-130	2	20		
Chromium, Dissolved	ug/L	ND	100	100	109	107	109	107	70-130	2	20		
Cobalt, Dissolved	ug/L	3.7	100	100	108	106	104	103	70-130	1	20		
Lead, Dissolved	ug/L	ND	100	100	105	103	105	103	70-130	3	20		
Selenium, Dissolved	ug/L	0.00058 mg/L	100	100	114	111	113	110	70-130	2	20		
Thallium, Dissolved	ug/L	ND	100	100	104	100	104	100	70-130	4	20		
Uranium-238, Dissolved	ug/L	10.3	100	100	118	116	108	106	70-130	2	20		
Vanadium, Dissolved	ug/L	ND	100	100	110	108	110	108	70-130	2	20		

MATRIX SPIKE SAMPLE: 2897741									
Parameter	Units	10427767003	Spike	MS	MS	% Rec	Qualifiers		
		Result	Conc.	Result	% Rec	Limits			
Antimony, Dissolved	ug/L	ND	100	105	105	70-130			
Arsenic, Dissolved	ug/L	ND	100	106	106	70-130			
Beryllium, Dissolved	ug/L	ND	100	115	115	70-130			
Boron, Dissolved	ug/L	11.5	100	124	113	70-130			
Cadmium, Dissolved	ug/L	ND	100	104	104	70-130			
Chromium, Dissolved	ug/L	ND	100	109	109	70-130			
Cobalt, Dissolved	ug/L	ND	100	110	110	70-130			
Lead, Dissolved	ug/L	ND	100	110	110	70-130			
Selenium, Dissolved	ug/L	ND	100	109	109	70-130			
Thallium, Dissolved	ug/L	ND	100	109	109	70-130			
Uranium-238, Dissolved	ug/L	ND	100	108	108	70-130			
Vanadium, Dissolved	ug/L	ND	100	107	107	70-130			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 534005 Analysis Method: EPA 524.2
 QC Batch Method: EPA 524.2 Analysis Description: 524.2 MSV
 Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2901053 Matrix: Water
 Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	ND	4.0	04/24/18 12:20	
1,2-Dichloroethane-d4 (S)	%.	97	75-125	04/24/18 12:20	
4-Bromofluorobenzene (S)	%.	98	75-125	04/24/18 12:20	
Toluene-d8 (S)	%.	93	75-125	04/24/18 12:20	

LABORATORY CONTROL SAMPLE: 2901054

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	80	84.4	105	70-130	
1,2-Dichloroethane-d4 (S)	%.			99	75-125	
4-Bromofluorobenzene (S)	%.			98	75-125	
Toluene-d8 (S)	%.			96	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2902553 2902554

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		10428490001 Result	Spike Conc.	Spike Conc.	Result						Result
Total Trihalomethanes (Calc.)	ug/L	ND	80	80	79.2	81.9	99	102	70-130	3	20
1,2-Dichloroethane-d4 (S)	%.						97	100	75-125		
4-Bromofluorobenzene (S)	%.						99	98	75-125		
Toluene-d8 (S)	%.						96	94	75-125		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 442244 Analysis Method: EPA 548.1
QC Batch Method: EPA 548.1 Analysis Description: 548 GCS Endothall
Associated Lab Samples: 10428032001, 10428032003, 10428032004

METHOD BLANK: 2399870 Matrix: Water
Associated Lab Samples: 10428032001, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Endothall	ug/L	ND	9.0	04/25/18 07:43	

LABORATORY CONTROL SAMPLE: 2399871

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	50	55.6	111	64-137	

LABORATORY CONTROL SAMPLE: 2399872

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	9	7.7J	85	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2400302 2400303

Parameter	Units	35387642002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endothall	ug/L	4.3U	50	50	34.7	42.5	69	85	64-137	20	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2401760 2401761

Parameter	Units	35387858001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endothall	ug/L	4.3U	50	50	43.1	33.6	86	67	64-137	25	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 442497 Analysis Method: EPA 549.2
QC Batch Method: EPA 549.2 Analysis Description: 549 HPLC Paraquat Diquat
Associated Lab Samples: 10428032001, 10428032003

METHOD BLANK: 2400903 Matrix: Water
Associated Lab Samples: 10428032001, 10428032003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diquat	ug/L	ND	0.40	04/25/18 12:31	
Paraquat	ug/L	ND	0.40	04/25/18 12:31	

LABORATORY CONTROL SAMPLE: 2400904

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	2	1.8	92	70-130	
Paraquat	ug/L	2	1.7	85	70-130	

LABORATORY CONTROL SAMPLE: 2400905

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	.4	0.59	147	50-150	
Paraquat	ug/L	.4	0.42	105	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2401428 2401429

Parameter	Units	35387355001 Result	MS Spike Conc.	MSD Spike Conc.	2401428		2401429		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Diquat	ug/L	<0.30	2	2	2.0	1.9	98	93	70-130	6	30	
Paraquat	ug/L	<0.30	2	2	1.8	1.6	90	82	70-130	9	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2401430 2401431

Parameter	Units	35387355002 Result	MS Spike Conc.	MSD Spike Conc.	2401430		2401431		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Diquat	ug/L	<0.30	2	2	2.1	2.1	103	107	70-130	4	30	
Paraquat	ug/L	<0.30	2	2	1.9	1.9	94	93	70-130	2	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 443467 Analysis Method: EPA 552.3
QC Batch Method: EPA 552.3 Analysis Description: 5523 Haloacetic Acids
Associated Lab Samples: 10428032001, 10428032003

METHOD BLANK: 2405897 Matrix: Water
Associated Lab Samples: 10428032001, 10428032003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromoacetic Acid	ug/L	ND	1.0	05/01/18 11:24	
Dichloroacetic Acid	ug/L	ND	1.0	05/01/18 11:24	
Haloacetic Acids (Total)	ug/L	ND	1.0	05/01/18 11:24	
Monobromoacetic Acid	ug/L	ND	1.0	05/01/18 11:24	
Monochloroacetic Acid	ug/L	ND	1.0	05/01/18 11:24	
Trichloroacetic Acid	ug/L	ND	1.0	05/01/18 11:24	
2,3-Dibromopropanoic Acid (S)	%	113	70-130	05/01/18 11:24	

LABORATORY CONTROL SAMPLE: 2405898

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromoacetic Acid	ug/L	10	10.7	107	70-130	
Dichloroacetic Acid	ug/L	10	10.7	107	70-130	
Haloacetic Acids (Total)	ug/L	50	55.3	111	70-130	
Monobromoacetic Acid	ug/L	10	10.8	108	70-130	
Monochloroacetic Acid	ug/L	10	11.6	116	70-130	
Trichloroacetic Acid	ug/L	10	11.4	114	70-130	
2,3-Dibromopropanoic Acid (S)	%			97	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2406753 2406754

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		35387664001 Result	Spike Conc.	Spike Conc.	MS Result						
Dibromoacetic Acid	ug/L	2.1	10	10	13.1	12.8	110	107	70-130	3	30
Dichloroacetic Acid	ug/L	25.2	10	10	34.7	40.2	95	150	70-130	15	30 M1
Haloacetic Acids (Total)	ug/L	46.1	50	50	113	116	135	139	70-130	2	30
Monobromoacetic Acid	ug/L	<0.29	10	10	14.0	13.1	140	131	70-130	6	30 M1
Monochloroacetic Acid	ug/L	<0.90	10	10	18.6	16.4	186	164	70-130	13	30 M1
Trichloroacetic Acid	ug/L	18.9	10	10	33.0	33.1	142	143	70-130	0	30 M1
2,3-Dibromopropanoic Acid (S)	%						113	109	70-130		30

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2406755 2406756

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		35387664002 Result	Spike Conc.	Spike Conc.	MS Result						
Dibromoacetic Acid	ug/L	2.3	10	10	12.9	12.5	106	102	70-130	3	30

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Parameter	Units	2406755		2406756		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		35387664002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Dichloroacetic Acid	ug/L	31.4	10	10	43.0	44.8	116	134	70-130	4	30 M1
Haloacetic Acids (Total)	ug/L	55.9	50	50	121	122	130	133	70-130	1	30
Monobromoacetic Acid	ug/L	<0.29	10	10	13.7	13.8	137	138	70-130	1	30 M1
Monochloroacetic Acid	ug/L	<0.90	10	10	17.8	17.4	178	174	70-130	2	30 M1
Trichloroacetic Acid	ug/L	22.2	10	10	33.3	33.9	112	117	70-130	2	30
2,3-Dibromopropanoic Acid (S)	%						113	112	70-130		30

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 534073

Analysis Method: EPA 8011

QC Batch Method: EPA 8011

Analysis Description: GCS 8011 EDB DBCP

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2901365

Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	ND	0.010	04/24/18 22:05	
1,2-Dibromoethane (EDB)	ug/L	ND	0.010	04/24/18 22:05	
4-Bromofluorobenzene (S)	%	102	30-150	04/24/18 22:05	

LABORATORY CONTROL SAMPLE & LCSD: 2901366

2901367

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	.11	0.10	0.097	95	89	60-140	7	20	
1,2-Dibromoethane (EDB)	ug/L	.11	0.11	0.10	100	94	60-140	6	20	
4-Bromofluorobenzene (S)	%				107	106	30-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 533542 Analysis Method: EPA 8081B
QC Batch Method: EPA Mod. 3510C Analysis Description: 8081B GCS Pesticides
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2898180 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/25/18 19:54	
4,4'-DDE	ug/L	ND	0.10	04/25/18 19:54	
4,4'-DDT	ug/L	ND	0.10	04/25/18 19:54	
Aldrin	ug/L	ND	0.050	04/25/18 19:54	
alpha-BHC	ug/L	ND	0.050	04/25/18 19:54	
alpha-Chlordane	ug/L	ND	0.050	04/25/18 19:54	
beta-BHC	ug/L	ND	0.050	04/25/18 19:54	
Chlordane (Technical)	ug/L	ND	0.50	04/25/18 19:54	
delta-BHC	ug/L	ND	0.050	04/25/18 19:54	
Dieldrin	ug/L	ND	0.10	04/25/18 19:54	
Endosulfan I	ug/L	ND	0.050	04/25/18 19:54	
Endosulfan II	ug/L	ND	0.10	04/25/18 19:54	
Endosulfan sulfate	ug/L	ND	0.10	04/25/18 19:54	
Endrin	ug/L	ND	0.10	04/25/18 19:54	
Endrin aldehyde	ug/L	ND	0.10	04/25/18 19:54	
Endrin ketone	ug/L	ND	0.10	04/25/18 19:54	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/25/18 19:54	
gamma-Chlordane	ug/L	ND	0.050	04/25/18 19:54	
Heptachlor	ug/L	ND	0.050	04/25/18 19:54	
Heptachlor epoxide	ug/L	ND	0.050	04/25/18 19:54	
Methoxychlor	ug/L	ND	0.50	04/25/18 19:54	
Toxaphene	ug/L	ND	1.5	04/25/18 19:54	
Decachlorobiphenyl (S)	%	75	30-143	04/25/18 19:54	
Tetrachloro-m-xylene (S)	%	80	62-125	04/25/18 19:54	

LABORATORY CONTROL SAMPLE & LCSD: 2898181

Parameter	Units	2898182							RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits				
4,4'-DDD	ug/L	1	1.0	0.95	104	95	67-125	10	20		
4,4'-DDE	ug/L	1	1.0	0.90	100	90	68-125	11	20		
4,4'-DDT	ug/L	1	0.92	0.83	92	83	66-125	10	20		
Aldrin	ug/L	.5	0.21	0.17	42	34	46-125	21	20	L2,R1	
alpha-BHC	ug/L	.5	0.50	0.45	101	90	66-125	11	20		
alpha-Chlordane	ug/L	.5	0.49	0.43	97	86	72-125	12	20		
beta-BHC	ug/L	.5	0.49	0.45	99	89	72-125	10	20		
delta-BHC	ug/L	.5	0.42	0.37	83	75	37-141	11	20		
Dieldrin	ug/L	1	1.1	1.0	112	100	71-125	11	20		
Endosulfan I	ug/L	.5	0.48	0.43	96	86	69-125	10	20		
Endosulfan II	ug/L	1	1.1	0.98	108	98	73-125	10	20		
Endosulfan sulfate	ug/L	1	0.96	0.87	96	87	63-127	9	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Parameter	Units	2898181		2898182			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Endrin	ug/L	1	1.0	0.92	103	92	72-125	11	20	
Endrin aldehyde	ug/L	1	1.0	0.92	101	92	70-125	10	20	
Endrin ketone	ug/L	1	1.1	0.98	108	98	72-127	10	20	
gamma-BHC (Lindane)	ug/L	.5	0.51	0.45	101	91	69-125	11	20	
gamma-Chlordane	ug/L	.5	0.43	0.38	86	75	64-125	14	20	
Heptachlor	ug/L	.5	0.34	0.28	67	57	54-125	17	20	
Heptachlor epoxide	ug/L	.5	0.50	0.45	101	90	72-125	11	20	
Methoxychlor	ug/L	5	4.6	4.2	92	84	67-127	9	20	
Decachlorobiphenyl (S)	%				80	76	30-143			
Tetrachloro-m-xylene (S)	%				85	70	62-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 533544 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2898185 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/23/18 14:24	
Decachlorobiphenyl (S)	%	105	30-125	04/23/18 14:24	CH
Tetrachloro-m-xylene (S)	%	50	30-125	04/23/18 14:24	

LABORATORY CONTROL SAMPLE & LCSD: 2898186 2898187

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.1	1.5	55	73	47-125	28	20	R1
PCB-1260 (Aroclor 1260)	ug/L	2	1.2	1.7	62	84	54-125	30	20	R1
Decachlorobiphenyl (S)	%				78	103	30-125			CH
Tetrachloro-m-xylene (S)	%				46	60	30-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 533843 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2899581 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/L	ND	10.0	05/03/18 16:45	
1,2-Dichlorobenzene	ug/L	ND	10.0	05/03/18 16:45	
1,2-Diphenylhydrazine	ug/L	ND	10.0	05/03/18 16:45	
1,3-Dichlorobenzene	ug/L	ND	10.0	05/03/18 16:45	
1,4-Dichlorobenzene	ug/L	ND	10.0	05/03/18 16:45	
1-Methylnaphthalene	ug/L	ND	10.0	05/03/18 16:45	
2,4,5-Trichlorophenol	ug/L	ND	10.0	05/03/18 16:45	
2,4,6-Trichlorophenol	ug/L	ND	10.0	05/03/18 16:45	
2,4-Dichlorophenol	ug/L	ND	10.0	05/03/18 16:45	
2,4-Dimethylphenol	ug/L	ND	50.0	05/03/18 16:45	
2,4-Dinitrophenol	ug/L	ND	10.0	05/03/18 16:45	
2,4-Dinitrotoluene	ug/L	ND	10.0	05/03/18 16:45	
2,6-Dinitrotoluene	ug/L	ND	10.0	05/03/18 16:45	
2-Chloronaphthalene	ug/L	ND	10.0	05/03/18 16:45	
2-Chlorophenol	ug/L	ND	10.0	05/03/18 16:45	
2-Methylnaphthalene	ug/L	ND	10.0	05/03/18 16:45	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	05/03/18 16:45	
2-Nitroaniline	ug/L	ND	10.0	05/03/18 16:45	
2-Nitrophenol	ug/L	ND	10.0	05/03/18 16:45	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	05/03/18 16:45	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	05/03/18 16:45	
3-Nitroaniline	ug/L	ND	10.0	05/03/18 16:45	
4,6-Dinitro-2-methylphenol	ug/L	ND	10.0	05/03/18 16:45	
4-Bromophenylphenyl ether	ug/L	ND	10.0	05/03/18 16:45	
4-Chloro-3-methylphenol	ug/L	ND	10.0	05/03/18 16:45	
4-Chloroaniline	ug/L	ND	50.0	05/03/18 16:45	
4-Chlorophenylphenyl ether	ug/L	ND	10.0	05/03/18 16:45	
4-Nitroaniline	ug/L	ND	10.0	05/03/18 16:45	
4-Nitrophenol	ug/L	ND	10.0	05/03/18 16:45	
Acenaphthene	ug/L	ND	10.0	05/03/18 16:45	
Acenaphthylene	ug/L	ND	10.0	05/03/18 16:45	
Anthracene	ug/L	ND	10.0	05/03/18 16:45	
Benzo(a)anthracene	ug/L	ND	10.0	05/03/18 16:45	
Benzo(a)pyrene	ug/L	ND	10.0	05/03/18 16:45	
Benzo(b)fluoranthene	ug/L	ND	10.0	05/03/18 16:45	
Benzo(g,h,i)perylene	ug/L	ND	10.0	05/03/18 16:45	
Benzo(k)fluoranthene	ug/L	ND	10.0	05/03/18 16:45	
bis(2-Chloroethoxy)methane	ug/L	ND	10.0	05/03/18 16:45	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	05/03/18 16:45	
bis(2-Chloroisopropyl) ether	ug/L	ND	10.0	05/03/18 16:45	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	05/03/18 16:45	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

METHOD BLANK: 2899581

Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Carbazole	ug/L	ND	10.0	05/03/18 16:45	
Chrysene	ug/L	ND	10.0	05/03/18 16:45	
Di-n-butylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Di-n-octylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Dibenz(a,h)anthracene	ug/L	ND	10.0	05/03/18 16:45	
Dibenzofuran	ug/L	ND	10.0	05/03/18 16:45	
Diethylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Dimethylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Fluoranthene	ug/L	ND	10.0	05/03/18 16:45	
Fluorene	ug/L	ND	10.0	05/03/18 16:45	
Hexachloro-1,3-butadiene	ug/L	ND	10.0	05/03/18 16:45	
Hexachlorobenzene	ug/L	ND	10.0	05/03/18 16:45	
Hexachloroethane	ug/L	ND	10.0	05/03/18 16:45	
Indeno(1,2,3-cd)pyrene	ug/L	ND	10.0	05/03/18 16:45	
Isophorone	ug/L	ND	10.0	05/03/18 16:45	
N-Nitroso-di-n-propylamine	ug/L	ND	10.0	05/03/18 16:45	
N-Nitrosodimethylamine	ug/L	ND	10.0	05/03/18 16:45	
N-Nitrosodiphenylamine	ug/L	ND	10.0	05/03/18 16:45	
Naphthalene	ug/L	ND	10.0	05/03/18 16:45	
Nitrobenzene	ug/L	ND	10.0	05/03/18 16:45	
Pentachlorophenol	ug/L	ND	20.0	05/03/18 16:45	
Phenanthrene	ug/L	ND	10.0	05/03/18 16:45	
Phenol	ug/L	ND	10.0	05/03/18 16:45	
Pyrene	ug/L	ND	10.0	05/03/18 16:45	
2,4,6-Tribromophenol (S)	%	89	65-125	05/03/18 16:45	
2-Fluorobiphenyl (S)	%	79	56-125	05/03/18 16:45	
2-Fluorophenol (S)	%	82	55-125	05/03/18 16:45	
Nitrobenzene-d5 (S)	%	86	60-125	05/03/18 16:45	
p-Terphenyl-d14 (S)	%	92	58-125	05/03/18 16:45	
Phenol-d6 (S)	%	85	58-125	05/03/18 16:45	

LABORATORY CONTROL SAMPLE & LCSD: 2899582

2899583

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	50	40.5	42.4	81	85	54-125	4	20	
1,2-Dichlorobenzene	ug/L	50	35.3	38.5	71	77	35-125	9	20	
1,2-Diphenylhydrazine	ug/L	50	45.2	48.7	90	97	68-125	8	20	
1,3-Dichlorobenzene	ug/L	50	33.3	35.2	67	70	30-125	5	20	
1,4-Dichlorobenzene	ug/L	50	34.4	36.3	69	73	33-125	5	20	
1-Methylnaphthalene	ug/L	50	42.3	44.1	85	88	67-125	4	20	
2,4,5-Trichlorophenol	ug/L	50	43.7	48.6	87	97	74-125	11	20	
2,4,6-Trichlorophenol	ug/L	50	43.7	48.0	87	96	74-125	9	20	
2,4-Dichlorophenol	ug/L	50	42.8	45.4	86	91	68-125	6	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

LABORATORY CONTROL SAMPLE & LCSD: 2899582		2899583									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
2,4-Dimethylphenol	ug/L	50	38.8J	42.1J	78	84	33-125		20		
2,4-Dinitrophenol	ug/L	50	11.9	16.0	24	32	30-127	29	20	L2,R1	
2,4-Dinitrotoluene	ug/L	50	42.8	47.5	86	95	75-125	10	20		
2,6-Dinitrotoluene	ug/L	50	43.2	47.4	86	95	75-125	9	20		
2-Chloronaphthalene	ug/L	50	43.0	46.1	86	92	70-125	7	20		
2-Chlorophenol	ug/L	50	41.8	45.0	84	90	61-125	7	20		
2-Methylnaphthalene	ug/L	50	42.0	44.9	84	90	67-125	7	20		
2-Methylphenol(o-Cresol)	ug/L	50	41.6	45.2	83	90	63-125	8	20		
2-Nitroaniline	ug/L	50	46.4	48.9	93	98	73-125	5	20		
2-Nitrophenol	ug/L	50	40.5	43.8	81	88	64-125	8	20		
3&4-Methylphenol(m&p Cresol)	ug/L	50	43.4	45.9	87	92	67-125	6	20		
3,3'-Dichlorobenzidine	ug/L	50	47J	46J	94	92	60-125		20	4M	
3-Nitroaniline	ug/L	50	45.4	44.4	91	89	73-125	2	20		
4,6-Dinitro-2-methylphenol	ug/L	50	8.6J	13.1	17	26	42-127		20	L2	
4-Bromophenylphenyl ether	ug/L	50	43.7	45.7	87	91	75-125	5	20		
4-Chloro-3-methylphenol	ug/L	50	44.0	46.3	88	93	75-125	5	20		
4-Chloroaniline	ug/L	50	38.5J	37.4J	77	75	60-125		20		
4-Chlorophenylphenyl ether	ug/L	50	43.5	47.8	87	96	74-125	9	20		
4-Nitroaniline	ug/L	50	45.4	48.9	91	98	69-125	8	20		
4-Nitrophenol	ug/L	50	46.9	51.2	94	102	62-125	9	20		
Acenaphthene	ug/L	50	42.5	46.5	85	93	74-125	9	20		
Acenaphthylene	ug/L	50	43.9	47.6	88	95	72-125	8	20		
Anthracene	ug/L	50	45.0	47.3	90	95	75-125	5	20		
Benzo(a)anthracene	ug/L	50	45.2	47.6	90	95	75-125	5	20		
Benzo(a)pyrene	ug/L	50	45.5	48.0	91	96	75-125	5	20		
Benzo(b)fluoranthene	ug/L	50	47.6	49.8	95	100	75-125	5	20		
Benzo(g,h,i)perylene	ug/L	50	44.6	46.3	89	93	73-125	4	20		
Benzo(k)fluoranthene	ug/L	50	45.7	48.6	91	97	75-125	6	20		
bis(2-Chloroethoxy)methane	ug/L	50	43.0	45.8	86	92	67-125	6	20		
bis(2-Chloroethyl) ether	ug/L	50	42.8	46.3	86	93	55-125	8	20		
bis(2-Chloroisopropyl) ether	ug/L	50	42.8	44.7	86	89	52-125	4	20		
bis(2-Ethylhexyl)phthalate	ug/L	50	46.9	48.2	94	96	72-129	3	20		
Butylbenzylphthalate	ug/L	50	46.3	48.6	93	97	69-127	5	20		
Carbazole	ug/L	50	45.9	47.8	92	96	75-125	4	20		
Chrysene	ug/L	50	46.7	47.3	93	95	75-125	1	20		
Di-n-butylphthalate	ug/L	50	46.3	48.3	93	97	75-125	4	20		
Di-n-octylphthalate	ug/L	50	47.0	48.7	94	97	69-131	4	20		
Dibenz(a,h)anthracene	ug/L	50	44.9	46.7	90	93	74-125	4	20		
Dibenzofuran	ug/L	50	43.7	47.4	87	95	75-125	8	20		
Diethylphthalate	ug/L	50	45.2	49.6	90	99	75-125	9	20		
Dimethylphthalate	ug/L	50	44.6	49.1	89	98	75-125	10	20		
Fluoranthene	ug/L	50	45.9	48.1	92	96	75-125	5	20		
Fluorene	ug/L	50	45.0	48.1	90	96	75-125	7	20		
Hexachloro-1,3-butadiene	ug/L	50	38.8	41.6	78	83	37-125	7	20		
Hexachlorobenzene	ug/L	50	44.0	47.3	88	95	74-125	7	20		
Hexachloroethane	ug/L	50	29.1	31.4	58	63	30-125	8	20		
Indeno(1,2,3-cd)pyrene	ug/L	50	44.5	46.4	89	93	74-125	4	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

LABORATORY CONTROL SAMPLE & LCSD: 2899582		2899583								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Isophorone	ug/L	50	42.9	45.7	86	91	72-125	6	20	
N-Nitroso-di-n-propylamine	ug/L	50	43.3	46.7	87	93	65-125	8	20	
N-Nitrosodimethylamine	ug/L	50	43.0	47.3	86	95	52-125	10	20	
N-Nitrosodiphenylamine	ug/L	50	45.1	46.5	90	93	75-125	3	20	
Naphthalene	ug/L	50	41.7	43.8	83	88	58-125	5	20	
Nitrobenzene	ug/L	50	43.1	45.3	86	91	64-125	5	20	
Pentachlorophenol	ug/L	50	40.2	43.5	80	87	52-125	8	20	
Phenanthrene	ug/L	50	44.9	47.2	90	94	75-125	5	20	
Phenol	ug/L	50	41.9	45.7	84	91	59-125	9	20	
Pyrene	ug/L	50	45.8	47.8	92	96	75-125	4	20	
2,4,6-Tribromophenol (S)	%				89	97	65-125			
2-Fluorobiphenyl (S)	%				71	78	56-125			
2-Fluorophenol (S)	%				78	85	55-125			
Nitrobenzene-d5 (S)	%				84	88	60-125			
p-Terphenyl-d14 (S)	%				90	93	58-125			
Phenol-d6 (S)	%				82	89	58-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 21096 Analysis Method: EPA 8315A
QC Batch Method: EPA 8315A Analysis Description: 8315 GCSV Aldehydes
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 84138 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Formaldehyde	ug/L	ND	100	04/26/18 12:42	

LABORATORY CONTROL SAMPLE: 84139

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	400	404	101	44-176	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 84140 84141

Parameter	Units	4611147001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Formaldehyde	ug/L	7450	400	400	8530	8420	269	242	35-167	1	20	M6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 533559

Analysis Method: Hach 10360 Rev 1.1

QC Batch Method: Hach 10360

Analysis Description: Hach 10360 Rev 1.1, BOD

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2898263

Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	04/25/18 13:36	B4

LABORATORY CONTROL SAMPLE: 2898265

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	166	84	85-115	B4

SAMPLE DUPLICATE: 2898266

Parameter	Units	10428032001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	11.2	11.0	3	20	B4

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 535555 Analysis Method: EPA 1664A OG
 QC Batch Method: EPA 1664A OG Analysis Description: 1664 HEM, Oil and Grease
 Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2910693 Matrix: Water
 Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	05/02/18 11:26	

LABORATORY CONTROL SAMPLE & LCSD: 2910694 2910859

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	40	36.1	37.4	90	94	78-114	4	18	

MATRIX SPIKE SAMPLE: 2910696

Parameter	Units	10428562001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	13.0	41.2	44.7	77	78-114	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 533531 Analysis Method: EPA 180.1
QC Batch Method: EPA 180.1 Analysis Description: 180.1 Turbidity
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2898133 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	04/20/18 11:33	1M

LABORATORY CONTROL SAMPLE: 2898134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.3	99	90-110	

SAMPLE DUPLICATE: 2898135

Parameter	Units	10428032004 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	152	146	4	20	

SAMPLE DUPLICATE: 2898156

Parameter	Units	10428032003 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	196	230	16	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 534218 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2902503 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	04/25/18 13:32	

LABORATORY CONTROL SAMPLE: 2902504

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	92.0	92	80-120	

SAMPLE DUPLICATE: 2902505

Parameter	Units	10428086001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	215	214	0	10	

SAMPLE DUPLICATE: 2902506

Parameter	Units	10428170001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	161	166	3	10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 442752

Analysis Method: SM 4500-CIO2

QC Batch Method: SM 4500-CIO2

Analysis Description: 4500CIO2 Chlorine Dioxide

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2402049

Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorine Dioxide	mg/L	ND	0.10	04/25/18 13:30	H6

LABORATORY CONTROL SAMPLE: 2402050

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorine Dioxide	mg/L	2.5	2.3	95	90-110	H6

SAMPLE DUPLICATE: 2402051

Parameter	Units	10427276001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	1.6	1.6	1	20	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 534745 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

LABORATORY CONTROL SAMPLE: 2905104

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	99	98-102	H6

SAMPLE DUPLICATE: 2905105

Parameter	Units	10427644001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.1	7.0	1	3	H6

SAMPLE DUPLICATE: 2905106

Parameter	Units	10427668001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	3	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 534208 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2902477 Matrix: Water
 Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	04/25/18 13:44	

LABORATORY CONTROL SAMPLE: 2902478

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	11.8	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2902479 2902480

Parameter	Units	10428289001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1.5	12.5	12.5	13.0	12.9	92	92	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2902481 2902482

Parameter	Units	10429393001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	36.1	12.5	12.5	43.7	40.9	61	39	90-110	7	20	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 535414 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2909828 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	ND	0.050	05/02/18 11:48	FS

LABORATORY CONTROL SAMPLE: 2909829

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	1	0.92	92	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2909830 2909831

Parameter	Units	10428106013 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.62	1	1	1.5	1.5	90	88	90-110	1	20	M3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2909832 2909833

Parameter	Units	10428536005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	ND	1	1	1.0	1.0	98	99	90-110	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 443383	Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1	Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10428032001, 10428032003	

METHOD BLANK: 2405368 Matrix: Water

Associated Lab Samples: 10428032001, 10428032003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorite	ug/L	ND	5.0	04/27/18 11:59	

LABORATORY CONTROL SAMPLE: 2405369

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	40	38.6	96	85-115	

MATRIX SPIKE SAMPLE: 2405371

Parameter	Units	10428032001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	ND	8000	7560	94	75-125	

SAMPLE DUPLICATE: 2405370

Parameter	Units	10428032001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorite	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 442670 Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1 Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10428032001, 10428032003

METHOD BLANK: 2401827 Matrix: Water
Associated Lab Samples: 10428032001, 10428032003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromate	ug/L	ND	1.0	04/25/18 15:18	

LABORATORY CONTROL SAMPLE: 2401828

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	8	7.7	96	85-115	

MATRIX SPIKE SAMPLE: 2401830

Parameter	Units	10428032001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	ND	80	82.9	104	75-125	

MATRIX SPIKE SAMPLE: 2403834

Parameter	Units	35388186001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	64.0U	400	349	87	75-125	

SAMPLE DUPLICATE: 2401829

Parameter	Units	10428032001 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromate	ug/L	ND	ND		20	

SAMPLE DUPLICATE: 2403833

Parameter	Units	35388186001 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromate	ug/L	64.0U	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 533560 Analysis Method: SM 3500-Cr B Modified
QC Batch Method: SM 3500-Cr B Modified Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2898271 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	04/20/18 13:48	FS

LABORATORY CONTROL SAMPLE: 2898272

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.21	106	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898273 2898274

Parameter	Units	10428032004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/L	ND	.2	.2	0.012	0.012	2	2	85-115	4	20	FS,M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 141457 Analysis Method: EPA 350.1 rev. 2 (1993)
QC Batch Method: EPA 350.1 rev. 2 (1993) Analysis Description: 350.1 Ammonia Distilled
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 559466 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	04/27/18 13:12	

LABORATORY CONTROL SAMPLE: 559467

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.2	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559468 559469

Parameter	Units	10428145001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Nitrogen, Ammonia	mg/L	ND	5	5.3	5	5.4	105	107	90-110	2	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559470 559471

Parameter	Units	12107585005 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Nitrogen, Ammonia	mg/L	ND	5	5.0	5	5.2	100	104	90-110	4	10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 533564 Analysis Method: EPA 353.2
 QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
 Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2898336 Matrix: Water
 Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	04/20/18 14:00	FS
Nitrite as N	mg/L	ND	0.020	04/20/18 14:00	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	04/20/18 14:00	FS

LABORATORY CONTROL SAMPLE: 2898337

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	1.0	100	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	0.98	98	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898338 2898339

Parameter	Units	10428032002		2898338		2898339		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Nitrite as N	mg/L	0.027	1	1	0.90	0.92	87	89	90-110	2	20	FS,M1	
Nitrogen, NO2 plus NO3	mg/L	0.11	1	1	0.92	0.95	81	85	90-110	4	20	FS,M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 21467 Analysis Method: EPA 9016
 QC Batch Method: EPA 9016 Analysis Description: 9016 Free Cyanide
 Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 85665 Matrix: Water
 Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/27/18 19:56	

LABORATORY CONTROL SAMPLE: 85666

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	154	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 85667 85668

Parameter	Units	10428166001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide, Free	ug/L	ND	150	150	154	161	103	107	80-120	4	11	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 534468 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2903673 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/27/18 09:57	

LABORATORY CONTROL SAMPLE: 2903674

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	258	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903675 2903676

Parameter	Units	10428172001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Cyanide	ug/L	10.1	250	238	250	242	91	93	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903677 2903678

Parameter	Units	10428174001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Cyanide	ug/L	10.6	250	241	250	242	92	92	80-120	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 535279 Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2909010 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.10	05/02/18 09:52	

LABORATORY CONTROL SAMPLE: 2909011

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	1.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2909012 2909013

Parameter	Units	10428985001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	ND	1	1	1.0	1.2	104	118	80-120	13	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2909014 2909015

Parameter	Units	10428376001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.30	1	1	1.3	1.3	95	103	80-120	7	30	

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-03		Lab ID: 10428032001	Collected: 04/19/18 09:30	Received: 04/20/18 08:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	5.81 ± 3.02 (4.06)		pCi/L	05/15/18 19:45	12587-46-1	
		C:NA T:NA					
Gross Beta	EPA 900.0	9.38 ± 3.53 (4.98)		pCi/L	05/15/18 19:45	12587-47-2	
		C:NA T:NA					
Radium-226	EPA 903.1	0.190 ± 0.512 (0.950)		pCi/L	05/08/18 19:15	13982-63-3	
		C:NA T:84%					
Radium-228	EPA 904.0	0.0206 ± 0.477 (1.11)		pCi/L	05/11/18 11:17	15262-20-1	
		C:58% T:65%					
Total Radium	Total Radium Calculation	0.211 ± 0.989 (2.06)		pCi/L	05/15/18 10:56	7440-14-4	

Sample: FL-TT-04		Lab ID: 10428032002	Collected: 04/19/18 13:00	Received: 04/20/18 08:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	4.78 ± 2.20 (3.10)		pCi/L	05/09/18 19:19	12587-46-1	
		C:NA T:NA					
Gross Beta	EPA 900.0	7.32 ± 1.94 (2.11)		pCi/L	05/09/18 19:19	12587-47-2	
		C:NA T:NA					
Radium-226	EPA 903.1	-0.125 ± 0.301 (0.753)		pCi/L	05/08/18 19:29	13982-63-3	
		C:NA T:86%					
Radium-228	EPA 904.0	1.01 ± 0.594 (1.08)		pCi/L	05/11/18 11:17	15262-20-1	
		C:78% T:48%					
Total Radium	Total Radium Calculation	1.01 ± 0.895 (1.83)		pCi/L	05/15/18 10:56	7440-14-4	

Sample: FL-TT-05		Lab ID: 10428032003	Collected: 04/19/18 15:45	Received: 04/20/18 08:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	9.07 ± 2.50 (2.36)		pCi/L	05/09/18 19:19	12587-46-1	
		C:NA T:NA					
Gross Beta	EPA 900.0	8.72 ± 1.93 (1.45)		pCi/L	05/09/18 19:19	12587-47-2	
		C:NA T:NA					
Radium-226	EPA 903.1	0.189 ± 0.446 (0.826)		pCi/L	05/08/18 19:29	13982-63-3	
		C:NA T:84%					
Radium-228	EPA 904.0	0.368 ± 0.380 (0.789)		pCi/L	05/11/18 11:17	15262-20-1	
		C:80% T:76%					
Total Radium	Total Radium Calculation	0.557 ± 0.826 (1.62)		pCi/L	05/15/18 10:56	7440-14-4	

Sample: FL-TT-07		Lab ID: 10428032004	Collected: 04/19/18 18:03	Received: 04/20/18 08:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	2.54 ± 1.66 (2.63)		pCi/L	05/09/18 19:19	12587-46-1	
		C:NA T:NA					
Gross Beta	EPA 900.0	7.15 ± 2.03 (2.41)		pCi/L	05/09/18 19:19	12587-47-2	
		C:NA T:NA					

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-07 **Lab ID: 10428032004** Collected: 04/19/18 18:03 Received: 04/20/18 08:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.567 ± 0.501 (0.743) C:NA T:93%	pCi/L	05/08/18 19:29	13982-63-3	
Radium-228	EPA 904.0	0.500 ± 0.362 (0.706) C:82% T:83%	pCi/L	05/11/18 11:17	15262-20-1	
Total Radium	Total Radium Calculation	1.07 ± 0.863 (1.45)	pCi/L	05/15/18 10:56	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch:	296005	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	10428032001, 10428032002, 10428032003, 10428032004		

METHOD BLANK:	1449102	Matrix:	Water
Associated Lab Samples:	10428032001, 10428032002, 10428032003, 10428032004		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0211 ± 0.300 (0.695) C:85% T:77%	pCi/L	05/11/18 11:15	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 298224

Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0

Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 10428032001

METHOD BLANK: 1460179

Matrix: Water

Associated Lab Samples: 10428032001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.360 ± 0.558 (1.21) C:NA T:NA	pCi/L	05/16/18 08:49	
Gross Beta	0.363 ± 0.780 (1.78) C:NA T:NA	pCi/L	05/16/18 08:49	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 295988 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 1449064 Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.168 ± 0.257 (0.413) C:NA T:91%	pCi/L	05/08/18 19:01	

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Act - Activity
Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).
Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)
(MDC) - Minimum Detectable Concentration
Trac - Tracer Recovery (%)
Carr - Carrier Recovery (%)
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan
PASI-I Pace Analytical Services - Indianapolis
PASI-M Pace Analytical Services - Minneapolis
PASI-O Pace Analytical Services - Ormond Beach
PASI-PA Pace Analytical Services - Greensburg
PASI-V Pace Analytical Services - Virginia

BATCH QUALIFIERS

Batch: 533719
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
Batch: 533882
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
Batch: 534052
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

BATCH QUALIFIERS

Batch: 534336

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 535555

[BE] Batch extracted by solid phase extraction (SPE).

ANALYTE QUALIFIERS

1M Analyte was detected in the method blank. All associated samples had concentrations of at least five times greater than the blank or were below the method detection limit.

2M Sample was yellow in color.

3M Surrogate recovery outside laboratory control limits due to emulsion

4M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

A Suspected aldol-condensation product (TICs).

B4 The glucose/glutamic acid standard exceeded the range of 198 plus or minus 30.5 mg/L.

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

FS The sample was filtered in the laboratory prior to analysis.

H1 Analysis conducted outside the recognized method holding time.

H3 Sample was received or analysis requested beyond the recognized method holding time.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

IO The internal standard response was outside the laboratory acceptance limits confirmed by reanalysis. The results reported are from the most QC compliant analysis.

L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

R1 RPD value was outside control limits.

S0 Surrogate recovery outside laboratory control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10428032001	FL-TT-03				
10428032002	FL-TT-04				
10428032003	FL-TT-05				
10428032004	FL-TT-07				
10428032001	FL-TT-03	EPA 531.1	445530		
10428032003	FL-TT-05	EPA 531.1	445530		
10428032001	FL-TT-03	EPA 547	443841		
10428032002	FL-TT-04	EPA 547	443841		
10428032003	FL-TT-05	EPA 547	443841		
10428032004	FL-TT-07	EPA 547	443841		
10428032001	FL-TT-03	EPA 549.2	442497	EPA 549.2	442774
10428032003	FL-TT-05	EPA 549.2	442497	EPA 549.2	442774
10428032001	FL-TT-03	EPA 552.3	443467	EPA 552.3	443713
10428032003	FL-TT-05	EPA 552.3	443467	EPA 552.3	443713
10428032001	FL-TT-03	EPA 8011	534073	EPA 8011	534336
10428032002	FL-TT-04	EPA 8011	534073	EPA 8011	534336
10428032003	FL-TT-05	EPA 8011	534073	EPA 8011	534336
10428032004	FL-TT-07	EPA 8011	534073	EPA 8011	534336
10428032001	FL-TT-03	EPA 8015 Alcohol-Glycol	438905		
10428032002	FL-TT-04	EPA 8015 Alcohol-Glycol	438905		
10428032003	FL-TT-05	EPA 8015 Alcohol-Glycol	438905		
10428032004	FL-TT-07	EPA 8015 Alcohol-Glycol	438905		
10428032001	FL-TT-03	EPA 8015 Alcohol-Glycol	438816		
10428032002	FL-TT-04	EPA 8015 Alcohol-Glycol	438816		
10428032003	FL-TT-05	EPA 8015 Alcohol-Glycol	438816		
10428032004	FL-TT-07	EPA 8015 Alcohol-Glycol	438816		
10428032001	FL-TT-03	EPA Mod. 3510C	533542	EPA 8081B	534052
10428032002	FL-TT-04	EPA Mod. 3510C	533542	EPA 8081B	534052
10428032003	FL-TT-05	EPA Mod. 3510C	533542	EPA 8081B	534052
10428032004	FL-TT-07	EPA Mod. 3510C	533542	EPA 8081B	534052
10428032001	FL-TT-03	EPA Mod. 3510C	533544	EPA 8082A	533719
10428032002	FL-TT-04	EPA Mod. 3510C	533544	EPA 8082A	533719
10428032003	FL-TT-05	EPA Mod. 3510C	533544	EPA 8082A	533719
10428032004	FL-TT-07	EPA Mod. 3510C	533544	EPA 8082A	533719
10428032001	FL-TT-03	EPA 8315A	21096	EPA 8315A	21168
10428032002	FL-TT-04	EPA 8315A	21096	EPA 8315A	21168
10428032003	FL-TT-05	EPA 8315A	21096	EPA 8315A	21168
10428032004	FL-TT-07	EPA 8315A	21096	EPA 8315A	21168
10428032001	FL-TT-03	EPA 8316	21113		
10428032002	FL-TT-04	EPA 8316	21113		
10428032003	FL-TT-05	EPA 8316	21113		
10428032004	FL-TT-07	EPA 8316	21113		
10428032001	FL-TT-03	EPA 200.7	533435	EPA 200.7	534229

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10428032002	FL-TT-04	EPA 200.7	533435	EPA 200.7	534229
10428032003	FL-TT-05	EPA 200.7	533435	EPA 200.7	534229
10428032004	FL-TT-07	EPA 200.7	533435	EPA 200.7	534229
10428032001	FL-TT-03	EPA 200.8	533691	EPA 200.8	533859
10428032002	FL-TT-04	EPA 200.8	533691	EPA 200.8	533859
10428032003	FL-TT-05	EPA 200.8	533691	EPA 200.8	533859
10428032004	FL-TT-07	EPA 200.8	533691	EPA 200.8	533859
10428032001	FL-TT-03	EPA 200.8	533428	EPA 200.8	533889
10428032002	FL-TT-04	EPA 200.8	533428	EPA 200.8	533889
10428032003	FL-TT-05	EPA 200.8	533428	EPA 200.8	533889
10428032004	FL-TT-07	EPA 200.8	533428	EPA 200.8	533889
10428032001	FL-TT-03	EPA 245.1	533449	EPA 245.1	533882
10428032002	FL-TT-04	EPA 245.1	533449	EPA 245.1	533882
10428032003	FL-TT-05	EPA 245.1	533449	EPA 245.1	533882
10428032004	FL-TT-07	EPA 245.1	533449	EPA 245.1	533882
10428032001	FL-TT-03	EPA 548.1	442244	EPA 548.1	442522
10428032003	FL-TT-05	EPA 548.1	442244	EPA 548.1	442522
10428032004	FL-TT-07	EPA 548.1	442244	EPA 548.1	442522
10428032001	FL-TT-03	EPA 3520	533843	EPA 8270D	534330
10428032002	FL-TT-04	EPA 3520	533843	EPA 8270D	534330
10428032003	FL-TT-05	EPA 3520	533843	EPA 8270D	534330
10428032004	FL-TT-07	EPA 3520	533843	EPA 8270D	534330
10428032001	FL-TT-03	EPA 524.2	534005		
10428032002	FL-TT-04	EPA 524.2	534005		
10428032003	FL-TT-05	EPA 524.2	534005		
10428032004	FL-TT-07	EPA 524.2	534005		
10428032001	FL-TT-03				
10428032002	FL-TT-04				
10428032003	FL-TT-05				
10428032004	FL-TT-07				
10428032001	FL-TT-03	EPA 900.0	298224		
10428032002	FL-TT-04	EPA 900.0	296913		
10428032003	FL-TT-05	EPA 900.0	296913		
10428032004	FL-TT-07	EPA 900.0	296913		
10428032001	FL-TT-03	EPA 903.1	295988		
10428032002	FL-TT-04	EPA 903.1	295988		
10428032003	FL-TT-05	EPA 903.1	295988		
10428032004	FL-TT-07	EPA 903.1	295988		
10428032001	FL-TT-03	EPA 904.0	296005		
10428032002	FL-TT-04	EPA 904.0	296005		
10428032003	FL-TT-05	EPA 904.0	296005		
10428032004	FL-TT-07	EPA 904.0	296005		
10428032001	FL-TT-03	Total Radium Calculation	298425		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10428032002	FL-TT-04	Total Radium Calculation	298425		
10428032003	FL-TT-05	Total Radium Calculation	298425		
10428032004	FL-TT-07	Total Radium Calculation	298425		
10428032001	FL-TT-03	Hach 10360	533559	Hach 10360 Rev 1.1	533761
10428032002	FL-TT-04	Hach 10360	533559	Hach 10360 Rev 1.1	533761
10428032003	FL-TT-05	Hach 10360	533559	Hach 10360 Rev 1.1	533761
10428032004	FL-TT-07	Hach 10360	533559	Hach 10360 Rev 1.1	533761
10428032001	FL-TT-03	EPA 1664A OG	535555		
10428032002	FL-TT-04	EPA 1664A OG	535555		
10428032003	FL-TT-05	EPA 1664A OG	535555		
10428032004	FL-TT-07	EPA 1664A OG	535555		
10428032001	FL-TT-03	EPA 180.1	533531		
10428032002	FL-TT-04	EPA 180.1	533531		
10428032003	FL-TT-05	EPA 180.1	533531		
10428032004	FL-TT-07	EPA 180.1	533531		
10428032001	FL-TT-03	SM 2540D	534218		
10428032002	FL-TT-04	SM 2540D	534218		
10428032003	FL-TT-05	SM 2540D	534218		
10428032004	FL-TT-07	SM 2540D	534218		
10428032001	FL-TT-03	SM 4500-CIO2	442752		
10428032002	FL-TT-04	SM 4500-CIO2	442752		
10428032003	FL-TT-05	SM 4500-CIO2	442752		
10428032004	FL-TT-07	SM 4500-CIO2	442752		
10428032001	FL-TT-03	SM 4500-H+B	534745		
10428032002	FL-TT-04	SM 4500-H+B	534745		
10428032003	FL-TT-05	SM 4500-H+B	534745		
10428032004	FL-TT-07	SM 4500-H+B	534745		
10428032001	FL-TT-03	Trivalent Chromium Calculation	535426		
10428032002	FL-TT-04	Trivalent Chromium Calculation	535426		
10428032003	FL-TT-05	Trivalent Chromium Calculation	535426		
10428032004	FL-TT-07	Trivalent Chromium Calculation	535426		
10428032001	FL-TT-03	EPA 300.0	534208		
10428032001	FL-TT-03	EPA 300.0	535414		
10428032002	FL-TT-04	EPA 300.0	534208		
10428032002	FL-TT-04	EPA 300.0	535414		
10428032003	FL-TT-05	EPA 300.0	534208		
10428032003	FL-TT-05	EPA 300.0	535414		
10428032004	FL-TT-07	EPA 300.0	534208		
10428032004	FL-TT-07	EPA 300.0	535414		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10428032001	FL-TT-03	EPA 300.1	443383		
10428032003	FL-TT-05	EPA 300.1	443383		
10428032001	FL-TT-03	EPA 300.1	442670		
10428032003	FL-TT-05	EPA 300.1	442670		
10428032001	FL-TT-03	SM 3500-Cr B Modified	533560		
10428032002	FL-TT-04	SM 3500-Cr B Modified	533560		
10428032003	FL-TT-05	SM 3500-Cr B Modified	533560		
10428032004	FL-TT-07	SM 3500-Cr B Modified	533560		
10428032001	FL-TT-03	EPA 350.1			
10428032002	FL-TT-04	EPA 350.1			
10428032003	FL-TT-05	EPA 350.1			
10428032004	FL-TT-07	EPA 350.1			
10428032001	FL-TT-03	EPA 350.1 rev. 2 (1993)	141457	EPA 350.1 rev. 2 (1993)	141577
10428032002	FL-TT-04	EPA 350.1 rev. 2 (1993)	141457	EPA 350.1 rev. 2 (1993)	141577
10428032003	FL-TT-05	EPA 350.1 rev. 2 (1993)	141457	EPA 350.1 rev. 2 (1993)	141577
10428032004	FL-TT-07	EPA 350.1 rev. 2 (1993)	141457	EPA 350.1 rev. 2 (1993)	141577
10428032001	FL-TT-03	EPA 353.2	533564		
10428032002	FL-TT-04	EPA 353.2	533564		
10428032003	FL-TT-05	EPA 353.2	533564		
10428032004	FL-TT-07	EPA 353.2	533564		
10428032001	FL-TT-03	EPA 9016	21467	EPA 9016	21631
10428032002	FL-TT-04	EPA 9016	21467	EPA 9016	21631
10428032003	FL-TT-05	EPA 9016	21467	EPA 9016	21631
10428032004	FL-TT-07	EPA 9016	21467	EPA 9016	21631
10428032001	FL-TT-03	SM 4500-CN-E	534468	SM 4500-CN-E	534565
10428032002	FL-TT-04	SM 4500-CN-E	534468	SM 4500-CN-E	534565
10428032003	FL-TT-05	SM 4500-CN-E	534468	SM 4500-CN-E	534565
10428032004	FL-TT-07	SM 4500-CN-E	534468	SM 4500-CN-E	534565
10428032001	FL-TT-03	SM 4500-P B	535279	SM 4500-P E	535335
10428032002	FL-TT-04	SM 4500-P B	535279	SM 4500-P E	535335
10428032003	FL-TT-05	SM 4500-P B	535279	SM 4500-P E	535335
10428032004	FL-TT-07	SM 4500-P B	535279	SM 4500-P E	535335

REPORT OF LABORATORY ANALYSIS

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WO#: 10428032



10428032

body Form	Work Order Number:	COC Type:	Page: 1 of 1
	Turnaround Time:	COC ID:	

CLIENT INFO	LABORATORY
Facility Code: MNSW057 / MPCA Freeway LF Waters	Lab Name:
Project Name: MPCA Freeway LF Waters	Address: 18-00383
Project Manager: Jennifer Anderson (Ba)	EPIC Profile # 38716
Potential Hazard? If yes, add information to Sampler Comments Section	Phone No:

FOR LAB USE ONLY
Lab Work Order Sticker

SAMPLE DETAILS											ANALYSIS REQUESTED						
SAMPLE TYPE CODES				LAB MATRIX CODES				FIELD MATRIX CODES			PRESERV.	ANALYSIS	List A	List B	List C	Lab Sample No.	#
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	# of Cont							
FL-TT-03	S	4/19/18	0930			G	NW	Wtr-Ground		41		X	X	X	001	1	
FL-TT-04	S	4/19/18	1300			G	NW	Wtr-Ground		37		X	X	X	002	2	
FL-TT-05	S	4/19/18	1545			G	NW	Wtr-Ground		41		X	X	X	003	3	
FL-TT-07	S	4/19/18	1830			G	NW	Wtr-Ground		38		X	X	X	004	4	
Blank rows 5-10																	

Sampled By: Brad Jacobson / JAK / TSB
 Sampler's Signature: *Brad Jacobson*
 Phone #: 612-596-8277

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
<i>[Signature]</i>	4-20-18/1830	<i>[Signature]</i> MACE	4-20-18 830

T = 2.6, 3.0, 2.0, 2.5, 3.9, 3.6, 2.7, 4.0 °C

Sample Condition Upon Receipt Client Name: MPLA/FIELD Project #: **WO# : 10428032**

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____

Tracking Number: _____

PM: JMA Due Date: 05/04/18
 CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 Type of Ice: Wet Blue None Dry Melted
 Used: G87A9155100842

Cooler Temp Read (°C): 2.6, 3.0, 2.0, 2.5 Cooler Temp Corrected (°C): 2.6, 3.0, 2.0, 2.5 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: TRUE Date and Initials of Person Examining Contents: WJP 4/20/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <u>Y</u> <u>N</u>
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1: 5/5</u> <u>2: 5/5</u> <u>3: 5/5</u> <u>4: 5/5</u>
Exceptions: <u>NO₃</u> , Coliform, TOC/DOC <u>oil and Grease</u> , DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature] Date: 04/20/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO3	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	EPA 8270C
PCBs	EPA 8082
PFCs	EPA 537
VOCs	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

**** ADD to Parameter List A:**

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Harness detrmination)

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 801.1
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace

Chain of Custody

WO#: 10428032



10428032



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin:

Workorder: 10428032

Workorder Name: 18-00383 MPCA Freeway LF Water

Owner Received Date:

4/20/2018

Results Requested By:

5/4/2018

Report To		Subcontract To					Requested Analysis															
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					Nitrogen, unionized ammonia, as N															
		Preserved Containers																				
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	H2SO4															LAB USE ONLY	
1	FL-TT-03	PS	4/19/2018 09:30	10428032001	Water	1															001	
2	FL-TT-04	PS	4/19/2018 13:00	10428032002	Water	1															002	
3	FL-TT-05	PS	4/19/2018 15:45	10428032003	Water	1															003	
4	FL-TT-07	PS	4/19/2018 18:03	10428032004	Water	1															004	
5																						
																	Comments					
Transfers	Released By	Date/Time	Received By	Date/Time																		
1	<i>[Signature]</i>	4/23/18 1400	<i>[Signature]</i>	4/24/18 1900	returning volume to MPLS																	
2	<i>[Signature]</i>	4/24/18 2315	<i>[Signature]</i>	4/25/18 0730																		
3	<i>[Signature]</i>	4/25/18 1830	<i>[Signature]</i>	4/25/18 1830																		
Cooler Temperature on Receipt		2.4 °C	Custody Seal		<input checked="" type="checkbox"/> or N	Received on Ice		<input checked="" type="checkbox"/> or N	Samples Intact													<input checked="" type="checkbox"/> or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

TE 3.6

Sample Condition Upon Receipt

Client Name: Pace MPIS
 Project #:

WO# : 10428032
 PM: JMA Due Date: 05/04/18
 CLIENT: PAST-MINFIELD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 G87A9155100842
 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 3.6 Cooler Temp Corrected (°C): 3.6 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: true Date and Initials of Person Examining Contents: ME 4/25/18

USDA Regulated Soil N/A, water sample
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MIN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7. <u>Return Samples</u>
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	12.
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-4</u> <u>4</u>
Initial when completed: _____ Lot # of added preservative: _____	
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: [Signature] Date: 04/26/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Sample Condition Upon Receipt

Client Name:

Pace MN

Project #:

WO#: 12107529

PM: HRZ

Due Date: 05/04/18

CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Optional: Proj Due Date: _____ Proj Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.1 Cooler Temp Corrected °C: 2.4 Biological Tissue Frozen? Yes No NA
Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: 4/24-18 DC

Comments: BM 4/25/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review:

Angela Lail

Date:

4/25/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Pittsburgh Lab Sample Condition Upon Receipt

30250592

Face Analytical

Client Name: pace MN

Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 2632

Label <u>BH</u>
LIMS Login <u>BH</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used N-A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>10D3671</u>	<u>BH 4-24-18</u>
Chain of Custody Present:	/			1.	
Chain of Custody Filled Out:	/			2.	
Chain of Custody Relinquished:	/			3.	
Sampler Name & Signature on COC:	/			4.	
Sample Labels match COC:	/			5.	
-Includes date/time/ID Matrix: <u>WT</u>					
Samples Arrived within Hold Time:	/			6.	
Short Hold Time Analysis (<72hr remaining):	/			7.	
Rush Turn Around Time Requested:	/			8.	
Sufficient Volume:	/			9.	
Correct Containers Used:	/			10.	
-Pace Containers Used:	/				
Containers Intact:	/			11.	
Orthophosphate field filtered			/	12.	
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.	
Organic Samples checked for dechlorination:			/	14.	
Filtered volume received for Dissolved tests			/	15.	
All containers have been checked for preservation.	/			16.	
All containers needing preservation are found to be in compliance with EPA recommendation.	/				<u>PHL2</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed <u>BH</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):			/	17.	
Trip Blank Present:			/	18.	
Trip Blank Custody Seals Present			/		
Rad Aqueous Samples Screened > 0.5 mrem/hr			/	Initial when completed: <u>BH</u>	Date: <u>4-24-18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

WO#: 4611204



4611204

contracting Laboratory.

State Of Origin: MN



Workorder: 10428032

Workorder Name: 18-00383 MPCA Freeway LF Water

Owner Received Date: 4/20/2018 Results Requested By: 5/4/2018

Report To		Subcontract To				Requested Analysis																				
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Grand Rapids 5560 Corporate Exchange Court Grand Rapids, MI 49512 USA Phone (616)975-4500				<div style="text-align: right; font-size: 24px; font-weight: bold;">73-4</div>																				
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Acrylamide EPA 8316 PDFW	Cyanide, free SM-500CIG	Formaldehyde EPA 8315 PGRM	LAB USE ONLY													
						Other	Unpreserved																			
1	FL-TT-03	PS	4/19/2018 09:30	10428032001	Water	2	5					X	X	X												
2	FL-TT-04	PS	4/19/2018 13:00	10428032002	Water	2	5					X	X	X												
3	FL-TT-05	PS	4/19/2018 15:45	10428032003	Water	2	5					X	X	X												
4	FL-TT-07	PS	4/19/2018 18:03	10428032004	Water	2	5					X	X	X												
5																										
Transfers		Released By	Date/Time	Received By	Date/Time	Comments																				
1		<i>Angela Pace</i>	4/23/18 1530	<i>Patricia</i>	4/24/18 0830																					
2																										
3																										
Cooler Temperature on Receipt		°C	Custody Seal Y or N		Received on Ice Y or N		Samples Intact Y or N																			

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

SAMPLE RECEIVING / LOG-IN CHECKLIST



Client: <u>Pace Minnesota</u>	Work Order #: <u>4611204</u>
Receipt Record Page/Line #: <u>23-4</u>	

Recorded by (initials/date): <u>TS 4/24/18</u>	<input type="checkbox"/> Cooler	Qty Received: <u>2</u>	<input checked="" type="checkbox"/> IR Gun (#202)
	<input type="checkbox"/> Box		Thermometer Used: <input type="checkbox"/> Digital Thermometer (#54)
	<input type="checkbox"/> Other		<input type="checkbox"/> IR Gun (#402)

Cooler #	Time	Cooler #	Time	Cooler #	Time	
<u>Blue</u>	<u>0920</u>	<u>Red</u>	<u>0928</u>			
Custody Seals: <input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		
Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		
Coolant Location: Dispersed / Top / Middle / Bottom		Coolant Location: Dispersed / Top / Middle / Bottom		Coolant Location: Dispersed / Top / Middle / Bottom		
Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		
If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		
	Observed °C	Correction Factor °C	Actual °C		Observed °C	
Temp Blank:				Temp Blank:		
Sample 1:	<u>1.1</u>	<u>1</u>	<u>1.1</u>	Sample 1:		
Sample 2:	<u>1.0</u>	<u>1</u>	<u>1.0</u>	Sample 2:		
Sample 3:	<u>1.09</u>	<u>1</u>	<u>1.09</u>	Sample 3:		
When above 6 °C take a 3 Sample Average °C:				When above 6 °C take a 3 Sample Average °C:		
<input type="checkbox"/> VOC Trip Blank received?				<input type="checkbox"/> VOC Trip Blank received?		

If any shaded areas checked, complete Sample Receiving Non-Conformance

Paperwork Received

Yes No

Chain of Custody record(s)? If No, Initiated By _____
Received for Lab Signed/Date/Time?

USDA Soil Documents?

Sampling / Field Forms?

Other _____

Check Sample Preservation

N/A Yes No

Temperature Blank OR average sample temperature, ≥6 °C?

If "Yes" was thermal preservation required?

If "Yes" were ALL samples collected the same day as receipt?

Completed Sample Preservation Verification Form?

Samples chemically preserved correctly?

If "No", add wire tag and fill out Non-Conformance Form?

Received unpreserved Terracore kit?

If "Yes" unpreserved vials must be frozen

COC Information

Pace COC Other _____

COC ID Numbers:

Work Order Not Logged In with Short Hold / Rush

Copies of COC To Lab Areas

Check COC for Accuracy

Yes No

Analysis Requested?

Sample ID matches COC?

Sample Date and Time matches COC?

All containers indicated are received?

Notes

Formaldehyde Air ore project

Sample Condition Summary

N/A	Yes	No	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Broken containers/lids?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Missing or incomplete labels?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Illegible information on labels?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Low volume received?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Inappropriate or non-Pace containers received?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	VOC vials have headspace?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Extra sample locations?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Containers not listed on COC?

Yes No

Were all samples logged into Epic?

Were all samples labelled?

Were samples placed on scan locations?

Initial / Date : TS 4/24/18

AQUEOUS SAMPLE PRESERVATION VERIFICATION

Client: Pace Minnesota Work Order #: 46 11204
 Receipt Log #: 23-4 Completed By (initials/date): PS 4/24/18

COC ID #		Adjusted by: _____ Date: _____												
Container Type	BP3C or AG30	BP1-4S		AG2S		BP1-4N Total		BP1-4N Dissolved						
Preservative	NaOH >12	H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2						
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted
COC Line #1	✓	N/A												
COC Line #2	✓	↓												
COC Line #3	✓	↓												
COC Line #4	✓	↓												
COC Line #5														
COC Line #6														
COC Line #7														
COC Line #8														
COC Line #9														
COC Line #10														
COC Line #11														
COC Line #12														

pH Strip Reagent or Lot #
 HC727135
 Other

Place a check mark in the Received box if pH is acceptable. If pH is not acceptable, document the Received and Adjusted pH values in the appropriate columns (project manager will review all adjustments at work order release). Never add more than 2x the default preservation volume (see table below for default volumes). Complete and attach a wire tag to all adjusted samples. A Sample Receiving Non-Conformance Report must be completed if a pH adjustment was required.

Comments:

COC ID #		Adjusted by: _____ Date: _____												
Container Type	BP3C or AG30	BP1-4S		AG2S		BP1-4N Total		BP1-4N Dissolved						
Preservative	NaOH >12	H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2						
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted
COC Line #1	✓	N/A												
COC Line #2	✓	↓												
COC Line #3														
COC Line #4														
COC Line #5														
COC Line #6														
COC Line #7														
COC Line #8														
COC Line #9														
COC Line #10														
COC Line #11														
COC Line #12														

Container Size (mL)	Default Preservative Volume (mL)
Container Types 5 / 23	NaOH
250	1.3
Container Type 4	H ₂ SO ₄
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H ₂ SO ₄
500	2.5
Container Types 6 / 15	HNO ₃
125	0.7
250	1.25
500	2.5
1000	5.0

Comments:



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #
Project Manager:
Client:

WO# : 35387887

PM: ADC Due Date: 05/04/18
CLIENT: PACMIN

Date and Initials of person:
Examining contents: KBI
Label: ALP
Deliver: _____
pH: _____

Thermometer Used: T337 Date: 4/24/18 Time: 1050 Initials: SS

State of Origin: _____

- | | |
|---|--|
| Cooler #1 Temp. °C <u>3.8</u> (Visual) <u>+0.41</u> (Correction Factor) <u>4.2</u> (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #2 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #3 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #4 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #5 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #6 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |

- Courier: Fed Ex UPS USPS Client Commercial Pace Other _____
- Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

- Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9832

- Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No Ice: Wet Blue Dry None

- Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (if Yes, complete) Shorted Date: _____ Shorted Time: _____ Qty: _____

Comments:

Chain of Custody Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Preservation Information: Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<u>SBA</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>See comments</u>
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: 3B2 4/24/18

Comments/ Resolution (use back for additional comments): sample # 4 "FL-IT-07" had 1/2 547
was with head space

Project Manager Review: Aaron Crump

Date: 04/24/18

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10428032 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 4/20/2018 Results Requested By: 5/4/2018

Report To		Subcontract To				Requested Analysis												
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Indianapolis 7726 Moller Road Indianapolis, IN 46268 Phone (317)228-3100																
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Methyl alcohol/Ethylene glycol/EPA	LAB USE ONLY						
						Unpreserved												
1	FL-TT-03	PS	4/19/2018 09:30	10428032001	Water	2					X							
2	FL-TT-04	PS	4/19/2018 13:00	10428032002	Water	2					X							
3	FL-TT-05	PS	4/19/2018 15:45	10428032003	Water	2					X							
4	FL-TT-07	PS	4/19/2018 18:03	10428032004	Water	2					X							
5																		
												Comments						
Transfers	Released By	Date/Time	Received By	Date/Time														
1	<i>[Signature]</i>	4/13/18	<i>[Signature]</i>															
2	<i>[Signature]</i>	4-24-18 0825	JASON HEWITT	4-24-18 0825														
3																		
Cooler Temperature on Receipt		3.9 °C	Custody Seal <input checked="" type="checkbox"/> or N		Received on Ice <input checked="" type="checkbox"/> or N		Samples Intact <input checked="" type="checkbox"/> or N											

50195165

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50195165

Date/Time and Initials of person examining contents: JH 4-24-18 1232

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 4832 2843

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 3.9/3.4 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		<input checked="" type="checkbox"/>	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl. All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			<input checked="" type="checkbox"/>
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		<input checked="" type="checkbox"/>				
Chain of Custody Present:	<input checked="" type="checkbox"/>		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			<input checked="" type="checkbox"/>
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>		Dissolved Metals field filtered?:			<input checked="" type="checkbox"/>
Short Hold Time Analysis (<72hr)? Analysis:		<input checked="" type="checkbox"/>	Headspace Wisconsin Sulfide			<input checked="" type="checkbox"/>
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			<input checked="" type="checkbox"/>
Rush TAT Requested:		<input checked="" type="checkbox"/>	Headspace in VOA Vials (>6mm):			<input checked="" type="checkbox"/>
Containers Intact?:	<input checked="" type="checkbox"/>		Trip Blank Present?:		<input checked="" type="checkbox"/>	
Sample Labels Match COC?: Except TCs, which only require sample ID	<input checked="" type="checkbox"/>		Trip Blank Custody Seals?:		<input checked="" type="checkbox"/>	

Comments:

Sample Container Count

WO#: 50195165



CLIENT: Pace MN

COC PAGE ___ of ___

COC ID# _____

Project # 50195165

SBS
Bulk
D
Kit

Matrix SIM
(Soil/Water/
Aqueous Lic

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	Matrix SIM (Soil/Water/Aqueous Lic)	pH <2	pH >9	pH >12
1																		2	W+			
2																		2	W+			
3																		2	W+			
4																		2	W+			
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
WGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				



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Madison, WI 53718
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May 03, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/24/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kari-Ann Killian For Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10428032
 Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FL-TT-07 (10428032004)	A181704-01	Water	04/19/2018	04/24/2018
FL-TT-03 (10428032001)	A181704-02	Water	04/19/2018	04/25/2018
FL-TT-04 (10428032002)	A181704-03	Water	04/19/2018	04/25/2018
FL-TT-05 (10428032003)	A181704-04	Water	04/19/2018	04/25/2018

CASE NARRATIVE

Sample Receipt Information:

1 sample was received on 04/24/2018. 3 samples were received on 04/25/2018. Samples were received at 3.1 and 2.5 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Continuing Calibration Verification (CCV):

The LC footnote on samples A181704-01 through A181704-04 states that there were low CCV recoveries for fonofos and prometon. The lower control limit is 80% and the lowest recoveries were 79.8% and 75.8%, respectively.

The LC footnote on samples A181704-03 through A181704-04 states that there was a low CCV recovery for 2,4-db. The lower control limit is 80% and the lowest recovery was 71.8%.

CCV also indicates a potential high bias for triallate for samples A181704-01 through A181704-04. Samples were less than the reporting limit for this analyte so no further action is required.



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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10428032
Project Manager: Jennifer Anderson

FL-TT-07 (10428032004)

A181704-01 (Water)

Date Sampled
04/19/2018 18:03

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804193

Acetochlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	LC
Metolachlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	LC
Propachlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	

Surrogate: Atrazine-d5		79.4 %		65.1-122	04/25/2018	04/27/2018 22:41	EPA 8270D	
Surrogate: Parathion-d10		110 %		22.3-159	04/25/2018	04/27/2018 22:41	EPA 8270D	
Surrogate: Triphenyl phosphate		93.6 %		65.2-151	04/25/2018	04/27/2018 22:41	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804196

2,4-D	ND	0.50	ug/L	1	04/26/2018	05/02/2018 06:58	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/26/2018	05/02/2018 06:58	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/26/2018	05/02/2018 06:58	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/26/2018	05/02/2018 06:58	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/26/2018	05/02/2018 06:58	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/26/2018	05/02/2018 06:58	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/26/2018	05/02/2018 06:58	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/26/2018	05/02/2018 06:58	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/26/2018	05/02/2018 06:58	EPA 8151A	

Surrogate: 2,4-D-d5		93.8 %		44.2-121	04/26/2018	05/02/2018 06:58	EPA 8151A	
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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10428032
 Project Manager: Jennifer Anderson

FL-TT-03 (10428032001)

A181704-02 (Water)

Date Sampled
04/19/2018 09:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804193

Acetochlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	LC
Metolachlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	LC
Propachlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Surrogate: Atrazine-d5		86.2 %		65.1-122	04/25/2018	04/27/2018 23:14	EPA 8270D	
Surrogate: Parathion-d10		132 %		22.3-159	04/25/2018	04/27/2018 23:14	EPA 8270D	
Surrogate: Triphenyl phosphate		108 %		65.2-151	04/25/2018	04/27/2018 23:14	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804196

2,4-D	ND	0.50	ug/L	1	04/26/2018	05/02/2018 07:33	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/26/2018	05/02/2018 07:33	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/26/2018	05/02/2018 07:33	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/26/2018	05/02/2018 07:33	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/26/2018	05/02/2018 07:33	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/26/2018	05/02/2018 07:33	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/26/2018	05/02/2018 07:33	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/26/2018	05/02/2018 07:33	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/26/2018	05/02/2018 07:33	EPA 8151A	
Surrogate: 2,4-D-d5		85.0 %		44.2-121	04/26/2018	05/02/2018 07:33	EPA 8151A	



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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10428032
Project Manager: Jennifer Anderson

FL-TT-04 (10428032002)

A181704-03 (Water)

Date Sampled
04/19/2018 13:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804193

Acetochlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	LC
Metolachlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	LC
Propachlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Surrogate: Atrazine-d5		77.4 %		65.1-122	04/25/2018	04/27/2018 23:47	EPA 8270D	
Surrogate: Parathion-d10		126 %		22.3-159	04/25/2018	04/27/2018 23:47	EPA 8270D	
Surrogate: Triphenyl phosphate		104 %		65.2-151	04/25/2018	04/27/2018 23:47	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804196

2,4-D	ND	0.50	ug/L	1	04/26/2018	05/02/2018 09:55	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/26/2018	05/02/2018 09:55	EPA 8151A	LC
2,4,5-T	ND	0.50	ug/L	1	04/26/2018	05/02/2018 09:55	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/26/2018	05/02/2018 09:55	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/26/2018	05/02/2018 09:55	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/26/2018	05/02/2018 09:55	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/26/2018	05/02/2018 09:55	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/26/2018	05/02/2018 09:55	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/26/2018	05/02/2018 09:55	EPA 8151A	
Surrogate: 2,4-D-d5		84.9 %		44.2-121	04/26/2018	05/02/2018 09:55	EPA 8151A	



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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10428032
 Project Manager: Jennifer Anderson

FL-TT-05 (10428032003)

Date Sampled
 04/19/2018 15:45

A181704-04 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804193

Acetochlor	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	LC
Metolachlor	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	LC
Propachlor	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Surrogate: Atrazine-d5		76.0 %		65.1-122	04/25/2018	04/28/2018 00:20	EPA 8270D	
Surrogate: Parathion-d10		139 %		22.3-159	04/25/2018	04/28/2018 00:20	EPA 8270D	
Surrogate: Triphenyl phosphate		101 %		65.2-151	04/25/2018	04/28/2018 00:20	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804196

2,4-D	ND	0.50	ug/L	1	04/26/2018	05/02/2018 10:31	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/26/2018	05/02/2018 10:31	EPA 8151A	LC
2,4,5-T	ND	0.50	ug/L	1	04/26/2018	05/02/2018 10:31	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/26/2018	05/02/2018 10:31	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/26/2018	05/02/2018 10:31	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/26/2018	05/02/2018 10:31	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/26/2018	05/02/2018 10:31	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/26/2018	05/02/2018 10:31	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/26/2018	05/02/2018 10:31	EPA 8151A	
Surrogate: 2,4-D-d5		94.4 %		44.2-121	04/26/2018	05/02/2018 10:31	EPA 8151A	



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 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10428032
 Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804193 - EPA 3510C

Blank (A804193-BLK1)

Prepared: 04/25/2018 Analyzed: 04/27/2018 00:21

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>69.9</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>98.8</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>90.8</i>	<i>65.2-151</i>			

LCS (A804193-BS1)

Prepared: 04/25/2018 Analyzed: 04/27/2018 00:53

Acetochlor	0.764	0.50	ug/L	1.000		76.4	67.5-120			
Alachlor	0.833	0.50	ug/L	1.000		83.3	71.7-120			
Atrazine	0.759	0.50	ug/L	1.000		75.9	72.8-113			
Chlorpyrifos	0.747	0.50	ug/L	1.000		74.7	65.3-119			
Cyanazine	0.791	0.20	ug/L	1.000		79.1	49.5-140			
Desethylatrazine	0.774	0.50	ug/L	1.000		77.4	66.9-116			
Deisopropylatrazine	0.625	0.50	ug/L	1.000		62.5	44.3-110			
Dimethenamid	0.805	0.50	ug/L	1.000		80.5	63.8-116			
EPTC	0.706	0.50	ug/L	1.000		70.6	41.7-102			
Ethalfuralin	0.886	0.50	ug/L	1.000		88.6	41-127			
Fonofos	0.804	0.50	ug/L	1.000		80.4	59.7-118			
Metolachlor	0.791	0.50	ug/L	1.000		79.1	71.7-122			
Metribuzin	0.824	0.50	ug/L	1.000		82.4	66.6-128			
Pendimethalin	0.866	0.50	ug/L	1.000		86.6	55.5-137			
Phorate	0.683	0.30	ug/L	1.000		68.3	41.2-114			
Prometon	0.799	0.50	ug/L	1.000		79.9	66.3-120			
Propachlor	0.813	0.50	ug/L	1.000		81.3	65.8-119			



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Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10428032
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804193 - EPA 3510C

LCS (A804193-BS1)

Prepared: 04/25/2018 Analyzed: 04/27/2018 00:53

Propazine	0.759	0.50	ug/L	1.000		75.9	72-122			
Simazine	0.776	0.50	ug/L	1.000		77.6	72.8-113			
Terbufos	0.719	0.20	ug/L	1.000		71.9	38.6-115			
Triallate	0.900	0.50	ug/L	1.000		90.0	51.4-116			
Trifluralin	0.809	0.50	ug/L	1.000		80.9	46.1-134			
<i>Surrogate: Atrazine-d5</i>	<i>0.378</i>		<i>ug/L</i>	<i>0.5000</i>		<i>75.6</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.588</i>		<i>ug/L</i>	<i>0.5000</i>		<i>118</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.426</i>		<i>ug/L</i>	<i>0.5000</i>		<i>85.3</i>	<i>65.2-151</i>			

LCS Dup (A804193-BSD1)

Prepared: 04/25/2018 Analyzed: 04/27/2018 01:26

Acetochlor	0.801	0.50	ug/L	1.000		80.1	67.5-120	4.76	20	
Alachlor	0.854	0.50	ug/L	1.000		85.4	71.7-120	2.45	20	
Atrazine	0.806	0.50	ug/L	1.000		80.6	72.8-113	6.00	20	
Chlorpyrifos	0.828	0.50	ug/L	1.000		82.8	65.3-119	10.4	20	
Cyanazine	0.754	0.20	ug/L	1.000		75.4	49.5-140	4.82	20	
Desethylatrazine	0.786	0.50	ug/L	1.000		78.6	66.9-116	1.53	20	
Deisopropylatrazine	0.679	0.50	ug/L	1.000		67.9	44.3-110	8.34	20	
Dimethenamid	0.822	0.50	ug/L	1.000		82.2	63.8-116	2.06	20	
EPTC	0.719	0.50	ug/L	1.000		71.9	41.7-102	1.79	20	
Ethalfuralin	0.837	0.50	ug/L	1.000		83.7	41-127	5.66	20	
Fonofos	0.827	0.50	ug/L	1.000		82.7	59.7-118	2.74	20	
Metolachlor	0.850	0.50	ug/L	1.000		85.0	71.7-122	7.16	20	
Metribuzin	0.840	0.50	ug/L	1.000		84.0	66.6-128	1.91	20	
Pendimethalin	0.922	0.50	ug/L	1.000		92.2	55.5-137	6.31	20	
Phorate	0.725	0.30	ug/L	1.000		72.5	41.2-114	6.00	20	
Prometon	0.857	0.50	ug/L	1.000		85.7	66.3-120	7.09	20	
Propachlor	0.808	0.50	ug/L	1.000		80.8	65.8-119	0.636	20	
Propazine	0.842	0.50	ug/L	1.000		84.2	72-122	10.3	20	
Simazine	0.801	0.50	ug/L	1.000		80.1	72.8-113	3.19	20	
Terbufos	0.731	0.20	ug/L	1.000		73.1	38.6-115	1.61	20	
Triallate	0.911	0.50	ug/L	1.000		91.1	51.4-116	1.32	20	
Trifluralin	0.844	0.50	ug/L	1.000		84.4	46.1-134	4.29	20	
<i>Surrogate: Atrazine-d5</i>	<i>0.362</i>		<i>ug/L</i>	<i>0.5000</i>		<i>72.3</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.528</i>		<i>ug/L</i>	<i>0.5000</i>		<i>106</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.416</i>		<i>ug/L</i>	<i>0.5000</i>		<i>83.1</i>	<i>65.2-151</i>			



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Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10428032
Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804196 - EPA 3510C

Blank (A804196-BLK1)

Prepared: 04/26/2018 Analyzed: 05/02/2018 02:12

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							

Surrogate: 2,4-D-d5

1.72 ug/L 2.016 85.2 44.2-121

LCS (A804196-BS1)

Prepared: 04/26/2018 Analyzed: 05/02/2018 04:35

2,4-D	1.85	0.50	ug/L	2.000		92.3	64.6-148			
2,4-DB	1.48	0.50	ug/L	2.000		73.8	66.7-143			
2,4,5-T	1.61	0.50	ug/L	2.000		80.4	63.4-133			
2,4,5-TP (Silvex)	1.66	0.50	ug/L	2.000		83.0	63-145			
Bentazon	0.819	0.50	ug/L	1.000		81.9	52.5-139			
Dicamba	1.70	0.50	ug/L	2.000		84.9	55.4-143			
MCPA	1.64	0.30	ug/L	2.000		82.2	33.5-143			
Picloram	0.642	0.50	ug/L	1.000		64.2	47.9-113			
Triclopyr	1.67	0.50	ug/L	2.000		83.6	65.1-141			

Surrogate: 2,4-D-d5

1.79 ug/L 2.016 88.6 44.2-121

LCS Dup (A804196-BSD1)

Prepared: 04/26/2018 Analyzed: 05/02/2018 05:11

2,4-D	1.99	0.50	ug/L	2.000		99.5	64.6-148	7.54	20	
2,4-DB	1.73	0.50	ug/L	2.000		86.5	66.7-143	15.9	20	
2,4,5-T	1.81	0.50	ug/L	2.000		90.5	63.4-133	11.9	20	
2,4,5-TP (Silvex)	1.84	0.50	ug/L	2.000		92.2	63-145	10.6	20	
Bentazon	0.939	0.50	ug/L	1.000		93.9	52.5-139	13.6	20	
Dicamba	1.92	0.50	ug/L	2.000		96.2	55.4-143	12.5	20	
MCPA	1.89	0.30	ug/L	2.000		94.5	33.5-143	13.8	20	
Picloram	0.729	0.50	ug/L	1.000		72.9	47.9-113	12.8	20	
Triclopyr	1.93	0.50	ug/L	2.000		96.7	65.1-141	14.6	20	

Surrogate: 2,4-D-d5

1.92 ug/L 2.016 95.3 44.2-121



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Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10428032
Project Manager: Jennifer Anderson

Notes and Definitions

- LC Results may be biased low because of low continuing calibration verification (CCV).
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

A181704

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10428032 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 4/20/2018 Results Requested By: 5/4/2018

Report To		Subcontract To					Requested Analysis														
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700																			
		Preserved Containers																			
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved															LAB USE ONLY
1	FL-TT-03	PS	4/19/2018 09:30	10428032001	Water	2															02
2	FL-TT-04	PS	4/19/2018 13:00	10428032002	Water	2															03
3	FL-TT-05	PS	4/19/2018 15:45	10428032003	Water	2															04
4	FL-TT-02	PS	4/19/2018 10:00	10428032004	Water	2															
5																					
Comments																					
Transfers	Released By	Date/Time	Received By	Date/Time																	
1	<i>Maryland Pace</i>	4/24/18	<i>Jessica Erickson</i>	04-25-18																	
2				0930																	
3																					
Cooler Temperature on Receipt		2.5 °C	Custody Seal	Y or N	Received on Ice	Y or N	Samples Intact		Y or N												

**In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

SIN 160142274
Exp. 07-12-18

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

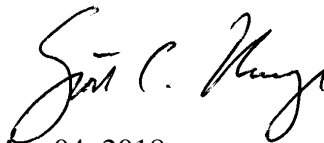
PaceProject#: 10428044
Sample Receipt Date: 04/20/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



May 04, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

May 4, 2018

DISCUSSION

This report presents the results from the analyses performed on four samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration point and a nominal 1-Liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 53-76%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 116-125% with a relative percent difference of 7.5%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10426745

Appendix A

Sample Management

WO#: 10428044



Report No.: 10428044_1613TCDD_DFR

body Form	Work Order Number:	COC Type:	Page: 1 of 1
	Turnaround Time:	COC ID:	

CLIENT INFO		LABORATORY	
Facility Code: MNSW057 / MPCA Freeway LF Waters	Program Code (MDH Lab Only):	Lab Name:	
Project Name: MPCA Freeway LF Waters	Project Task Code:	Address: 18-00383	
Project Manager: Jennifer Anderson (Paw)		EPIC Profile #38716	
Potential Hazard?	If yes, add information to Sampler Comments Section	Phone No:	

FOR LAB USE ONLY

Lab Work Order Sticker

SAMPLE DETAILS											ANALYSIS REQUESTED						
SAMPLE TYPE CODES				LAB MATRIX CODES				FIELD MATRIX CODES			PRESERV.	ANALYSIS	List A	List B	List C	Lab Sample No.	#
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)							
FL-TT-03	S	4/19/18	0930			G	NW	Wtr-Ground			41	X	X	X	001	1	
FL-TT-04	S	4/19/18	1300			G	NW	Wtr-Ground			37	X	X	X	002	2	
FL-TT-05	S	4/19/18	1545			G	NW	Wtr-Ground			41	X	X	X	003	3	
FL-TT-07	S	4/19/18	1830			G	NW	Wtr-Ground			38	X	X	X	004	4	
																5	
																6	
																7	
																8	
																9	
																10	

Sampled By: Brad Jackson / SWK / TSB Sampler's Signature: *Brad Jackson* Phone #: 612-590-8224

Receiving Comments:	
Relinquished By/Affiliation: <i>[Signature]</i>	Date/Time: 4-20-18/830
Accepted By/Affiliation: <i>[Signature]</i>	Date/Time: 4-20-18 830

T_s 2.6, 3.0, 2.0, 2.5, 3.9, 3.6, 2.7, 4.0 °C

Page 5 of 16

Sample Condition Upon Receipt **Client Name:** FSD / MPCA **Project #:** **WO#: 10428044**

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

PM: SCU **Due Date: 05/04/18**
CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer 151401163 **Type of Ice:** Wet Blue None Dry Melted
Used: G87A9155100842 **Cooler Temp Read (°C):** 2.6, 1.3, 0.2, 2.0, 2.5, 4.0 **Cooler Temp Corrected (°C):** 2.0, 3.0, 2.0, 2.5

Cooler Temp Read (°C): 2.6, 1.3, 0.2, 2.0, 2.5, 4.0 **Cooler Temp Corrected (°C):** 3.4, 1.3, 0.2, 2.7, 4.0 **Biological Tissue Frozen?** Yes No N/A

Temp should be above freezing to 6°C **Correction Factor:** True **Date and Initials of Person Examining Contents:** ME 4/20/18

USDA Regulated Soil (N/A, water sample)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature] **Date:** 04/20/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10426745

Report No.....10428044_1613TCDD_DFR

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Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-03		
Lab Sample ID	10428044001		
Filename	U180503B_12		
Injected By	SMT		
Total Amount Extracted	935 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	04/19/2018 09:30
ICAL ID	U180405	Received	04/20/2018 08:30
CCal Filename(s)	U180503A_13	Extracted	04/24/2018 11:20
Method Blank ID	BLANK-61923	Analyzed	05/04/2018 01:00

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	60
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	90

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-04		
Lab Sample ID	10428044002		
Filename	U180503B_13		
Injected By	SMT		
Total Amount Extracted	1010 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	04/19/2018 13:00
ICAL ID	U180405	Received	04/20/2018 08:30
CCal Filename(s)	U180503A_13	Extracted	04/24/2018 11:20
Method Blank ID	BLANK-61923	Analyzed	05/04/2018 01:48

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	53
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	88

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

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Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-05		
Lab Sample ID	10428044003		
Filename	U180503B_14		
Injected By	SMT		
Total Amount Extracted	998 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	04/19/2018 15:45
ICAL ID	U180405	Received	04/20/2018 08:30
CCal Filename(s)	U180503A_13	Extracted	04/24/2018 11:20
Method Blank ID	BLANK-61923	Analyzed	05/04/2018 02:36

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	76
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	90

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

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Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-07		
Lab Sample ID	10428044004		
Filename	U180503B_15		
Injected By	SMT		
Total Amount Extracted	1000 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	04/19/2018 18:30
ICAL ID	U180405	Received	04/20/2018 08:30
CCal Filename(s)	U180503A_13	Extracted	04/24/2018 11:20
Method Blank ID	BLANK-61923	Analyzed	05/04/2018 03:23

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	55
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	58

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61923	Matrix	Water
Filename	U180502B_08	Dilution	NA
Total Amount Extracted	1020 mL	Extracted	04/24/2018 11:20
ICAL ID	U180405	Analyzed	05/02/2018 21:50
CCal Filename(s)	U180502A_10	Injected By	SMT

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	71
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	73

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61924	Matrix	Water
Filename	U180502B_06	Dilution	NA
Total Amount Extracted	1010 mL	Extracted	04/24/2018 11:20
ICAL ID	U180405	Analyzed	05/02/2018 20:14
CCal Filename	U180502A_10	Injected By	SMT
Method Blank ID	BLANK-61923		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	12	7.3	14.6	125
2,3,7,8-TCDD-37Cl4	10	8.4	3.7	15.8	84
2,3,7,8-TCDD-13C	100	75	25.0	141.0	75

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61925	Matrix	Water
Filename	U180502B_07	Dilution	NA
Total Amount Extracted	1030 mL	Extracted	04/24/2018 11:20
ICAL ID	U180405	Analyzed	05/02/2018 21:02
CCal Filename	U180502A_10	Injected By	SMT
Method Blank ID	BLANK-61923		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	12	7.3	14.6	116
2,3,7,8-TCDD-37Cl4	10	9.0	3.7	15.8	90
2,3,7,8-TCDD-13C	100	75	25.0	141.0	75

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61924
 Spike 1 Filename U180502B_06

Spike 2 ID LCSD-61925
 Spike 2 Filename U180502B_07

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	125	116	7.5

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

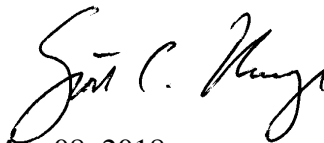
PaceProject#: 10428092
Sample Receipt Date: 04/20/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



May 08, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

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The results relate only to the samples included in this report.

Report Prepared Date:

May 8, 2018

DISCUSSION

This report presents the results from the analyses performed on five samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The samples were received above the recommended temperature range of 0-6 degrees Celsius.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 56-78%. All of the labeled internal standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 118%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10428092

Appendix A

Sample Management



		Chain-of-Custody Form				Work Order Number:		COC Type:		Page: 1 of 1						
PROJECT/CLIENT INFO						Turnaround Time:		COC ID:		FOR LAB USE ONLY						
LABORATORY																
Facility Code: MNSW057/MPCA Freeway LF Solids		Program Code: (MDH Lab Only)				Lab Name:										
Project Name: MPCA - Freeway LF Solids		Project Task Code:				Address: 18-CO383		EPIC Profile # 38716								
Project Manager:						Phone No.:				Lab Work Order Sticker						
Potential Hazard?		If yes, add information to Sampler Comments Section														
SAMPLE DETAILS						ANALYSIS REQUESTED										
SAMPLE TYPE CODES Sample-Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample		QC-FB=Field Blank Sample QC-FR=Field Replicate Sample QC-TB=Trip Blank Sample		LAB MATRIX CODES DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe		AR=Air SL=Biological Material OT=Other TS=Tissue		FIELD MATRIX CODES GW=Ground=Groundwater SW=Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample		PRESERV.		ANALYSIS		Lab Sample No. #		
Location Identifier	Sample Type	Date	Time	Start Depth, Fm	End Depth, Fm	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Coats	See Attach for 1, 2, 3, 4, 5 waste. Inc Id Dioxin				
FL-TT-03 (2-10)WM	S	4/19/18	0900	2	10	C	SD				13	X			001	1
FL-TT-06 (0-10)S	S	4/19/18	1145	0	10	C	SD				13	X			002	2
FL-TT-04 (2-14)WM	S	4/19/18	1230	2	14	C	SD				13	X			003	3
FL-TT-05 (5-15)WM	S	4/19/18	1500	5	15	C	SD				13	X			004	4
FL-TT-07 (1-5)S	S	4/19/18	1715	1	5	C	SD				13	X			005	5
 B.C. 04/20/18 																
Sampled By: Brad Jacobson/SAR/TJB						Sampler's Signature: <i>Brad Jacobson</i>						Phone #: 612-570-8276				
Receiving Comments:																
Relinquished By/Affiliation						Date/Time		Accepted By/Affiliation				Date/Time				
<i>JTB</i>						4-20-18/030		<i>W. PACE</i>				4-20-18 830				

3692

Sample Condition Upon Receipt **Client Name:** Minnesota Pollution Control Agency **Project #:** _____

Courier: Fed Ex UPS USPS Client

Commercial Pace SpeeDee Other: _____

Tracking Number: _____

WO# : 10428092

PM: SCU **Due Date: 05/04/18**

CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer 151401163 **Type of Ice:** Wet Blue None Dry Melted

Used: G87A9155100842

Cooler Temp Read (°C): 3.6 **Cooler Temp Corrected (°C):** 3.6 **Biological Tissue Frozen?** Yes No N/A

Temp should be above freezing to 6°C **Correction Factor:** True **Date and Initials of Person Examining Contents:** H 4-20-18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature] **Date:** 04/20/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10428092

Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-03 (2-10)WM		
Lab Sample ID	10428092001		
Filename	U180504B_04		
Injected By	BAL		
Total Amount Extracted	14.7 g	Matrix	Solid
% Moisture	71.2	Dilution	NA
Dry Weight Extracted	4.23 g	Collected	04/19/2018 09:00
ICAL ID	U180405	Received	04/20/2018 08:30
CCal Filename(s)	U180504A_16 & U180504B_15	Extracted	04/25/2018 15:05
Method Blank ID	BLANK-61942	Analyzed	05/04/2018 20:20

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	4.3	----	1.0	2,3,7,8-TCDD-13C	2.00	64
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	63

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-06 (0-10)S		
Lab Sample ID	10428092002		
Filename	U180504B_05		
Injected By	BAL		
Total Amount Extracted	14.0 g	Matrix	Solid
% Moisture	25.3	Dilution	NA
Dry Weight Extracted	10.5 g	Collected	04/19/2018 11:45
ICAL ID	U180405	Received	04/20/2018 08:30
CCal Filename(s)	U180504A_16 & U180504B_15	Extracted	04/25/2018 15:05
Method Blank ID	BLANK-61942	Analyzed	05/04/2018 21:08

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	72
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	68

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-04 (2-14)WM		
Lab Sample ID	10428092003		
Filename	U180504A_04		
Injected By	SMT		
Total Amount Extracted	13.3 g	Matrix	Solid
% Moisture	26.1	Dilution	NA
Dry Weight Extracted	9.83 g	Collected	04/19/2018 12:30
ICAL ID	U180405	Received	04/20/2018 08:30
CCal Filename(s)	U180503B_16 & U180504A_16	Extracted	04/25/2018 15:05
Method Blank ID	BLANK-61942	Analyzed	05/04/2018 07:22

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	1.4	----	1.0	2,3,7,8-TCDD-13C	2.00	59
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	61

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-05 (5-15)WM		
Lab Sample ID	10428092004		
Filename	U180504A_05		
Injected By	SMT		
Total Amount Extracted	15.7 g	Matrix	Solid
% Moisture	35.6	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	04/19/2018 15:00
ICAL ID	U180405	Received	04/20/2018 08:30
CCal Filename(s)	U180503B_16 & U180504A_16	Extracted	04/25/2018 15:05
Method Blank ID	BLANK-61942	Analyzed	05/04/2018 08:10

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	78
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	81

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-07 (1-5)S		
Lab Sample ID	10428092005		
Filename	U180504A_06		
Injected By	SMT		
Total Amount Extracted	12.3 g	Matrix	Solid
% Moisture	48.2	Dilution	NA
Dry Weight Extracted	6.37 g	Collected	04/19/2018 17:15
ICAL ID	U180405	Received	04/20/2018 08:30
CCal Filename(s)	U180503B_16 & U180504A_16	Extracted	04/25/2018 15:05
Method Blank ID	BLANK-61942	Analyzed	05/04/2018 08:58

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	4.3	----	1.0	2,3,7,8-TCDD-13C	2.00	56
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	54

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61942	Matrix	Solid
Filename	F180502B_07	Dilution	NA
Total Amount Extracted	75.5 g	Extracted	04/25/2018 15:05
ICAL ID	F180405	Analyzed	05/02/2018 16:51
CCal Filename(s)	F180502B_01 & F180502B_17	Injected By	SMT

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	59

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61943	Matrix	Solid
Filename	F180502B_16	Dilution	NA
Total Amount Extracted	75.6 g	Extracted	04/25/2018 15:05
ICAL ID	F180405	Analyzed	05/02/2018 23:37
CCal Filename(s)	F180502B_01 & F180502B_17	Injected By	SMT
Method Blank ID	BLANK-61942		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.24	118	2,3,7,8-TCDD-13C	2.0	59
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	62

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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May 08, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 20, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Montana Certificate #CERT0103
California Certification #2973
California Certification #2973
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
Montana DHHS Certification #: CERT0102
Minnesota Dept of Health Certification #: 1382680

Nevada DCNR Certification #: MN000372018-1
Wisconsin DNR Certification #: 999446800
North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001

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CERTIFICATIONS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10428096001	FL-TT-03(2-10) WM	Solid	04/19/18 09:00	04/20/18 08:30
10428096002	FL-TT-06 (0-10) S	Solid	04/19/18 11:45	04/20/18 08:30
10428096003	FL-TT-04 (2-14) WM	Solid	04/19/18 12:30	04/20/18 08:30
10428096004	FL-TT-05 (5-15) WM	Solid	04/19/18 15:00	04/20/18 08:30
10428096005	FL-TT-07 (1-5) S	Solid	04/19/18 17:15	04/20/18 08:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10428096001	FL-TT-03(2-10) WM	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	JRH	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010C	DM	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	TT3	10	PASI-M		
		EPA 7471	LMW	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	AT1	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10428096002	FL-TT-06 (0-10) S	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M
WI MOD DRO	JRH			2	PASI-M		
WI MOD GRO	AJR			2	PASI-M		
EPA 6010C	DM			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	TT3			10	PASI-M		
EPA 7471	LMW			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	AT1			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8260B	CD2			70	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
10428096003	FL-TT-04 (2-14) WM			EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	PW1	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10428096004	FL-TT-05 (5-15) WM	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	PW1	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10428096005	FL-TT-07 (1-5) S	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	PW1	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: **FL-TT-03(2-10) WM** Lab ID: **10428096001** Collected: 04/19/18 09:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	29.1	ng/g	24.0	1	05/04/18 10:07	05/07/18 14:03	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	309-00-2	
alpha-BHC	ND	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	319-84-6	
beta-BHC	ND	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	319-85-7	
delta-BHC	ND	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	319-86-8	
gamma-BHC (Lindane)	102	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	58-89-9	
Chlordane (Technical)	ND	ug/kg	231	2	04/20/18 16:36	05/01/18 21:45	57-74-9	
alpha-Chlordane	ND	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	5103-71-9	
gamma-Chlordane	ND	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	5103-74-2	
4,4'-DDD	ND	ug/kg	46.1	2	04/20/18 16:36	05/01/18 21:45	72-54-8	
4,4'-DDE	53.4	ug/kg	46.1	2	04/20/18 16:36	05/01/18 21:45	72-55-9	
4,4'-DDT	75.3	ug/kg	46.1	2	04/20/18 16:36	05/01/18 21:45	50-29-3	
Dieldrin	ND	ug/kg	46.1	2	04/20/18 16:36	05/01/18 21:45	60-57-1	
Endosulfan I	ND	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	959-98-8	
Endosulfan II	ND	ug/kg	46.1	2	04/20/18 16:36	05/01/18 21:45	33213-65-9	
Endosulfan sulfate	ND	ug/kg	46.1	2	04/20/18 16:36	05/01/18 21:45	1031-07-8	
Endrin	ND	ug/kg	46.1	2	04/20/18 16:36	05/01/18 21:45	72-20-8	
Endrin aldehyde	ND	ug/kg	46.1	2	04/20/18 16:36	05/01/18 21:45	7421-93-4	
Endrin ketone	355	ug/kg	46.1	2	04/20/18 16:36	05/01/18 21:45	53494-70-5	
Heptachlor	ND	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	76-44-8	
Heptachlor epoxide	ND	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	1024-57-3	
Methoxychlor	ND	ug/kg	231	2	04/20/18 16:36	05/01/18 21:45	72-43-5	
Toxaphene	ND	ug/kg	692	2	04/20/18 16:36	05/01/18 21:45	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	84	%	30-150	2	04/20/18 16:36	05/01/18 21:45	877-09-8	3M, D4
Decachlorobiphenyl (S)	76	%	30-150	2	04/20/18 16:36	05/01/18 21:45	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	229	1	04/20/18 16:33	04/24/18 15:10	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	229	1	04/20/18 16:33	04/24/18 15:10	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	229	1	04/20/18 16:33	04/24/18 15:10	11141-16-5	
PCB-1242 (Aroclor 1242)	10500	ug/kg	458	2	04/20/18 16:33	04/27/18 13:36	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	229	1	04/20/18 16:33	04/24/18 15:10	12672-29-6	
PCB-1254 (Aroclor 1254)	878	ug/kg	229	1	04/20/18 16:33	04/24/18 15:10	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	229	1	04/20/18 16:33	04/24/18 15:10	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	229	1	04/20/18 16:33	04/24/18 15:10	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	229	1	04/20/18 16:33	04/24/18 15:10	11100-14-4	
PCB, Total	11300	ug/kg	458	2	04/20/18 16:33	04/27/18 13:36	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	75	%	48-125	1	04/20/18 16:33	04/24/18 15:10	877-09-8	
Decachlorobiphenyl (S)	114	%	30-134	1	04/20/18 16:33	04/24/18 15:10	2051-24-3	CH
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	3370	mg/kg	2890	10	04/20/18 17:57	04/22/18 14:26		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-03(2-10) WM **Lab ID: 10428096001** Collected: 04/19/18 09:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	0	%	50-150	10	04/20/18 17:57	04/22/18 14:26	638-68-6	P3,S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	33.6	1	05/02/18 10:19	05/02/18 19:36		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	05/02/18 10:19	05/02/18 19:36	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	24900	mg/kg	34.1	1	04/23/18 07:48	04/26/18 13:42	7429-90-5	P6,R1
Barium	428	mg/kg	1.7	1	04/23/18 07:48	04/26/18 13:42	7440-39-3	M1
Boron	109	mg/kg	25.6	1	04/23/18 07:48	04/26/18 13:42	7440-42-8	M1,R1
Copper	448	mg/kg	1.7	1	04/23/18 07:48	04/26/18 13:42	7440-50-8	M1,R1
Iron	166000	mg/kg	85.2	10	04/23/18 07:48	04/26/18 14:39	7439-89-6	M6,R1
Manganese	596	mg/kg	0.85	1	04/23/18 07:48	04/26/18 13:42	7439-96-5	M1
Nickel	62.5	mg/kg	3.4	1	04/23/18 07:48	04/26/18 13:42	7440-02-0	
Silver	26.3	mg/kg	1.7	1	04/23/18 07:48	04/26/18 13:42	7440-22-4	
Tin	406	mg/kg	12.8	1	04/23/18 07:48	04/26/18 13:42	7440-31-5	M1,R1
Titanium	208	mg/kg	4.3	1	04/23/18 07:48	04/26/18 13:42	7440-32-6	M1
Zinc	831	mg/kg	3.4	1	04/23/18 07:48	04/26/18 13:42	7440-66-6	P6
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	54.7	mg/kg	0.63	1	04/25/18 09:25	04/26/18 04:15	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	3.7	mg/kg	1.7	20	04/23/18 08:19	04/25/18 15:59	7440-36-0	
Arsenic	11.9	mg/kg	1.7	20	04/23/18 08:19	04/25/18 15:59	7440-38-2	
Beryllium	ND	mg/kg	0.69	20	04/23/18 08:19	04/25/18 15:59	7440-41-7	
Cadmium	38.6	mg/kg	0.28	20	04/23/18 08:19	04/25/18 15:59	7440-43-9	
Cobalt	8.4	mg/kg	1.7	20	04/23/18 08:19	04/25/18 15:59	7440-48-4	
Lead	691	mg/kg	0.34	20	04/23/18 08:19	04/25/18 15:59	7439-92-1	M6,R1
Lithium	2.4	mg/kg	1.7	20	04/23/18 08:19	04/25/18 15:59	7439-93-2	
Selenium	1.8	mg/kg	1.7	20	04/23/18 08:19	04/25/18 15:59	7782-49-2	
Strontium	31.2	mg/kg	1.7	20	04/23/18 08:19	04/25/18 15:59	7440-24-6	
Vanadium	40.2	mg/kg	3.4	20	04/23/18 08:19	04/25/18 15:59	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.72	mg/kg	0.065	1	04/23/18 07:02	04/24/18 16:27	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	71.2	%	0.10	1		04/24/18 15:34		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	83-32-9	
Acenaphthylene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-03(2-10) WM **Lab ID: 10428096001** Collected: 04/19/18 09:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	120-12-7	
Benzo(a)anthracene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	56-55-3	
Benzo(a)pyrene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	101-55-3	
Butylbenzylphthalate	4230000	ug/kg	565000	250	04/20/18 16:47	04/27/18 17:40	85-68-7	
Carbazole	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	59-50-7	
4-Chloroaniline	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	108-60-1	
2-Chloronaphthalene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	91-58-7	
2-Chlorophenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	7005-72-3	
Chrysene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	53-70-3	
Dibenzofuran	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	120-83-2	
Diethylphthalate	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	105-67-9	
Dimethylphthalate	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	131-11-3	
Di-n-butylphthalate	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	582000	50	04/20/18 16:47	04/27/18 16:43	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	606-20-2	
Di-n-octylphthalate	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	117-81-7	
Fluoranthene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	206-44-0	
Fluorene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	87-68-3	
Hexachlorobenzene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	118-74-1	
Hexachloroethane	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	193-39-5	
Isophorone	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	78-59-1	
1-Methylnaphthalene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	90-12-0	
2-Methylnaphthalene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-03(2-10) WM **Lab ID: 10428096001** Collected: 04/19/18 09:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	226000	50	04/20/18 16:47	04/27/18 16:43		
Naphthalene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	91-20-3	
2-Nitroaniline	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	88-74-4	
3-Nitroaniline	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	99-09-2	
4-Nitroaniline	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	100-01-6	
Nitrobenzene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	98-95-3	
2-Nitrophenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	88-75-5	
4-Nitrophenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	86-30-6	
Pentachlorophenol	ND	ug/kg	229000	50	04/20/18 16:47	04/27/18 16:43	87-86-5	
Phenanthrene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	85-01-8	
Phenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	108-95-2	
Pyrene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%.	43-125	50	04/20/18 16:47	04/27/18 16:43	4165-60-0	D4,S4
2-Fluorobiphenyl (S)	0	%.	30-132	50	04/20/18 16:47	04/27/18 16:43	321-60-8	S4
p-Terphenyl-d14 (S)	0	%.	62-125	50	04/20/18 16:47	04/27/18 16:43	1718-51-0	S4
Phenol-d6 (S)	0	%.	48-125	50	04/20/18 16:47	04/27/18 16:43	13127-88-3	S4
2-Fluorophenol (S)	0	%.	40-125	50	04/20/18 16:47	04/27/18 16:43	367-12-4	S4
2,4,6-Tribromophenol (S)	0	%.	60-125	50	04/20/18 16:47	04/27/18 16:43	118-79-6	S4

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	83-32-9	
Acenaphthylene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	208-96-8	
Anthracene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	120-12-7	
Benzo(a)anthracene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	56-55-3	
Benzo(a)pyrene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	207-08-9	
Chrysene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	53-70-3	
Fluoranthene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	206-44-0	
Fluorene	206	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	193-39-5	
Naphthalene	199	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	91-20-3	
Phenanthrene	249	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	85-01-8	
Pyrene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	64	%.	42-125	5	04/23/18 18:32	04/24/18 19:28	321-60-8	D3
p-Terphenyl-d14 (S)	61	%.	57-125	5	04/23/18 18:32	04/24/18 19:28	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: **FL-TT-03(2-10) WM** Lab ID: **10428096001** Collected: 04/19/18 09:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	3470	1	05/01/18 16:53	05/02/18 20:15	67-64-1	
Allyl chloride	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	107-05-1	
Benzene	ND	ug/kg	69.3	1	05/01/18 16:53	05/02/18 20:15	71-43-2	
Bromobenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	108-86-1	
Bromochloromethane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	74-97-5	
Bromodichloromethane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	75-27-4	
Bromoform	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	75-25-2	
Bromomethane	ND	ug/kg	1730	1	05/01/18 16:53	05/02/18 20:15	74-83-9	
2-Butanone (MEK)	ND	ug/kg	866	1	05/01/18 16:53	05/02/18 20:15	78-93-3	
n-Butylbenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	104-51-8	
sec-Butylbenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	135-98-8	
tert-Butylbenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	98-06-6	
Carbon tetrachloride	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	56-23-5	
Chlorobenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	108-90-7	
Chloroethane	ND	ug/kg	1730	1	05/01/18 16:53	05/02/18 20:15	75-00-3	
Chloroform	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	67-66-3	
Chloromethane	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	74-87-3	
2-Chlorotoluene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	95-49-8	
4-Chlorotoluene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1730	1	05/01/18 16:53	05/02/18 20:15	96-12-8	
Dibromochloromethane	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	106-93-4	
Dibromomethane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	541-73-1	
1,4-Dichlorobenzene	175	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	75-71-8	
1,1-Dichloroethane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	75-34-3	
1,2-Dichloroethane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	107-06-2	
1,1-Dichloroethene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1730	1	05/01/18 16:53	05/02/18 20:15	75-43-4	
1,2-Dichloropropane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	78-87-5	
1,3-Dichloropropane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	142-28-9	
2,2-Dichloropropane	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	594-20-7	
1,1-Dichloropropene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	60-29-7	
Ethylbenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	866	1	05/01/18 16:53	05/02/18 20:15	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	98-82-8	
p-Isopropyltoluene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	99-87-6	
Methylene Chloride	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	866	1	05/01/18 16:53	05/02/18 20:15	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-03(2-10) WM **Lab ID: 10428096001** Collected: 04/19/18 09:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	1634-04-4	
Naphthalene	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	91-20-3	
n-Propylbenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	103-65-1	
Styrene	219	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	79-34-5	
Tetrachloroethene	178	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	127-18-4	D6
Tetrahydrofuran	ND	ug/kg	6930	1	05/01/18 16:53	05/02/18 20:15	109-99-9	
Toluene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	79-00-5	
Trichloroethene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	79-01-6	
Trichlorofluoromethane	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	108-67-8	
Vinyl chloride	ND	ug/kg	69.3	1	05/01/18 16:53	05/02/18 20:15	75-01-4	
Xylene (Total)	ND	ug/kg	520	1	05/01/18 16:53	05/02/18 20:15	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1	05/01/18 16:53	05/02/18 20:15	17060-07-0	C0
Toluene-d8 (S)	96	%.	75-125	1	05/01/18 16:53	05/02/18 20:15	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	75-125	1	05/01/18 16:53	05/02/18 20:15	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	34.1	5	04/28/18 10:35	05/01/18 11:00	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	54.7	mg/kg	1.0	1		05/03/18 07:33	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	4.0	mg/kg	2.3	1	04/25/18 11:00	04/25/18 13:44	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.9	2	04/27/18 12:45	04/30/18 19:36	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-06 (0-10) S **Lab ID: 10428096002** Collected: 04/19/18 11:45 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	7.33	1	05/04/18 10:07	05/07/18 14:10	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	309-00-2	
alpha-BHC	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	319-84-6	
beta-BHC	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	319-85-7	
delta-BHC	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	58-89-9	
Chlordane (Technical)	ND	ug/kg	22.3	1	04/20/18 16:36	05/01/18 21:27	57-74-9	
alpha-Chlordane	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	5103-71-9	
gamma-Chlordane	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	5103-74-2	
4,4'-DDD	ND	ug/kg	4.5	1	04/20/18 16:36	05/01/18 21:27	72-54-8	
4,4'-DDE	ND	ug/kg	4.5	1	04/20/18 16:36	05/01/18 21:27	72-55-9	
4,4'-DDT	ND	ug/kg	4.5	1	04/20/18 16:36	05/01/18 21:27	50-29-3	
Dieldrin	ND	ug/kg	4.5	1	04/20/18 16:36	05/01/18 21:27	60-57-1	
Endosulfan I	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	959-98-8	
Endosulfan II	ND	ug/kg	4.5	1	04/20/18 16:36	05/01/18 21:27	33213-65-9	
Endosulfan sulfate	ND	ug/kg	4.5	1	04/20/18 16:36	05/01/18 21:27	1031-07-8	
Endrin	ND	ug/kg	4.5	1	04/20/18 16:36	05/01/18 21:27	72-20-8	
Endrin aldehyde	ND	ug/kg	4.5	1	04/20/18 16:36	05/01/18 21:27	7421-93-4	
Endrin ketone	ND	ug/kg	4.5	1	04/20/18 16:36	05/01/18 21:27	53494-70-5	
Heptachlor	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	76-44-8	
Heptachlor epoxide	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	1024-57-3	
Methoxychlor	ND	ug/kg	22.3	1	04/20/18 16:36	05/01/18 21:27	72-43-5	
Toxaphene	ND	ug/kg	66.9	1	04/20/18 16:36	05/01/18 21:27	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	88	%	30-150	1	04/20/18 16:36	05/01/18 21:27	877-09-8	
Decachlorobiphenyl (S)	77	%	30-150	1	04/20/18 16:36	05/01/18 21:27	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	11100-14-4	
PCB, Total	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	72	%	48-125	1	04/20/18 16:33	04/24/18 16:29	877-09-8	
Decachlorobiphenyl (S)	104	%	30-134	1	04/20/18 16:33	04/24/18 16:29	2051-24-3	CH
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	ND	mg/kg	8.3	1	04/20/18 17:57	04/22/18 13:50		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-06 (0-10) S **Lab ID: 10428096002** Collected: 04/19/18 11:45 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	100	%	50-150	1	04/20/18 17:57	04/22/18 13:50	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	13.4	1	05/02/18 10:19	05/02/18 20:00		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	05/02/18 10:19	05/02/18 20:00	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	5520	mg/kg	12.4	1	04/23/18 07:48	04/26/18 14:02	7429-90-5	
Barium	78.6	mg/kg	0.62	1	04/23/18 07:48	04/26/18 14:02	7440-39-3	
Boron	9.3	mg/kg	9.3	1	04/23/18 07:48	04/26/18 14:02	7440-42-8	
Copper	8.9	mg/kg	0.62	1	04/23/18 07:48	04/26/18 14:02	7440-50-8	
Iron	10000	mg/kg	3.1	1	04/23/18 07:48	04/26/18 14:02	7439-89-6	
Manganese	498	mg/kg	0.31	1	04/23/18 07:48	04/26/18 14:02	7439-96-5	
Nickel	11.7	mg/kg	1.2	1	04/23/18 07:48	04/26/18 14:02	7440-02-0	
Silver	ND	mg/kg	0.62	1	04/23/18 07:48	04/26/18 14:02	7440-22-4	
Tin	ND	mg/kg	4.6	1	04/23/18 07:48	04/26/18 14:02	7440-31-5	
Titanium	155	mg/kg	1.5	1	04/23/18 07:48	04/26/18 14:02	7440-32-6	
Zinc	31.2	mg/kg	1.2	1	04/23/18 07:48	04/26/18 14:02	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	3.3	mg/kg	0.24	1	04/25/18 09:25	04/26/18 04:19	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.66	20	04/23/18 08:19	04/25/18 16:07	7440-36-0	
Arsenic	3.4	mg/kg	0.66	20	04/23/18 08:19	04/25/18 16:07	7440-38-2	
Beryllium	0.61	mg/kg	0.27	20	04/23/18 08:19	04/25/18 16:07	7440-41-7	
Cadmium	0.34	mg/kg	0.11	20	04/23/18 08:19	04/25/18 16:07	7440-43-9	
Cobalt	7.1	mg/kg	0.66	20	04/23/18 08:19	04/25/18 16:07	7440-48-4	
Lead	8.9	mg/kg	0.13	20	04/23/18 08:19	04/25/18 16:07	7439-92-1	
Lithium	10.2	mg/kg	0.66	20	04/23/18 08:19	04/25/18 16:07	7439-93-2	
Selenium	0.69	mg/kg	0.66	20	04/23/18 08:19	04/25/18 16:07	7782-49-2	
Strontium	52.8	mg/kg	0.66	20	04/23/18 08:19	04/25/18 16:07	7440-24-6	
Vanadium	30.3	mg/kg	1.3	20	04/23/18 08:19	04/25/18 16:07	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.026	mg/kg	0.026	1	04/23/18 07:02	04/24/18 16:29	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	25.3	%	0.10	1		04/24/18 15:35		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	83-32-9	
Acenaphthylene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: **FL-TT-06 (0-10) S** Lab ID: **10428096002** Collected: 04/19/18 11:45 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Anthracene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	120-12-7	
Benzo(a)anthracene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	56-55-3	
Benzo(a)pyrene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	101-55-3	
Butylbenzylphthalate	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	85-68-7	
Carbazole	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	59-50-7	
4-Chloroaniline	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	108-60-1	
2-Chloronaphthalene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	91-58-7	
2-Chlorophenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	7005-72-3	
Chrysene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	53-70-3	
Dibenzofuran	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	120-83-2	
Diethylphthalate	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	105-67-9	
Dimethylphthalate	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	131-11-3	
Di-n-butylphthalate	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2270	1	04/20/18 16:47	04/27/18 15:16	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	606-20-2	
Di-n-octylphthalate	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	117-81-7	
Fluoranthene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	206-44-0	
Fluorene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	87-68-3	
Hexachlorobenzene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	118-74-1	
Hexachloroethane	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	193-39-5	
Isophorone	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	78-59-1	
1-Methylnaphthalene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	90-12-0	
2-Methylnaphthalene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-06 (0-10) S **Lab ID: 10428096002** Collected: 04/19/18 11:45 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

3&4-Methylphenol(m&p Cresol)	ND	ug/kg	881	1	04/20/18 16:47	04/27/18 15:16		
Naphthalene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	91-20-3	
2-Nitroaniline	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	88-74-4	
3-Nitroaniline	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	99-09-2	
4-Nitroaniline	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	100-01-6	
Nitrobenzene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	98-95-3	
2-Nitrophenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	88-75-5	
4-Nitrophenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	86-30-6	
Pentachlorophenol	ND	ug/kg	895	1	04/20/18 16:47	04/27/18 15:16	87-86-5	
Phenanthrene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	85-01-8	
Phenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	108-95-2	
Pyrene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	68	%.	43-125	1	04/20/18 16:47	04/27/18 15:16	4165-60-0	
2-Fluorobiphenyl (S)	71	%.	30-132	1	04/20/18 16:47	04/27/18 15:16	321-60-8	
p-Terphenyl-d14 (S)	85	%.	62-125	1	04/20/18 16:47	04/27/18 15:16	1718-51-0	
Phenol-d6 (S)	70	%.	48-125	1	04/20/18 16:47	04/27/18 15:16	13127-88-3	
2-Fluorophenol (S)	66	%.	40-125	1	04/20/18 16:47	04/27/18 15:16	367-12-4	
2,4,6-Tribromophenol (S)	58	%.	60-125	1	04/20/18 16:47	04/27/18 15:16	118-79-6	SO

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	83-32-9	
Acenaphthylene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	208-96-8	
Anthracene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	120-12-7	
Benzo(a)anthracene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	56-55-3	
Benzo(a)pyrene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	207-08-9	
Chrysene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	53-70-3	
Fluoranthene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	206-44-0	
Fluorene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	193-39-5	
Naphthalene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	91-20-3	
Phenanthrene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	85-01-8	
Pyrene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	89	%.	42-125	1	04/23/18 18:32	04/24/18 14:59	321-60-8	
p-Terphenyl-d14 (S)	96	%.	57-125	1	04/23/18 18:32	04/24/18 14:59	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-06 (0-10) S **Lab ID: 10428096002** Collected: 04/19/18 11:45 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1350	1	05/01/18 16:53	05/03/18 03:51	67-64-1	
Allyl chloride	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	107-05-1	
Benzene	ND	ug/kg	27.1	1	05/01/18 16:53	05/03/18 03:51	71-43-2	
Bromobenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	108-86-1	
Bromochloromethane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	74-97-5	
Bromodichloromethane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	75-27-4	
Bromoform	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	75-25-2	
Bromomethane	ND	ug/kg	677	1	05/01/18 16:53	05/03/18 03:51	74-83-9	
2-Butanone (MEK)	ND	ug/kg	338	1	05/01/18 16:53	05/03/18 03:51	78-93-3	
n-Butylbenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	104-51-8	
sec-Butylbenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	135-98-8	
tert-Butylbenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	98-06-6	
Carbon tetrachloride	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	56-23-5	
Chlorobenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	108-90-7	
Chloroethane	ND	ug/kg	677	1	05/01/18 16:53	05/03/18 03:51	75-00-3	
Chloroform	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	67-66-3	
Chloromethane	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	74-87-3	
2-Chlorotoluene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	95-49-8	
4-Chlorotoluene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	677	1	05/01/18 16:53	05/03/18 03:51	96-12-8	
Dibromochloromethane	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	106-93-4	
Dibromomethane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	75-71-8	
1,1-Dichloroethane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	75-34-3	
1,2-Dichloroethane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	107-06-2	
1,1-Dichloroethene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	156-60-5	
Dichlorofluoromethane	ND	ug/kg	677	1	05/01/18 16:53	05/03/18 03:51	75-43-4	
1,2-Dichloropropane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	78-87-5	
1,3-Dichloropropane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	142-28-9	
2,2-Dichloropropane	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	594-20-7	
1,1-Dichloropropene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	60-29-7	
Ethylbenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	338	1	05/01/18 16:53	05/03/18 03:51	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	98-82-8	
p-Isopropyltoluene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	99-87-6	
Methylene Chloride	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	338	1	05/01/18 16:53	05/03/18 03:51	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-06 (0-10) S **Lab ID: 10428096002** Collected: 04/19/18 11:45 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	1634-04-4	
Naphthalene	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	91-20-3	
n-Propylbenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	103-65-1	
Styrene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	79-34-5	
Tetrachloroethene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	127-18-4	
Tetrahydrofuran	ND	ug/kg	2710	1	05/01/18 16:53	05/03/18 03:51	109-99-9	
Toluene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	79-00-5	
Trichloroethene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	79-01-6	
Trichlorofluoromethane	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	108-67-8	
Vinyl chloride	ND	ug/kg	27.1	1	05/01/18 16:53	05/03/18 03:51	75-01-4	
Xylene (Total)	ND	ug/kg	203	1	05/01/18 16:53	05/03/18 03:51	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1	05/01/18 16:53	05/03/18 03:51	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1	05/01/18 16:53	05/03/18 03:51	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125	1	05/01/18 16:53	05/03/18 03:51	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	13.4	5	04/28/18 10:35	05/01/18 13:40	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	3.3	mg/kg	1.0	1		05/03/18 07:33	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.51	1	04/25/18 11:00	04/25/18 13:45	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	3.0	mg/kg	1.0	1	04/27/18 12:45	04/30/18 18:57	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: **FL-TT-04 (2-14) WM** Lab ID: **10428096003** Collected: 04/19/18 12:30 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	9.16	1	05/04/18 10:07	05/07/18 14:17	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	309-00-2	
alpha-BHC	4.7	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	319-84-6	
beta-BHC	ND	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	319-85-7	
delta-BHC	ND	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	58-89-9	
Chlordane (Technical)	ND	ug/kg	45.1	2	04/20/18 16:36	05/01/18 22:03	57-74-9	
alpha-Chlordane	ND	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	5103-71-9	
gamma-Chlordane	ND	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	5103-74-2	
4,4'-DDD	ND	ug/kg	9.0	2	04/20/18 16:36	05/01/18 22:03	72-54-8	
4,4'-DDE	ND	ug/kg	9.0	2	04/20/18 16:36	05/01/18 22:03	72-55-9	
4,4'-DDT	ND	ug/kg	9.0	2	04/20/18 16:36	05/01/18 22:03	50-29-3	
Dieldrin	ND	ug/kg	9.0	2	04/20/18 16:36	05/01/18 22:03	60-57-1	
Endosulfan I	ND	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	959-98-8	
Endosulfan II	ND	ug/kg	9.0	2	04/20/18 16:36	05/01/18 22:03	33213-65-9	
Endosulfan sulfate	ND	ug/kg	9.0	2	04/20/18 16:36	05/01/18 22:03	1031-07-8	
Endrin	ND	ug/kg	9.0	2	04/20/18 16:36	05/01/18 22:03	72-20-8	
Endrin aldehyde	ND	ug/kg	9.0	2	04/20/18 16:36	05/01/18 22:03	7421-93-4	
Endrin ketone	ND	ug/kg	9.0	2	04/20/18 16:36	05/01/18 22:03	53494-70-5	
Heptachlor	ND	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	76-44-8	
Heptachlor epoxide	ND	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	1024-57-3	
Methoxychlor	ND	ug/kg	45.1	2	04/20/18 16:36	05/01/18 22:03	72-43-5	
Toxaphene	ND	ug/kg	135	2	04/20/18 16:36	05/01/18 22:03	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	84	%	30-150	2	04/20/18 16:36	05/01/18 22:03	877-09-8	3M, D4
Decachlorobiphenyl (S)	74	%	30-150	2	04/20/18 16:36	05/01/18 22:03	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	11141-16-5	
PCB-1242 (Aroclor 1242)	475	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	12672-29-6	
PCB-1254 (Aroclor 1254)	158	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	11100-14-4	
PCB, Total	633	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	86	%	48-125	1	04/20/18 16:33	04/24/18 15:42	877-09-8	
Decachlorobiphenyl (S)	113	%	30-134	1	04/20/18 16:33	04/24/18 15:42	2051-24-3	CH
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WIDRO C10-C28	171	mg/kg	101	10	04/20/18 17:57	04/22/18 13:00		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-04 (2-14) WM **Lab ID: 10428096003** Collected: 04/19/18 12:30 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	0	%	50-150	10	04/20/18 17:57	04/22/18 13:00	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	14.2	1	05/02/18 10:19	05/02/18 13:42		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	05/02/18 10:19	05/02/18 13:42	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	9530	mg/kg	12.9	1	04/23/18 07:48	04/26/18 14:05	7429-90-5	
Barium	177	mg/kg	0.64	1	04/23/18 07:48	04/26/18 14:05	7440-39-3	
Boron	12.2	mg/kg	9.7	1	04/23/18 07:48	04/26/18 14:05	7440-42-8	
Copper	102	mg/kg	0.64	1	04/23/18 07:48	04/26/18 14:05	7440-50-8	
Iron	26700	mg/kg	16.1	5	04/23/18 07:48	04/26/18 14:53	7439-89-6	
Manganese	531	mg/kg	0.32	1	04/23/18 07:48	04/26/18 14:05	7439-96-5	
Nickel	27.5	mg/kg	1.3	1	04/23/18 07:48	04/26/18 14:05	7440-02-0	
Silver	ND	mg/kg	0.64	1	04/23/18 07:48	04/26/18 14:05	7440-22-4	
Tin	16.6	mg/kg	4.8	1	04/23/18 07:48	04/26/18 14:05	7440-31-5	
Titanium	181	mg/kg	1.6	1	04/23/18 07:48	04/26/18 14:05	7440-32-6	
Zinc	364	mg/kg	1.3	1	04/23/18 07:48	04/26/18 14:05	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	5.0	mg/kg	0.25	1	04/25/18 09:25	04/26/18 04:24	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.3	mg/kg	0.63	20	04/23/18 08:19	04/25/18 16:10	7440-36-0	
Arsenic	8.9	mg/kg	0.63	20	04/23/18 08:19	04/25/18 16:10	7440-38-2	
Beryllium	0.89	mg/kg	0.25	20	04/23/18 08:19	04/25/18 16:10	7440-41-7	
Cadmium	1.0	mg/kg	0.10	20	04/23/18 08:19	04/25/18 16:10	7440-43-9	
Cobalt	10.6	mg/kg	0.63	20	04/23/18 08:19	04/25/18 16:10	7440-48-4	
Lead	273	mg/kg	0.13	20	04/23/18 08:19	04/25/18 16:10	7439-92-1	
Lithium	8.6	mg/kg	0.63	20	04/23/18 08:19	04/25/18 16:10	7439-93-2	
Selenium	0.84	mg/kg	0.63	20	04/23/18 08:19	04/25/18 16:10	7782-49-2	
Strontium	54.8	mg/kg	0.63	20	04/23/18 08:19	04/25/18 16:10	7440-24-6	
Vanadium	38.0	mg/kg	1.3	20	04/23/18 08:19	04/25/18 16:10	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.20	mg/kg	0.026	1	04/23/18 07:02	04/24/18 16:35	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	26.1	%	0.10	1		04/30/18 11:27		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	83-32-9	
Acenaphthylene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: **FL-TT-04 (2-14) WM** Lab ID: **10428096003** Collected: 04/19/18 12:30 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	120-12-7	
Benzo(a)anthracene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	56-55-3	
Benzo(a)pyrene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	101-55-3	
Butylbenzylphthalate	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	85-68-7	
Carbazole	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	59-50-7	
4-Chloroaniline	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	108-60-1	
2-Chloronaphthalene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	91-58-7	
2-Chlorophenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	7005-72-3	
Chrysene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	53-70-3	
Dibenzofuran	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	120-83-2	
Diethylphthalate	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	105-67-9	
Dimethylphthalate	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	131-11-3	
Di-n-butylphthalate	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2300	1	04/20/18 16:47	04/26/18 19:05	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	606-20-2	
Di-n-octylphthalate	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	122-66-7	
bis(2-Ethylhexyl)phthalate	488	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	117-81-7	
Fluoranthene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	206-44-0	
Fluorene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	87-68-3	
Hexachlorobenzene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	118-74-1	
Hexachloroethane	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	193-39-5	
Isophorone	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	78-59-1	
1-Methylnaphthalene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	90-12-0	
2-Methylnaphthalene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: **FL-TT-04 (2-14) WM** Lab ID: **10428096003** Collected: 04/19/18 12:30 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	893	1	04/20/18 16:47	04/26/18 19:05		
Naphthalene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	91-20-3	
2-Nitroaniline	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	88-74-4	
3-Nitroaniline	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	99-09-2	
4-Nitroaniline	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	100-01-6	
Nitrobenzene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	98-95-3	
2-Nitrophenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	88-75-5	
4-Nitrophenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	86-30-6	
Pentachlorophenol	ND	ug/kg	906	1	04/20/18 16:47	04/26/18 19:05	87-86-5	
Phenanthrene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	85-01-8	
Phenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	108-95-2	
Pyrene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	58	%.	43-125	1	04/20/18 16:47	04/26/18 19:05	4165-60-0	
2-Fluorobiphenyl (S)	71	%.	30-132	1	04/20/18 16:47	04/26/18 19:05	321-60-8	
p-Terphenyl-d14 (S)	89	%.	62-125	1	04/20/18 16:47	04/26/18 19:05	1718-51-0	
Phenol-d6 (S)	63	%.	48-125	1	04/20/18 16:47	04/26/18 19:05	13127-88-3	
2-Fluorophenol (S)	60	%.	40-125	1	04/20/18 16:47	04/26/18 19:05	367-12-4	
2,4,6-Tribromophenol (S)	65	%.	60-125	1	04/20/18 16:47	04/26/18 19:05	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	83-32-9	
Acenaphthylene	ND	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	208-96-8	
Anthracene	ND	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	120-12-7	
Benzo(a)anthracene	98.8	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	56-55-3	
Benzo(a)pyrene	124	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	50-32-8	
Benzo(b)fluoranthene	135	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	205-99-2	
Benzo(g,h,i)perylene	121	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	191-24-2	
Benzo(k)fluoranthene	45.7	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	207-08-9	
Chrysene	96.3	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	218-01-9	
Dibenz(a,h)anthracene	27.8	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	53-70-3	
Fluoranthene	146	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	206-44-0	
Fluorene	ND	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	86-73-7	
Indeno(1,2,3-cd)pyrene	66.3	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	193-39-5	
Naphthalene	ND	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	91-20-3	
Phenanthrene	78.7	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	85-01-8	
Pyrene	124	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	101	%.	42-125	2	04/23/18 18:32	04/25/18 18:02	321-60-8	D3
p-Terphenyl-d14 (S)	115	%.	57-125	2	04/23/18 18:32	04/25/18 18:02	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-04 (2-14) WM **Lab ID: 10428096003** Collected: 04/19/18 12:30 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1440	1	05/01/18 16:53	05/03/18 04:08	67-64-1	
Allyl chloride	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	107-05-1	
Benzene	ND	ug/kg	28.8	1	05/01/18 16:53	05/03/18 04:08	71-43-2	
Bromobenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	108-86-1	
Bromochloromethane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	74-97-5	
Bromodichloromethane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	75-27-4	
Bromoform	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	75-25-2	
Bromomethane	ND	ug/kg	720	1	05/01/18 16:53	05/03/18 04:08	74-83-9	
2-Butanone (MEK)	ND	ug/kg	360	1	05/01/18 16:53	05/03/18 04:08	78-93-3	
n-Butylbenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	104-51-8	
sec-Butylbenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	135-98-8	
tert-Butylbenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	98-06-6	
Carbon tetrachloride	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	56-23-5	
Chlorobenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	108-90-7	
Chloroethane	ND	ug/kg	720	1	05/01/18 16:53	05/03/18 04:08	75-00-3	
Chloroform	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	67-66-3	
Chloromethane	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	74-87-3	
2-Chlorotoluene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	95-49-8	
4-Chlorotoluene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	720	1	05/01/18 16:53	05/03/18 04:08	96-12-8	
Dibromochloromethane	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	106-93-4	
Dibromomethane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	75-71-8	
1,1-Dichloroethane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	75-34-3	
1,2-Dichloroethane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	107-06-2	
1,1-Dichloroethene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	156-60-5	
Dichlorofluoromethane	ND	ug/kg	720	1	05/01/18 16:53	05/03/18 04:08	75-43-4	
1,2-Dichloropropane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	78-87-5	
1,3-Dichloropropane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	142-28-9	
2,2-Dichloropropane	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	594-20-7	
1,1-Dichloropropene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	60-29-7	
Ethylbenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	360	1	05/01/18 16:53	05/03/18 04:08	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	98-82-8	
p-Isopropyltoluene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	99-87-6	
Methylene Chloride	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	360	1	05/01/18 16:53	05/03/18 04:08	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-04 (2-14) WM **Lab ID: 10428096003** Collected: 04/19/18 12:30 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	1634-04-4	
Naphthalene	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	91-20-3	
n-Propylbenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	103-65-1	
Styrene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	79-34-5	
Tetrachloroethene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	127-18-4	
Tetrahydrofuran	ND	ug/kg	2880	1	05/01/18 16:53	05/03/18 04:08	109-99-9	
Toluene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	79-00-5	
Trichloroethene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	79-01-6	
Trichlorofluoromethane	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	108-67-8	
Vinyl chloride	ND	ug/kg	28.8	1	05/01/18 16:53	05/03/18 04:08	75-01-4	
Xylene (Total)	ND	ug/kg	216	1	05/01/18 16:53	05/03/18 04:08	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%.	75-125	1	05/01/18 16:53	05/03/18 04:08	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1	05/01/18 16:53	05/03/18 04:08	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1	05/01/18 16:53	05/03/18 04:08	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	13.2	5	04/28/18 10:35	05/01/18 13:41	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	5.0	mg/kg	1.0	1		05/03/18 07:33	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.61	mg/kg	0.45	1	04/25/18 11:00	04/25/18 13:46	57-12-5	M0,R1
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.99	1	04/27/18 12:45	04/30/18 17:59	16984-48-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-05 (5-15) WM **Lab ID: 10428096004** Collected: 04/19/18 15:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.5	1	05/04/18 10:07	05/07/18 14:23	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	309-00-2	
alpha-BHC	ND	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	319-84-6	
beta-BHC	18.5	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	319-85-7	
delta-BHC	ND	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	58-89-9	M1
Chlordane (Technical)	ND	ug/kg	130	5	04/20/18 16:36	05/01/18 19:55	57-74-9	
alpha-Chlordane	ND	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	5103-71-9	
gamma-Chlordane	ND	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	5103-74-2	
4,4'-DDD	ND	ug/kg	25.8	5	04/20/18 16:36	05/01/18 19:55	72-54-8	M1
4,4'-DDE	ND	ug/kg	25.8	5	04/20/18 16:36	05/01/18 19:55	72-55-9	
4,4'-DDT	ND	ug/kg	25.8	5	04/20/18 16:36	05/01/18 19:55	50-29-3	
Dieldrin	ND	ug/kg	25.8	5	04/20/18 16:36	05/01/18 19:55	60-57-1	
Endosulfan I	22.0	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	959-98-8	M1
Endosulfan II	ND	ug/kg	25.8	5	04/20/18 16:36	05/01/18 19:55	33213-65-9	
Endosulfan sulfate	ND	ug/kg	25.8	5	04/20/18 16:36	05/01/18 19:55	1031-07-8	
Endrin	ND	ug/kg	25.8	5	04/20/18 16:36	05/01/18 19:55	72-20-8	
Endrin aldehyde	ND	ug/kg	25.8	5	04/20/18 16:36	05/01/18 19:55	7421-93-4	
Endrin ketone	ND	ug/kg	25.8	5	04/20/18 16:36	05/01/18 19:55	53494-70-5	
Heptachlor	ND	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	76-44-8	
Heptachlor epoxide	19.9	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	1024-57-3	M1
Methoxychlor	ND	ug/kg	130	5	04/20/18 16:36	05/01/18 19:55	72-43-5	
Toxaphene	ND	ug/kg	388	5	04/20/18 16:36	05/01/18 19:55	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	108	%	30-150	5	04/20/18 16:36	05/01/18 19:55	877-09-8	2M,D4
Decachlorobiphenyl (S)	105	%	30-150	5	04/20/18 16:36	05/01/18 19:55	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	11141-16-5	
PCB-1242 (Aroclor 1242)	1000	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	12672-29-6	
PCB-1254 (Aroclor 1254)	224	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	11100-14-4	
PCB, Total	1230	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	78	%	48-125	1	04/20/18 16:33	04/24/18 15:26	877-09-8	
Decachlorobiphenyl (S)	98	%	30-134	1	04/20/18 16:33	04/24/18 15:26	2051-24-3	CH
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	395	mg/kg	236	20	04/20/18 17:57	04/22/18 14:11		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-05 (5-15) WM **Lab ID: 10428096004** Collected: 04/19/18 15:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	0	%	50-150	20	04/20/18 17:57	04/22/18 14:11	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	74.1	mg/kg	15.9	1	05/02/18 10:19	05/02/18 20:24		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	05/02/18 10:19	05/02/18 20:24	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	23100	mg/kg	14.5	1	04/23/18 07:48	04/26/18 14:07	7429-90-5	
Barium	246	mg/kg	0.73	1	04/23/18 07:48	04/26/18 14:07	7440-39-3	
Boron	73.4	mg/kg	10.9	1	04/23/18 07:48	04/26/18 14:07	7440-42-8	
Copper	175	mg/kg	0.73	1	04/23/18 07:48	04/26/18 14:07	7440-50-8	
Iron	22000	mg/kg	18.1	5	04/23/18 07:48	04/26/18 14:55	7439-89-6	
Manganese	522	mg/kg	0.36	1	04/23/18 07:48	04/26/18 14:07	7439-96-5	
Nickel	16.3	mg/kg	1.5	1	04/23/18 07:48	04/26/18 14:07	7440-02-0	
Silver	ND	mg/kg	0.73	1	04/23/18 07:48	04/26/18 14:07	7440-22-4	
Tin	25.8	mg/kg	5.4	1	04/23/18 07:48	04/26/18 14:07	7440-31-5	
Titanium	277	mg/kg	1.8	1	04/23/18 07:48	04/26/18 14:07	7440-32-6	
Zinc	463	mg/kg	1.5	1	04/23/18 07:48	04/26/18 14:07	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	3.6	mg/kg	0.29	1	04/25/18 09:25	04/26/18 04:28	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.3	mg/kg	0.73	20	04/23/18 08:19	04/24/18 18:59	7440-36-0	
Arsenic	8.1	mg/kg	0.73	20	04/23/18 08:19	04/24/18 18:59	7440-38-2	
Beryllium	0.68	mg/kg	0.29	20	04/23/18 08:19	04/24/18 18:59	7440-41-7	
Cadmium	2.5	mg/kg	0.12	20	04/23/18 08:19	04/24/18 18:59	7440-43-9	
Cobalt	7.0	mg/kg	0.73	20	04/23/18 08:19	04/24/18 18:59	7440-48-4	
Lead	284	mg/kg	0.15	20	04/23/18 08:19	04/24/18 18:59	7439-92-1	
Lithium	7.4	mg/kg	0.73	20	04/23/18 08:19	04/24/18 18:59	7439-93-2	
Selenium	0.90	mg/kg	0.73	20	04/23/18 08:19	04/24/18 18:59	7782-49-2	
Strontium	32.0	mg/kg	0.73	20	04/23/18 08:19	04/24/18 18:59	7440-24-6	
Vanadium	30.7	mg/kg	1.5	20	04/23/18 08:19	04/24/18 18:59	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.55	mg/kg	0.027	1	04/23/18 07:02	04/24/18 16:37	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	35.6	%	0.10	1		04/30/18 11:27		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	83-32-9	
Acenaphthylene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	208-96-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: **FL-TT-05 (5-15) WM** Lab ID: **10428096004** Collected: 04/19/18 15:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	120-12-7	
Benzo(a)anthracene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	56-55-3	
Benzo(a)pyrene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	101-55-3	
Butylbenzylphthalate	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	85-68-7	
Carbazole	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	59-50-7	
4-Chloroaniline	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	108-60-1	
2-Chloronaphthalene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	91-58-7	
2-Chlorophenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	7005-72-3	
Chrysene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	53-70-3	
Dibenzofuran	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	120-83-2	
Diethylphthalate	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	105-67-9	
Dimethylphthalate	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	131-11-3	
Di-n-butylphthalate	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2630	1	04/20/18 16:47	04/26/18 19:34	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	606-20-2	
Di-n-octylphthalate	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	122-66-7	
bis(2-Ethylhexyl)phthalate	2200	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	117-81-7	
Fluoranthene	874	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	206-44-0	
Fluorene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	87-68-3	
Hexachlorobenzene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	118-74-1	
Hexachloroethane	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	193-39-5	
Isophorone	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	78-59-1	
1-Methylnaphthalene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	90-12-0	
2-Methylnaphthalene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: **FL-TT-05 (5-15) WM** Lab ID: **10428096004** Collected: 04/19/18 15:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1020	1	04/20/18 16:47	04/26/18 19:34		
Naphthalene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	91-20-3	
2-Nitroaniline	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	88-74-4	
3-Nitroaniline	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	99-09-2	
4-Nitroaniline	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	100-01-6	
Nitrobenzene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	98-95-3	
2-Nitrophenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	88-75-5	
4-Nitrophenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	86-30-6	
Pentachlorophenol	ND	ug/kg	1040	1	04/20/18 16:47	04/26/18 19:34	87-86-5	
Phenanthrene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	85-01-8	
Phenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	108-95-2	
Pyrene	790	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	62	%.	43-125	1	04/20/18 16:47	04/26/18 19:34	4165-60-0	
2-Fluorobiphenyl (S)	76	%.	30-132	1	04/20/18 16:47	04/26/18 19:34	321-60-8	
p-Terphenyl-d14 (S)	90	%.	62-125	1	04/20/18 16:47	04/26/18 19:34	1718-51-0	
Phenol-d6 (S)	71	%.	48-125	1	04/20/18 16:47	04/26/18 19:34	13127-88-3	
2-Fluorophenol (S)	70	%.	40-125	1	04/20/18 16:47	04/26/18 19:34	367-12-4	
2,4,6-Tribromophenol (S)	78	%.	60-125	1	04/20/18 16:47	04/26/18 19:34	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	83-32-9	
Acenaphthylene	154	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	208-96-8	
Anthracene	169	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	120-12-7	
Benzo(a)anthracene	748	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	56-55-3	
Benzo(a)pyrene	788	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	50-32-8	
Benzo(b)fluoranthene	997	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	205-99-2	
Benzo(g,h,i)perylene	503	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	191-24-2	
Benzo(k)fluoranthene	391	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	207-08-9	
Chrysene	764	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	218-01-9	
Dibenz(a,h)anthracene	123	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	53-70-3	
Fluoranthene	1340	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	206-44-0	
Fluorene	ND	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	86-73-7	
Indeno(1,2,3-cd)pyrene	453	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	193-39-5	
Naphthalene	ND	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	91-20-3	
Phenanthrene	437	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	85-01-8	
Pyrene	1100	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	84	%.	42-125	5	04/23/18 18:32	04/24/18 20:10	321-60-8	D3
p-Terphenyl-d14 (S)	96	%.	57-125	5	04/23/18 18:32	04/24/18 20:10	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-05 (5-15) WM **Lab ID: 10428096004** Collected: 04/19/18 15:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1520	1	05/01/18 16:53	05/03/18 04:25	67-64-1	
Allyl chloride	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	107-05-1	
Benzene	ND	ug/kg	30.3	1	05/01/18 16:53	05/03/18 04:25	71-43-2	
Bromobenzene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	108-86-1	
Bromochloromethane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	74-97-5	
Bromodichloromethane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	75-27-4	
Bromoform	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	75-25-2	
Bromomethane	ND	ug/kg	759	1	05/01/18 16:53	05/03/18 04:25	74-83-9	
2-Butanone (MEK)	ND	ug/kg	379	1	05/01/18 16:53	05/03/18 04:25	78-93-3	
n-Butylbenzene	234	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	104-51-8	
sec-Butylbenzene	269	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	135-98-8	
tert-Butylbenzene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	98-06-6	
Carbon tetrachloride	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	56-23-5	
Chlorobenzene	129	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	108-90-7	
Chloroethane	ND	ug/kg	759	1	05/01/18 16:53	05/03/18 04:25	75-00-3	
Chloroform	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	67-66-3	
Chloromethane	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	74-87-3	
2-Chlorotoluene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	95-49-8	
4-Chlorotoluene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	759	1	05/01/18 16:53	05/03/18 04:25	96-12-8	
Dibromochloromethane	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	106-93-4	
Dibromomethane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	541-73-1	
1,4-Dichlorobenzene	443	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	75-71-8	
1,1-Dichloroethane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	75-34-3	
1,2-Dichloroethane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	107-06-2	
1,1-Dichloroethene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	156-60-5	
Dichlorofluoromethane	ND	ug/kg	759	1	05/01/18 16:53	05/03/18 04:25	75-43-4	
1,2-Dichloropropane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	78-87-5	
1,3-Dichloropropane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	142-28-9	
2,2-Dichloropropane	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	594-20-7	
1,1-Dichloropropene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	60-29-7	
Ethylbenzene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	379	1	05/01/18 16:53	05/03/18 04:25	87-68-3	
Isopropylbenzene (Cumene)	127	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	98-82-8	
p-Isopropyltoluene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	99-87-6	
Methylene Chloride	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	379	1	05/01/18 16:53	05/03/18 04:25	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-05 (5-15) WM **Lab ID: 10428096004** Collected: 04/19/18 15:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	1634-04-4	
Naphthalene	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	91-20-3	
n-Propylbenzene	121	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	103-65-1	
Styrene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	79-34-5	
Tetrachloroethene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	127-18-4	
Tetrahydrofuran	ND	ug/kg	3030	1	05/01/18 16:53	05/03/18 04:25	109-99-9	
Toluene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	79-00-5	
Trichloroethene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	79-01-6	
Trichlorofluoromethane	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	76-13-1	
1,2,4-Trimethylbenzene	164	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	108-67-8	
Vinyl chloride	ND	ug/kg	30.3	1	05/01/18 16:53	05/03/18 04:25	75-01-4	
Xylene (Total)	ND	ug/kg	228	1	05/01/18 16:53	05/03/18 04:25	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	75-125	1	05/01/18 16:53	05/03/18 04:25	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1	05/01/18 16:53	05/03/18 04:25	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1	05/01/18 16:53	05/03/18 04:25	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	15.8	5	04/28/18 10:35	05/01/18 13:41	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	3.6	mg/kg	1.0	1		05/03/18 07:33	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.47	1	04/26/18 10:15	04/26/18 14:28	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.99	1	04/27/18 12:45	04/30/18 19:56	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-07 (1-5) S **Lab ID: 10428096005** Collected: 04/19/18 17:15 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	12.3	1	05/04/18 10:07	05/07/18 14:57	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	309-00-2	
alpha-BHC	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	319-84-6	
beta-BHC	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	319-85-7	
delta-BHC	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	58-89-9	
Chlordane (Technical)	ND	ug/kg	64.4	2	04/20/18 16:36	05/01/18 22:22	57-74-9	
alpha-Chlordane	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	5103-71-9	
gamma-Chlordane	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	5103-74-2	
4,4'-DDD	ND	ug/kg	12.8	2	04/20/18 16:36	05/01/18 22:22	72-54-8	
4,4'-DDE	ND	ug/kg	12.8	2	04/20/18 16:36	05/01/18 22:22	72-55-9	
4,4'-DDT	ND	ug/kg	12.8	2	04/20/18 16:36	05/01/18 22:22	50-29-3	
Dieldrin	ND	ug/kg	12.8	2	04/20/18 16:36	05/01/18 22:22	60-57-1	
Endosulfan I	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	959-98-8	
Endosulfan II	ND	ug/kg	12.8	2	04/20/18 16:36	05/01/18 22:22	33213-65-9	
Endosulfan sulfate	ND	ug/kg	12.8	2	04/20/18 16:36	05/01/18 22:22	1031-07-8	
Endrin	ND	ug/kg	12.8	2	04/20/18 16:36	05/01/18 22:22	72-20-8	
Endrin aldehyde	ND	ug/kg	12.8	2	04/20/18 16:36	05/01/18 22:22	7421-93-4	
Endrin ketone	ND	ug/kg	12.8	2	04/20/18 16:36	05/01/18 22:22	53494-70-5	
Heptachlor	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	76-44-8	
Heptachlor epoxide	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	1024-57-3	
Methoxychlor	ND	ug/kg	64.4	2	04/20/18 16:36	05/01/18 22:22	72-43-5	
Toxaphene	ND	ug/kg	193	2	04/20/18 16:36	05/01/18 22:22	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	78	%	30-150	2	04/20/18 16:36	05/01/18 22:22	877-09-8	3M, D3
Decachlorobiphenyl (S)	67	%	30-150	2	04/20/18 16:36	05/01/18 22:22	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	11100-14-4	
PCB, Total	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	82	%	48-125	1	04/20/18 16:33	04/24/18 16:45	877-09-8	
Decachlorobiphenyl (S)	106	%	30-134	1	04/20/18 16:33	04/24/18 16:45	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	ND	mg/kg	14.7	1	04/20/18 17:57	04/22/18 13:43		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Project No.: 10428096

Sample: FL-TT-07 (1-5) S **Lab ID: 10428096005** Collected: 04/19/18 17:15 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	101	%	50-150	1	04/20/18 17:57	04/22/18 13:43	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	18.5	1	05/02/18 10:19	05/02/18 20:49		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	05/02/18 10:19	05/02/18 20:49	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	8590	mg/kg	19.1	1	04/23/18 07:48	04/26/18 14:10	7429-90-5	
Barium	240	mg/kg	0.96	1	04/23/18 07:48	04/26/18 14:10	7440-39-3	
Boron	27.0	mg/kg	14.3	1	04/23/18 07:48	04/26/18 14:10	7440-42-8	
Copper	17.5	mg/kg	0.96	1	04/23/18 07:48	04/26/18 14:10	7440-50-8	
Iron	23300	mg/kg	23.9	5	04/23/18 07:48	04/26/18 14:58	7439-89-6	
Manganese	999	mg/kg	2.4	5	04/23/18 07:48	04/26/18 14:58	7439-96-5	
Nickel	16.4	mg/kg	1.9	1	04/23/18 07:48	04/26/18 14:10	7440-02-0	
Silver	ND	mg/kg	0.96	1	04/23/18 07:48	04/26/18 14:10	7440-22-4	
Tin	ND	mg/kg	7.2	1	04/23/18 07:48	04/26/18 14:10	7440-31-5	
Titanium	170	mg/kg	2.4	1	04/23/18 07:48	04/26/18 14:10	7440-32-6	
Zinc	62.5	mg/kg	1.9	1	04/23/18 07:48	04/26/18 14:10	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	7.5	mg/kg	0.37	1	04/25/18 09:25	04/26/18 04:33	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.90	20	04/23/18 08:19	04/25/18 16:13	7440-36-0	
Arsenic	6.3	mg/kg	0.90	20	04/23/18 08:19	04/25/18 16:13	7440-38-2	
Beryllium	0.67	mg/kg	0.36	20	04/23/18 08:19	04/25/18 16:13	7440-41-7	
Cadmium	0.47	mg/kg	0.14	20	04/23/18 08:19	04/25/18 16:13	7440-43-9	
Cobalt	8.3	mg/kg	0.90	20	04/23/18 08:19	04/25/18 16:13	7440-48-4	
Lead	16.2	mg/kg	0.18	20	04/23/18 08:19	04/25/18 16:13	7439-92-1	
Lithium	9.8	mg/kg	0.90	20	04/23/18 08:19	04/25/18 16:13	7439-93-2	
Selenium	2.2	mg/kg	0.90	20	04/23/18 08:19	04/25/18 16:13	7782-49-2	
Strontium	102	mg/kg	0.90	20	04/23/18 08:19	04/25/18 16:13	7440-24-6	
Vanadium	29.8	mg/kg	1.8	20	04/23/18 08:19	04/25/18 16:13	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.065	mg/kg	0.037	1	04/23/18 07:02	04/24/18 16:39	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	48.2	%	0.10	1		04/30/18 11:28		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	83-32-9	
Acenaphthylene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-07 (1-5) S **Lab ID: 10428096005** Collected: 04/19/18 17:15 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	120-12-7	
Benzo(a)anthracene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	56-55-3	
Benzo(a)pyrene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	101-55-3	
Butylbenzylphthalate	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	85-68-7	
Carbazole	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	59-50-7	
4-Chloroaniline	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	108-60-1	
2-Chloronaphthalene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	91-58-7	
2-Chlorophenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	7005-72-3	
Chrysene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	53-70-3	
Dibenzofuran	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	120-83-2	
Diethylphthalate	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	105-67-9	
Dimethylphthalate	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	131-11-3	
Di-n-butylphthalate	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	3280	1	04/20/18 16:47	04/26/18 20:03	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	606-20-2	
Di-n-octylphthalate	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	117-81-7	
Fluoranthene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	206-44-0	
Fluorene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	87-68-3	
Hexachlorobenzene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	118-74-1	
Hexachloroethane	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	193-39-5	
Isophorone	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	78-59-1	
1-Methylnaphthalene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	90-12-0	
2-Methylnaphthalene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: **FL-TT-07 (1-5) S** Lab ID: **10428096005** Collected: 04/19/18 17:15 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1270	1	04/20/18 16:47	04/26/18 20:03		
Naphthalene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	91-20-3	
2-Nitroaniline	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	88-74-4	
3-Nitroaniline	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	99-09-2	
4-Nitroaniline	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	100-01-6	
Nitrobenzene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	98-95-3	
2-Nitrophenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	88-75-5	
4-Nitrophenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	86-30-6	
Pentachlorophenol	ND	ug/kg	1290	1	04/20/18 16:47	04/26/18 20:03	87-86-5	
Phenanthrene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	85-01-8	
Phenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	108-95-2	
Pyrene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	57	%.	43-125	1	04/20/18 16:47	04/26/18 20:03	4165-60-0	
2-Fluorobiphenyl (S)	71	%.	30-132	1	04/20/18 16:47	04/26/18 20:03	321-60-8	
p-Terphenyl-d14 (S)	89	%.	62-125	1	04/20/18 16:47	04/26/18 20:03	1718-51-0	
Phenol-d6 (S)	65	%.	48-125	1	04/20/18 16:47	04/26/18 20:03	13127-88-3	
2-Fluorophenol (S)	62	%.	40-125	1	04/20/18 16:47	04/26/18 20:03	367-12-4	
2,4,6-Tribromophenol (S)	60	%.	60-125	1	04/20/18 16:47	04/26/18 20:03	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	83-32-9	
Acenaphthylene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	208-96-8	
Anthracene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	120-12-7	
Benzo(a)anthracene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	56-55-3	
Benzo(a)pyrene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	207-08-9	
Chrysene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	53-70-3	
Fluoranthene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	206-44-0	
Fluorene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	193-39-5	
Naphthalene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	91-20-3	
Phenanthrene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	85-01-8	
Pyrene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	56	%.	42-125	1	04/20/18 15:33	04/24/18 21:12	321-60-8	
p-Terphenyl-d14 (S)	68	%.	57-125	1	04/20/18 15:33	04/24/18 21:12	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-07 (1-5) S **Lab ID: 10428096005** Collected: 04/19/18 17:15 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	2020	1	05/01/18 16:53	05/03/18 04:42	67-64-1	
Allyl chloride	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	107-05-1	
Benzene	ND	ug/kg	40.4	1	05/01/18 16:53	05/03/18 04:42	71-43-2	
Bromobenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	108-86-1	
Bromochloromethane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	74-97-5	
Bromodichloromethane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	75-27-4	
Bromoform	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	75-25-2	
Bromomethane	ND	ug/kg	1010	1	05/01/18 16:53	05/03/18 04:42	74-83-9	
2-Butanone (MEK)	ND	ug/kg	505	1	05/01/18 16:53	05/03/18 04:42	78-93-3	
n-Butylbenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	104-51-8	
sec-Butylbenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	135-98-8	
tert-Butylbenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	98-06-6	
Carbon tetrachloride	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	56-23-5	
Chlorobenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	108-90-7	
Chloroethane	ND	ug/kg	1010	1	05/01/18 16:53	05/03/18 04:42	75-00-3	
Chloroform	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	67-66-3	
Chloromethane	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	74-87-3	
2-Chlorotoluene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	95-49-8	
4-Chlorotoluene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1010	1	05/01/18 16:53	05/03/18 04:42	96-12-8	
Dibromochloromethane	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	106-93-4	
Dibromomethane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	75-71-8	
1,1-Dichloroethane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	75-34-3	
1,2-Dichloroethane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	107-06-2	
1,1-Dichloroethene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1010	1	05/01/18 16:53	05/03/18 04:42	75-43-4	
1,2-Dichloropropane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	78-87-5	
1,3-Dichloropropane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	142-28-9	
2,2-Dichloropropane	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	594-20-7	
1,1-Dichloropropene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	60-29-7	
Ethylbenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	505	1	05/01/18 16:53	05/03/18 04:42	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	98-82-8	
p-Isopropyltoluene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	99-87-6	
Methylene Chloride	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	505	1	05/01/18 16:53	05/03/18 04:42	108-10-1	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-07 (1-5) S **Lab ID: 10428096005** Collected: 04/19/18 17:15 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	1634-04-4	
Naphthalene	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	91-20-3	
n-Propylbenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	103-65-1	
Styrene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	79-34-5	
Tetrachloroethene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	127-18-4	
Tetrahydrofuran	ND	ug/kg	4040	1	05/01/18 16:53	05/03/18 04:42	109-99-9	
Toluene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	79-00-5	
Trichloroethene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	79-01-6	
Trichlorofluoromethane	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	108-67-8	
Vinyl chloride	ND	ug/kg	40.4	1	05/01/18 16:53	05/03/18 04:42	75-01-4	
Xylene (Total)	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:42	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	75-125	1	05/01/18 16:53	05/03/18 04:42	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1	05/01/18 16:53	05/03/18 04:42	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1	05/01/18 16:53	05/03/18 04:42	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	190	50	04/28/18 10:35	05/01/18 13:41	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	7.5	mg/kg	1.0	1		05/03/18 07:33	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.78	mg/kg	0.53	1	04/26/18 10:15	04/26/18 14:28	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.99	1	04/27/18 12:45	04/30/18 19:17	16984-48-8	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

QC Batch: 142287 Analysis Method: EPA 1630 (1998)
QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 562608 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.21	05/07/18 13:37	N3

METHOD BLANK: 562609 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.15	05/07/18 13:43	N3

METHOD BLANK: 562610 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.21	05/07/18 13:50	N3

LABORATORY CONTROL SAMPLE: 562611

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	100	113	112	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 562612 562613

Parameter	Units	10428096004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	359	372	373	444	104	119	65-135	17	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 535145

Analysis Method: WI MOD GRO

QC Batch Method: EPA 5030 Medium Soil

Analysis Description: WIGRO Solid GCV

Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2910764

Matrix: Solid

Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	05/02/18 11:15	
a,a,a-Trifluorotoluene (S)	%.	99	80-150	05/02/18 11:15	

LABORATORY CONTROL SAMPLE & LCSD: 2907780

2907781

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	40.4	41.9	81	84	80-120	4	20	
a,a,a-Trifluorotoluene (S)	%.				99	99	80-150			

MATRIX SPIKE SAMPLE: 2910759

Parameter	Units	10427824002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	ND	56.5	67.3	119	80-120	
a,a,a-Trifluorotoluene (S)	%.				98	80-150	

SAMPLE DUPLICATE: 2910758

Parameter	Units	10428096003 Result	Dup Result	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	4.6J		20	
a,a,a-Trifluorotoluene (S)	%.	99	99	3		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 533683

Analysis Method: EPA 7471

QC Batch Method: EPA 7471

Analysis Description: 7471 Mercury

Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2898961

Matrix: Solid

Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.020	04/24/18 15:54	

LABORATORY CONTROL SAMPLE: 2898962

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.47	0.51	109	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898963 2898964

Parameter	Units	10428159001		2898963		2898964		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result				
Mercury	mg/kg	0.097	.52	.51	0.65	0.62	105	103	80-120	5	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 533686 Analysis Method: EPA 6010C
QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2898973 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.3	04/26/18 13:37	
Barium	mg/kg	ND	0.47	04/26/18 13:37	
Boron	mg/kg	ND	7.0	04/26/18 13:37	
Copper	mg/kg	ND	0.47	04/26/18 13:37	
Iron	mg/kg	ND	2.3	04/26/18 13:37	
Manganese	mg/kg	ND	0.23	04/26/18 13:37	
Nickel	mg/kg	ND	0.93	04/26/18 13:37	
Silver	mg/kg	ND	0.47	04/26/18 13:37	
Tin	mg/kg	ND	3.5	04/26/18 13:37	
Titanium	mg/kg	ND	1.2	04/26/18 13:37	
Zinc	mg/kg	ND	0.93	04/26/18 13:37	

LABORATORY CONTROL SAMPLE: 2898974

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	971	965	99	80-120	
Barium	mg/kg	48.5	50.1	103	80-120	
Boron	mg/kg	48.5	44.5	92	80-120	
Copper	mg/kg	48.5	48.4	100	80-120	
Iron	mg/kg	971	983	101	80-120	
Manganese	mg/kg	48.5	49.9	103	80-120	
Nickel	mg/kg	48.5	48.5	100	80-120	
Silver	mg/kg	24.3	22.8	94	80-120	
Tin	mg/kg	48.5	48.8	100	80-120	
Titanium	mg/kg	48.5	49.1	101	80-120	
Zinc	mg/kg	48.5	47.4	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898975 2898976

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10428096001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Aluminum	mg/kg	24900	3380	3480	19400	40300	-165	441	75-125	70	20	P6,R1
Barium	mg/kg	428	169	174	408	498	-12	40	75-125	20	20	M1
Boron	mg/kg	109	169	174	229	285	71	101	75-125	22	20	M1,R1
Copper	mg/kg	448	169	174	446	1230	-1	452	75-125	94	20	M1,R1
Iron	mg/kg	166000	3380	3480	226000	163000	1800	-74	75-125	32	20	M6,R1
Manganese	mg/kg	596	169	174	887	870	172	158	75-125	2	20	M1
Nickel	mg/kg	62.5	169	174	223	235	95	99	75-125	5	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Parameter	Units	2898975		2898976		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10428096001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Silver	mg/kg	26.3	84.5	86.9	95.0	99.1	81	84	75-125	4	20
Tin	mg/kg	406	169	174	601	743	116	194	75-125	21	20 M1, R1
Titanium	mg/kg	208	169	174	430	468	131	149	75-125	9	20 M1
Zinc	mg/kg	831	169	174	901	1010	42	105	75-125	12	20 P6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 438855 Analysis Method: EPA 6020
 QC Batch Method: EPA 3050B Analysis Description: 6020 MET
 Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2027873 Matrix: Solid
 Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.19	04/26/18 02:38	N2

LABORATORY CONTROL SAMPLE: 2027874

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.7	3.9	106	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027875 2027876

Parameter	Units	2027875		2027876		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427642001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chromium	mg/kg	5.4	4.87	4.87	7.0	6.1	34	15	75-125	14	20 M0, N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

QC Batch: 533687 Analysis Method: EPA 6020A
QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2898977 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.49	04/24/18 18:20	
Arsenic	mg/kg	ND	0.49	04/24/18 18:20	
Beryllium	mg/kg	ND	0.19	04/24/18 18:20	
Cadmium	mg/kg	ND	0.078	04/24/18 18:20	
Cobalt	mg/kg	ND	0.49	04/24/18 18:20	
Lead	mg/kg	ND	0.097	04/24/18 18:20	
Lithium	mg/kg	ND	0.49	04/24/18 18:20	
Selenium	mg/kg	ND	0.49	04/24/18 18:20	
Strontium	mg/kg	ND	0.49	04/24/18 18:20	
Vanadium	mg/kg	ND	0.97	04/24/18 18:20	

LABORATORY CONTROL SAMPLE: 2898978

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	47.6	47.2	99	80-120	
Arsenic	mg/kg	47.6	46.8	98	80-120	
Beryllium	mg/kg	47.6	49.9	105	80-120	
Cadmium	mg/kg	47.6	47.0	99	80-120	
Cobalt	mg/kg	47.6	48.1	101	80-120	
Lead	mg/kg	47.6	49.6	104	80-120	
Lithium	mg/kg	47.6	52.3	110	80-120	
Selenium	mg/kg	47.6	48.6	102	80-120	
Strontium	mg/kg	47.6	48.0	101	80-120	
Vanadium	mg/kg	47.6	47.3	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898979 2898980

Parameter	Units	10428096001		2898980		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Antimony	mg/kg	3.7	167	170	162	153	95	88	75-125	6	20	
Arsenic	mg/kg	11.9	167	170	200	181	113	99	75-125	10	20	
Beryllium	mg/kg	ND	167	170	195	181	116	106	75-125	8	20	
Cadmium	mg/kg	38.6	167	170	182	178	86	82	75-125	2	20	
Cobalt	mg/kg	8.4	167	170	214	187	123	105	75-125	13	20	
Lead	mg/kg	691	167	170	41400	4040	24300	1970	75-125	164	20	E, M6, R1
Lithium	mg/kg	2.4	167	170	205	191	121	111	75-125	7	20	
Selenium	mg/kg	1.8	167	170	175	166	104	96	75-125	5	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Parameter	Units	2898979		2898980		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10428096001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Strontium	mg/kg	31.2	167	170	210	211	107	105	75-125	0	20		
Vanadium	mg/kg	40.2	167	170	200	211	96	100	75-125	5	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 534083

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10428096001, 10428096002

SAMPLE DUPLICATE: 2901467

Parameter	Units	10428393003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	20.6	20.4	1	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

QC Batch: 535059 Analysis Method: ASTM D2974
QC Batch Method: ASTM D2974 Analysis Description: Dry Weight / %M by ASTM D2974
Associated Lab Samples: 10428096003, 10428096004, 10428096005

SAMPLE DUPLICATE: 2907119

Parameter	Units	10428896001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	7.9	8.3	5	30	

SAMPLE DUPLICATE: 2907120

Parameter	Units	10428133002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	12.0	11.9	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 535427 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2909873 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	05/02/18 18:51	
1,1,1-Trichloroethane	ug/kg	ND	50.0	05/02/18 18:51	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	05/02/18 18:51	
1,1,2-Trichloroethane	ug/kg	ND	50.0	05/02/18 18:51	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	05/02/18 18:51	
1,1-Dichloroethane	ug/kg	ND	50.0	05/02/18 18:51	
1,1-Dichloroethene	ug/kg	ND	50.0	05/02/18 18:51	
1,1-Dichloropropene	ug/kg	ND	50.0	05/02/18 18:51	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	05/02/18 18:51	
1,2,3-Trichloropropane	ug/kg	ND	200	05/02/18 18:51	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	05/02/18 18:51	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	05/02/18 18:51	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	05/02/18 18:51	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	05/02/18 18:51	
1,2-Dichlorobenzene	ug/kg	ND	50.0	05/02/18 18:51	
1,2-Dichloroethane	ug/kg	ND	50.0	05/02/18 18:51	
1,2-Dichloropropane	ug/kg	ND	50.0	05/02/18 18:51	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	05/02/18 18:51	
1,3-Dichlorobenzene	ug/kg	ND	50.0	05/02/18 18:51	
1,3-Dichloropropane	ug/kg	ND	50.0	05/02/18 18:51	
1,4-Dichlorobenzene	ug/kg	ND	50.0	05/02/18 18:51	
2,2-Dichloropropane	ug/kg	ND	200	05/02/18 18:51	
2-Butanone (MEK)	ug/kg	ND	250	05/02/18 18:51	
2-Chlorotoluene	ug/kg	ND	50.0	05/02/18 18:51	
4-Chlorotoluene	ug/kg	ND	50.0	05/02/18 18:51	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	05/02/18 18:51	
Acetone	ug/kg	ND	1000	05/02/18 18:51	
Allyl chloride	ug/kg	ND	200	05/02/18 18:51	
Benzene	ug/kg	ND	20.0	05/02/18 18:51	
Bromobenzene	ug/kg	ND	50.0	05/02/18 18:51	
Bromochloromethane	ug/kg	ND	50.0	05/02/18 18:51	
Bromodichloromethane	ug/kg	ND	50.0	05/02/18 18:51	
Bromoform	ug/kg	ND	200	05/02/18 18:51	
Bromomethane	ug/kg	ND	500	05/02/18 18:51	
Carbon tetrachloride	ug/kg	ND	50.0	05/02/18 18:51	
Chlorobenzene	ug/kg	ND	50.0	05/02/18 18:51	
Chloroethane	ug/kg	ND	500	05/02/18 18:51	
Chloroform	ug/kg	ND	50.0	05/02/18 18:51	
Chloromethane	ug/kg	ND	200	05/02/18 18:51	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	05/02/18 18:51	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	05/02/18 18:51	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

METHOD BLANK: 2909873 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	05/02/18 18:51	
Dibromomethane	ug/kg	ND	50.0	05/02/18 18:51	
Dichlorodifluoromethane	ug/kg	ND	200	05/02/18 18:51	
Dichlorofluoromethane	ug/kg	ND	500	05/02/18 18:51	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	05/02/18 18:51	
Ethylbenzene	ug/kg	ND	50.0	05/02/18 18:51	
Hexachloro-1,3-butadiene	ug/kg	ND	250	05/02/18 18:51	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	05/02/18 18:51	
Methyl-tert-butyl ether	ug/kg	ND	50.0	05/02/18 18:51	
Methylene Chloride	ug/kg	ND	200	05/02/18 18:51	
n-Butylbenzene	ug/kg	ND	50.0	05/02/18 18:51	
n-Propylbenzene	ug/kg	ND	50.0	05/02/18 18:51	
Naphthalene	ug/kg	ND	200	05/02/18 18:51	
p-Isopropyltoluene	ug/kg	ND	50.0	05/02/18 18:51	
sec-Butylbenzene	ug/kg	ND	50.0	05/02/18 18:51	
Styrene	ug/kg	ND	50.0	05/02/18 18:51	
tert-Butylbenzene	ug/kg	ND	50.0	05/02/18 18:51	
Tetrachloroethene	ug/kg	ND	50.0	05/02/18 18:51	
Tetrahydrofuran	ug/kg	ND	2000	05/02/18 18:51	
Toluene	ug/kg	ND	50.0	05/02/18 18:51	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	05/02/18 18:51	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	05/02/18 18:51	
Trichloroethene	ug/kg	ND	50.0	05/02/18 18:51	
Trichlorofluoromethane	ug/kg	ND	200	05/02/18 18:51	
Vinyl chloride	ug/kg	ND	20.0	05/02/18 18:51	
Xylene (Total)	ug/kg	ND	150	05/02/18 18:51	
1,2-Dichloroethane-d4 (S)	%	99	75-125	05/02/18 18:51	
4-Bromofluorobenzene (S)	%	98	75-125	05/02/18 18:51	
Toluene-d8 (S)	%	99	75-125	05/02/18 18:51	

Parameter	Units	2909874		2909875		% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec				
1,1,1,2-Tetrachloroethane	ug/kg	1000	914	897	91	90	59-125	2	20
1,1,1-Trichloroethane	ug/kg	1000	898	976	90	98	59-125	8	20
1,1,2,2-Tetrachloroethane	ug/kg	1000	901	920	90	92	58-125	2	20
1,1,2-Trichloroethane	ug/kg	1000	889	909	89	91	64-125	2	20
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	852	881	85	88	65-125	3	20
1,1-Dichloroethane	ug/kg	1000	883	930	88	93	63-125	5	20
1,1-Dichloroethene	ug/kg	1000	830	873	83	87	59-125	5	20
1,1-Dichloropropene	ug/kg	1000	866	942	87	94	64-125	8	20
1,2,3-Trichlorobenzene	ug/kg	1000	927	953	93	95	55-126	3	20
1,2,3-Trichloropropane	ug/kg	1000	943	948	94	95	62-125	1	20
1,2,4-Trichlorobenzene	ug/kg	1000	941	939	94	94	62-125	0	20

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

LABORATORY CONTROL SAMPLE & LCSD: 2909874		2909875									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,2,4-Trimethylbenzene	ug/kg	1000	944	928	94	93	59-125	2	20		
1,2-Dibromo-3-chloropropane	ug/kg	2500	2370	2440	95	98	54-125	3	20		
1,2-Dibromoethane (EDB)	ug/kg	1000	852	919	85	92	64-125	8	20		
1,2-Dichlorobenzene	ug/kg	1000	859	884	86	88	63-125	3	20		
1,2-Dichloroethane	ug/kg	1000	836	819	84	82	57-125	2	20		
1,2-Dichloropropane	ug/kg	1000	884	908	88	91	67-125	3	20		
1,3,5-Trimethylbenzene	ug/kg	1000	914	913	91	91	59-125	0	20		
1,3-Dichlorobenzene	ug/kg	1000	898	883	90	88	64-125	2	20		
1,3-Dichloropropane	ug/kg	1000	864	880	86	88	64-125	2	20		
1,4-Dichlorobenzene	ug/kg	1000	886	881	89	88	63-125	1	20		
2,2-Dichloropropane	ug/kg	1000	845	916	84	92	37-126	8	20		
2-Butanone (MEK)	ug/kg	5000	3880	4310	78	86	48-125	10	20		
2-Chlorotoluene	ug/kg	1000	878	881	88	88	62-125	0	20		
4-Chlorotoluene	ug/kg	1000	904	908	90	91	63-125	0	20		
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4550	4650	91	93	52-135	2	20		
Acetone	ug/kg	5000	4580	4400	92	88	65-125	4	20		
Allyl chloride	ug/kg	1000	825	855	82	86	52-125	4	20		
Benzene	ug/kg	1000	936	916	94	92	61-125	2	20		
Bromobenzene	ug/kg	1000	922	938	92	94	64-125	2	20		
Bromochloromethane	ug/kg	1000	871	952	87	95	65-125	9	20		
Bromodichloromethane	ug/kg	1000	936	941	94	94	57-125	1	20		
Bromoform	ug/kg	1000	790	822	79	82	57-125	4	20		
Bromomethane	ug/kg	1000	993	1020	99	102	60-125	3	20		
Carbon tetrachloride	ug/kg	1000	890	972	89	97	58-125	9	20		
Chlorobenzene	ug/kg	1000	917	925	92	92	66-125	1	20		
Chloroethane	ug/kg	1000	751	825	75	82	62-125	9	20		
Chloroform	ug/kg	1000	827	932	83	93	59-125	12	20		
Chloromethane	ug/kg	1000	731	793	73	79	50-125	8	20		
cis-1,2-Dichloroethene	ug/kg	1000	854	904	85	90	61-125	6	20		
cis-1,3-Dichloropropene	ug/kg	1000	927	967	93	97	61-125	4	20		
Dibromochloromethane	ug/kg	1000	894	902	89	90	60-125	1	20		
Dibromomethane	ug/kg	1000	886	904	89	90	69-125	2	20		
Dichlorodifluoromethane	ug/kg	1000	517	551	52	55	38-125	6	20		
Dichlorofluoromethane	ug/kg	1000	826	927	83	93	67-125	12	20		
Diethyl ether (Ethyl ether)	ug/kg	1000	2330	3490	233	349	60-125	40	20	L3,R1	
Ethylbenzene	ug/kg	1000	918	930	92	93	62-125	1	20		
Hexachloro-1,3-butadiene	ug/kg	1000	930	947	93	95	56-125	2	20		
Isopropylbenzene (Cumene)	ug/kg	1000	958	961	96	96	65-125	0	20		
Methyl-tert-butyl ether	ug/kg	1000	818	876	82	88	59-125	7	20		
Methylene Chloride	ug/kg	1000	793	871	79	87	64-125	9	20		
n-Butylbenzene	ug/kg	1000	916	951	92	95	59-125	4	20		
n-Propylbenzene	ug/kg	1000	953	906	95	91	61-125	5	20		
Naphthalene	ug/kg	1000	914	934	91	93	53-125	2	20		
p-Isopropyltoluene	ug/kg	1000	927	947	93	95	63-125	2	20		
sec-Butylbenzene	ug/kg	1000	895	923	89	92	62-125	3	20		
Styrene	ug/kg	1000	925	931	92	93	66-125	1	20		
tert-Butylbenzene	ug/kg	1000	974	973	97	97	64-125	0	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

LABORATORY CONTROL SAMPLE & LCSD: 2909874

Parameter	Units	2909875		LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result						
Tetrachloroethene	ug/kg	1000	919	913	92	91	67-125	1	20
Tetrahydrofuran	ug/kg	10000	8930	9280	89	93	62-125	4	20
Toluene	ug/kg	1000	904	896	90	90	61-125	1	20
trans-1,2-Dichloroethene	ug/kg	1000	824	845	82	84	64-125	3	20
trans-1,3-Dichloropropene	ug/kg	1000	887	907	89	91	56-125	2	20
Trichloroethene	ug/kg	1000	887	888	89	89	67-125	0	20
Trichlorofluoromethane	ug/kg	1000	764	815	76	81	65-125	6	20
Vinyl chloride	ug/kg	1000	733	779	73	78	57-125	6	20
Xylene (Total)	ug/kg	3000	2680	2740	89	91	62-125	2	20
1,2-Dichloroethane-d4 (S)	%				99	97	75-125		
4-Bromofluorobenzene (S)	%				102	102	75-125		
Toluene-d8 (S)	%				99	100	75-125		

MATRIX SPIKE SAMPLE: 2909876

Parameter	Units	10429252001		MS Result	MS % Rec	% Rec Limits	Qualifiers
		Result	Spike Conc.				
1,1,1,2-Tetrachloroethane	ug/kg	ND	2120	2260	106	64-146	
1,1,1-Trichloroethane	ug/kg	ND	2120	2360	111	56-148	
1,1,2,2-Tetrachloroethane	ug/kg	ND	2120	2330	110	36-150	
1,1,2-Trichloroethane	ug/kg	ND	2120	2180	102	67-148	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	2120	2300	108	60-142	
1,1-Dichloroethane	ug/kg	ND	2120	2280	107	57-140	
1,1-Dichloroethene	ug/kg	ND	2120	2170	102	59-139	
1,1-Dichloropropene	ug/kg	ND	2120	2290	108	61-142	
1,2,3-Trichlorobenzene	ug/kg	ND	2120	2390	113	69-150	
1,2,3-Trichloropropane	ug/kg	ND	2120	2420	114	64-150	
1,2,4-Trichlorobenzene	ug/kg	ND	2120	2440	115	71-149	
1,2,4-Trimethylbenzene	ug/kg	ND	2120	2320	109	67-149	
1,2-Dibromo-3-chloropropane	ug/kg	ND	5310	6340	119	61-150	
1,2-Dibromoethane (EDB)	ug/kg	ND	2120	2160	102	67-147	
1,2-Dichlorobenzene	ug/kg	ND	2120	2210	104	70-142	
1,2-Dichloroethane	ug/kg	ND	2120	2190	103	58-132	
1,2-Dichloropropane	ug/kg	ND	2120	2140	101	64-144	
1,3,5-Trimethylbenzene	ug/kg	ND	2120	2290	108	71-146	
1,3-Dichlorobenzene	ug/kg	ND	2120	2210	104	71-142	
1,3-Dichloropropane	ug/kg	ND	2120	2120	100	68-140	
1,4-Dichlorobenzene	ug/kg	ND	2120	2250	106	68-142	
2,2-Dichloropropane	ug/kg	ND	2120	2260	106	34-150	
2-Butanone (MEK)	ug/kg	ND	10600	10200	96	51-150	
2-Chlorotoluene	ug/kg	ND	2120	2230	105	66-144	
4-Chlorotoluene	ug/kg	ND	2120	2240	105	66-140	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	10600	11400	107	63-150	
Acetone	ug/kg	ND	10600	10100	95	54-150	
Allyl chloride	ug/kg	ND	2120	2120	100	53-135	
Benzene	ug/kg	ND	2120	2160	102	65-135	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

MATRIX SPIKE SAMPLE: 2909876		10429252001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/kg	ND	2120	2350	111	71-141	
Bromochloromethane	ug/kg	ND	2120	2230	105	62-145	
Bromodichloromethane	ug/kg	ND	2120	2300	108	59-148	
Bromoform	ug/kg	ND	2120	2080	98	57-145	
Bromomethane	ug/kg	ND	16.4	925	5110	51-129	1M,M1
Carbon tetrachloride	ug/kg	ND	2120	2410	113	55-144	
Chlorobenzene	ug/kg	ND	2120	2240	105	70-142	
Chloroethane	ug/kg	ND	16.4	ND	0	61-135	1M,M1
Chloroform	ug/kg	ND	2120	2180	103	58-135	
Chloromethane	ug/kg	ND	16.4	80.5J	343	37-125	1M,M1
cis-1,2-Dichloroethene	ug/kg	ND	2120	2150	101	60-138	
cis-1,3-Dichloropropene	ug/kg	ND	2120	2240	105	62-142	
Dibromochloromethane	ug/kg	ND	2120	2260	107	65-141	
Dibromomethane	ug/kg	ND	2120	2110	100	72-150	
Dichlorodifluoromethane	ug/kg	ND	16.4	ND	0	30-125	1M,M1
Dichlorofluoromethane	ug/kg	ND	16.4	ND	0	62-148	1M,M1
Diethyl ether (Ethyl ether)	ug/kg	ND	2120	11700	549	62-135	M0
Ethylbenzene	ug/kg	ND	2120	2230	105	72-138	
Hexachloro-1,3-butadiene	ug/kg	ND	2120	3030	143	38-150	
Isopropylbenzene (Cumene)	ug/kg	ND	2120	2360	111	75-148	
Methyl-tert-butyl ether	ug/kg	ND	2120	2220	104	63-139	
Methylene Chloride	ug/kg	ND	2120	2070	97	58-135	
n-Butylbenzene	ug/kg	ND	2120	2430	114	63-150	
n-Propylbenzene	ug/kg	ND	2120	2350	110	70-146	
Naphthalene	ug/kg	ND	2120	2350	111	63-150	
p-Isopropyltoluene	ug/kg	ND	2120	2360	111	72-150	
sec-Butylbenzene	ug/kg	ND	2120	2370	112	66-150	
Styrene	ug/kg	ND	2120	2270	107	72-146	
tert-Butylbenzene	ug/kg	ND	2120	2460	116	71-148	
Tetrachloroethene	ug/kg	ND	2120	2190	103	70-150	
Tetrahydrofuran	ug/kg	ND	21200	21300	100	62-150	
Toluene	ug/kg	ND	2120	2170	102	65-142	
trans-1,2-Dichloroethene	ug/kg	ND	2120	2120	100	55-141	
trans-1,3-Dichloropropene	ug/kg	ND	2120	2210	104	57-147	
Trichloroethene	ug/kg	ND	2120	2220	104	62-150	
Trichlorofluoromethane	ug/kg	ND	16.4	ND	0	51-150	1M,M1
Vinyl chloride	ug/kg	ND	16.4	ND	0	45-132	1M,M1
Xylene (Total)	ug/kg	ND	6370	6570	103	75-140	
1,2-Dichloroethane-d4 (S)	%				109	75-125	C0
4-Bromofluorobenzene (S)	%				103	75-125	
Toluene-d8 (S)	%				99	75-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

SAMPLE DUPLICATE: 2909877

Parameter	Units	10428096001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,1-Trichloroethane	ug/kg	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,2-Trichloroethane	ug/kg	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	ND		30	
1,1-Dichloroethane	ug/kg	ND	ND		30	
1,1-Dichloroethene	ug/kg	ND	ND		30	
1,1-Dichloropropene	ug/kg	ND	ND		30	
1,2,3-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,3-Trichloropropane	ug/kg	ND	ND		30	
1,2,4-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,4-Trimethylbenzene	ug/kg	ND	133J		30	
1,2-Dibromo-3-chloropropane	ug/kg	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	ND		30	
1,2-Dichlorobenzene	ug/kg	ND	ND		30	
1,2-Dichloroethane	ug/kg	ND	ND		30	
1,2-Dichloropropane	ug/kg	ND	ND		30	
1,3,5-Trimethylbenzene	ug/kg	ND	41.4J		30	
1,3-Dichlorobenzene	ug/kg	ND	ND		30	
1,3-Dichloropropane	ug/kg	ND	ND		30	
1,4-Dichlorobenzene	ug/kg	175	209	18	30	
2,2-Dichloropropane	ug/kg	ND	ND		30	
2-Butanone (MEK)	ug/kg	ND	ND		30	
2-Chlorotoluene	ug/kg	ND	ND		30	
4-Chlorotoluene	ug/kg	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND		30	
Acetone	ug/kg	ND	ND		30	
Allyl chloride	ug/kg	ND	ND		30	
Benzene	ug/kg	ND	ND		30	
Bromobenzene	ug/kg	ND	ND		30	
Bromochloromethane	ug/kg	ND	ND		30	
Bromodichloromethane	ug/kg	ND	ND		30	
Bromoform	ug/kg	ND	ND		30	
Bromomethane	ug/kg	ND	ND		30	
Carbon tetrachloride	ug/kg	ND	ND		30	
Chlorobenzene	ug/kg	ND	ND		30	
Chloroethane	ug/kg	ND	ND		30	
Chloroform	ug/kg	ND	ND		30	
Chloromethane	ug/kg	ND	ND		30	
cis-1,2-Dichloroethene	ug/kg	ND	ND		30	
cis-1,3-Dichloropropene	ug/kg	ND	ND		30	
Dibromochloromethane	ug/kg	ND	ND		30	
Dibromomethane	ug/kg	ND	ND		30	
Dichlorodifluoromethane	ug/kg	ND	ND		30	
Dichlorofluoromethane	ug/kg	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/kg	ND	ND		30	
Ethylbenzene	ug/kg	ND	613		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

SAMPLE DUPLICATE: 2909877

Parameter	Units	10428096001 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	ND	ND		30	
Isopropylbenzene (Cumene)	ug/kg	ND	98.8J		30	
Methyl-tert-butyl ether	ug/kg	ND	ND		30	
Methylene Chloride	ug/kg	ND	ND		30	
n-Butylbenzene	ug/kg	ND	ND		30	
n-Propylbenzene	ug/kg	ND	83.3J		30	
Naphthalene	ug/kg	ND	ND		30	
p-Isopropyltoluene	ug/kg	ND	ND		30	
sec-Butylbenzene	ug/kg	ND	49.7J		30	
Styrene	ug/kg	219	111J		30	
tert-Butylbenzene	ug/kg	ND	ND		30	
Tetrachloroethene	ug/kg	178	352	65	30	D6
Tetrahydrofuran	ug/kg	ND	ND		30	
Toluene	ug/kg	ND	185		30	
trans-1,2-Dichloroethene	ug/kg	ND	ND		30	
trans-1,3-Dichloropropene	ug/kg	ND	ND		30	
Trichloroethene	ug/kg	ND	ND		30	
Trichlorofluoromethane	ug/kg	ND	ND		30	
Vinyl chloride	ug/kg	ND	ND		30	
Xylene (Total)	ug/kg	ND	469J		30	
1,2-Dichloroethane-d4 (S)	%.	96	99	1		C0
4-Bromofluorobenzene (S)	%.	100	99	5		
Toluene-d8 (S)	%.	96	96	4		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 533571 Analysis Method: EPA 8081B
QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2898364 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	05/01/18 19:18	
4,4'-DDE	ug/kg	ND	3.3	05/01/18 19:18	
4,4'-DDT	ug/kg	ND	3.3	05/01/18 19:18	
Aldrin	ug/kg	ND	1.7	05/01/18 19:18	
alpha-BHC	ug/kg	ND	1.7	05/01/18 19:18	
alpha-Chlordane	ug/kg	ND	1.7	05/01/18 19:18	
beta-BHC	ug/kg	ND	1.7	05/01/18 19:18	
Chlordane (Technical)	ug/kg	ND	16.7	05/01/18 19:18	
delta-BHC	ug/kg	ND	1.7	05/01/18 19:18	
Dieldrin	ug/kg	ND	3.3	05/01/18 19:18	
Endosulfan I	ug/kg	ND	1.7	05/01/18 19:18	
Endosulfan II	ug/kg	ND	3.3	05/01/18 19:18	
Endosulfan sulfate	ug/kg	ND	3.3	05/01/18 19:18	
Endrin	ug/kg	ND	3.3	05/01/18 19:18	
Endrin aldehyde	ug/kg	ND	3.3	05/01/18 19:18	
Endrin ketone	ug/kg	ND	3.3	05/01/18 19:18	
gamma-BHC (Lindane)	ug/kg	ND	1.7	05/01/18 19:18	
gamma-Chlordane	ug/kg	ND	1.7	05/01/18 19:18	
Heptachlor	ug/kg	ND	1.7	05/01/18 19:18	
Heptachlor epoxide	ug/kg	ND	1.7	05/01/18 19:18	
Methoxychlor	ug/kg	ND	16.7	05/01/18 19:18	
Toxaphene	ug/kg	ND	50.0	05/01/18 19:18	
Decachlorobiphenyl (S)	%	85	30-150	05/01/18 19:18	
Tetrachloro-m-xylene (S)	%	95	30-150	05/01/18 19:18	

LABORATORY CONTROL SAMPLE: 2898365

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	32.1	96	62-127	
4,4'-DDE	ug/kg	33.3	31.5	94	66-125	
4,4'-DDT	ug/kg	33.3	29.4	88	67-128	
Aldrin	ug/kg	16.7	15.6	93	66-125	
alpha-BHC	ug/kg	16.7	16.4	98	64-125	
alpha-Chlordane	ug/kg	16.7	15.8	95	68-125	
beta-BHC	ug/kg	16.7	15.9	96	69-125	
delta-BHC	ug/kg	16.7	12.8	77	42-133	
Dieldrin	ug/kg	33.3	33.5	100	69-126	
Endosulfan I	ug/kg	16.7	14.8	89	63-125	
Endosulfan II	ug/kg	33.3	32.6	98	69-125	
Endosulfan sulfate	ug/kg	33.3	28.3	85	56-137	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

LABORATORY CONTROL SAMPLE: 2898365

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	31.3	94	69-125	
Endrin aldehyde	ug/kg	33.3	30.8	92	65-125	
Endrin ketone	ug/kg	33.3	32.6	98	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	16.3	98	67-125	
gamma-Chlordane	ug/kg	16.7	13.1	78	63-125	
Heptachlor	ug/kg	16.7	16.1	97	69-125	
Heptachlor epoxide	ug/kg	16.7	16.0	96	68-125	
Methoxychlor	ug/kg	167	145	87	65-134	
Decachlorobiphenyl (S)	%			87	30-150	
Tetrachloro-m-xylene (S)	%			98	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898412 2898413

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10428096004 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
4,4'-DDD	ug/kg	ND	51.7	51.7	67.6	58.4	131	113	56-125	15	20	M1
4,4'-DDE	ug/kg	ND	51.7	51.7	50.4	57.9	98	112	32-150	14	20	
4,4'-DDT	ug/kg	ND	51.7	51.7	56.5	57.6	109	112	60-132	2	20	
Aldrin	ug/kg	ND	25.8	25.8	29.8	25.8	115	100	56-125	14	20	
alpha-BHC	ug/kg	ND	25.8	25.8	24.4	25.4	94	98	54-136	4	20	
alpha-Chlordane	ug/kg	ND	25.8	25.8	27.7	29.7	107	115	54-133	7	20	
beta-BHC	ug/kg	18.5	25.8	25.8	27.6	27.4	35	34	30-150	1	20	
delta-BHC	ug/kg	ND	25.8	25.8	19.8	19.9	77	77	45-145	0	20	
Dieldrin	ug/kg	ND	51.7	51.7	54.7	54.3	106	105	47-150	1	20	
Endosulfan I	ug/kg	22.0	25.8	25.8	27.9	26.5	23	17	35-145	5	20	M1
Endosulfan II	ug/kg	ND	51.7	51.7	51.2	52.0	99	101	50-147	2	20	
Endosulfan sulfate	ug/kg	ND	51.7	51.7	44.4	45.5	86	88	54-132	3	20	
Endrin	ug/kg	ND	51.7	51.7	47.1	46.9	91	91	62-125	0	20	
Endrin aldehyde	ug/kg	ND	51.7	51.7	55.2	50.3	107	97	33-150	9	20	
Endrin ketone	ug/kg	ND	51.7	51.7	55.0	53.0	106	103	56-144	4	20	
gamma-BHC (Lindane)	ug/kg	ND	25.8	25.8	31.0	37.8	120	146	63-125	20	20	M1
gamma-Chlordane	ug/kg	ND	25.8	25.8	22.6	24.1	88	93	45-132	6	20	
Heptachlor	ug/kg	ND	25.8	25.8	24.5	25.9	95	100	51-142	6	20	
Heptachlor epoxide	ug/kg	19.9	25.8	25.8	26.0	26.9	24	27	50-142	4	20	M1
Methoxychlor	ug/kg	ND	258	258	302	299	117	116	58-139	1	20	
Decachlorobiphenyl (S)	%						85	92	30-150			
Tetrachloro-m-xylene (S)	%						85	90	30-150			2M,D4

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 533570 Analysis Method: EPA 8082A
 QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
 Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2898360 Matrix: Solid
 Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/24/18 14:38	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/24/18 14:38	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/24/18 14:38	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/24/18 14:38	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/24/18 14:38	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/24/18 14:38	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/24/18 14:38	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/24/18 14:38	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/24/18 14:38	
Decachlorobiphenyl (S)	%	122	30-134	04/24/18 14:38	CH
Tetrachloro-m-xylene (S)	%	83	48-125	04/24/18 14:38	

LABORATORY CONTROL SAMPLE: 2898361

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	501	75	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	547	82	62-125	
Decachlorobiphenyl (S)	%			124	30-134	CH
Tetrachloro-m-xylene (S)	%			86	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898410 2898411

Parameter	Units	10428096003		2898410		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
PCB-1016 (Aroclor 1016)	ug/kg	ND	901	901	864	893	96	99	30-150	3	30	
PCB-1260 (Aroclor 1260)	ug/kg	ND	901	901	776	840	86	93	30-138	8	30	
Decachlorobiphenyl (S)	%						111	118	30-134			CH
Tetrachloro-m-xylene (S)	%						83	86	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 533569 Analysis Method: EPA 8270D
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
 Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2898356 Matrix: Solid
 Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/25/18 18:45	
1,2-Dichlorobenzene	ug/kg	ND	330	04/25/18 18:45	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/25/18 18:45	
1,3-Dichlorobenzene	ug/kg	ND	330	04/25/18 18:45	
1,4-Dichlorobenzene	ug/kg	ND	330	04/25/18 18:45	
1-Methylnaphthalene	ug/kg	ND	330	04/25/18 18:45	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/25/18 18:45	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/25/18 18:45	
2,4-Dichlorophenol	ug/kg	ND	330	04/25/18 18:45	
2,4-Dimethylphenol	ug/kg	ND	330	04/25/18 18:45	
2,4-Dinitrophenol	ug/kg	ND	330	04/25/18 18:45	
2,4-Dinitrotoluene	ug/kg	ND	330	04/25/18 18:45	
2,6-Dinitrotoluene	ug/kg	ND	330	04/25/18 18:45	
2-Chloronaphthalene	ug/kg	ND	330	04/25/18 18:45	
2-Chlorophenol	ug/kg	ND	330	04/25/18 18:45	
2-Methylnaphthalene	ug/kg	ND	330	04/25/18 18:45	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/25/18 18:45	
2-Nitroaniline	ug/kg	ND	330	04/25/18 18:45	
2-Nitrophenol	ug/kg	ND	330	04/25/18 18:45	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/25/18 18:45	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/25/18 18:45	
3-Nitroaniline	ug/kg	ND	330	04/25/18 18:45	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/25/18 18:45	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/25/18 18:45	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/25/18 18:45	
4-Chloroaniline	ug/kg	ND	330	04/25/18 18:45	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/25/18 18:45	
4-Nitroaniline	ug/kg	ND	330	04/25/18 18:45	
4-Nitrophenol	ug/kg	ND	330	04/25/18 18:45	
Acenaphthene	ug/kg	ND	330	04/25/18 18:45	
Acenaphthylene	ug/kg	ND	330	04/25/18 18:45	
Anthracene	ug/kg	ND	330	04/25/18 18:45	
Benzo(a)anthracene	ug/kg	ND	330	04/25/18 18:45	
Benzo(a)pyrene	ug/kg	ND	330	04/25/18 18:45	
Benzo(b)fluoranthene	ug/kg	ND	330	04/25/18 18:45	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/25/18 18:45	
Benzo(k)fluoranthene	ug/kg	ND	330	04/25/18 18:45	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/25/18 18:45	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/25/18 18:45	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/25/18 18:45	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/25/18 18:45	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

METHOD BLANK: 2898356

Matrix: Solid

Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/25/18 18:45	
Carbazole	ug/kg	ND	330	04/25/18 18:45	
Chrysene	ug/kg	ND	330	04/25/18 18:45	
Di-n-butylphthalate	ug/kg	ND	330	04/25/18 18:45	
Di-n-octylphthalate	ug/kg	ND	330	04/25/18 18:45	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/25/18 18:45	
Dibenzofuran	ug/kg	ND	330	04/25/18 18:45	
Diethylphthalate	ug/kg	ND	330	04/25/18 18:45	
Dimethylphthalate	ug/kg	ND	330	04/25/18 18:45	
Fluoranthene	ug/kg	ND	330	04/25/18 18:45	
Fluorene	ug/kg	ND	330	04/25/18 18:45	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/25/18 18:45	
Hexachlorobenzene	ug/kg	ND	330	04/25/18 18:45	
Hexachloroethane	ug/kg	ND	330	04/25/18 18:45	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/25/18 18:45	
Isophorone	ug/kg	ND	330	04/25/18 18:45	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/25/18 18:45	
N-Nitrosodimethylamine	ug/kg	ND	330	04/25/18 18:45	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/25/18 18:45	
Naphthalene	ug/kg	ND	330	04/25/18 18:45	
Nitrobenzene	ug/kg	ND	330	04/25/18 18:45	
Pentachlorophenol	ug/kg	ND	670	04/25/18 18:45	
Phenanthrene	ug/kg	ND	330	04/25/18 18:45	
Phenol	ug/kg	ND	330	04/25/18 18:45	
Pyrene	ug/kg	ND	330	04/25/18 18:45	
2,4,6-Tribromophenol (S)	%	73	60-125	04/25/18 18:45	
2-Fluorobiphenyl (S)	%	71	30-132	04/25/18 18:45	
2-Fluorophenol (S)	%	69	40-125	04/25/18 18:45	
Nitrobenzene-d5 (S)	%	68	43-125	04/25/18 18:45	
p-Terphenyl-d14 (S)	%	86	62-125	04/25/18 18:45	
Phenol-d6 (S)	%	67	48-125	04/25/18 18:45	

LABORATORY CONTROL SAMPLE: 2898357

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1250	75	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1280	77	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1360	82	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1260	76	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1280	77	39-125	
1-Methylnaphthalene	ug/kg	1670	1310	79	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1400	84	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1390	83	61-125	
2,4-Dichlorophenol	ug/kg	1670	1380	83	57-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

LABORATORY CONTROL SAMPLE: 2898357

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1310	78	51-125	
2,4-Dinitrophenol	ug/kg	1670	1250	75	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1620	97	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1540	93	63-125	
2-Chloronaphthalene	ug/kg	1670	1360	82	61-125	
2-Chlorophenol	ug/kg	1670	1340	81	46-125	
2-Methylnaphthalene	ug/kg	1670	1320	79	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1320	79	50-125	
2-Nitroaniline	ug/kg	1670	1410	84	61-125	
2-Nitrophenol	ug/kg	1670	1380	83	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1350	81	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1520	91	47-125	
3-Nitroaniline	ug/kg	1670	1440	86	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1570J	94	30-141	
4-Bromophenylphenyl ether	ug/kg	1670	1410	85	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1460	88	64-125	
4-Chloroaniline	ug/kg	1670	1160	69	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1380	83	64-125	
4-Nitroaniline	ug/kg	1670	1430	86	59-125	
4-Nitrophenol	ug/kg	1670	1350	81	54-125	
Acenaphthene	ug/kg	1670	1360	82	62-125	
Acenaphthylene	ug/kg	1670	1360	82	61-125	
Anthracene	ug/kg	1670	1450	87	66-125	
Benzo(a)anthracene	ug/kg	1670	1490	89	69-125	
Benzo(a)pyrene	ug/kg	1670	1470	88	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1510	90	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1550	93	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1470	88	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1270	76	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1220	73	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1100	66	37-125 4M	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1730	104	69-131	
Butylbenzylphthalate	ug/kg	1670	1680	101	69-129	
Carbazole	ug/kg	1670	1530	92	66-125	
Chrysene	ug/kg	1670	1510	91	68-125	
Di-n-butylphthalate	ug/kg	1670	1620	97	69-125	
Di-n-octylphthalate	ug/kg	1670	1750	105	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1570	94	64-125	
Dibenzofuran	ug/kg	1670	1420	85	65-125	
Diethylphthalate	ug/kg	1670	1510	90	67-125	
Dimethylphthalate	ug/kg	1670	1480	89	67-125	
Fluoranthene	ug/kg	1670	1490	89	66-125	
Fluorene	ug/kg	1670	1400	84	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1230	74	40-125	
Hexachlorobenzene	ug/kg	1670	1440	86	62-125	
Hexachloroethane	ug/kg	1670	1290	78	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1560	93	64-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

LABORATORY CONTROL SAMPLE: 2898357

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1310	79	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1320	79	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1290	77	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1490	89	65-125	
Naphthalene	ug/kg	1670	1280	77	48-125	
Nitrobenzene	ug/kg	1670	1270	76	48-125	
Pentachlorophenol	ug/kg	1670	1050	63	41-125	
Phenanthrene	ug/kg	1670	1430	86	66-125	
Phenol	ug/kg	1670	1270	76	46-125	
Pyrene	ug/kg	1670	1550	93	69-125	
2,4,6-Tribromophenol (S)	%			82	60-125	
2-Fluorobiphenyl (S)	%			73	30-132	
2-Fluorophenol (S)	%			73	40-125	
Nitrobenzene-d5 (S)	%			69	43-125	
p-Terphenyl-d14 (S)	%			89	62-125	
Phenol-d6 (S)	%			71	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898403 2898404

Parameter	Units	10428096002		MSD		MSD		MSD		% Rec Limits	RPD	RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
1,2,4-Trichlorobenzene	ug/kg	ND	2240	2220	1700	1760	76	79	30-127	4	30		
1,2-Dichlorobenzene	ug/kg	ND	2240	2220	1720	1740	77	79	30-125	1	30		
1,2-Diphenylhydrazine	ug/kg	ND	2240	2220	1800	1770	81	80	30-150	2	30		
1,3-Dichlorobenzene	ug/kg	ND	2240	2220	1690	1730	76	78	30-125	2	30		
1,4-Dichlorobenzene	ug/kg	ND	2240	2220	1710	1720	77	77	30-125	0	30		
1-Methylnaphthalene	ug/kg	ND	2240	2220	1780	1790	80	81	42-125	1	30		
2,4,5-Trichlorophenol	ug/kg	ND	2240	2220	1780	1740	80	78	30-150	2	30		
2,4,6-Trichlorophenol	ug/kg	ND	2240	2220	1790	1770	80	80	30-150	1	30		
2,4-Dichlorophenol	ug/kg	ND	2240	2220	1880	1850	84	83	30-135	2	30		
2,4-Dimethylphenol	ug/kg	ND	2240	2220	1590	1670	71	75	30-148	5	30		
2,4-Dinitrophenol	ug/kg	ND	2240	2220	808	817	36	37	30-125	1	30		
2,4-Dinitrotoluene	ug/kg	ND	2240	2220	2090	2040	94	92	30-150	3	30		
2,6-Dinitrotoluene	ug/kg	ND	2240	2220	1980	1960	89	88	30-150	1	30		
2-Chloronaphthalene	ug/kg	ND	2240	2220	1820	1800	82	81	30-138	1	30		
2-Chlorophenol	ug/kg	ND	2240	2220	1780	1810	80	82	30-130	2	30		
2-Methylnaphthalene	ug/kg	ND	2240	2220	1760	1780	79	80	46-125	1	30		
2-Methylphenol(o-Cresol)	ug/kg	ND	2240	2220	1740	1750	78	79	30-133	1	30		
2-Nitroaniline	ug/kg	ND	2240	2220	1890	1870	85	84	30-150	1	30		
2-Nitrophenol	ug/kg	ND	2240	2220	1850	1930	83	87	30-134	4	30		
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	2240	2220	1830	1820	82	82	30-138	0	30		
3,3'-Dichlorobenzidine	ug/kg	ND	2240	2220	1930	2080	87	94	30-149	8	30		
3-Nitroaniline	ug/kg	ND	2240	2220	1820	1920	82	87	30-150	6	30		
4,6-Dinitro-2-methylphenol	ug/kg	ND	2240	2220	1450J	1440J	65	65	30-133		30		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898403												2898404											
Parameter	Units	MS		MSD		MS		MSD		% Rec		Max		Qual									
		10428096002	Spike Conc.	Spike Conc.	Result	Result	Result	Result	% Rec	% Rec	Limits	RPD	RPD										
4-Bromophenylphenyl ether	ug/kg	ND	2240	2220	1830	1790	82	81	44-125	2	30												
4-Chloro-3-methylphenol	ug/kg	ND	2240	2220	1910	1880	85	85	30-150	1	30												
4-Chloroaniline	ug/kg	ND	2240	2220	1280	1500	58	68	30-125	16	30												
4-Chlorophenylphenyl ether	ug/kg	ND	2240	2220	1790	1790	80	81	44-125	0	30												
4-Nitroaniline	ug/kg	ND	2240	2220	1770	1860	79	84	30-150	5	30												
4-Nitrophenol	ug/kg	ND	2240	2220	1740	1730	78	78	30-150	1	30												
Acenaphthene	ug/kg	ND	2240	2220	1750	1730	79	78	40-125	1	30												
Acenaphthylene	ug/kg	ND	2240	2220	1830	1790	82	81	30-150	2	30												
Anthracene	ug/kg	ND	2240	2220	1860	1850	83	83	30-150	0	30												
Benzo(a)anthracene	ug/kg	ND	2240	2220	1900	1900	85	86	30-150	0	30												
Benzo(a)pyrene	ug/kg	ND	2240	2220	1960	1900	88	86	30-150	3	30												
Benzo(b)fluoranthene	ug/kg	ND	2240	2220	1980	1920	89	87	30-150	3	30												
Benzo(g,h,i)perylene	ug/kg	ND	2240	2220	1970	1890	88	85	30-150	4	30												
Benzo(k)fluoranthene	ug/kg	ND	2240	2220	1950	1890	88	85	30-150	4	30												
bis(2-Chloroethoxy)methane	ug/kg	ND	2240	2220	1750	1750	79	79	30-134	0	30												
bis(2-Chloroethyl) ether	ug/kg	ND	2240	2220	1740	1730	78	78	30-125	0	30												
bis(2-Chloroisopropyl) ether	ug/kg	ND	2240	2220	1560	1580	70	71	30-125	1	30												
bis(2-Ethylhexyl)phthalate	ug/kg	ND	2240	2220	2230	2200	100	99	30-150	2	30												
Butylbenzylphthalate	ug/kg	ND	2240	2220	2130	2120	96	95	30-150	1	30												
Carbazole	ug/kg	ND	2240	2220	2000	1940	89	87	41-125	3	30												
Chrysene	ug/kg	ND	2240	2220	1930	1890	87	85	30-150	3	30												
Di-n-butylphthalate	ug/kg	ND	2240	2220	2050	2060	92	93	30-150	0	30												
Di-n-octylphthalate	ug/kg	ND	2240	2220	2260	2220	102	100	30-150	2	30												
Dibenz(a,h)anthracene	ug/kg	ND	2240	2220	2010	1960	90	88	30-150	3	30												
Dibenzofuran	ug/kg	ND	2240	2220	1830	1810	82	81	45-125	1	30												
Diethylphthalate	ug/kg	ND	2240	2220	1930	1920	87	86	30-150	1	30												
Dimethylphthalate	ug/kg	ND	2240	2220	1930	1880	86	85	30-150	2	30												
Fluoranthene	ug/kg	ND	2240	2220	1920	1910	86	86	30-150	1	30												
Fluorene	ug/kg	ND	2240	2220	1840	1820	82	82	30-150	1	30												
Hexachloro-1,3-butadiene	ug/kg	ND	2240	2220	1630	1680	73	76	30-128	3	30												
Hexachlorobenzene	ug/kg	ND	2240	2220	1850	1830	83	82	30-150	1	30												
Hexachloroethane	ug/kg	ND	2240	2220	1610	1630	72	74	30-125	2	30												
Indeno(1,2,3-cd)pyrene	ug/kg	ND	2240	2220	1990	1930	89	87	30-150	3	30												
Isophorone	ug/kg	ND	2240	2220	1760	1790	79	81	30-140	2	30												
N-Nitroso-di-n-propylamine	ug/kg	ND	2240	2220	1780	1820	80	82	30-147	2	30												
N-Nitrosodimethylamine	ug/kg	ND	2240	2220	1700	1740	76	78	30-125	2	30												
N-Nitrosodiphenylamine	ug/kg	ND	2240	2220	1930	1920	87	86	30-150	1	30												
Naphthalene	ug/kg	ND	2240	2220	1740	1770	78	80	44-125	2	30												
Nitrobenzene	ug/kg	ND	2240	2220	1740	1790	78	80	30-136	3	30												
Pentachlorophenol	ug/kg	ND	2240	2220	1070	1110	48	50	30-150	3	30												
Phenanthrene	ug/kg	ND	2240	2220	1850	1840	83	83	30-150	1	30												
Phenol	ug/kg	ND	2240	2220	1760	1750	79	79	30-129	1	30												
Pyrene	ug/kg	ND	2240	2220	1980	1940	89	87	30-150	2	30												
2,4,6-Tribromophenol (S)	%						78	78	60-125														
2-Fluorobiphenyl (S)	%						74	73	30-132														
2-Fluorophenol (S)	%						73	74	40-125														

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Parameter	Units	2898403		2898404		MS % Rec	MSD % Rec	% Rec	Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Nitrobenzene-d5 (S)	%.					70	72	43-125				
p-Terphenyl-d14 (S)	%.					85	84	62-125				
Phenol-d6 (S)	%.					73	72	48-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

QC Batch: 533524 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
Associated Lab Samples: 10428096005

METHOD BLANK: 2898117 Matrix: Solid
Associated Lab Samples: 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/24/18 12:08	
Acenaphthylene	ug/kg	ND	10.0	04/24/18 12:08	
Anthracene	ug/kg	ND	10.0	04/24/18 12:08	
Benzo(a)anthracene	ug/kg	ND	10.0	04/24/18 12:08	
Benzo(a)pyrene	ug/kg	ND	10.0	04/24/18 12:08	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/24/18 12:08	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/24/18 12:08	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/24/18 12:08	
Chrysene	ug/kg	ND	10.0	04/24/18 12:08	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/24/18 12:08	
Fluoranthene	ug/kg	ND	10.0	04/24/18 12:08	
Fluorene	ug/kg	ND	10.0	04/24/18 12:08	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/24/18 12:08	
Naphthalene	ug/kg	ND	10.0	04/24/18 12:08	
Phenanthrene	ug/kg	ND	10.0	04/24/18 12:08	
Pyrene	ug/kg	ND	10.0	04/24/18 12:08	
2-Fluorobiphenyl (S)	%	63	42-125	04/24/18 12:08	
p-Terphenyl-d14 (S)	%	89	57-125	04/24/18 12:08	

LABORATORY CONTROL SAMPLE: 2898118

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	24.7	74	52-125	
Acenaphthylene	ug/kg	33.3	23.8	71	50-125	
Anthracene	ug/kg	33.3	31.6	95	65-125	
Benzo(a)anthracene	ug/kg	33.3	26.7	80	60-125	
Benzo(a)pyrene	ug/kg	33.3	29.0	87	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	27.2	82	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	29.0	87	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	30.2	91	67-125	
Chrysene	ug/kg	33.3	30.2	91	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	29.2	88	63-125	
Fluoranthene	ug/kg	33.3	30.8	92	75-125	
Fluorene	ug/kg	33.3	25.0	75	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	29.5	89	63-125	
Naphthalene	ug/kg	33.3	25.2	76	49-125	
Phenanthrene	ug/kg	33.3	27.6	83	65-125	
Pyrene	ug/kg	33.3	26.9	81	64-125	
2-Fluorobiphenyl (S)	%			73	42-125	
p-Terphenyl-d14 (S)	%			90	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Parameter	Units	2898119		2898120		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427685001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Acenaphthene	ug/kg	1290	41.7	41.7	1130J	1340	-396	100	30-125		30	M6	
Acenaphthylene	ug/kg	ND	41.7	41.7	621J	736J	1490	1760	30-133		30	M6	
Anthracene	ug/kg	ND	41.7	41.7	2010	2620	4810	6270	30-150	26	30	M6	
Benzo(a)anthracene	ug/kg	ND	41.7	41.7	741J	999J	1780	2390	30-150		30	M6	
Benzo(a)pyrene	ug/kg	ND	41.7	41.7	197J	231J	473	554	30-150		30	M6	
Benzo(b)fluoranthene	ug/kg	ND	41.7	41.7	209J	223J	500	533	30-150		30	M6	
Benzo(g,h,i)perylene	ug/kg	ND	41.7	41.7	153J	146J	367	351	30-150		30	M6	
Benzo(k)fluoranthene	ug/kg	ND	41.7	41.7	ND	ND	0	0	30-150		30	M6	
Chrysene	ug/kg	ND	41.7	41.7	924J	1220J	2220	2920	30-150		30	M6	
Dibenz(a,h)anthracene	ug/kg	ND	41.7	41.7	80.7J	71.7J	193	172	30-131		30	M6	
Fluoranthene	ug/kg	ND	41.7	41.7	497J	579J	1190	1390	30-150		30	M6	
Fluorene	ug/kg	3310	41.7	41.7	2870	3300	-1060	-31	30-147	14	30	M6	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	41.7	41.7	ND	ND	176	196	30-150		30	M6	
Naphthalene	ug/kg	17700	41.7	41.7	13000	15300	-11400	-5700	30-131	17	30	M6	
Phenanthrene	ug/kg	10400	41.7	41.7	8630	10300	-4160	-164	30-150	18	30	M6	
Pyrene	ug/kg	ND	41.7	41.7	829J	1030J	1990	2460	30-150		30	M6	
2-Fluorobiphenyl (S)	%.						0	0	42-125			D3,P3, S4	
p-Terphenyl-d14 (S)	%.						0	0	57-125			S4	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 533802 Analysis Method: EPA 8270D by SIM
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
 Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004

METHOD BLANK: 2899450 Matrix: Solid
 Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/24/18 12:50	
Acenaphthylene	ug/kg	ND	10.0	04/24/18 12:50	
Anthracene	ug/kg	ND	10.0	04/24/18 12:50	
Benzo(a)anthracene	ug/kg	ND	10.0	04/24/18 12:50	
Benzo(a)pyrene	ug/kg	ND	10.0	04/24/18 12:50	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/24/18 12:50	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/24/18 12:50	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/24/18 12:50	
Chrysene	ug/kg	ND	10.0	04/24/18 12:50	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/24/18 12:50	
Fluoranthene	ug/kg	ND	10.0	04/24/18 12:50	
Fluorene	ug/kg	ND	10.0	04/24/18 12:50	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/24/18 12:50	
Naphthalene	ug/kg	ND	10.0	04/24/18 12:50	
Phenanthrene	ug/kg	ND	10.0	04/24/18 12:50	
Pyrene	ug/kg	ND	10.0	04/24/18 12:50	
2-Fluorobiphenyl (S)	%	58	42-125	04/24/18 12:50	
p-Terphenyl-d14 (S)	%	100	57-125	04/24/18 12:50	

LABORATORY CONTROL SAMPLE: 2899451

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	25.2	76	52-125	
Acenaphthylene	ug/kg	33.3	24.3	73	50-125	
Anthracene	ug/kg	33.3	28.8	86	65-125	
Benzo(a)anthracene	ug/kg	33.3	27.8	84	60-125	
Benzo(a)pyrene	ug/kg	33.3	29.2	87	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	26.5	79	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	28.3	85	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	30.2	91	67-125	
Chrysene	ug/kg	33.3	31.0	93	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	28.2	85	63-125	
Fluoranthene	ug/kg	33.3	28.3	85	75-125	
Fluorene	ug/kg	33.3	25.9	78	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	28.4	85	63-125	
Naphthalene	ug/kg	33.3	24.4	73	49-125	
Phenanthrene	ug/kg	33.3	26.2	79	65-125	
Pyrene	ug/kg	33.3	29.3	88	64-125	
2-Fluorobiphenyl (S)	%			79	42-125	
p-Terphenyl-d14 (S)	%			101	57-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Parameter	Units	2899452		2899453		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result								
Acenaphthene	ug/kg	16.1	41.3	41.3	54.1	54.1	92	92	30-125	0	30		
Acenaphthylene	ug/kg	ND	41.3	41.3	40.9	34.6	99	84	30-133	17	30		
Anthracene	ug/kg	23.9	41.3	41.3	75.1	68.9	124	109	30-150	9	30		
Benzo(a)anthracene	ug/kg	58.8	41.3	41.3	126	105	163	111	30-150	19	30	M1	
Benzo(a)pyrene	ug/kg	74.7	41.3	41.3	151	124	184	121	30-150	19	30	M1	
Benzo(b)fluoranthene	ug/kg	91.9	41.3	41.3	175	148	200	136	30-150	16	30	M1	
Benzo(g,h,i)perylene	ug/kg	53.2	41.3	41.3	118	94.3	157	99	30-150	23	30	M1	
Benzo(k)fluoranthene	ug/kg	31.6	41.3	41.3	87.5	75.3	135	106	30-150	15	30		
Chrysene	ug/kg	84.4	41.3	41.3	161	132	186	116	30-150	20	30	M1	
Dibenz(a,h)anthracene	ug/kg	ND	41.3	41.3	49.2	42.3	119	102	30-131	15	30		
Fluoranthene	ug/kg	124	41.3	41.3	248	191	301	164	30-150	26	30	M1	
Fluorene	ug/kg	13.0	41.3	41.3	52.2	49.2	95	88	30-147	6	30		
Indeno(1,2,3-cd)pyrene	ug/kg	40.6	41.3	41.3	98.2	82.4	139	101	30-150	17	30		
Naphthalene	ug/kg	19.3	41.3	41.3	43.3	50.1	58	75	30-131	14	30		
Phenanthrene	ug/kg	94.8	41.3	41.3	197	162	247	163	30-150	19	30	M1	
Pyrene	ug/kg	141	41.3	41.3	258	192	284	124	30-150	29	30	M1	
2-Fluorobiphenyl (S)	%.						75	73	42-125				
p-Terphenyl-d14 (S)	%.						94	93	57-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 533572 Analysis Method: WI MOD DRO
 QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS
 Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2898368 Matrix: Solid
 Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	04/22/18 12:39	
n-Triacontane (S)	%.	115	50-150	04/22/18 12:39	

LABORATORY CONTROL SAMPLE & LCSD: 2898369

2898370

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	86.0	86.0	107	107	70-120	0	20	
n-Triacontane (S)	%.				115	119	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 439502 Analysis Method: EPA 7196A
 QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
 Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2030883 Matrix: Solid
 Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	05/01/18 10:56	

LABORATORY CONTROL SAMPLE: 2030884

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	994	907	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2030886 2030887

Parameter	Units	60268827001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	1240	1220	1210	1170	98	95	75-125	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2030888 2030889

Parameter	Units	60268827001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	49.7	49.1	40.0	37.2	81	76	75-125	7	20	

SAMPLE DUPLICATE: 2030885

Parameter	Units	50195327001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 286937 Analysis Method: EPA 9012
QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
Associated Lab Samples: 10428096001, 10428096002, 10428096003

METHOD BLANK: 1678360 Matrix: Solid

Associated Lab Samples: 10428096001, 10428096002, 10428096003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/25/18 13:16	

LABORATORY CONTROL SAMPLE: 1678361

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.1	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1678362 1678363

Parameter	Units	10427642001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Cyanide	mg/kg	0.52	3.72	3.72	4.0	4.1	93	97	80-120	4	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1678364 1678365

Parameter	Units	10428096003		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Cyanide	mg/kg	0.61	3.65	3.52	4.7	3.6	112	87	80-120	25	20	M0,R1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 287059

Analysis Method: EPA 9012

QC Batch Method: EPA 9012A

Analysis Description: 9012 Cyanide

Associated Lab Samples: 10428096004, 10428096005

METHOD BLANK: 1679101

Matrix: Solid

Associated Lab Samples: 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/26/18 14:20	

LABORATORY CONTROL SAMPLE: 1679102

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.0	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1679103 1679104

Parameter	Units	10428176001 Result	MS		MSD		% Rec		% Rec Limits	Max		Qual
			Spike Conc.	MS Result	MSD Result	% Rec	% Rec	RPD		RPD		
Cyanide	mg/kg	ND	10.3	8.3	10.3	10.9	71	95	80-120	27	20	M0,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

QC Batch: 141540 Analysis Method: EPA 9056A
QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 559769 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	0.99	04/30/18 17:39	

LABORATORY CONTROL SAMPLE: 559768

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	50.3	51.9	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559770 559771

Parameter	Units	10428096003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/kg	ND	50	49.3	11.4	12.3	23	25	80-120	7	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559772 559773

Parameter	Units	10428159006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/kg	0.97 U	49.7	48.9	35.9	41.7	72	85	80-120	15	20	M1

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QUALIFIERS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth

PASI-G Pace Analytical Services - Green Bay

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

ANALYTE QUALIFIERS

1M Analyte was not added to the MS due to spiking error.

2M Sample was brown in color.

3M Sample was yellow in color.

4M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

C0 Result confirmed by second analysis.

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

D4 Sample was diluted due to the presence of high levels of target analytes.

D6 The precision between the sample and sample duplicate exceeded laboratory control limits.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

ANALYTE QUALIFIERS

- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- N2 The lab does not hold NELAC/TNI accreditation for this parameter.
- N3 Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
- P3 Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
- P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
- R1 RPD value was outside control limits.
- S0 Surrogate recovery outside laboratory control limits.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.
- T6 High boiling point hydrocarbons are present in the sample.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10428096001	FL-TT-03(2-10) WM	EPA 1630 (1998)	142287	EPA 1630 (1998)	142288
10428096002	FL-TT-06 (0-10) S	EPA 1630 (1998)	142287	EPA 1630 (1998)	142288
10428096003	FL-TT-04 (2-14) WM	EPA 1630 (1998)	142287	EPA 1630 (1998)	142288
10428096004	FL-TT-05 (5-15) WM	EPA 1630 (1998)	142287	EPA 1630 (1998)	142288
10428096005	FL-TT-07 (1-5) S	EPA 1630 (1998)	142287	EPA 1630 (1998)	142288
10428096001	FL-TT-03(2-10) WM	EPA 3550	533571	EPA 8081B	534053
10428096002	FL-TT-06 (0-10) S	EPA 3550	533571	EPA 8081B	534053
10428096003	FL-TT-04 (2-14) WM	EPA 3550	533571	EPA 8081B	534053
10428096004	FL-TT-05 (5-15) WM	EPA 3550	533571	EPA 8081B	534053
10428096005	FL-TT-07 (1-5) S	EPA 3550	533571	EPA 8081B	534053
10428096001	FL-TT-03(2-10) WM	EPA 3550	533570	EPA 8082A	533946
10428096002	FL-TT-06 (0-10) S	EPA 3550	533570	EPA 8082A	533946
10428096003	FL-TT-04 (2-14) WM	EPA 3550	533570	EPA 8082A	533946
10428096004	FL-TT-05 (5-15) WM	EPA 3550	533570	EPA 8082A	533946
10428096005	FL-TT-07 (1-5) S	EPA 3550	533570	EPA 8082A	533946
10428096001	FL-TT-03(2-10) WM	WI MOD DRO	533572	WI MOD DRO	533638
10428096002	FL-TT-06 (0-10) S	WI MOD DRO	533572	WI MOD DRO	533638
10428096003	FL-TT-04 (2-14) WM	WI MOD DRO	533572	WI MOD DRO	533638
10428096004	FL-TT-05 (5-15) WM	WI MOD DRO	533572	WI MOD DRO	533638
10428096005	FL-TT-07 (1-5) S	WI MOD DRO	533572	WI MOD DRO	533638
10428096001	FL-TT-03(2-10) WM	EPA 5030 Medium Soil	535145	WI MOD GRO	535423
10428096002	FL-TT-06 (0-10) S	EPA 5030 Medium Soil	535145	WI MOD GRO	535423
10428096003	FL-TT-04 (2-14) WM	EPA 5030 Medium Soil	535145	WI MOD GRO	535423
10428096004	FL-TT-05 (5-15) WM	EPA 5030 Medium Soil	535145	WI MOD GRO	535423
10428096005	FL-TT-07 (1-5) S	EPA 5030 Medium Soil	535145	WI MOD GRO	535423
10428096001	FL-TT-03(2-10) WM	EPA 3050	533686	EPA 6010C	534230
10428096002	FL-TT-06 (0-10) S	EPA 3050	533686	EPA 6010C	534230
10428096003	FL-TT-04 (2-14) WM	EPA 3050	533686	EPA 6010C	534230
10428096004	FL-TT-05 (5-15) WM	EPA 3050	533686	EPA 6010C	534230
10428096005	FL-TT-07 (1-5) S	EPA 3050	533686	EPA 6010C	534230
10428096001	FL-TT-03(2-10) WM	EPA 3050B	438855	EPA 6020	439080
10428096002	FL-TT-06 (0-10) S	EPA 3050B	438855	EPA 6020	439080
10428096003	FL-TT-04 (2-14) WM	EPA 3050B	438855	EPA 6020	439080
10428096004	FL-TT-05 (5-15) WM	EPA 3050B	438855	EPA 6020	439080
10428096005	FL-TT-07 (1-5) S	EPA 3050B	438855	EPA 6020	439080
10428096001	FL-TT-03(2-10) WM	EPA 3050	533687	EPA 6020A	533858
10428096002	FL-TT-06 (0-10) S	EPA 3050	533687	EPA 6020A	533858
10428096003	FL-TT-04 (2-14) WM	EPA 3050	533687	EPA 6020A	533858
10428096004	FL-TT-05 (5-15) WM	EPA 3050	533687	EPA 6020A	533858
10428096005	FL-TT-07 (1-5) S	EPA 3050	533687	EPA 6020A	533858
10428096001	FL-TT-03(2-10) WM	EPA 7471	533683	EPA 7471	533810
10428096002	FL-TT-06 (0-10) S	EPA 7471	533683	EPA 7471	533810
10428096003	FL-TT-04 (2-14) WM	EPA 7471	533683	EPA 7471	533810
10428096004	FL-TT-05 (5-15) WM	EPA 7471	533683	EPA 7471	533810
10428096005	FL-TT-07 (1-5) S	EPA 7471	533683	EPA 7471	533810

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10428096001	FL-TT-03(2-10) WM	ASTM D2974	534083		
10428096002	FL-TT-06 (0-10) S	ASTM D2974	534083		
10428096003	FL-TT-04 (2-14) WM	ASTM D2974	535059		
10428096004	FL-TT-05 (5-15) WM	ASTM D2974	535059		
10428096005	FL-TT-07 (1-5) S	ASTM D2974	535059		
10428096001	FL-TT-03(2-10) WM	EPA 3550	533569	EPA 8270D	533831
10428096002	FL-TT-06 (0-10) S	EPA 3550	533569	EPA 8270D	533831
10428096003	FL-TT-04 (2-14) WM	EPA 3550	533569	EPA 8270D	533831
10428096004	FL-TT-05 (5-15) WM	EPA 3550	533569	EPA 8270D	533831
10428096005	FL-TT-07 (1-5) S	EPA 3550	533569	EPA 8270D	533831
10428096001	FL-TT-03(2-10) WM	EPA 3550	533802	EPA 8270D by SIM	534011
10428096002	FL-TT-06 (0-10) S	EPA 3550	533802	EPA 8270D by SIM	534011
10428096003	FL-TT-04 (2-14) WM	EPA 3550	533802	EPA 8270D by SIM	534011
10428096004	FL-TT-05 (5-15) WM	EPA 3550	533802	EPA 8270D by SIM	534011
10428096005	FL-TT-07 (1-5) S	EPA 3550	533524	EPA 8270D by SIM	534010
10428096001	FL-TT-03(2-10) WM	EPA 5035/5030B	535427	EPA 8260B	535620
10428096002	FL-TT-06 (0-10) S	EPA 5035/5030B	535427	EPA 8260B	535620
10428096003	FL-TT-04 (2-14) WM	EPA 5035/5030B	535427	EPA 8260B	535620
10428096004	FL-TT-05 (5-15) WM	EPA 5035/5030B	535427	EPA 8260B	535620
10428096005	FL-TT-07 (1-5) S	EPA 5035/5030B	535427	EPA 8260B	535620
10428096001	FL-TT-03(2-10) WM	EPA 3060A	439502	EPA 7196A	439771
10428096002	FL-TT-06 (0-10) S	EPA 3060A	439502	EPA 7196A	439771
10428096003	FL-TT-04 (2-14) WM	EPA 3060A	439502	EPA 7196A	439771
10428096004	FL-TT-05 (5-15) WM	EPA 3060A	439502	EPA 7196A	439771
10428096005	FL-TT-07 (1-5) S	EPA 3060A	439502	EPA 7196A	439771
10428096001	FL-TT-03(2-10) WM	Trivalent Chromium Calculation	440378		
10428096002	FL-TT-06 (0-10) S	Trivalent Chromium Calculation	440378		
10428096003	FL-TT-04 (2-14) WM	Trivalent Chromium Calculation	440378		
10428096004	FL-TT-05 (5-15) WM	Trivalent Chromium Calculation	440378		
10428096005	FL-TT-07 (1-5) S	Trivalent Chromium Calculation	440378		
10428096001	FL-TT-03(2-10) WM	EPA 9012A	286937	EPA 9012	286958
10428096002	FL-TT-06 (0-10) S	EPA 9012A	286937	EPA 9012	286958
10428096003	FL-TT-04 (2-14) WM	EPA 9012A	286937	EPA 9012	286958
10428096004	FL-TT-05 (5-15) WM	EPA 9012A	287059	EPA 9012	287085
10428096005	FL-TT-07 (1-5) S	EPA 9012A	287059	EPA 9012	287085
10428096001	FL-TT-03(2-10) WM	EPA 300.0	141540	EPA 9056A	141561
10428096002	FL-TT-06 (0-10) S	EPA 300.0	141540	EPA 9056A	141561
10428096003	FL-TT-04 (2-14) WM	EPA 300.0	141540	EPA 9056A	141561
10428096004	FL-TT-05 (5-15) WM	EPA 300.0	141540	EPA 9056A	141561
10428096005	FL-TT-07 (1-5) S	EPA 300.0	141540	EPA 9056A	141561

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
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REPORT OF LABORATORY ANALYSIS

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WO#: 10428096



10428096

Minnesota Pollution Control Agency		PROJECT/CLIENT INFO		Work Order Number:		COC Type:		Page: 1 of 1							
Facility Code: MNSW057/mPCA Freeway LF Solids		Project Name: MPCA - Freeway LF Solids		Turnaround Time:		COC ID:		FOR LAB USE ONLY							
Project Manager:		Potential Hazard? If yes, add information to Sampler Comments Section		Lab Name:		Address: 18-00383		LABORATORY							
Program Code (MDH Lab Only):		Project Task Code:		Phone No:		Epic Profile #38716		Lab Work Order Sticker							
SAMPLE DETAILS					ANALYSIS REQUESTED										
SAMPLE TYPE CODES Sample Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample		LAB MATRIX CODES DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe		FIELD MATRIX CODES Wtr-Ground=Groundwater Wtr-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample		LABORATORY AR=Air BL=Biological Material OT=Other TS=Tissue		ANALYSIS REQUESTED		FOR LAB USE ONLY					
Location Identifier	Sample Type	Date	Time	Start Depth, ft	End Depth, ft	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	LABORATORY	Lab Sample No.	#
FL-TT-03 (2-10)WM	S	4/19/18	0900	2	10	C	SD				13	X		001	1
FL-TT-06 (0-10)S	S	4/19/18	1145	0	10	C	SD				13	X		002	2
FL-TT-04 (2-14)WM	S	4/19/18	1230	2	14	C	SD				13	X		003	3
FL-TT-05 (5-15)WM	S	4/19/18	1500	5	15	C	SD				13	X		004	4
FL-TT-07 (1-5)S	S	4/19/18	1715	1	5	C	SD				13	X		005	5
Be J															
04/20/18															
Sampled By: Brad Jacobson/SJK/TJB										Sampler's Signature: <i>Brad Jacobson</i>		Phone #: 612-590-8276			
Receiving Comments:															
Relinquished By/Affiliation					Date/Time			Accepted By/Affiliation			Date/Time				
<i>A JO</i>					4-20-18 0830			<i>AK ACE</i>			4-20-18 830				

3.6°C

Sample Condition Upon Receipt

Client Name: Minnesota Pollution Control Agency
Project #: _____

WO#: 10428096

PM: JMA Due Date: 05/04/18
CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial HH 4-20-18 Pade SpeeDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 3.6 Cooler Temp Corrected (°C): 3.6 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: True Date and Initials of Person Examining Contents: HH 4-20-18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: [Signature]

Date: 04/20/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigaiton Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Litium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.



Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10428096 Workorder Name: 18-00383 MPCA-FreewayLF Solids Owner Received Date: 4/20/2018 Results Requested By: 5/4/2018

Report To		Subcontract To					Requested Analysis															
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																				
							Preserved Containers					Total Fluoride by 9056										
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved															LAB USE ONLY	
1	FL-TT-03(2-10) WM	PS	4/19/2018 09:00	10428096001	Solid	1																
2	FL-TT-06 (0-10) S	PS	4/19/2018 11:45	10428096002	Solid	1																
3	FL-TT-04 (2-14) WM	PS	4/19/2018 12:30	10428096003	Solid	1																
4	FL-TT-05 (5-15) WM	PS	4/19/2018 15:00	10428096004	Solid	1																
5	FL-TT-07 (1-5) S	PS	4/19/2018 17:15	10428096005	Solid	1																
																	Comments					
Transfers	Released By	Date/Time	Received By	Date/Time																		
1	<i>[Signature]</i>	4/23/18 1800	<i>[Signature]</i>	4-24-18 1900																		
2	<i>[Signature]</i>	4-24-18 2315	<i>[Signature]</i>	4/25/18 0730																		
3																						
Cooler Temperature on Receipt		2.4 °C	Custody Seal		<input checked="" type="radio"/> or N	Received on Ice		<input checked="" type="radio"/> or N	Samples Intact													<input checked="" type="radio"/> or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:
Sample Condition Upon Receipt Form
 Document No.:
F-VM-C-001-Rev.10

Document Revised: 15Mar2016
 Page 1 of 1
 Issuing Authority:
 Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt

Client Name:
Pace MN

Project #:
WO# : 12107524
 PM: HRZ Due Date: 05/04/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other:

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.1 Cooler Temp Corrected °C: 2.4 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: 4/24/18 DC

Comments: Bm 4/25/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____
 Field Data Required? Yes No

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N
 Project Manager Review: [Signature] Date: 4/25/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Sample Condition Upon Receipt

Client Name: Pace MN Project #: _____

WO#: 12107524
 PM: HRZ Due Date: 05/04/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.5 Cooler Temp Corrected °C: 0.8 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: FD. 3 Date and Initials of Person Examining Contents: 4-24-18 BSL

Comments: BM 4/25/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N
 Project Manager Review: [Signature] Date: 4/25/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Client Name: Pace MN Sample Preservation Receipt Form
 Project # 40167891

All containers needing preservation have been checked and noted below: Yes No N/A


Initial when completed: _____ Date/Time: _____

Lab Lot# of pH paper: _____ Lab Std #ID of preservation (if pH adjusted): _____

Pace Lab #	Glass							Plastic							Vials				Jars			General			VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)				
	AG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP2N	BP2Z	BP3U	BP3C	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU	WPFU	SP5T								ZPLC	GN		
001																																			2.5 / 5 / 10
002																																			2.5 / 5 / 10
003																																			2.5 / 5 / 10
004																																			2.5 / 5 / 10
005																																			2.5 / 5 / 10
006																																			2.5 / 5 / 10
007																																			2.5 / 5 / 10
008																																			2.5 / 5 / 10
009																																			2.5 / 5 / 10
010																																			2.5 / 5 / 10
011																																			2.5 / 5 / 10
012																																			2.5 / 5 / 10
013																																			2.5 / 5 / 10
014																																			2.5 / 5 / 10
015																																			2.5 / 5 / 10
016																																			2.5 / 5 / 10
017																																			2.5 / 5 / 10
018																																			2.5 / 5 / 10
019																																			2.5 / 5 / 10
020																																			2.5 / 5 / 10


Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm) : Yes No N/A *If yes look in headspace column

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	DG9A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO3	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL		
AG5U	100 mL amber glass unpres	BP3C	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres	BP3S	250 mL plastic H2SO4			GN:	

 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 31Jan2018
	Document No.: F-GB-C-031-rev.06	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace, MN
Courier: CS Logistics Fed Ex Speedee UPS Walco
 Client Pace Other: _____

Project #: _____
WO# : 40167891

 40167891

Tracking #: 1699968
Custody Seal on Cooler/Box Present: yes no **Seals intact:** yes no
Custody Seal on Samples Present: yes no **Seals intact:** yes no
Packing Material: Bubble Wrap Bubble Bags None Other
Thermometer Used: SR - 4 **Type of Ice:** Wet Blue Dry None Samples on ice, cooling process has begun
Cooler Temperature: Uncorr: 35 / Corr: 3

Temp Blank Present: yes no **Biological Tissue is Frozen:** yes no
 Temp should be above freezing to 6°C.
 Biota Samples may be received at ≤ 0°C.

Person examining contents:
 Date: 4-24-18
 Initials: SW

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time: _____
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>S</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution: _____ If checked, see attached form for additional comments
 Person Contacted: _____ Date/Time: _____
 Comments/ Resolution: _____

Project Manager Review: CS **Date:** 4/24/18

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10428096 Workorder Name: 18-00383 MPCA-FreewayLF Solids Owner Received Date: 4/20/2018 Results Requested By: 5/4/2018

Report To		Subcontract To				Requested Analysis																																				
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Indianapolis 7726 Moller Road Indianapolis, IN 46268 Phone (317)228-3100																																								
						Cr III			Cr VI			Total Cr by 6020																														
						5019S167																																				
						LAB USE ONLY																																				
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Cr III	Cr VI	Total Cr by 6020																													
						Unpreserved																																				
1	FL-TT-03(2-10) WM	PS	4/19/2018 09:00	10428096001	Solid	1						X	X	X																												
2	FL-TT-06 (0-10) S	PS	4/19/2018 11:45	10428096002	Solid	1						X	X	X																												
3	FL-TT-04 (2-14) WM	PS	4/19/2018 12:30	10428096003	Solid	1						X	X	X																												
4	FL-TT-05 (5-15) WM	PS	4/19/2018 15:00	10428096004	Solid	1						X	X	X																												
5	FL-TT-07 (1-5) S	PS	4/19/2018 17:15	10428096005	Solid	1						X	X	X																												
Transfers		Released By	Date/Time	Received By		Date/Time		Comments																																		
1		<i>Longford</i>	<i>4/23/18</i>	<i>KHO</i>		<i>fedex</i>																																				
2		<i>fedex</i>	<i>4-24-18 0825</i>	<i>Jason Hoff</i>		<i>4-24-18 0825</i>																																				
3																																										
Cooler Temperature on Receipt			3.0 °C	Custody Seal			<input checked="" type="radio"/> or N	Received on Ice			<input checked="" type="radio"/> or N	Samples Intact				<input checked="" type="radio"/> or N																										

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50195167

Date/Time and Initials of person examining contents: JH 4-24-18 1232

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 2993

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 3.9/3.9 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		<input checked="" type="checkbox"/>	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		<input checked="" type="checkbox"/>	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			<input checked="" type="checkbox"/>
Chain of Custody Present:	<input checked="" type="checkbox"/>		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>		Dissolved Metals field filtered?:			<input checked="" type="checkbox"/>
Short Hold Time Analysis (<72hr)? Analysis:		<input checked="" type="checkbox"/>	Headspace Wisconsin Sulfide			<input checked="" type="checkbox"/>
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			<input checked="" type="checkbox"/>
Rush TAT Requested:		<input checked="" type="checkbox"/>	Headspace in VOA Vials (>6mm):			<input checked="" type="checkbox"/>
Containers Intact?:	<input checked="" type="checkbox"/>		Trip Blank Present?:		<input checked="" type="checkbox"/>	
Sample Labels Match COC? Except TCs, which only require sample ID	<input checked="" type="checkbox"/>		Trip Blank Custody Seals?:		<input checked="" type="checkbox"/>	

Comments:

Sample Container Count

WO#: 50195167



50195167

CLIENT: Pacem

COC PAGE ___ of ___

COC ID# _____

Project # 50195167

SBS
DI
Bulk
Kit

Matrix S/M
(Soil/Water/
Aqueous Li

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	Matrix S/M (Soil/Water/Aqueous Li)	pH <2	pH >9	pH >12	
1																							
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
WG9U	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				



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May 04, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Solid - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/24/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kari-Ann Killian For Jessica Esser
Project Manager

Certification List

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10428096
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FL-TT-03(2-10) WM (10428096001)	A181702-01	Solid	04/19/2018	04/24/2018
FL-TT-06 (0-10) S (10428096002)	A181702-02	Solid	04/19/2018	04/24/2018
FL-TT-04 (2-14) WM (10428096003)	A181702-03	Solid	04/19/2018	04/24/2018
FL-TT-05 (5-15) WM (10428096004)	A181702-04	Solid	04/19/2018	04/24/2018
FL-TT-07 (1-5) S (10428096005)	A181702-05	Solid	04/19/2018	04/24/2018

CASE NARRATIVE

Sample Receipt Information:

Five samples were received on April 24, 2018. Samples were received at 3.1 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.



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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10428096
 Project Manager: Jennifer Anderson

FL-TT-04 (2-14) WM (10428096003)
A181702-03 (Solid)

Date Sampled
 04/19/2018 12:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804197

2,4-D	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 03:05	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 03:05	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 22:01	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 03:05	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 22:01	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 22:01	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 22:01	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 22:01	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 22:01	EPA 8321B	
Surrogate: DCAA		87.1 %	70.8-116		04/26/2018	05/01/2018 22:01	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	59.5	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10428096
 Project Manager: Jennifer Anderson

FL-TT-05 (5-15) WM (10428096004)
A181702-04 (Solid)

Date Sampled
 04/19/2018 15:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804197

2,4-D	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 04:11	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 04:11	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 23:08	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 23:08	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 23:08	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 04:11	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 04:11	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 23:08	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 23:08	EPA 8321B	
Surrogate: DCAA		81.8 %	70.8-116		04/26/2018	05/01/2018 23:08	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	67.6	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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Pace Analytical
 1700 Elm Street, Suite 200
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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10428096
 Project Manager: Jennifer Anderson

FL-TT-07 (1-5) S (10428096005)
A181702-05 (Solid)

Date Sampled
04/19/2018 17:15

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804197

2,4-D	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 00:15	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 00:15	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 05:17	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 00:15	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 05:17	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 00:15	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 00:15	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 00:15	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 00:15	EPA 8321B	
Surrogate: DCAA		85.8 %		70.8-116	04/26/2018	05/02/2018 00:15	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	51.1	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10428096
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804197 - EPA 3570

Blank (A804197-BLK1)		Prepared: 04/26/2018 Analyzed: 04/27/2018 01:46								
2,4-D	ND	0.10	mg/kg wet							
2,4-D [2C]	ND	0.10	mg/kg wet							
2,4-DB	ND	0.10	mg/kg wet							
2,4-DB [2C]	ND	0.10	mg/kg wet							
2,4,5-T	ND	0.10	mg/kg wet							
2,4,5-T [2C]	ND	0.10	mg/kg wet							
2,4,5-TP	ND	0.10	mg/kg wet							
2,4,5-TP [2C]	ND	0.10	mg/kg wet							
Bentazon	ND	0.10	mg/kg wet							
Bentazon [2C]	ND	0.10	mg/kg wet							
Dicamba	ND	0.10	mg/kg wet							
Dicamba [2C]	ND	0.10	mg/kg wet							
MCPA	ND	0.10	mg/kg wet							
MCPA [2C]	ND	0.10	mg/kg wet							
Picloram	ND	0.10	mg/kg wet							
Picloram [2C]	ND	0.10	mg/kg wet							
Triclopyr	ND	0.10	mg/kg wet							
Triclopyr [2C]	ND	0.10	mg/kg wet							
Surrogate: DCAA	21.3		mg/kg wet	20.00		107	70.8-116			
Surrogate: DCAA [2C]	20.2		mg/kg wet	20.00		101	62.3-114			

LCS (A804197-BS1)		Prepared: 04/26/2018 Analyzed: 04/26/2018 23:32								
2,4-D	1.91	0.10	mg/kg wet	2.000		95.3	81.6-107			
2,4-D [2C]	1.87	0.10	mg/kg wet	2.000		93.4	71.8-120			
2,4-DB	1.75	0.10	mg/kg wet	2.000		87.5	76.4-107			
2,4-DB [2C]	1.90	0.10	mg/kg wet	2.000		95.1	62.2-129			
2,4,5-T	1.94	0.10	mg/kg wet	2.000		97.1	81.2-110			
2,4,5-T [2C]	1.99	0.10	mg/kg wet	2.000		99.6	70.6-125			
2,4,5-TP	1.89	0.10	mg/kg wet	2.000		94.3	79.1-106			
2,4,5-TP [2C]	1.93	0.10	mg/kg wet	2.000		96.3	68.2-118			
Bentazon	1.03	0.10	mg/kg wet	1.000		103	82.5-119			
Bentazon [2C]	0.898	0.10	mg/kg wet	1.000		89.8	73.3-125			
Dicamba	2.00	0.10	mg/kg wet	2.000		99.9	85.1-108			
Dicamba [2C]	2.03	0.10	mg/kg wet	2.000		101	71.4-115			
Picloram	0.993	0.10	mg/kg wet	1.000		99.3	86.1-106			
Picloram [2C]	0.891	0.10	mg/kg wet	1.000		89.1	74.5-114			
Triclopyr	1.84	0.10	mg/kg wet	2.000		91.8	78.6-106			
Triclopyr [2C]	1.90	0.10	mg/kg wet	2.000		95.1	69.4-118			
Surrogate: DCAA	20.6		mg/kg wet	20.00		103	70.8-116			
Surrogate: DCAA [2C]	19.8		mg/kg wet	20.00		98.8	62.3-114			

LCS (A804197-BS2)		Prepared: 04/26/2018 Analyzed: 04/27/2018 00:39								
MCPA	2.14	0.10	mg/kg wet	2.000		107	79.4-116			
MCPA [2C]	2.26	0.10	mg/kg wet	2.000		113	77-123			



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Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10428096
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804197 - EPA 3570

LCS (A804197-BS2)

Prepared: 04/26/2018 Analyzed: 04/27/2018 00:39

Surrogate: DCAA	21.0		mg/kg wet	20.00		105	70.8-116			
Surrogate: DCAA [2C]	22.4		mg/kg wet	20.00		112	62.3-114			

Matrix Spike (A804197-MS1)

Source: A181702-02

Prepared: 04/26/2018 Analyzed: 05/01/2018 17:33

2,4-D	2.39	0.10	mg/kg dry	2.682	ND	89.2	71.4-105			
2,4-D [2C]	2.16	0.10	mg/kg dry	2.682	0.0340	79.1	50.5-123			
2,4-DB	2.20	0.10	mg/kg dry	2.682	ND	82.2	46.4-117			
2,4-DB [2C]	2.12	0.10	mg/kg dry	2.682	0.0486	77.3	44.5-121			
2,4,5-T	2.46	0.10	mg/kg dry	2.682	0.0528	89.8	66.2-110			
2,4,5-T [2C]	2.28	0.10	mg/kg dry	2.682	ND	85.0	43.6-126			
2,4,5-TP	2.37	0.10	mg/kg dry	2.682	ND	88.5	52.4-114			
2,4,5-TP [2C]	2.21	0.10	mg/kg dry	2.682	0.0443	80.7	47.6-117			
Bentazon	1.25	0.10	mg/kg dry	1.341	0.0694	88.0	61.5-117			
Bentazon [2C]	0.896	0.10	mg/kg dry	1.341	0.0365	64.1	50.7-127			
Dicamba	2.06	0.10	mg/kg dry	2.682	ND	76.6	48.4-111			
Dicamba [2C]	1.95	0.10	mg/kg dry	2.682	0.0300	71.6	43.3-108			
Picloram	0.852	0.10	mg/kg dry	1.341	ND	63.5	26.7-110			
Picloram [2C]	0.565	0.10	mg/kg dry	1.341	0.00941	41.4	10.8-110			
Triclopyr	2.34	0.10	mg/kg dry	2.682	ND	87.2	56-113			
Triclopyr [2C]	2.29	0.10	mg/kg dry	2.682	0.0413	83.7	47.9-120			
Surrogate: DCAA	25.5		mg/kg dry	26.82		95.0	70.8-116			
Surrogate: DCAA [2C]	21.9		mg/kg dry	26.82		81.8	62.3-114			

Matrix Spike (A804197-MS2)

Source: A181702-02

Prepared: 04/26/2018 Analyzed: 05/01/2018 19:47

MCPA	2.69	0.10	mg/kg dry	2.682	ND	100	74.2-114			
MCPA [2C]	2.57	0.10	mg/kg dry	2.682	0.0400	94.5	60.9-122			
Surrogate: DCAA	26.5		mg/kg dry	26.82		98.8	70.8-116			
Surrogate: DCAA [2C]	26.3		mg/kg dry	26.82		98.2	62.3-114			

Matrix Spike Dup (A804197-MSD1)

Source: A181702-02

Prepared: 04/26/2018 Analyzed: 05/01/2018 18:40

2,4-D	2.40	0.10	mg/kg dry	2.682	ND	89.3	71.4-105	0.174	20	
2,4-D [2C]	2.16	0.10	mg/kg dry	2.682	0.0340	79.1	50.5-123	0.0217	20	
2,4-DB	2.19	0.10	mg/kg dry	2.682	ND	81.5	46.4-117	0.805	20	
2,4-DB [2C]	2.14	0.10	mg/kg dry	2.682	0.0486	78.0	44.5-121	0.882	20	
2,4,5-T	2.44	0.10	mg/kg dry	2.682	0.0528	89.0	66.2-110	0.921	20	
2,4,5-T [2C]	2.28	0.10	mg/kg dry	2.682	ND	85.1	43.6-126	0.192	20	
2,4,5-TP	2.40	0.10	mg/kg dry	2.682	ND	89.4	52.4-114	1.02	20	
2,4,5-TP [2C]	2.17	0.10	mg/kg dry	2.682	0.0443	79.3	47.6-117	1.71	20	
Bentazon	1.39	0.10	mg/kg dry	1.341	0.0694	98.4	61.5-117	10.6	20	
Bentazon [2C]	1.03	0.10	mg/kg dry	1.341	0.0365	74.2	50.7-127	14.1	20	
Dicamba	2.18	0.10	mg/kg dry	2.682	ND	81.4	48.4-111	6.02	20	
Dicamba [2C]	2.12	0.10	mg/kg dry	2.682	0.0300	77.9	43.3-108	8.30	20	
Picloram	0.927	0.10	mg/kg dry	1.341	ND	69.1	26.7-110	8.41	20	
Picloram [2C]	0.611	0.10	mg/kg dry	1.341	0.00941	44.9	10.8-110	7.94	20	



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10428096
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804197 - EPA 3570

Matrix Spike Dup (A804197-MSD1)		Source: A181702-02			Prepared: 04/26/2018 Analyzed: 05/01/2018 18:40					
Triclopyr	2.32	0.10	mg/kg dry	2.682	ND	86.3	56-113	1.05	20	
Triclopyr [2C]	2.16	0.10	mg/kg dry	2.682	0.0413	78.9	47.9-120	5.78	20	
Surrogate: DCAA	26.2		mg/kg dry	26.82		97.8	70.8-116			
Surrogate: DCAA [2C]	23.6		mg/kg dry	26.82		88.1	62.3-114			
Matrix Spike Dup (A804197-MSD2)		Source: A181702-02			Prepared: 04/26/2018 Analyzed: 05/01/2018 20:54					
MCPA	2.68	0.10	mg/kg dry	2.682	ND	99.8	74.2-114	0.430	20	
MCPA [2C]	2.53	0.10	mg/kg dry	2.682	0.0400	92.7	60.9-122	1.83	20	
Surrogate: DCAA	25.9		mg/kg dry	26.82		96.7	70.8-116			
Surrogate: DCAA [2C]	26.3		mg/kg dry	26.82		98.0	62.3-114			



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 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN

Project Number: 10428096

Project Manager: Jennifer Anderson

Classical Chemistry Parameters - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804195 - % Solids

Duplicate (A804195-DUP1)

Source: A181708-01

Prepared: 04/25/2018 Analyzed: 04/27/2018 09:07

% Solids	79.2	0.00	% by Weight		79.6			0.516	20	
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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10428096
Project Manager: Jennifer Anderson

Notes and Definitions

- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Chain of Custody

A181702



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10428096 Workorder Name: 18-00383 MPCA-FreewayLF Solids Owner Received Date: 4/20/2018 Results Requested By: 5/4/2018

Report To		Subcontract To					Requested Analysis														
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700																			
						MDA List II															
						Preserved Containers															
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unreserved															LAB USE ONLY
1	FL-TT-03(2-10) WM	PS	4/19/2018 09:00	10428096001	Solid	1															01
2	FL-TT-06 (0-10) S	PS	4/19/2018 11:45	10428096002	Solid	1															02
3	FL-TT-04 (2-14) WM	PS	4/19/2018 12:30	10428096003	Solid	1															03
4	FL-TT-05 (5-15) WM	PS	4/19/2018 15:00	10428096004	Solid	1															04
5	FL-TT-07 (1-5) S	PS	4/19/2018 17:15	10428096005	Solid	1															05
Comments																					
Transfers	Released By	Date/Time	Received By	Date/Time																	
1	<i>Mary Sue Pace</i>	4/23/18 16:30	<i>Kari Ann Kelli</i>	4/24/18																	
2				0924																	
3																					
Cooler Temperature on Receipt		3.1 °C	Custody Seal		(Y) or N	Received on Ice		(Y) or N	Samples Intact											(Y) or N	

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274 Exp. 7/12/18

May 07, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 20, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Montana Certificate #CERT0103
California Certification #2973
California Certification #2973
Alaska Certification UST-107
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512
Minnesota Department of Health, Certificate #1385941
Arkansas Department of Environmental Quality, Certificate #17-046-0
Georgia Environmental Protection Division, Stipulation
Illinois Environmental Protection Agency, Certificate #004325
Michigan Department of Environmental Quality, Laboratory #0034

New York State Department of Health, Serial #56192 and 56193
North Carolina Division of Water Resources, Certificate #659
Virginia Department of General Services, Certificate #9028
Wisconsin Department of Natural Resources, Laboratory #999472650
U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10428166001	FL-TT-08	Water	04/20/18 15:00	04/20/18 17:30
10428166002	FL-TT-08Dup	Water	04/20/18 15:25	04/20/18 17:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory	
10428166001	FL-TT-08	EPA 8081B	XV1	24	PASI-M	
		EPA 8082A	RAG	11	PASI-M	
		EPA 200.7	DM	8	PASI-M	
		EPA 200.8	RJS	2	PASI-M	
		EPA 200.8	TT3	12	PASI-M	
		EPA 245.1	LMW	1	PASI-M	
		EPA 8270D	AT1	38	PASI-M	
			CLJ	2	PASI-V	
			Hach 10360 Rev 1.1	AJS	1	PASI-M
			EPA 1664A OG	AR3	1	PASI-M
			EPA 180.1	JFP	1	PASI-M
			SM 2540D	NAS	1	PASI-M
			SM 4500-H+B	KEO	1	PASI-M
			Trivalent Chromium Calculation	KEO	1	PASI-M
			EPA 300.0	KEO	1	PASI-M
			SM 3500-Cr B Modified	JFP	1	PASI-M
			EPA 350.1	CLJ	1	PASI-V
			EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
			EPA 353.2	JFP	3	PASI-M
			EPA 9016	AMM	1	PASI-GRMI
		10428166002	FL-TT-08Dup	SM 4500-CN-E	DCL	1
SM 4500-P E	DCL			1	PASI-M	
EPA 8081B	XV1			24	PASI-M	
EPA 8082A	RAG			11	PASI-M	
EPA 200.7	DM			8	PASI-M	
EPA 200.8	RJS			2	PASI-M	
EPA 200.8	TT3			12	PASI-M	
EPA 245.1	LMW			1	PASI-M	
EPA 8270D	AT1			38	PASI-M	
	CLJ			2	PASI-V	
	Hach 10360 Rev 1.1			AJS	1	PASI-M
	EPA 1664A OG			AR3	1	PASI-M
	EPA 180.1			JFP	1	PASI-M
	SM 2540D			NAS	1	PASI-M
	SM 4500-H+B			KEO	1	PASI-M
	Trivalent Chromium Calculation	KEO	1	PASI-M		
	EPA 300.0	KEO	1	PASI-M		

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		EPA 353.2	JFP	3	PASI-M
		EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Sample: FL-TT-08	Lab ID: 10428166001	Collected: 04/20/18 15:00	Received: 04/20/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data								
Analytical Method:								
Field pH	6.0	Std. Units	0.10	1		04/20/18 15:00		
Field Temperature	10.5	deg C	0.50	1		04/20/18 15:00		
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	309-00-2	
alpha-BHC	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	319-84-6	
beta-BHC	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	319-85-7	
delta-BHC	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	58-89-9	
Chlordane (Technical)	ND	ug/L	2.6	5	04/24/18 19:41	05/04/18 23:34	57-74-9	
alpha-Chlordane	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	5103-71-9	
gamma-Chlordane	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	5103-74-2	
4,4'-DDD	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:34	72-54-8	
4,4'-DDE	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:34	72-55-9	
4,4'-DDT	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:34	50-29-3	
Dieldrin	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:34	60-57-1	
Endosulfan I	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	959-98-8	
Endosulfan II	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:34	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:34	1031-07-8	
Endrin	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:34	72-20-8	
Endrin aldehyde	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:34	7421-93-4	
Endrin ketone	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:34	53494-70-5	
Heptachlor	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	76-44-8	
Heptachlor epoxide	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	1024-57-3	
Methoxychlor	ND	ug/L	2.6	5	04/24/18 19:41	05/04/18 23:34	72-43-5	
Toxaphene	ND	ug/L	7.7	5	04/24/18 19:41	05/04/18 23:34	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	70	%.	62-125	5	04/24/18 19:41	05/04/18 23:34	877-09-8	1M, D3
Decachlorobiphenyl (S)	35	%.	30-143	5	04/24/18 19:41	05/04/18 23:34	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:27	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:27	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:27	11141-16-5	
PCB-1242 (Aroclor 1242)	0.92	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:27	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:27	12672-29-6	
PCB-1254 (Aroclor 1254)	0.19	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:27	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:27	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:27	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:27	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	93	%.	30-125	1	04/24/18 12:23	04/25/18 10:27	877-09-8	
Decachlorobiphenyl (S)	27	%.	30-125	1	04/24/18 12:23	04/25/18 10:27	2051-24-3	S0
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	350	ug/L	200	1	04/23/18 14:49	04/25/18 18:19	7429-90-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Sample: FL-TT-08		Lab ID: 10428166001	Collected: 04/20/18 15:00	Received: 04/20/18 17:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Dissolved	303	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:19	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:19	7440-50-8	
Manganese, Dissolved	2290	ug/L	5.0	1	04/23/18 14:49	04/25/18 18:19	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:19	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:19	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/23/18 14:49	04/25/18 18:19	7440-31-5	
Zinc, Dissolved	32.3	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:19	7440-66-6	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Chromium	64.4	ug/L	10.0	20	04/23/18 10:35	04/25/18 16:05	7440-47-3	
Total Hardness by 2340B	795000	ug/L	2820	20	04/23/18 10:35	04/25/18 16:05		
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	0.78	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:42	7440-36-0	
Arsenic, Dissolved	1.3	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:42	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/23/18 14:28	04/24/18 01:42	7440-41-7	
Boron, Dissolved	352	ug/L	25.0	5	04/23/18 14:28	04/24/18 21:15	7440-42-8	
Cadmium, Dissolved	0.10	ug/L	0.080	1	04/23/18 14:28	04/24/18 01:42	7440-43-9	
Chromium, Dissolved	1.1	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:42	7440-47-3	
Cobalt, Dissolved	3.2	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:42	7440-48-4	
Lead, Dissolved	6.2	ug/L	0.10	1	04/23/18 14:28	04/24/18 01:42	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:42	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/23/18 14:28	04/24/18 01:42	7440-28-0	
Uranium-238, Dissolved	2.5	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:42	7440-61-1	
Vanadium, Dissolved	1.1	ug/L	1.0	1	04/23/18 14:28	04/24/18 01:42	7440-62-2	
245.1 Mercury, Dissolved		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:23	7439-97-6	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	83-32-9	
Anthracene	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	120-12-7	
Benzo(a)pyrene	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	50-32-8	
Benzoic acid	ND	ug/L	256	1	04/23/18 14:40	05/03/18 20:34	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	101-55-3	
Butylbenzylphthalate	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	111-44-4	
2-Chlorophenol	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	256	1	04/23/18 14:40	05/03/18 20:34	91-94-1	
2,4-Dichlorophenol	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	120-83-2	
Diethylphthalate	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	84-66-2	
2,4-Dimethylphenol	ND	ug/L	256	1	04/23/18 14:40	05/03/18 20:34	105-67-9	
Dimethylphthalate	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	131-11-3	
Di-n-butylphthalate	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	84-74-2	
2,4-Dinitrophenol	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	51-28-5	L2
Di-n-octylphthalate	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	117-84-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Sample: FL-TT-08	Lab ID: 10428166001	Collected: 04/20/18 15:00	Received: 04/20/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
bis(2-Ethylhexyl)phthalate	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	117-81-7	
Fluoranthene	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	206-44-0	
Fluorene	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	86-73-7	
Hexachlorobenzene	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	256	1	04/23/18 14:40	05/03/18 20:34	77-47-4	L2
Hexachloroethane	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	67-72-1	
Isophorone	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	78-59-1	
2-Methylnaphthalene	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	103	1	04/23/18 14:40	05/03/18 20:34		
N-Nitrosodiphenylamine	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	86-30-6	
Pentachlorophenol	ND	ug/L	103	1	04/23/18 14:40	05/03/18 20:34	87-86-5	
Phenanthrene	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	85-01-8	
Phenol	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	108-95-2	
Pyrene	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	85	%	60-125	1	04/23/18 14:40	05/03/18 20:34	4165-60-0	P3
2-Fluorobiphenyl (S)	75	%	56-125	1	04/23/18 14:40	05/03/18 20:34	321-60-8	
p-Terphenyl-d14 (S)	71	%	58-125	1	04/23/18 14:40	05/03/18 20:34	1718-51-0	
Phenol-d6 (S)	81	%	58-125	1	04/23/18 14:40	05/03/18 20:34	13127-88-3	
2-Fluorophenol (S)	78	%	55-125	1	04/23/18 14:40	05/03/18 20:34	367-12-4	
2,4,6-Tribromophenol (S)	78	%	65-125	1	04/23/18 14:40	05/03/18 20:34	118-79-6	
Field Data		Analytical Method:						
Field pH	6.0	Std. Units		1		04/20/18 15:00		
Field Temperature	10.5	deg C		1		04/20/18 15:00		
Hach 10360 Rev 1.1 BOD		Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360						
BOD, 5 day	60.2	mg/L	20.0	10	04/20/18 18:08	04/25/18 14:03		B4
1664 HEM, Oil and Grease		Analytical Method: EPA 1664A OG						
Oil and Grease	ND	mg/L	4.8	1		05/07/18 10:00		
180.1 Turbidity		Analytical Method: EPA 180.1						
Turbidity	1460	NTU	15.0	50		04/21/18 12:03		
2540D Total Suspended Solids		Analytical Method: SM 2540D						
Total Suspended Solids	2370	mg/L	66.7	1		04/26/18 10:14		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	6.7	Std. Units	0.10	1		04/27/18 12:10		H6
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	0.064	mg/L	0.010	1		05/01/18 16:04		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Sample: FL-TT-08		Lab ID: 10428166001		Collected: 04/20/18 15:00	Received: 04/20/18 17:30	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions		Analytical Method: EPA 300.0						
Fluoride	0.17	mg/L	0.050	1		04/26/18 19:07	16984-48-8	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		04/21/18 08:42		FS,M1
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		05/02/18 14:18		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	11.1	mg/L	0.20	2	04/30/18 09:45	05/01/18 08:01	7664-41-7	
353.2 Nitrate + Nitrite		Analytical Method: EPA 353.2						
Nitrate as N	0.37	mg/L	0.020	1		04/21/18 08:34	14797-55-8	FS
Nitrite as N	0.046	mg/L	0.020	1		04/21/18 08:34	14797-65-0	FS
Nitrogen, NO2 plus NO3	0.42	mg/L	0.020	1		04/21/18 08:34		FS
9016 Cyanide, Free		Analytical Method: EPA 9016 Preparation Method: EPA 9016						
Cyanide, Free	ND	ug/L	5.0	1	04/27/18 18:40	04/27/18 19:58		
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	16.3	ug/L	10.0	1	04/26/18 11:59	04/27/18 10:24	57-12-5	
SM4500P-E, Total Phosphorus		Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B						
Phosphorus	0.41	mg/L	0.10	1	05/03/18 12:33	05/04/18 07:48	7723-14-0	

Sample: FL-TT-08Dup		Lab ID: 10428166002		Collected: 04/20/18 15:25	Received: 04/20/18 17:30	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Field pH	6.0	Std. Units	0.10	1		04/20/18 15:25		
Field Temperature	10.5	deg C	0.50	1		04/20/18 15:25		
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C						
Aldrin	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	309-00-2	
alpha-BHC	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	319-84-6	
beta-BHC	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	319-85-7	
delta-BHC	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	58-89-9	
Chlordane (Technical)	ND	ug/L	2.6	5	04/24/18 19:41	05/04/18 23:53	57-74-9	
alpha-Chlordane	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	5103-71-9	
gamma-Chlordane	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	5103-74-2	
4,4'-DDD	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:53	72-54-8	
4,4'-DDE	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:53	72-55-9	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Sample: FL-TT-08Dup	Lab ID: 10428166002	Collected: 04/20/18 15:25	Received: 04/20/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C						
4,4'-DDT	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:53	50-29-3	
Dieldrin	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:53	60-57-1	
Endosulfan I	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	959-98-8	
Endosulfan II	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:53	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:53	1031-07-8	
Endrin	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:53	72-20-8	
Endrin aldehyde	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:53	7421-93-4	
Endrin ketone	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:53	53494-70-5	
Heptachlor	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	76-44-8	
Heptachlor epoxide	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	1024-57-3	
Methoxychlor	ND	ug/L	2.6	5	04/24/18 19:41	05/04/18 23:53	72-43-5	
Toxaphene	ND	ug/L	7.8	5	04/24/18 19:41	05/04/18 23:53	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	69	%	62-125	5	04/24/18 19:41	05/04/18 23:53	877-09-8	1M, D3
Decachlorobiphenyl (S)	31	%	30-143	5	04/24/18 19:41	05/04/18 23:53	2051-24-3	
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:42	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:42	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:42	11141-16-5	
PCB-1242 (Aroclor 1242)	1.4	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:42	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:42	12672-29-6	
PCB-1254 (Aroclor 1254)	0.24	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:42	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:42	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:42	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:42	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	93	%	30-125	1	04/24/18 12:23	04/25/18 10:42	877-09-8	
Decachlorobiphenyl (S)	26	%	30-125	1	04/24/18 12:23	04/25/18 10:42	2051-24-3	SO
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	1100	ug/L	200	1	04/23/18 14:49	04/25/18 18:22	7429-90-5	
Barium, Dissolved	315	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:22	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:22	7440-50-8	
Manganese, Dissolved	2300	ug/L	5.0	1	04/23/18 14:49	04/25/18 18:22	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:22	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:22	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/23/18 14:49	04/25/18 18:22	7440-31-5	
Zinc, Dissolved	59.5	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:22	7440-66-6	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Chromium	38.3	ug/L	10.0	20	04/23/18 10:35	04/25/18 16:10	7440-47-3	
Total Hardness by 2340B	708000	ug/L	2820	20	04/23/18 10:35	04/25/18 16:10		
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	0.66	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:45	7440-36-0	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Sample:	Lab ID:	Collected:	Received:	Matrix:				
FL-TT-08Dup	10428166002	04/20/18 15:25	04/20/18 17:30	Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8					Preparation Method: EPA 200.8			
Arsenic, Dissolved	1.5	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:45	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/23/18 14:28	04/24/18 01:45	7440-41-7	
Boron, Dissolved	336	ug/L	25.0	5	04/23/18 14:28	04/24/18 21:18	7440-42-8	
Cadmium, Dissolved	0.24	ug/L	0.080	1	04/23/18 14:28	04/24/18 01:45	7440-43-9	
Chromium, Dissolved	2.6	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:45	7440-47-3	
Cobalt, Dissolved	2.8	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:45	7440-48-4	
Lead, Dissolved	17.5	ug/L	0.10	1	04/23/18 14:28	04/24/18 01:45	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:45	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/23/18 14:28	04/24/18 01:45	7440-28-0	
Uranium-238, Dissolved	2.5	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:45	7440-61-1	
Vanadium, Dissolved	2.4	ug/L	1.0	1	04/23/18 14:28	04/24/18 01:45	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1					Preparation Method: EPA 245.1			
Mercury, Dissolved	ND	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:25	7439-97-6	
8270D MSSV								
Analytical Method: EPA 8270D					Preparation Method: EPA 3520			
Acenaphthene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	83-32-9	
Anthracene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	50-32-8	
Benzoic acid	ND	ug/L	51.0	1	04/23/18 14:40	05/03/18 21:03	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	111-44-4	
2-Chlorophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	51.0	1	04/23/18 14:40	05/03/18 21:03	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	120-83-2	
Diethylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	84-66-2	
2,4-Dimethylphenol	ND	ug/L	51.0	1	04/23/18 14:40	05/03/18 21:03	105-67-9	
Dimethylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	51-28-5	L2
Di-n-octylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	117-81-7	
Fluoranthene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	206-44-0	
Fluorene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	86-73-7	
Hexachlorobenzene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	51.0	1	04/23/18 14:40	05/03/18 21:03	77-47-4	L2
Hexachloroethane	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	67-72-1	
Isophorone	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.4	1	04/23/18 14:40	05/03/18 21:03		
N-Nitrosodiphenylamine	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	86-30-6	
Pentachlorophenol	ND	ug/L	20.4	1	04/23/18 14:40	05/03/18 21:03	87-86-5	
Phenanthrene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	85-01-8	
Phenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	108-95-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Sample: FL-TT-08Dup	Lab ID: 10428166002	Collected: 04/20/18 15:25	Received: 04/20/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Pyrene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	79	%	60-125	1	04/23/18 14:40	05/03/18 21:03	4165-60-0	
2-Fluorobiphenyl (S)	74	%	56-125	1	04/23/18 14:40	05/03/18 21:03	321-60-8	
p-Terphenyl-d14 (S)	69	%	58-125	1	04/23/18 14:40	05/03/18 21:03	1718-51-0	
Phenol-d6 (S)	79	%	58-125	1	04/23/18 14:40	05/03/18 21:03	13127-88-3	
2-Fluorophenol (S)	76	%	55-125	1	04/23/18 14:40	05/03/18 21:03	367-12-4	
2,4,6-Tribromophenol (S)	86	%	65-125	1	04/23/18 14:40	05/03/18 21:03	118-79-6	
Field Data								
Analytical Method:								
Field pH	6.0	Std. Units		1		04/20/18 15:25		
Field Temperature	10.5	deg C		1		04/20/18 15:25		
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	47.7	mg/L	20.0	10	04/20/18 18:08	04/25/18 14:06		B4
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	4.9	1		05/07/18 10:00		
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	965	NTU	15.0	50		04/21/18 12:06		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	1170	mg/L	50.0	1		04/26/18 10:14		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	6.6	Std. Units	0.10	1		04/27/18 12:10		H6
Trivalent Chromium Calculation								
Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	0.038	mg/L	0.010	1		05/01/18 16:04		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Fluoride	0.16	mg/L	0.050	1		04/26/18 19:23	16984-48-8	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr B Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		04/21/18 08:42		FS
350.1 Ammonia, Unionized								
Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		05/02/18 14:27		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	10.6	mg/L	0.20	2	04/30/18 09:45	05/01/18 08:03	7664-41-7	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sample: FL-TT-08Dup		Lab ID: 10428166002		Collected: 04/20/18 15:25	Received: 04/20/18 17:30	Matrix: Water		
353.2 Nitrate + Nitrite Analytical Method: EPA 353.2								
Nitrate as N	0.30	mg/L	0.020	1		04/21/18 08:37	14797-55-8	FS
Nitrite as N	0.043	mg/L	0.020	1		04/21/18 08:37	14797-65-0	FS
Nitrogen, NO2 plus NO3	0.34	mg/L	0.020	1		04/21/18 08:37		FS
9016 Cyanide, Free Analytical Method: EPA 9016 Preparation Method: EPA 9016								
Cyanide, Free	ND	ug/L	5.0	1	04/27/18 18:40	04/27/18 20:07		
SM4500CN-E Cyanide Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	20.5	ug/L	10.0	1	04/26/18 11:59	04/27/18 10:24	57-12-5	
SM4500P-E, Total Phosphorus Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B								
Phosphorus	0.50	mg/L	0.10	1	05/03/18 12:33	05/04/18 07:49	7723-14-0	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

QC Batch: 533449	Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1	Analysis Description: 245.1 Mercury - Dissolved
Associated Lab Samples: 10428166001, 10428166002	

METHOD BLANK: 2897827 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	04/23/18 17:53	

LABORATORY CONTROL SAMPLE & LCSD: 2897828 2897829

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury, Dissolved	ug/L	5	4.9	4.8	98	96	85-115	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

QC Batch: 533435 Analysis Method: EPA 200.7
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
 Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2897770 Matrix: Water

Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/25/18 17:32	
Barium, Dissolved	ug/L	ND	10.0	04/25/18 17:32	
Copper, Dissolved	ug/L	ND	10.0	04/25/18 17:32	
Manganese, Dissolved	ug/L	ND	5.0	04/25/18 17:32	
Nickel, Dissolved	ug/L	ND	20.0	04/25/18 17:32	
Silver, Dissolved	ug/L	ND	10.0	04/25/18 17:32	
Tin, Dissolved	ug/L	ND	75.0	04/25/18 17:32	
Zinc, Dissolved	ug/L	ND	20.0	04/25/18 17:32	

LABORATORY CONTROL SAMPLE: 2897771

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20700	103	85-115	
Barium, Dissolved	ug/L	1000	1040	104	85-115	
Copper, Dissolved	ug/L	1000	986	99	85-115	
Manganese, Dissolved	ug/L	1000	1050	105	85-115	
Nickel, Dissolved	ug/L	1000	1060	106	85-115	
Silver, Dissolved	ug/L	500	503	101	85-115	
Tin, Dissolved	ug/L	1000	1040	104	85-115	
Zinc, Dissolved	ug/L	1000	1070	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897772 2897773

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427742001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	21200	21400	106	107	70-130	1	30
Barium, Dissolved	ug/L	95.0	1000	1000	1130	1140	104	104	70-130	1	30
Copper, Dissolved	ug/L	ND	1000	1000	1000	1010	100	101	70-130	1	30
Manganese, Dissolved	ug/L	ND	1000	1000	1040	1050	104	105	70-130	1	30
Nickel, Dissolved	ug/L	ND	1000	1000	1020	1020	102	102	70-130	1	30
Silver, Dissolved	ug/L	ND	500	500	509	514	102	103	70-130	1	30
Tin, Dissolved	ug/L	ND	1000	1000	1040	1050	104	105	70-130	1	30
Zinc, Dissolved	ug/L	36.2	1000	1000	1070	1070	103	104	70-130	1	30

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

MATRIX SPIKE SAMPLE: 2898920		10428032004	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Aluminum, Dissolved	ug/L	358	20000	22100	109	70-130	
Barium, Dissolved	ug/L	607	1000	1630	102	70-130	
Copper, Dissolved	ug/L	ND	1000	1020	102	70-130	
Manganese, Dissolved	ug/L	902	1000	1940	103	70-130	
Nickel, Dissolved	ug/L	ND	1000	1030	102	70-130	
Silver, Dissolved	ug/L	ND	500	515	103	70-130	
Tin, Dissolved	ug/L	ND	1000	1040	104	70-130	
Zinc, Dissolved	ug/L	ND	1000	1030	102	70-130	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

QC Batch: 533691 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2898992 Matrix: Water

Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	0.50	04/24/18 18:12	

LABORATORY CONTROL SAMPLE: 2898993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	100	99.9	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898994 2898995

Parameter	Units	10428058001		2898994		2898995		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Chromium	ug/L	0.77	100	100	101	104	100	103	70-130	2	20

MATRIX SPIKE SAMPLE: 2898996

Parameter	Units	10428098002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	<0.50	100	99.4	99	70-130	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 533428 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2897737 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Arsenic, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Beryllium, Dissolved	ug/L	ND	0.20	04/25/18 08:49	
Boron, Dissolved	ug/L	ND	5.0	04/25/18 08:49	
Cadmium, Dissolved	ug/L	ND	0.080	04/25/18 08:49	
Chromium, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Cobalt, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Lead, Dissolved	ug/L	ND	0.10	04/25/18 08:49	
Selenium, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Thallium, Dissolved	ug/L	ND	0.10	04/25/18 08:49	
Uranium-238, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Vanadium, Dissolved	ug/L	ND	1.0	04/25/18 08:49	

LABORATORY CONTROL SAMPLE: 2897738

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	99.4	99	85-115	
Arsenic, Dissolved	ug/L	100	99.4	99	85-115	
Beryllium, Dissolved	ug/L	100	107	107	85-115	
Boron, Dissolved	ug/L	100	104	104	85-115	
Cadmium, Dissolved	ug/L	100	99.0	99	85-115	
Chromium, Dissolved	ug/L	100	101	101	85-115	
Cobalt, Dissolved	ug/L	100	102	102	85-115	
Lead, Dissolved	ug/L	100	105	105	85-115	
Selenium, Dissolved	ug/L	100	103	103	85-115	
Thallium, Dissolved	ug/L	100	103	103	85-115	
Uranium-238, Dissolved	ug/L	100	101	101	85-115	
Vanadium, Dissolved	ug/L	100	99.6	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897739 2897740

Parameter	Units	10427867001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Antimony, Dissolved	ug/L	0.0029 mg/L	100	110	108	107	105	70-130	2	20		
Arsenic, Dissolved	ug/L	ND	100	112	109	111	109	70-130	2	20		
Beryllium, Dissolved	ug/L	ND	100	107	104	107	104	70-130	3	20		
Boron, Dissolved	ug/L	32.5	100	137	133	104	101	70-130	2	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897739												2897740	
Parameter	Units	10427867001	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	RPD	RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits				
Cadmium, Dissolved	ug/L	ND	100	100	102	101	102	101	70-130	2	20		
Chromium, Dissolved	ug/L	ND	100	100	109	107	109	107	70-130	2	20		
Cobalt, Dissolved	ug/L	3.7	100	100	108	106	104	103	70-130	1	20		
Lead, Dissolved	ug/L	ND	100	100	105	103	105	103	70-130	3	20		
Selenium, Dissolved	ug/L	0.00058 mg/L	100	100	114	111	113	110	70-130	2	20		
Thallium, Dissolved	ug/L	ND	100	100	104	100	104	100	70-130	4	20		
Uranium-238, Dissolved	ug/L	10.3	100	100	118	116	108	106	70-130	2	20		
Vanadium, Dissolved	ug/L	ND	100	100	110	108	110	108	70-130	2	20		

MATRIX SPIKE SAMPLE: 2897741											
Parameter	Units	10427767003	Spike	MS	MS	% Rec					
		Result	Conc.	Result	% Rec	Limits	Qualifiers				
Antimony, Dissolved	ug/L	ND	100	105	105	70-130					
Arsenic, Dissolved	ug/L	ND	100	106	106	70-130					
Beryllium, Dissolved	ug/L	ND	100	115	115	70-130					
Boron, Dissolved	ug/L	11.5	100	124	113	70-130					
Cadmium, Dissolved	ug/L	ND	100	104	104	70-130					
Chromium, Dissolved	ug/L	ND	100	109	109	70-130					
Cobalt, Dissolved	ug/L	ND	100	110	110	70-130					
Lead, Dissolved	ug/L	ND	100	110	110	70-130					
Selenium, Dissolved	ug/L	ND	100	109	109	70-130					
Thallium, Dissolved	ug/L	ND	100	109	109	70-130					
Uranium-238, Dissolved	ug/L	ND	100	108	108	70-130					
Vanadium, Dissolved	ug/L	ND	100	107	107	70-130					

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

QC Batch: 534022 Analysis Method: EPA 8081B
 QC Batch Method: EPA Mod. 3510C Analysis Description: 8081B GCS Pesticides
 Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2901130 Matrix: Water

Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	05/04/18 19:36	
4,4'-DDE	ug/L	ND	0.10	05/04/18 19:36	
4,4'-DDT	ug/L	ND	0.10	05/04/18 19:36	
Aldrin	ug/L	ND	0.050	05/04/18 19:36	
alpha-BHC	ug/L	ND	0.050	05/04/18 19:36	
alpha-Chlordane	ug/L	ND	0.050	05/04/18 19:36	
beta-BHC	ug/L	ND	0.050	05/04/18 19:36	
Chlordane (Technical)	ug/L	ND	0.50	05/04/18 19:36	
delta-BHC	ug/L	ND	0.050	05/04/18 19:36	
Dieldrin	ug/L	ND	0.10	05/04/18 19:36	
Endosulfan I	ug/L	ND	0.050	05/04/18 19:36	
Endosulfan II	ug/L	ND	0.10	05/04/18 19:36	
Endosulfan sulfate	ug/L	ND	0.10	05/04/18 19:36	
Endrin	ug/L	ND	0.10	05/04/18 19:36	
Endrin aldehyde	ug/L	ND	0.10	05/04/18 19:36	
Endrin ketone	ug/L	ND	0.10	05/04/18 19:36	
gamma-BHC (Lindane)	ug/L	ND	0.050	05/04/18 19:36	
gamma-Chlordane	ug/L	ND	0.050	05/04/18 19:36	
Heptachlor	ug/L	ND	0.050	05/04/18 19:36	
Heptachlor epoxide	ug/L	ND	0.050	05/04/18 19:36	
Methoxychlor	ug/L	ND	0.50	05/04/18 19:36	
Toxaphene	ug/L	ND	1.5	05/04/18 19:36	
Decachlorobiphenyl (S)	%	69	30-143	05/04/18 19:36	
Tetrachloro-m-xylene (S)	%	89	62-125	05/04/18 19:36	

LABORATORY CONTROL SAMPLE & LCSD: 2901131

Parameter	Units	2901132							RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits				
4,4'-DDD	ug/L	1	1.0	1.0	101	102	67-125	1	20		
4,4'-DDE	ug/L	1	1.0	1.0	100	100	68-125	1	20		
4,4'-DDT	ug/L	1	0.84	0.85	84	85	66-125	1	20		
Aldrin	ug/L	.5	0.46	0.45	91	91	46-125	1	20		
alpha-BHC	ug/L	.5	0.50	0.51	100	101	66-125	1	20		
alpha-Chlordane	ug/L	.5	0.50	0.51	100	101	72-125	1	20		
beta-BHC	ug/L	.5	0.50	0.50	99	100	72-125	1	20		
delta-BHC	ug/L	.5	0.43	0.43	85	86	37-141	1	20		
Dieldrin	ug/L	1	1.1	1.1	108	110	71-125	1	20		
Endosulfan I	ug/L	.5	0.49	0.49	97	99	69-125	2	20		
Endosulfan II	ug/L	1	1.0	1.1	105	107	73-125	2	20		
Endosulfan sulfate	ug/L	1	0.91	0.92	91	92	63-127	1	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Parameter	Units	2901131		2901132			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Endrin	ug/L	1	1.0	1.0	101	102	72-125	1	20	
Endrin aldehyde	ug/L	1	0.98	0.99	98	99	70-125	1	20	
Endrin ketone	ug/L	1	1.0	1.0	103	104	72-127	1	20	
gamma-BHC (Lindane)	ug/L	.5	0.51	0.51	101	102	69-125	1	20	
gamma-Chlordane	ug/L	.5	0.41	0.42	83	84	64-125	1	20	
Heptachlor	ug/L	.5	0.47	0.47	94	94	54-125	0	20	
Heptachlor epoxide	ug/L	.5	0.51	0.52	103	104	72-125	1	20	
Methoxychlor	ug/L	5	4.1	4.1	82	83	67-127	1	20	
Decachlorobiphenyl (S)	%				67	72	30-143			
Tetrachloro-m-xylene (S)	%				96	96	62-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 534023 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2901133 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/25/18 09:57	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/25/18 09:57	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/25/18 09:57	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/25/18 09:57	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/25/18 09:57	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/25/18 09:57	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/25/18 09:57	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/25/18 09:57	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/25/18 09:57	
Decachlorobiphenyl (S)	%	62	30-125	04/25/18 09:57	
Tetrachloro-m-xylene (S)	%	54	30-125	04/25/18 09:57	

LABORATORY CONTROL SAMPLE & LCSD: 2901134

Parameter	Units	2901135								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.3	1.3	67	64	47-125	5	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.5	1.4	73	68	54-125	6	20	
Decachlorobiphenyl (S)	%				63	62	30-125			
Tetrachloro-m-xylene (S)	%				73	58	30-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 533843 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2899581 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	05/03/18 16:45	
2,4-Dichlorophenol	ug/L	ND	10.0	05/03/18 16:45	
2,4-Dimethylphenol	ug/L	ND	50.0	05/03/18 16:45	
2,4-Dinitrophenol	ug/L	ND	10.0	05/03/18 16:45	
2-Chlorophenol	ug/L	ND	10.0	05/03/18 16:45	
2-Methylnaphthalene	ug/L	ND	10.0	05/03/18 16:45	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	05/03/18 16:45	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	05/03/18 16:45	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	05/03/18 16:45	
4-Bromophenylphenyl ether	ug/L	ND	10.0	05/03/18 16:45	
Acenaphthene	ug/L	ND	10.0	05/03/18 16:45	
Anthracene	ug/L	ND	10.0	05/03/18 16:45	
Benzo(a)pyrene	ug/L	ND	10.0	05/03/18 16:45	
Benzoic acid	ug/L	ND	50.0	05/03/18 16:45	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	05/03/18 16:45	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	05/03/18 16:45	
Butylbenzylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Di-n-butylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Di-n-octylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Diethylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Dimethylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Fluoranthene	ug/L	ND	10.0	05/03/18 16:45	
Fluorene	ug/L	ND	10.0	05/03/18 16:45	
Hexachlorobenzene	ug/L	ND	10.0	05/03/18 16:45	
Hexachlorocyclopentadiene	ug/L	ND	50.0	05/03/18 16:45	
Hexachloroethane	ug/L	ND	10.0	05/03/18 16:45	
Isophorone	ug/L	ND	10.0	05/03/18 16:45	
N-Nitrosodiphenylamine	ug/L	ND	10.0	05/03/18 16:45	
Pentachlorophenol	ug/L	ND	20.0	05/03/18 16:45	
Phenanthrene	ug/L	ND	10.0	05/03/18 16:45	
Phenol	ug/L	ND	10.0	05/03/18 16:45	
Pyrene	ug/L	ND	10.0	05/03/18 16:45	
2,4,6-Tribromophenol (S)	%	89	65-125	05/03/18 16:45	
2-Fluorobiphenyl (S)	%	79	56-125	05/03/18 16:45	
2-Fluorophenol (S)	%	82	55-125	05/03/18 16:45	
Nitrobenzene-d5 (S)	%	86	60-125	05/03/18 16:45	
p-Terphenyl-d14 (S)	%	92	58-125	05/03/18 16:45	
Phenol-d6 (S)	%	85	58-125	05/03/18 16:45	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

LABORATORY CONTROL SAMPLE & LCSD: 2899582		2899583								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	43.7	48.0	87	96	74-125	9	20	
2,4-Dichlorophenol	ug/L	50	42.8	45.4	86	91	68-125	6	20	
2,4-Dimethylphenol	ug/L	50	38.8J	42.1J	78	84	33-125		20	
2,4-Dinitrophenol	ug/L	50	11.9	16.0	24	32	30-127	29	20	L2,R1
2-Chlorophenol	ug/L	50	41.8	45.0	84	90	61-125	7	20	
2-Methylnaphthalene	ug/L	50	42.0	44.9	84	90	67-125	7	20	
2-Methylphenol(o-Cresol)	ug/L	50	41.6	45.2	83	90	63-125	8	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	43.4	45.9	87	92	67-125	6	20	
3,3'-Dichlorobenzidine	ug/L	50	47J	46J	94	92	60-125		20	2M
4-Bromophenylphenyl ether	ug/L	50	43.7	45.7	87	91	75-125	5	20	
Acenaphthene	ug/L	50	42.5	46.5	85	93	74-125	9	20	
Anthracene	ug/L	50	45.0	47.3	90	95	75-125	5	20	
Benzo(a)pyrene	ug/L	50	45.5	48.0	91	96	75-125	5	20	
Benzoic acid	ug/L	50	35.8J	42.7J	72	85	30-125		20	
bis(2-Chloroethyl) ether	ug/L	50	42.8	46.3	86	93	55-125	8	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	46.9	48.2	94	96	72-129	3	20	
Butylbenzylphthalate	ug/L	50	46.3	48.6	93	97	69-127	5	20	
Di-n-butylphthalate	ug/L	50	46.3	48.3	93	97	75-125	4	20	
Di-n-octylphthalate	ug/L	50	47.0	48.7	94	97	69-131	4	20	
Diethylphthalate	ug/L	50	45.2	49.6	90	99	75-125	9	20	
Dimethylphthalate	ug/L	50	44.6	49.1	89	98	75-125	10	20	
Fluoranthene	ug/L	50	45.9	48.1	92	96	75-125	5	20	
Fluorene	ug/L	50	45.0	48.1	90	96	75-125	7	20	
Hexachlorobenzene	ug/L	50	44.0	47.3	88	95	74-125	7	20	
Hexachlorocyclopentadiene	ug/L	50	ND	ND	22	23	30-125		20	L2
Hexachloroethane	ug/L	50	29.1	31.4	58	63	30-125	8	20	
Isophorone	ug/L	50	42.9	45.7	86	91	72-125	6	20	
N-Nitrosodiphenylamine	ug/L	50	45.1	46.5	90	93	75-125	3	20	
Pentachlorophenol	ug/L	50	40.2	43.5	80	87	52-125	8	20	
Phenanthrene	ug/L	50	44.9	47.2	90	94	75-125	5	20	
Phenol	ug/L	50	41.9	45.7	84	91	59-125	9	20	
Pyrene	ug/L	50	45.8	47.8	92	96	75-125	4	20	
2,4,6-Tribromophenol (S)	%				89	97	65-125			
2-Fluorobiphenyl (S)	%				71	78	56-125			
2-Fluorophenol (S)	%				78	85	55-125			
Nitrobenzene-d5 (S)	%				84	88	60-125			
p-Terphenyl-d14 (S)	%				90	93	58-125			
Phenol-d6 (S)	%				82	89	58-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

QC Batch: 533559

Analysis Method: Hach 10360 Rev 1.1

QC Batch Method: Hach 10360

Analysis Description: Hach 10360 Rev 1.1, BOD

Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2898263

Matrix: Water

Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	04/25/18 13:36	B4

LABORATORY CONTROL SAMPLE: 2898265

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	166	84	85-115	B4

SAMPLE DUPLICATE: 2898266

Parameter	Units	10428032001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	11.2	11.0	3	20	B4

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 536509 Analysis Method: EPA 1664A OG
QC Batch Method: EPA 1664A OG Analysis Description: 1664 HEM, Oil and Grease
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2916482 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	05/07/18 10:00	

LABORATORY CONTROL SAMPLE: 2916483

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	37.4	94	78-114	

MATRIX SPIKE SAMPLE: 2916484

Parameter	Units	10429264001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	ND	40	32.4	79	78-114	

SAMPLE DUPLICATE: 2916485

Parameter	Units	10429268001 Result	Dup Result	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	ND	ND		18	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

QC Batch: 533620 Analysis Method: EPA 180.1
 QC Batch Method: EPA 180.1 Analysis Description: 180.1 Turbidity
 Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2898779 Matrix: Water

Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	04/21/18 11:51	

LABORATORY CONTROL SAMPLE: 2898780

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.2	98	90-110	

SAMPLE DUPLICATE: 2898781

Parameter	Units	10428166001 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	1460	1590	9	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 534453 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2903621 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	04/26/18 10:14	

LABORATORY CONTROL SAMPLE: 2903622

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	94.0	94	80-120	

SAMPLE DUPLICATE: 2903623

Parameter	Units	10428237001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	66.0	65.0	2	10	

SAMPLE DUPLICATE: 2903624

Parameter	Units	10428237002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	9J		10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

QC Batch: 534746 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 10428166001, 10428166002

LABORATORY CONTROL SAMPLE: 2905107

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.1	102	98-102	H6

SAMPLE DUPLICATE: 2905108

Parameter	Units	10428045005 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.5	7.5	0	3	H6

SAMPLE DUPLICATE: 2905109

Parameter	Units	10428106007 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.6	6.6	0	3	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 534491 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2903856 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	ND	0.050	04/26/18 13:21	

LABORATORY CONTROL SAMPLE: 2903857

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	1	0.98	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903858 2903859

Parameter	Units	10428659008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.64	1	1	1.6	1.6	93	92	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903860 2903861

Parameter	Units	10428686003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.18J	1	1	1.2	1.2	101	98	90-110	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 533606 Analysis Method: SM 3500-Cr B Modified
QC Batch Method: SM 3500-Cr B Modified Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2898701 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	04/21/18 08:41	FS

LABORATORY CONTROL SAMPLE: 2898702

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.21	107	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898703 2898704

Parameter	Units	10428166001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/L	ND	.2	.2	.0062J	.0057J	1	0	85-115		20	FS,M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 141636 Analysis Method: EPA 350.1 rev. 2 (1993)
QC Batch Method: EPA 350.1 rev. 2 (1993) Analysis Description: 350.1 Ammonia Distilled
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 560012 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	05/01/18 07:54	

LABORATORY CONTROL SAMPLE: 560013

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.2	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 560014 560015

Parameter	Units	12107666003		560014		560015		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result				
Nitrogen, Ammonia	mg/L	0.21	5	5	5	ND	0.28	-4	1	90-110	10 M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

QC Batch: 533605

Analysis Method: EPA 353.2

QC Batch Method: EPA 353.2

Analysis Description: 353.2 Nitrate + Nitrite, preserved

Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2898697

Matrix: Water

Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	04/21/18 08:38	FS
Nitrite as N	mg/L	ND	0.020	04/21/18 08:38	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	04/21/18 08:38	FS

LABORATORY CONTROL SAMPLE: 2898698

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	0.99	99	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	0.95	95	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898699 2898700

Parameter	Units	10428166001		2898700		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Nitrite as N	mg/L	0.046	1	1	1.0	1.0	97	96	90-110	1	20	FS
Nitrogen, NO2 plus NO3	mg/L	0.42	1	1	1.4	1.4	99	95	90-110	3	20	FS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 21467 Analysis Method: EPA 9016
QC Batch Method: EPA 9016 Analysis Description: 9016 Free Cyanide
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 85665 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/27/18 19:56	

LABORATORY CONTROL SAMPLE: 85666

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	154	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 85667 85668

Parameter	Units	10428166001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Cyanide, Free	ug/L	ND	150	150	150	154	161	103	107	80-120	4	11			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 534468 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2903673 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/27/18 09:57	

LABORATORY CONTROL SAMPLE: 2903674

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	258	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903675 2903676

Parameter	Units	10428172001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Cyanide	ug/L	10.1	250	238	250	242	91	93	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903677 2903678

Parameter	Units	10428174001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Cyanide	ug/L	10.6	250	241	250	242	92	92	80-120	0	30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 535812 Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2912141 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.10	05/04/18 07:47	

LABORATORY CONTROL SAMPLE: 2912142

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	0.98	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2912143 2912144

Parameter	Units	10429163001		2912143		2912144		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Phosphorus	mg/L	0.34	1	1	1.3	1.4	101	104	80-120	2	30

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2912145 2912146

Parameter	Units	10429163002		2912145		2912146		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Phosphorus	mg/L	0.45	1	1	1.4	1.5	99	102	80-120	2	30

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10428166

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 533882

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 534200

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 534351

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 536509

[BE] Batch extracted by solid phase extraction (SPE).

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

ANALYTE QUALIFIERS

1M	Sample was yellow in color.
2M	The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
B4	The glucose/glutamic acid standard exceeded the range of 198 plus or minus 30.5 mg/L.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
FS	The sample was filtered in the laboratory prior to analysis.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
P3	Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
R1	RPD value was outside control limits.
S0	Surrogate recovery outside laboratory control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10428166001	FL-TT-08				
10428166002	FL-TT-08Dup				
10428166001	FL-TT-08	EPA Mod. 3510C	534022	EPA 8081B	534351
10428166002	FL-TT-08Dup	EPA Mod. 3510C	534022	EPA 8081B	534351
10428166001	FL-TT-08	EPA Mod. 3510C	534023	EPA 8082A	534200
10428166002	FL-TT-08Dup	EPA Mod. 3510C	534023	EPA 8082A	534200
10428166001	FL-TT-08	EPA 200.7	533435	EPA 200.7	534229
10428166002	FL-TT-08Dup	EPA 200.7	533435	EPA 200.7	534229
10428166001	FL-TT-08	EPA 200.8	533691	EPA 200.8	533859
10428166002	FL-TT-08Dup	EPA 200.8	533691	EPA 200.8	533859
10428166001	FL-TT-08	EPA 200.8	533428	EPA 200.8	533889
10428166002	FL-TT-08Dup	EPA 200.8	533428	EPA 200.8	533889
10428166001	FL-TT-08	EPA 245.1	533449	EPA 245.1	533882
10428166002	FL-TT-08Dup	EPA 245.1	533449	EPA 245.1	533882
10428166001	FL-TT-08	EPA 3520	533843	EPA 8270D	534330
10428166002	FL-TT-08Dup	EPA 3520	533843	EPA 8270D	534330
10428166001	FL-TT-08				
10428166002	FL-TT-08Dup				
10428166001	FL-TT-08	Hach 10360	533559	Hach 10360 Rev 1.1	533761
10428166002	FL-TT-08Dup	Hach 10360	533559	Hach 10360 Rev 1.1	533761
10428166001	FL-TT-08	EPA 1664A OG	536509		
10428166002	FL-TT-08Dup	EPA 1664A OG	536509		
10428166001	FL-TT-08	EPA 180.1	533620		
10428166002	FL-TT-08Dup	EPA 180.1	533620		
10428166001	FL-TT-08	SM 2540D	534453		
10428166002	FL-TT-08Dup	SM 2540D	534453		
10428166001	FL-TT-08	SM 4500-H+B	534746		
10428166002	FL-TT-08Dup	SM 4500-H+B	534746		
10428166001	FL-TT-08	Trivalent Chromium Calculation	535426		
10428166002	FL-TT-08Dup	Trivalent Chromium Calculation	535426		
10428166001	FL-TT-08	EPA 300.0	534491		
10428166002	FL-TT-08Dup	EPA 300.0	534491		
10428166001	FL-TT-08	SM 3500-Cr B Modified	533606		
10428166002	FL-TT-08Dup	SM 3500-Cr B Modified	533606		
10428166001	FL-TT-08	EPA 350.1			
10428166002	FL-TT-08Dup	EPA 350.1			
10428166001	FL-TT-08	EPA 350.1 rev. 2 (1993)	141636	EPA 350.1 rev. 2 (1993)	141774
10428166002	FL-TT-08Dup	EPA 350.1 rev. 2 (1993)	141636	EPA 350.1 rev. 2 (1993)	141774

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10428166001	FL-TT-08	EPA 353.2	533605		
10428166002	FL-TT-08Dup	EPA 353.2	533605		
10428166001	FL-TT-08	EPA 9016	21467	EPA 9016	21631
10428166002	FL-TT-08Dup	EPA 9016	21467	EPA 9016	21631
10428166001	FL-TT-08	SM 4500-CN-E	534468	SM 4500-CN-E	534565
10428166002	FL-TT-08Dup	SM 4500-CN-E	534468	SM 4500-CN-E	534565
10428166001	FL-TT-08	SM 4500-P B	535812	SM 4500-P E	535910
10428166002	FL-TT-08Dup	SM 4500-P B	535812	SM 4500-P E	535910

REPORT OF LABORATORY ANALYSIS

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WO#: 10428166



10428166

Client Form	Work Order Number:	COC Type:	Page: 1 of 3
CLIENT INFO	Turnaround Time:	COC ID:	FOR LAB USE ONLY
Facility Code: MNSW-057/MPCA Freeway LF	Program Code (MDH Lab Only):	LABORATORY	Lab Work Order Sticker
Project Name: MPCA Freeway LF Waters	Project Task Code:	Lab Name:	
Project Manager: Jennifer Anderson (Pace)	Potential Hazard? If yes, add information to Sampler Comments Section	Address: 18-00383	
		EPIC Profile # 38716	
		Phone No:	

SAMPLE DETAILS										ANALYSIS REQUESTED															
SAMPLE TYPE CODES				LAB MATRIX CODES				FIELD MATRIX CODES				PRESERV.	ANALYSIS												
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont		1	2	3	4	5	6	7	8	9	10			
FL-TT-08	S	4/20/18	1500			G	NW	wtr-ground			16	X									001	1			
FL-TT-08 Dup	S	4/20/18	1525			G	NW	wtr-ground			16	X									002	2			
JAK 4/20/18																									

Sampled By: Jack Kokkinen / Zack Eckstrom Sampler's Signature: *[Signature]* Phone #: 612-437-5651

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
<i>[Signature]</i>	4/20/18 1730	<i>[Signature] Pace</i>	4/20/18 1730

T = 6.6°C
7.1°C

Sample Condition Upon Receipt

Client Name: MPCA Project #: _____

WO# : 10428166
 PM: JMA Due Date: 05/07/18
 CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 G87A9155100842
 Used: _____ Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 6.6, 7.1 Cooler Temp Corrected (°C): 6.6, 7.1 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: None Date and Initials of Person Examining Contents: HF 4-20-18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Colliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-2, 3, 7/2, 1/1, 1/1</u>
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: [Signature] Date: 04/20/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals - Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury - Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	
	EPA 8270 SIM

- Analysis by MDH Laboratory

** ADD to Parameter List A:

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Hardness determination)

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500ClO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 801.1
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace

Sample Condition Upon Receipt

Client Name: Pace MRI
 Project #:

WO# : 10428166
 PM: JMA Due Date: 05/07/18
 CLIENT: PAST-MINELD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other:
 Tracking Number:

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: Temp Blank? Yes No

Thermometer: 151401163 687A9155100842
 Used: Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 3.6 Cooler Temp Corrected (°C): 3.6 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: none Date and Initials of Person Examining Contents: ME 4/25/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7. <u>Return Samples</u>
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>Wf</u>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-2</u>
(HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: [Signature] Date: 04/26/2018
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

WO#: 12107530



12107530

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10428166 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 4/20/2018 Results Requested By: 5/7/2018

Report To		Subcontract To					Requested Analysis																																																																																																																																							
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Nitrogen, unionized ammonia, as N</div> <table border="1" style="width: 100%; height: 100%;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> </div>																																																																																																																																							
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	H2SO4	LAB USE ONLY																																																																																																																																							
1	FL-TT-08	PS	4/20/2018 15:00	10428166001	Water	1																																																																																																																																								
2	FL-TT-08Dup	PS	4/20/2018 15:25	10428166002	Water	1																																																																																																																																								
3																																																																																																																																														
4																																																																																																																																														
5																																																																																																																																														

Transfers						Comments									
Released By	Date/Time	Received By	Date/Time												
<i>Wendy J. Pace</i>	4/23/18	<i>B. Mathews</i>	4/24/18	1906											
<i>R. Orr</i>	4/24/18	<i>B. Mathews</i>	4/25/18	0730											

Cooler Temperature on Receipt 2.4 °C Custody Seal M or N Received on Ice Y or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace MN

Project #: **WO#: 12107530**
 PM: HRZ Due Date: 05/07/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.1 Cooler Temp Corrected °C: 2.4 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: HRZ 4/25/18

Comments: Bm 4/25/18

Chain of Custody Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review:

Angela Loisel

Date: 4/25/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

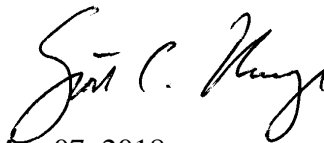
PaceProject#: 10428168
Sample Receipt Date: 04/20/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



May 07, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

May 7, 2018



DISCUSSION

This report presents the results from the analyses performed on two samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration point and a nominal 1-Liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The samples were received above the recommended temperature range of 0-6 degrees Celsius.

The isotopically-labeled TCDD internal standard in the sample extracts was recovered at 68-78%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 127-128% with a relative percent difference of 0.8%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10428232

Appendix A

Sample Management



Report No.: 10428168_1613TCDD_DFR

Custody Form

Work Order Number: _____ COC Type: _____ Page: 1 of 1

Turnaround Time: _____ COC ID: _____

Control Agency	PROJECT/CLIENT INFO	LABORATORY	FOR LAB USE ONLY Lab Work Order Sticker
Facility Code: MNSW-057/MPCA Freeway LF	Program Code (MDH Lab Only):	Lab Name:	
Project Name: MPCA Freeway LF Waters	Project Task Code:	Address: 18-00383	
Project Manager: Jennifer Anderson (Pace)		EPIC Profile # 38716	
Potential Hazard?	If yes, add information to Sampler Comments Section	Phone No:	

SAMPLE DETAILS										ANALYSIS REQUESTED														
SAMPLE TYPE CODES				LAB MATRIX CODES				FIELD MATRIX CODES		PRESERV.	ANALYSIS	ANALYSIS REQUESTED								Lab Sample No.	#			
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS			Sampler Comments (filter volume, special handling, etc.)	# of Cont	1	2	3	4	5	6			7	8	9
FL-TT-08	S	4/20/18	1500			G	NW	wt-ground			16	X										001	1	
FL-TT-08 Dup	S	4/20/18	1525			G	NW	wt-ground			16	X											002	2
JAK 4/20/18																								
																								3
																								4
																								5
																								6
																								7
																								8
																								9
																								10

Sampled By: Jack Kollinen / Zack Ekstrom Sampler's Signature: *[Signature]* Phone #: 612-437-5651

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
<i>[Signature]</i>	4/20/18 1730	<i>[Signature] Pace</i>	4/20/18 1730

T = 6.6°C
7.1°C

Sample Condition Upon Receipt

Client Name: MPCA Project #: _____

WOH: 10428168

PM: SCU DUG D-UG 05/07/18

CLIENT: PA-MN-110

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____
 Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 Type of Ice: Wet Blue None Dry Melted
 Used: G87A9155100842

Cooler Temp Read (°C): 6.6, 7.1 Cooler Temp Corrected (°C): 6.6, 7.1 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: True Date and Initials of Person Examining Contents: HF 4-20-18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. <u>NO 4/20/18</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: Received during cool down phase.

Project Manager Review: [Signature] Date: 04/23/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10428232

Report No.....10428168_1613TCDD_DFR

Page 7 of 14

Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-08		
Lab Sample ID	10428168001		
Filename	U180507A_13		
Injected By	BAL		
Total Amount Extracted	501 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	04/20/2018 15:00
ICAL ID	U180405	Received	04/20/2018 17:30
CCal Filename(s)	U180506B_16	Extracted	04/26/2018 14:00
Method Blank ID	BLANK-61971	Analyzed	05/07/2018 07:18

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	78
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	92

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-08Dup		
Lab Sample ID	10428168002		
Filename	U180507A_14		
Injected By	BAL		
Total Amount Extracted	528 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	04/20/2018 15:25
ICAL ID	U180405	Received	04/20/2018 17:30
CCal Filename(s)	U180506B_16	Extracted	04/26/2018 14:00
Method Blank ID	BLANK-61971	Analyzed	05/07/2018 08:06

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	68
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	75

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61971	Matrix	Water
Filename	F180501A_06	Dilution	NA
Total Amount Extracted	1040 mL	Extracted	04/26/2018 14:00
ICAL ID	F180405	Analyzed	05/01/2018 20:42
CCal Filename(s)	F180501A_01	Injected By	BAL

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	74
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	83

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61972	Matrix	Water
Filename	F180501A_04	Dilution	NA
Total Amount Extracted	1040 mL	Extracted	04/26/2018 14:00
ICAL ID	F180405	Analyzed	05/01/2018 19:12
CCal Filename	F180501A_01	Injected By	BAL
Method Blank ID	BLANK-61971		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	13	7.3	14.6	127
2,3,7,8-TCDD-37Cl4	10	9.6	3.7	15.8	96
2,3,7,8-TCDD-13C	100	82	25.0	141.0	82

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61973	Matrix	Water
Filename	F180501A_05	Dilution	NA
Total Amount Extracted	1010 mL	Extracted	04/26/2018 14:00
ICAL ID	F180405	Analyzed	05/01/2018 19:57
CCal Filename	F180501A_01	Injected By	BAL
Method Blank ID	BLANK-61971		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	13	7.3	14.6	128
2,3,7,8-TCDD-37Cl4	10	6.2	3.7	15.8	62
2,3,7,8-TCDD-13C	100	51	25.0	141.0	51

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61972
Spike 1 Filename F180501A_04

Spike 2 ID LCSD-61973
Spike 2 Filename F180501A_05

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	127	128	0.8

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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May 09, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 20, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

California Certification #2973

Montana Certificate #CERT0103

California Certification #2973

Alaska Certification UST-107

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842018-1

Oklahoma Department of Environmental Quality

California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807

Minnesota Dept of Health Certification #: 1382680

Nevada DCNR Certification #: MN000372018-1

Montana DHHS Certification #: CERT0102

Wisconsin DNR Certification #: 999446800

North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

Virginia VELAP ID: 460263

South Carolina Certification #: 83006001

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10428176001	FL-TT-08 (1-7 WM)	Solid	04/20/18 14:30	04/20/18 17:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10428176001	FL-TT-08 (1-7 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	AET1	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Sample: **FL-TT-08 (1-7 WM)** Lab ID: **10428176001** Collected: 04/20/18 14:30 Received: 04/20/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	18.3	1	05/04/18 10:07	05/07/18 15:03	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	309-00-2	
alpha-BHC	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	319-84-6	
beta-BHC	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	319-85-7	
delta-BHC	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	58-89-9	
Chlordane (Technical)	ND	ug/kg	232	5	04/26/18 06:51	05/04/18 23:16	57-74-9	
alpha-Chlordane	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	5103-71-9	
gamma-Chlordane	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	5103-74-2	
4,4'-DDD	68.7	ug/kg	46.2	5	04/26/18 06:51	05/04/18 23:16	72-54-8	
4,4'-DDE	93.9	ug/kg	46.2	5	04/26/18 06:51	05/04/18 23:16	72-55-9	
4,4'-DDT	ND	ug/kg	46.2	5	04/26/18 06:51	05/04/18 23:16	50-29-3	
Dieldrin	ND	ug/kg	46.2	5	04/26/18 06:51	05/04/18 23:16	60-57-1	
Endosulfan I	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	959-98-8	
Endosulfan II	ND	ug/kg	46.2	5	04/26/18 06:51	05/04/18 23:16	33213-65-9	
Endosulfan sulfate	ND	ug/kg	46.2	5	04/26/18 06:51	05/04/18 23:16	1031-07-8	
Endrin	ND	ug/kg	46.2	5	04/26/18 06:51	05/04/18 23:16	72-20-8	
Endrin aldehyde	ND	ug/kg	46.2	5	04/26/18 06:51	05/04/18 23:16	7421-93-4	
Endrin ketone	ND	ug/kg	46.2	5	04/26/18 06:51	05/04/18 23:16	53494-70-5	
Heptachlor	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	76-44-8	
Heptachlor epoxide	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	1024-57-3	
Methoxychlor	ND	ug/kg	232	5	04/26/18 06:51	05/04/18 23:16	72-43-5	
Toxaphene	ND	ug/kg	693	5	04/26/18 06:51	05/04/18 23:16	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	94	%	30-150	5	04/26/18 06:51	05/04/18 23:16	877-09-8	1M,D4
Decachlorobiphenyl (S)	97	%	30-150	5	04/26/18 06:51	05/04/18 23:16	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	11100-14-4	
PCB, Total	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	67	%	48-125	1	04/23/18 13:09	04/24/18 12:01	877-09-8	
Decachlorobiphenyl (S)	74	%	30-134	1	04/23/18 13:09	04/24/18 12:01	2051-24-3	CH
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	781	mg/kg	211	10	04/23/18 18:25	04/25/18 13:58		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Lab Project No.: 10428176

Sample: FL-TT-08 (1-7 WM) **Lab ID:** 10428176001 Collected: 04/20/18 14:30 Received: 04/20/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	0	%	50-150	10	04/23/18 18:25	04/25/18 13:58	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	29.9	1	05/03/18 14:43	05/04/18 08:24		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	05/03/18 14:43	05/04/18 08:24	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	9180	mg/kg	27.0	1	04/23/18 07:48	04/26/18 14:13	7429-90-5	
Barium	383	mg/kg	1.3	1	04/23/18 07:48	04/26/18 14:13	7440-39-3	
Boron	47.3	mg/kg	20.2	1	04/23/18 07:48	04/26/18 14:13	7440-42-8	
Copper	30.6	mg/kg	1.3	1	04/23/18 07:48	04/26/18 14:13	7440-50-8	
Iron	22500	mg/kg	6.7	1	04/23/18 07:48	04/26/18 14:13	7439-89-6	
Manganese	470	mg/kg	0.67	1	04/23/18 07:48	04/26/18 14:13	7439-96-5	
Nickel	19.6	mg/kg	2.7	1	04/23/18 07:48	04/26/18 14:13	7440-02-0	
Silver	2.6	mg/kg	1.3	1	04/23/18 07:48	04/26/18 14:13	7440-22-4	
Tin	16.2	mg/kg	10.1	1	04/23/18 07:48	04/26/18 14:13	7440-31-5	
Titanium	163	mg/kg	3.4	1	04/23/18 07:48	04/26/18 14:13	7440-32-6	
Zinc	776	mg/kg	2.7	1	04/23/18 07:48	04/26/18 14:13	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	14.4	mg/kg	0.54	1	04/25/18 09:25	04/26/18 04:38	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.4	20	04/23/18 08:19	04/25/18 16:16	7440-36-0	
Arsenic	5.6	mg/kg	1.4	20	04/23/18 08:19	04/25/18 16:16	7440-38-2	
Beryllium	0.73	mg/kg	0.56	20	04/23/18 08:19	04/25/18 16:16	7440-41-7	
Cadmium	2.0	mg/kg	0.22	20	04/23/18 08:19	04/25/18 16:16	7440-43-9	
Cobalt	11.4	mg/kg	1.4	20	04/23/18 08:19	04/25/18 16:16	7440-48-4	
Lead	88.4	mg/kg	0.28	20	04/23/18 08:19	04/25/18 16:16	7439-92-1	
Lithium	7.8	mg/kg	1.4	20	04/23/18 08:19	04/25/18 16:16	7439-93-2	
Selenium	1.9	mg/kg	1.4	20	04/23/18 08:19	04/25/18 16:16	7782-49-2	
Strontium	81.7	mg/kg	1.4	20	04/23/18 08:19	04/25/18 16:16	7440-24-6	
Vanadium	34.2	mg/kg	2.8	20	04/23/18 08:19	04/25/18 16:16	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.12	mg/kg	0.052	1	04/23/18 07:02	04/24/18 16:41	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	64.0	%	0.10	1		05/02/18 12:05		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	83-32-9	
Acenaphthylene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Sample: FL-TT-08 (1-7 WM) **Lab ID: 10428176001** Collected: 04/20/18 14:30 Received: 04/20/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	120-12-7	
Benzo(a)anthracene	1060	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	56-55-3	
Benzo(a)pyrene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	50-32-8	
Benzo(b)fluoranthene	1160	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	101-55-3	
Butylbenzylphthalate	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	85-68-7	
Carbazole	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	59-50-7	
4-Chloroaniline	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	108-60-1	
2-Chloronaphthalene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	91-58-7	
2-Chlorophenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	7005-72-3	
Chrysene	1090	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	53-70-3	
Dibenzofuran	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	120-83-2	
Diethylphthalate	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	105-67-9	
Dimethylphthalate	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	131-11-3	
Di-n-butylphthalate	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	4720	1	04/24/18 16:53	04/26/18 18:36	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	606-20-2	
Di-n-octylphthalate	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	122-66-7	
bis(2-Ethylhexyl)phthalate	8130	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	117-81-7	
Fluoranthene	2280	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	206-44-0	
Fluorene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	87-68-3	
Hexachlorobenzene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	118-74-1	
Hexachloroethane	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	193-39-5	
Isophorone	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	78-59-1	
1-Methylnaphthalene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	90-12-0	
2-Methylnaphthalene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Sample: **FL-TT-08 (1-7 WM)** Lab ID: **10428176001** Collected: 04/20/18 14:30 Received: 04/20/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1830	1	04/24/18 16:53	04/26/18 18:36		
Naphthalene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	91-20-3	
2-Nitroaniline	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	88-74-4	
3-Nitroaniline	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	99-09-2	
4-Nitroaniline	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	100-01-6	
Nitrobenzene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	98-95-3	
2-Nitrophenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	88-75-5	
4-Nitrophenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	86-30-6	
Pentachlorophenol	ND	ug/kg	1860	1	04/24/18 16:53	04/26/18 18:36	87-86-5	
Phenanthrene	1700	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	85-01-8	
Phenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	108-95-2	
Pyrene	2050	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	62	%.	43-125	1	04/24/18 16:53	04/26/18 18:36	4165-60-0	
2-Fluorobiphenyl (S)	75	%.	30-132	1	04/24/18 16:53	04/26/18 18:36	321-60-8	
p-Terphenyl-d14 (S)	86	%.	62-125	1	04/24/18 16:53	04/26/18 18:36	1718-51-0	
Phenol-d6 (S)	65	%.	48-125	1	04/24/18 16:53	04/26/18 18:36	13127-88-3	
2-Fluorophenol (S)	63	%.	40-125	1	04/24/18 16:53	04/26/18 18:36	367-12-4	
2,4,6-Tribromophenol (S)	76	%.	60-125	1	04/24/18 16:53	04/26/18 18:36	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	83-32-9	
Acenaphthylene	ND	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	208-96-8	
Anthracene	29.6	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	120-12-7	
Benzo(a)anthracene	66.4	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	56-55-3	
Benzo(a)pyrene	69.7	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	50-32-8	
Benzo(b)fluoranthene	98.3	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	205-99-2	
Benzo(g,h,i)perylene	58.5	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	191-24-2	
Benzo(k)fluoranthene	81.8	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	207-08-9	
Chrysene	98.1	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	53-70-3	
Fluoranthene	126	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	206-44-0	
Fluorene	90.8	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	86-73-7	
Indeno(1,2,3-cd)pyrene	46.6	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	193-39-5	
Naphthalene	30.8	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	91-20-3	
Phenanthrene	116	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	85-01-8	
Pyrene	96.0	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	80	%.	42-125	1	04/23/18 07:27	04/24/18 20:33	321-60-8	
p-Terphenyl-d14 (S)	62	%.	57-125	1	04/23/18 07:27	04/24/18 20:33	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Sample: **FL-TT-08 (1-7 WM)** Lab ID: **10428176001** Collected: 04/20/18 14:30 Received: 04/20/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	2740	1	05/03/18 13:18	05/03/18 21:13	67-64-1	
Allyl chloride	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	107-05-1	
Benzene	ND	ug/kg	54.9	1	05/03/18 13:18	05/03/18 21:13	71-43-2	
Bromobenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	108-86-1	
Bromochloromethane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	74-97-5	
Bromodichloromethane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	75-27-4	
Bromoform	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	75-25-2	
Bromomethane	ND	ug/kg	1370	1	05/03/18 13:18	05/03/18 21:13	74-83-9	
2-Butanone (MEK)	ND	ug/kg	686	1	05/03/18 13:18	05/03/18 21:13	78-93-3	
n-Butylbenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	104-51-8	
sec-Butylbenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	135-98-8	
tert-Butylbenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	98-06-6	
Carbon tetrachloride	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	56-23-5	
Chlorobenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	108-90-7	
Chloroethane	ND	ug/kg	1370	1	05/03/18 13:18	05/03/18 21:13	75-00-3	
Chloroform	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	67-66-3	
Chloromethane	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	74-87-3	
2-Chlorotoluene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	95-49-8	
4-Chlorotoluene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1370	1	05/03/18 13:18	05/03/18 21:13	96-12-8	
Dibromochloromethane	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	106-93-4	
Dibromomethane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	541-73-1	
1,4-Dichlorobenzene	415	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	75-71-8	
1,1-Dichloroethane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	75-34-3	
1,2-Dichloroethane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	107-06-2	
1,1-Dichloroethene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1370	1	05/03/18 13:18	05/03/18 21:13	75-43-4	
1,2-Dichloropropane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	78-87-5	
1,3-Dichloropropane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	142-28-9	
2,2-Dichloropropane	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	594-20-7	
1,1-Dichloropropene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	60-29-7	
Ethylbenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	686	1	05/03/18 13:18	05/03/18 21:13	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	98-82-8	
p-Isopropyltoluene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	99-87-6	
Methylene Chloride	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	686	1	05/03/18 13:18	05/03/18 21:13	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Sample: FL-TT-08 (1-7 WM) **Lab ID:** 10428176001 Collected: 04/20/18 14:30 Received: 04/20/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	1634-04-4	
Naphthalene	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	91-20-3	
n-Propylbenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	103-65-1	
Styrene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	79-34-5	
Tetrachloroethene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	127-18-4	
Tetrahydrofuran	ND	ug/kg	5490	1	05/03/18 13:18	05/03/18 21:13	109-99-9	
Toluene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	79-00-5	
Trichloroethene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	79-01-6	
Trichlorofluoromethane	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	76-13-1	
1,2,4-Trimethylbenzene	156	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	108-67-8	
Vinyl chloride	ND	ug/kg	54.9	1	05/03/18 13:18	05/03/18 21:13	75-01-4	
Xylene (Total)	ND	ug/kg	412	1	05/03/18 13:18	05/03/18 21:13	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	75-125	1	05/03/18 13:18	05/03/18 21:13	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1	05/03/18 13:18	05/03/18 21:13	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	75-125	1	05/03/18 13:18	05/03/18 21:13	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	281	50	04/28/18 10:30	04/30/18 14:43	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	14.4	mg/kg	1.0	1		05/04/18 14:40	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	1.4	1	04/26/18 10:15	04/26/18 14:29	57-12-5	M0,R1
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	04/27/18 12:45	04/30/18 20:15	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

QC Batch: 142287 Analysis Method: EPA 1630 (1998)
QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
Associated Lab Samples: 10428176001

METHOD BLANK: 562608 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.21	05/07/18 13:37	N3

METHOD BLANK: 562609 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.15	05/07/18 13:43	N3

METHOD BLANK: 562610 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.21	05/07/18 13:50	N3

LABORATORY CONTROL SAMPLE: 562611

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	100	113	112	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 562612 562613

Parameter	Units	10428096004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	359	372	373	444	104	119	65-135	17	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

QC Batch: 535880 Analysis Method: WI MOD GRO
QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10428176001

METHOD BLANK: 2912515 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	05/03/18 23:08	
a,a,a-Trifluorotoluene (S)	%.	100	80-150	05/03/18 23:08	

LABORATORY CONTROL SAMPLE & LCSD: 2912516 2912517

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	43.4	45.7	87	91	80-120	5	20	
a,a,a-Trifluorotoluene (S)	%.				98	97	80-150			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2912904 2912905

Parameter	Units	10429117007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Gasoline Range Organics	mg/kg	ND	51.8	50.2	51.9	48.7	100	97	80-120	6	20	
a,a,a-Trifluorotoluene (S)	%.						99	99	80-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

QC Batch: 533683

Analysis Method: EPA 7471

QC Batch Method: EPA 7471

Analysis Description: 7471 Mercury

Associated Lab Samples: 10428176001

METHOD BLANK: 2898961

Matrix: Solid

Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.020	04/24/18 15:54	

LABORATORY CONTROL SAMPLE: 2898962

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.47	0.51	109	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898963 2898964

Parameter	Units	10428159001		2898963		2898964		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MS Result	MS Spike Conc.	MS Result	MS Spike Conc.				
Mercury	mg/kg	0.097	.52	.51	0.65	0.62	105	103	80-120	5	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

QC Batch: 533686 Analysis Method: EPA 6010C
QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
Associated Lab Samples: 10428176001

METHOD BLANK: 2898973 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.3	04/26/18 13:37	
Barium	mg/kg	ND	0.47	04/26/18 13:37	
Boron	mg/kg	ND	7.0	04/26/18 13:37	
Copper	mg/kg	ND	0.47	04/26/18 13:37	
Iron	mg/kg	ND	2.3	04/26/18 13:37	
Manganese	mg/kg	ND	0.23	04/26/18 13:37	
Nickel	mg/kg	ND	0.93	04/26/18 13:37	
Silver	mg/kg	ND	0.47	04/26/18 13:37	
Tin	mg/kg	ND	3.5	04/26/18 13:37	
Titanium	mg/kg	ND	1.2	04/26/18 13:37	
Zinc	mg/kg	ND	0.93	04/26/18 13:37	

LABORATORY CONTROL SAMPLE: 2898974

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	971	965	99	80-120	
Barium	mg/kg	48.5	50.1	103	80-120	
Boron	mg/kg	48.5	44.5	92	80-120	
Copper	mg/kg	48.5	48.4	100	80-120	
Iron	mg/kg	971	983	101	80-120	
Manganese	mg/kg	48.5	49.9	103	80-120	
Nickel	mg/kg	48.5	48.5	100	80-120	
Silver	mg/kg	24.3	22.8	94	80-120	
Tin	mg/kg	48.5	48.8	100	80-120	
Titanium	mg/kg	48.5	49.1	101	80-120	
Zinc	mg/kg	48.5	47.4	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898975 2898976

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10428096001 Result	Spike Conc.	Spike Conc.	Result						
Aluminum	mg/kg	24900	3380	3480	19400	40300	-165	441	75-125	70	20 P6,R1
Barium	mg/kg	428	169	174	408	498	-12	40	75-125	20	20 M1
Boron	mg/kg	109	169	174	229	285	71	101	75-125	22	20 M1,R1
Copper	mg/kg	448	169	174	446	1230	-1	452	75-125	94	20 M1,R1
Iron	mg/kg	166000	3380	3480	226000	163000	1800	-74	75-125	32	20 M6,R1
Manganese	mg/kg	596	169	174	887	870	172	158	75-125	2	20 M1
Nickel	mg/kg	62.5	169	174	223	235	95	99	75-125	5	20

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Parameter	Units	2898975		2898976		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10428096001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Silver	mg/kg	26.3	84.5	86.9	95.0	99.1	81	84	75-125	4	20		
Tin	mg/kg	406	169	174	601	743	116	194	75-125	21	20	M1, R1	
Titanium	mg/kg	208	169	174	430	468	131	149	75-125	9	20	M1	
Zinc	mg/kg	831	169	174	901	1010	42	105	75-125	12	20	P6	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

QC Batch: 438855 Analysis Method: EPA 6020
QC Batch Method: EPA 3050B Analysis Description: 6020 MET
Associated Lab Samples: 10428176001

METHOD BLANK: 2027873 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.19	04/26/18 02:38	N2

LABORATORY CONTROL SAMPLE: 2027874

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.7	3.9	106	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027875 2027876

Parameter	Units	2027875		2027876		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427642001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chromium	mg/kg	5.4	4.87	4.87	7.0	6.1	34	15	75-125	14	20 M0, N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

QC Batch: 533687 Analysis Method: EPA 6020A
QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
Associated Lab Samples: 10428176001

METHOD BLANK: 2898977 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.49	04/24/18 18:20	
Arsenic	mg/kg	ND	0.49	04/24/18 18:20	
Beryllium	mg/kg	ND	0.19	04/24/18 18:20	
Cadmium	mg/kg	ND	0.078	04/24/18 18:20	
Cobalt	mg/kg	ND	0.49	04/24/18 18:20	
Lead	mg/kg	ND	0.097	04/24/18 18:20	
Lithium	mg/kg	ND	0.49	04/24/18 18:20	
Selenium	mg/kg	ND	0.49	04/24/18 18:20	
Strontium	mg/kg	ND	0.49	04/24/18 18:20	
Vanadium	mg/kg	ND	0.97	04/24/18 18:20	

LABORATORY CONTROL SAMPLE: 2898978

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	47.6	47.2	99	80-120	
Arsenic	mg/kg	47.6	46.8	98	80-120	
Beryllium	mg/kg	47.6	49.9	105	80-120	
Cadmium	mg/kg	47.6	47.0	99	80-120	
Cobalt	mg/kg	47.6	48.1	101	80-120	
Lead	mg/kg	47.6	49.6	104	80-120	
Lithium	mg/kg	47.6	52.3	110	80-120	
Selenium	mg/kg	47.6	48.6	102	80-120	
Strontium	mg/kg	47.6	48.0	101	80-120	
Vanadium	mg/kg	47.6	47.3	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898979 2898980

Parameter	Units	10428096001		MSD		MSD		% Rec		Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec			
Antimony	mg/kg	3.7	167	170	162	153	95	88	75-125	6	20
Arsenic	mg/kg	11.9	167	170	200	181	113	99	75-125	10	20
Beryllium	mg/kg	ND	167	170	195	181	116	106	75-125	8	20
Cadmium	mg/kg	38.6	167	170	182	178	86	82	75-125	2	20
Cobalt	mg/kg	8.4	167	170	214	187	123	105	75-125	13	20
Lead	mg/kg	691	167	170	41400	4040	24300	1970	75-125	164	20 E, M6, R1
Lithium	mg/kg	2.4	167	170	205	191	121	111	75-125	7	20
Selenium	mg/kg	1.8	167	170	175	166	104	96	75-125	5	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898979		2898980		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10428096001 Result	MS Spike Conc.	MSD Spike Conc.									
Strontium	mg/kg	31.2	167	170	210	211	107	105	75-125	0	20		
Vanadium	mg/kg	40.2	167	170	200	211	96	100	75-125	5	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

QC Batch: 535536

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10428176001

SAMPLE DUPLICATE: 2910636

Parameter	Units	10427732013 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	60.7	61.2	1	30	

SAMPLE DUPLICATE: 2910889

Parameter	Units	10429116010 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	18.5	18.4	1	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

QC Batch: 535771 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
Associated Lab Samples: 10428176001

METHOD BLANK: 2912043 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	05/03/18 15:30	
1,1,1-Trichloroethane	ug/kg	ND	50.0	05/03/18 15:30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	05/03/18 15:30	
1,1,2-Trichloroethane	ug/kg	ND	50.0	05/03/18 15:30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	05/03/18 15:30	
1,1-Dichloroethane	ug/kg	ND	50.0	05/03/18 15:30	
1,1-Dichloroethene	ug/kg	ND	50.0	05/03/18 15:30	
1,1-Dichloropropene	ug/kg	ND	50.0	05/03/18 15:30	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	05/03/18 15:30	
1,2,3-Trichloropropane	ug/kg	ND	200	05/03/18 15:30	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	05/03/18 15:30	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	05/03/18 15:30	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	05/03/18 15:30	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	05/03/18 15:30	
1,2-Dichlorobenzene	ug/kg	ND	50.0	05/03/18 15:30	
1,2-Dichloroethane	ug/kg	ND	50.0	05/03/18 15:30	
1,2-Dichloropropane	ug/kg	ND	50.0	05/03/18 15:30	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	05/03/18 15:30	
1,3-Dichlorobenzene	ug/kg	ND	50.0	05/03/18 15:30	
1,3-Dichloropropane	ug/kg	ND	50.0	05/03/18 15:30	
1,4-Dichlorobenzene	ug/kg	ND	50.0	05/03/18 15:30	
2,2-Dichloropropane	ug/kg	ND	200	05/03/18 15:30	
2-Butanone (MEK)	ug/kg	ND	250	05/03/18 15:30	
2-Chlorotoluene	ug/kg	ND	50.0	05/03/18 15:30	
4-Chlorotoluene	ug/kg	ND	50.0	05/03/18 15:30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	05/03/18 15:30	
Acetone	ug/kg	ND	1000	05/03/18 15:30	
Allyl chloride	ug/kg	ND	200	05/03/18 15:30	
Benzene	ug/kg	ND	20.0	05/03/18 15:30	
Bromobenzene	ug/kg	ND	50.0	05/03/18 15:30	
Bromochloromethane	ug/kg	ND	50.0	05/03/18 15:30	
Bromodichloromethane	ug/kg	ND	50.0	05/03/18 15:30	
Bromoform	ug/kg	ND	200	05/03/18 15:30	
Bromomethane	ug/kg	ND	500	05/03/18 15:30	
Carbon tetrachloride	ug/kg	ND	50.0	05/03/18 15:30	
Chlorobenzene	ug/kg	ND	50.0	05/03/18 15:30	
Chloroethane	ug/kg	ND	500	05/03/18 15:30	
Chloroform	ug/kg	ND	50.0	05/03/18 15:30	
Chloromethane	ug/kg	ND	200	05/03/18 15:30	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	05/03/18 15:30	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	05/03/18 15:30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

METHOD BLANK: 2912043

Matrix: Solid

Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	05/03/18 15:30	
Dibromomethane	ug/kg	ND	50.0	05/03/18 15:30	
Dichlorodifluoromethane	ug/kg	ND	200	05/03/18 15:30	
Dichlorofluoromethane	ug/kg	ND	500	05/03/18 15:30	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	05/03/18 15:30	
Ethylbenzene	ug/kg	ND	50.0	05/03/18 15:30	
Hexachloro-1,3-butadiene	ug/kg	ND	250	05/03/18 15:30	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	05/03/18 15:30	
Methyl-tert-butyl ether	ug/kg	ND	50.0	05/03/18 15:30	
Methylene Chloride	ug/kg	ND	200	05/03/18 15:30	
n-Butylbenzene	ug/kg	ND	50.0	05/03/18 15:30	
n-Propylbenzene	ug/kg	ND	50.0	05/03/18 15:30	
Naphthalene	ug/kg	ND	200	05/03/18 15:30	
p-Isopropyltoluene	ug/kg	ND	50.0	05/03/18 15:30	
sec-Butylbenzene	ug/kg	ND	50.0	05/03/18 15:30	
Styrene	ug/kg	ND	50.0	05/03/18 15:30	
tert-Butylbenzene	ug/kg	ND	50.0	05/03/18 15:30	
Tetrachloroethene	ug/kg	ND	50.0	05/03/18 15:30	
Tetrahydrofuran	ug/kg	ND	2000	05/03/18 15:30	
Toluene	ug/kg	ND	50.0	05/03/18 15:30	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	05/03/18 15:30	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	05/03/18 15:30	
Trichloroethene	ug/kg	ND	50.0	05/03/18 15:30	
Trichlorofluoromethane	ug/kg	ND	200	05/03/18 15:30	
Vinyl chloride	ug/kg	ND	20.0	05/03/18 15:30	
Xylene (Total)	ug/kg	ND	150	05/03/18 15:30	
1,2-Dichloroethane-d4 (S)	%	97	75-125	05/03/18 15:30	
4-Bromofluorobenzene (S)	%	101	75-125	05/03/18 15:30	
Toluene-d8 (S)	%	98	75-125	05/03/18 15:30	

LABORATORY CONTROL SAMPLE & LCSD: 2912044

2912045

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	848	777	85	78	59-125	9	20	
1,1,1-Trichloroethane	ug/kg	1000	818	860	82	86	59-125	5	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	948	878	95	88	58-125	8	20	
1,1,2-Trichloroethane	ug/kg	1000	886	839	89	84	64-125	6	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	854	828	85	83	65-125	3	20	
1,1-Dichloroethane	ug/kg	1000	803	815	80	81	63-125	1	20	
1,1-Dichloroethene	ug/kg	1000	827	823	83	82	59-125	1	20	
1,1-Dichloropropene	ug/kg	1000	826	844	83	84	64-125	2	20	
1,2,3-Trichlorobenzene	ug/kg	1000	912	889	91	89	55-126	3	20	
1,2,3-Trichloropropane	ug/kg	1000	980	949	98	95	62-125	3	20	
1,2,4-Trichlorobenzene	ug/kg	1000	913	900	91	90	62-125	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

LABORATORY CONTROL SAMPLE & LCSD: 2912044		2912045								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	1000	941	882	94	88	59-125	6	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	2260	2130	91	85	54-125	6	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	905	812	90	81	64-125	11	20	
1,2-Dichlorobenzene	ug/kg	1000	887	827	89	83	63-125	7	20	
1,2-Dichloroethane	ug/kg	1000	832	759	83	76	57-125	9	20	
1,2-Dichloropropane	ug/kg	1000	879	824	88	82	67-125	6	20	
1,3,5-Trimethylbenzene	ug/kg	1000	917	859	92	86	59-125	6	20	
1,3-Dichlorobenzene	ug/kg	1000	891	827	89	83	64-125	7	20	
1,3-Dichloropropane	ug/kg	1000	887	821	89	82	64-125	8	20	
1,4-Dichlorobenzene	ug/kg	1000	895	820	90	82	63-125	9	20	
2,2-Dichloropropane	ug/kg	1000	796	792	80	79	37-126	0	20	
2-Butanone (MEK)	ug/kg	5000	3900	4060	78	81	48-125	4	20	
2-Chlorotoluene	ug/kg	1000	877	832	88	83	62-125	5	20	
4-Chlorotoluene	ug/kg	1000	904	865	90	86	63-125	4	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4800	4370	96	87	52-135	9	20	
Acetone	ug/kg	5000	4310	4130	86	83	65-125	4	20	
Allyl chloride	ug/kg	1000	754	760	75	76	52-125	1	20	
Benzene	ug/kg	1000	808	828	81	83	61-125	3	20	
Bromobenzene	ug/kg	1000	909	864	91	86	64-125	5	20	
Bromochloromethane	ug/kg	1000	836	838	84	84	65-125	0	20	
Bromodichloromethane	ug/kg	1000	862	810	86	81	57-125	6	20	
Bromoform	ug/kg	1000	701	642	70	64	57-125	9	20	
Bromomethane	ug/kg	1000	737	778	74	78	60-125	5	20	
Carbon tetrachloride	ug/kg	1000	804	838	80	84	58-125	4	20	
Chlorobenzene	ug/kg	1000	903	844	90	84	66-125	7	20	
Chloroethane	ug/kg	1000	714	740	71	74	62-125	4	20	
Chloroform	ug/kg	1000	776	800	78	80	59-125	3	20	
Chloromethane	ug/kg	1000	740	732	74	73	50-125	1	20	
cis-1,2-Dichloroethene	ug/kg	1000	798	766	80	77	61-125	4	20	
cis-1,3-Dichloropropene	ug/kg	1000	889	876	89	88	61-125	1	20	
Dibromochloromethane	ug/kg	1000	791	735	79	74	60-125	7	20	
Dibromomethane	ug/kg	1000	841	811	84	81	69-125	4	20	
Dichlorodifluoromethane	ug/kg	1000	662	654	66	65	38-125	1	20	
Dichlorofluoromethane	ug/kg	1000	756	765	76	76	67-125	1	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	1700	1530	170	153	60-125	10	20	CH,L3
Ethylbenzene	ug/kg	1000	914	855	91	85	62-125	7	20	
Hexachloro-1,3-butadiene	ug/kg	1000	899	802	90	80	56-125	11	20	
Isopropylbenzene (Cumene)	ug/kg	1000	975	891	98	89	65-125	9	20	
Methyl-tert-butyl ether	ug/kg	1000	820	815	82	82	59-125	1	20	
Methylene Chloride	ug/kg	1000	772	790	77	79	64-125	2	20	
n-Butylbenzene	ug/kg	1000	946	868	95	87	59-125	9	20	
n-Propylbenzene	ug/kg	1000	932	888	93	89	61-125	5	20	
Naphthalene	ug/kg	1000	976	921	98	92	53-125	6	20	
p-Isopropyltoluene	ug/kg	1000	918	858	92	86	63-125	7	20	
sec-Butylbenzene	ug/kg	1000	916	858	92	86	62-125	7	20	
Styrene	ug/kg	1000	922	865	92	86	66-125	6	20	
tert-Butylbenzene	ug/kg	1000	949	892	95	89	64-125	6	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

LABORATORY CONTROL SAMPLE & LCSD: 2912044		2912045									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Tetrachloroethene	ug/kg	1000	916	851	92	85	67-125	7	20		
Tetrahydrofuran	ug/kg	10000	8660	8850	87	89	62-125	2	20		
Toluene	ug/kg	1000	884	829	88	83	61-125	6	20		
trans-1,2-Dichloroethene	ug/kg	1000	794	775	79	78	64-125	2	20		
trans-1,3-Dichloropropene	ug/kg	1000	886	829	89	83	56-125	7	20		
Trichloroethene	ug/kg	1000	891	805	89	80	67-125	10	20		
Trichlorofluoromethane	ug/kg	1000	717	684	72	68	65-125	5	20		
Vinyl chloride	ug/kg	1000	774	772	77	77	57-125	0	20		
Xylene (Total)	ug/kg	3000	2700	2500	90	83	62-125	8	20		
1,2-Dichloroethane-d4 (S)	%				101	98	75-125				
4-Bromofluorobenzene (S)	%				101	103	75-125				
Toluene-d8 (S)	%				100	99	75-125				

MATRIX SPIKE SAMPLE: 2912046		10429096001	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Parameter	Units	Result					
1,1,1,2-Tetrachloroethane	ug/kg	ND	1270	1140	90	64-146	
1,1,1-Trichloroethane	ug/kg	ND	1270	1080	85	56-148	
1,1,2,2-Tetrachloroethane	ug/kg	ND	1270	1260	99	36-150	
1,1,2-Trichloroethane	ug/kg	ND	1270	1210	95	67-148	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	1270	1140	90	60-142	
1,1-Dichloroethane	ug/kg	ND	1270	1100	87	57-140	
1,1-Dichloroethene	ug/kg	ND	1270	1090	86	59-139	
1,1-Dichloropropene	ug/kg	ND	1270	1100	87	61-142	
1,2,3-Trichlorobenzene	ug/kg	ND	1270	1250	98	69-150	
1,2,3-Trichloropropane	ug/kg	ND	1270	1320	104	64-150	
1,2,4-Trichlorobenzene	ug/kg	ND	1270	1240	98	71-149	
1,2,4-Trimethylbenzene	ug/kg	ND	1270	1240	98	67-149	
1,2-Dibromo-3-chloropropane	ug/kg	ND	3160	3090	98	61-150	
1,2-Dibromoethane (EDB)	ug/kg	ND	1270	1190	94	67-147	
1,2-Dichlorobenzene	ug/kg	ND	1270	1170	93	70-142	
1,2-Dichloroethane	ug/kg	ND	1270	1090	86	58-132	
1,2-Dichloropropane	ug/kg	ND	1270	1140	90	64-144	
1,3,5-Trimethylbenzene	ug/kg	ND	1270	1180	93	71-146	
1,3-Dichlorobenzene	ug/kg	ND	1270	1160	92	71-142	
1,3-Dichloropropane	ug/kg	ND	1270	1180	93	68-140	
1,4-Dichlorobenzene	ug/kg	ND	1270	1150	91	68-142	
2,2-Dichloropropane	ug/kg	ND	1270	1060	83	34-150	
2-Butanone (MEK)	ug/kg	ND	6330	5120	81	51-150	
2-Chlorotoluene	ug/kg	ND	1270	1170	92	66-144	
4-Chlorotoluene	ug/kg	ND	1270	1230	97	66-140	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	6330	6280	99	63-150	
Acetone	ug/kg	ND	6330	5800	90	54-150	
Allyl chloride	ug/kg	ND	1270	1000	79	53-135	
Benzene	ug/kg	ND	1270	1230	97	65-135	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

MATRIX SPIKE SAMPLE: 2912046		10429096001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/kg	ND	1270	1230	97	71-141	
Bromochloromethane	ug/kg	ND	1270	1090	86	62-145	
Bromodichloromethane	ug/kg	ND	1270	1140	90	59-148	
Bromoform	ug/kg	ND	1270	937	74	57-145	
Bromomethane	ug/kg	ND	1270	918	69	51-129	
Carbon tetrachloride	ug/kg	ND	1270	1070	85	55-144	
Chlorobenzene	ug/kg	ND	1270	1200	95	70-142	
Chloroethane	ug/kg	ND	1270	957	76	61-135	
Chloroform	ug/kg	ND	1270	1030	81	58-135	
Chloromethane	ug/kg	ND	1270	981	78	37-125	
cis-1,2-Dichloroethene	ug/kg	ND	1270	1040	82	60-138	
cis-1,3-Dichloropropene	ug/kg	ND	1270	1180	93	62-142	
Dibromochloromethane	ug/kg	ND	1270	1080	86	65-141	
Dibromomethane	ug/kg	ND	1270	1150	90	72-150	
Dichlorodifluoromethane	ug/kg	ND	1270	819	65	30-125	
Dichlorofluoromethane	ug/kg	ND	1270	1020	81	62-148	
Diethyl ether (Ethyl ether)	ug/kg	ND	1270	4290	339	62-135	CH,M0
Ethylbenzene	ug/kg	ND	1270	1220	96	72-138	
Hexachloro-1,3-butadiene	ug/kg	ND	1270	1220	96	38-150	
Isopropylbenzene (Cumene)	ug/kg	ND	1270	1280	101	75-148	
Methyl-tert-butyl ether	ug/kg	ND	1270	1080	86	63-139	
Methylene Chloride	ug/kg	ND	1270	1030	79	58-135	
n-Butylbenzene	ug/kg	ND	1270	1250	99	63-150	
n-Propylbenzene	ug/kg	ND	1270	1260	100	70-146	
Naphthalene	ug/kg	ND	1270	1300	102	63-150	
p-Isopropyltoluene	ug/kg	ND	1270	1240	98	72-150	
sec-Butylbenzene	ug/kg	ND	1270	1200	95	66-150	
Styrene	ug/kg	ND	1270	1220	96	72-146	
tert-Butylbenzene	ug/kg	ND	1270	1260	100	71-148	
Tetrachloroethene	ug/kg	ND	1270	1220	97	70-150	
Tetrahydrofuran	ug/kg	ND	12700	11800	93	62-150	
Toluene	ug/kg	ND	1270	1170	93	65-142	
trans-1,2-Dichloroethene	ug/kg	ND	1270	1020	81	55-141	
trans-1,3-Dichloropropene	ug/kg	ND	1270	1170	93	57-147	
Trichloroethene	ug/kg	ND	1270	1170	92	62-150	
Trichlorofluoromethane	ug/kg	ND	1270	958	76	51-150	
Vinyl chloride	ug/kg	ND	1270	1010	80	45-132	
Xylene (Total)	ug/kg	ND	3800	3550	93	75-140	
1,2-Dichloroethane-d4 (S)	%				101	75-125	
4-Bromofluorobenzene (S)	%				101	75-125	
Toluene-d8 (S)	%				99	75-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

SAMPLE DUPLICATE: 2912047

Parameter	Units	10429096002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,1-Trichloroethane	ug/kg	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,2-Trichloroethane	ug/kg	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	ND		30	
1,1-Dichloroethane	ug/kg	ND	ND		30	
1,1-Dichloroethene	ug/kg	ND	ND		30	
1,1-Dichloropropene	ug/kg	ND	ND		30	
1,2,3-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,3-Trichloropropane	ug/kg	ND	ND		30	
1,2,4-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,4-Trimethylbenzene	ug/kg	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/kg	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	ND		30	
1,2-Dichlorobenzene	ug/kg	ND	ND		30	
1,2-Dichloroethane	ug/kg	ND	ND		30	
1,2-Dichloropropane	ug/kg	ND	ND		30	
1,3,5-Trimethylbenzene	ug/kg	ND	ND		30	
1,3-Dichlorobenzene	ug/kg	ND	ND		30	
1,3-Dichloropropane	ug/kg	ND	ND		30	
1,4-Dichlorobenzene	ug/kg	ND	ND		30	
2,2-Dichloropropane	ug/kg	ND	ND		30	
2-Butanone (MEK)	ug/kg	ND	ND		30	
2-Chlorotoluene	ug/kg	ND	ND		30	
4-Chlorotoluene	ug/kg	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND		30	
Acetone	ug/kg	ND	ND		30	
Allyl chloride	ug/kg	ND	ND		30	
Benzene	ug/kg	ND	ND		30	
Bromobenzene	ug/kg	ND	ND		30	
Bromochloromethane	ug/kg	ND	ND		30	
Bromodichloromethane	ug/kg	ND	ND		30	
Bromoform	ug/kg	ND	ND		30	
Bromomethane	ug/kg	ND	ND		30	
Carbon tetrachloride	ug/kg	ND	ND		30	
Chlorobenzene	ug/kg	ND	ND		30	
Chloroethane	ug/kg	ND	ND		30	
Chloroform	ug/kg	ND	ND		30	
Chloromethane	ug/kg	ND	ND		30	
cis-1,2-Dichloroethene	ug/kg	ND	ND		30	
cis-1,3-Dichloropropene	ug/kg	ND	ND		30	
Dibromochloromethane	ug/kg	ND	ND		30	
Dibromomethane	ug/kg	ND	ND		30	
Dichlorodifluoromethane	ug/kg	ND	ND		30	
Dichlorofluoromethane	ug/kg	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/kg	ND	ND		30	
Ethylbenzene	ug/kg	ND	ND		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

SAMPLE DUPLICATE: 2912047

Parameter	Units	10429096002 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	ND	ND		30	
Isopropylbenzene (Cumene)	ug/kg	ND	ND		30	
Methyl-tert-butyl ether	ug/kg	ND	ND		30	
Methylene Chloride	ug/kg	ND	ND		30	
n-Butylbenzene	ug/kg	ND	ND		30	
n-Propylbenzene	ug/kg	ND	ND		30	
Naphthalene	ug/kg	ND	ND		30	
p-Isopropyltoluene	ug/kg	ND	ND		30	
sec-Butylbenzene	ug/kg	ND	ND		30	
Styrene	ug/kg	ND	ND		30	
tert-Butylbenzene	ug/kg	ND	ND		30	
Tetrachloroethene	ug/kg	ND	ND		30	
Tetrahydrofuran	ug/kg	ND	ND		30	
Toluene	ug/kg	ND	ND		30	
trans-1,2-Dichloroethene	ug/kg	ND	ND		30	
trans-1,3-Dichloropropene	ug/kg	ND	ND		30	
Trichloroethene	ug/kg	ND	ND		30	
Trichlorofluoromethane	ug/kg	ND	ND		30	
Vinyl chloride	ug/kg	ND	ND		30	
Xylene (Total)	ug/kg	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	98	100	1		
4-Bromofluorobenzene (S)	%.	103	101	5		
Toluene-d8 (S)	%.	98	97	3		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

QC Batch: 534409

Analysis Method: EPA 8081B

QC Batch Method: EPA 3550

Analysis Description: 8081S GCS Pesticides

Associated Lab Samples: 10428176001

METHOD BLANK: 2903518

Matrix: Solid

Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	05/04/18 21:08	
4,4'-DDE	ug/kg	ND	3.3	05/04/18 21:08	
4,4'-DDT	ug/kg	ND	3.3	05/04/18 21:08	
Aldrin	ug/kg	ND	1.7	05/04/18 21:08	
alpha-BHC	ug/kg	ND	1.7	05/04/18 21:08	
alpha-Chlordane	ug/kg	ND	1.7	05/04/18 21:08	
beta-BHC	ug/kg	ND	1.7	05/04/18 21:08	
Chlordane (Technical)	ug/kg	ND	16.7	05/04/18 21:08	
delta-BHC	ug/kg	ND	1.7	05/04/18 21:08	
Dieldrin	ug/kg	ND	3.3	05/04/18 21:08	
Endosulfan I	ug/kg	ND	1.7	05/04/18 21:08	
Endosulfan II	ug/kg	ND	3.3	05/04/18 21:08	
Endosulfan sulfate	ug/kg	ND	3.3	05/04/18 21:08	
Endrin	ug/kg	ND	3.3	05/04/18 21:08	
Endrin aldehyde	ug/kg	ND	3.3	05/04/18 21:08	
Endrin ketone	ug/kg	ND	3.3	05/04/18 21:08	
gamma-BHC (Lindane)	ug/kg	ND	1.7	05/04/18 21:08	
gamma-Chlordane	ug/kg	ND	1.7	05/04/18 21:08	
Heptachlor	ug/kg	ND	1.7	05/04/18 21:08	
Heptachlor epoxide	ug/kg	ND	1.7	05/04/18 21:08	
Methoxychlor	ug/kg	ND	16.7	05/04/18 21:08	
Toxaphene	ug/kg	ND	50.0	05/04/18 21:08	
Decachlorobiphenyl (S)	%	85	30-150	05/04/18 21:08	
Tetrachloro-m-xylene (S)	%	92	30-150	05/04/18 21:08	

LABORATORY CONTROL SAMPLE: 2903519

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	32.8	98	62-127	
4,4'-DDE	ug/kg	33.3	32.3	97	66-125	
4,4'-DDT	ug/kg	33.3	28.6	86	67-128	
Aldrin	ug/kg	16.7	15.8	95	66-125	
alpha-BHC	ug/kg	16.7	16.1	97	64-125	
alpha-Chlordane	ug/kg	16.7	16.1	97	68-125	
beta-BHC	ug/kg	16.7	15.9	95	69-125	
delta-BHC	ug/kg	16.7	13.5	81	42-133	
Dieldrin	ug/kg	33.3	34.6	104	69-126	
Endosulfan I	ug/kg	16.7	15.4	92	63-125	
Endosulfan II	ug/kg	33.3	33.8	101	69-125	
Endosulfan sulfate	ug/kg	33.3	29.3	88	56-137	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

LABORATORY CONTROL SAMPLE: 2903519

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	32.2	97	69-125	
Endrin aldehyde	ug/kg	33.3	32.0	96	65-125	
Endrin ketone	ug/kg	33.3	33.7	101	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	16.3	98	67-125	
gamma-Chlordane	ug/kg	16.7	13.5	81	63-125	
Heptachlor	ug/kg	16.7	16.1	96	69-125	
Heptachlor epoxide	ug/kg	16.7	16.4	98	68-125	
Methoxychlor	ug/kg	167	140	84	65-134	
Decachlorobiphenyl (S)	%			85	30-150	
Tetrachloro-m-xylene (S)	%			93	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903520 2903521

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10428610001 Result	Spike Conc.	Spike Conc.	MS Result						
4,4'-DDD	ug/kg	<0.38	37.6	37.4	38.5	37.7	102	101	56-125	2	20
4,4'-DDE	ug/kg	0.64J	37.6	37.4	35.3	34.3	92	90	32-150	3	20
4,4'-DDT	ug/kg	3.1J	37.6	37.4	39.5	38.3	97	94	60-132	3	20
Aldrin	ug/kg	<0.33	18.8	18.7	17.0	16.8	90	90	56-125	1	20
alpha-BHC	ug/kg	<0.13	18.8	18.7	17.0	17.0	90	91	54-136	0	20
alpha-Chlordane	ug/kg	<0.16	18.8	18.7	17.4	17.1	93	91	54-133	2	20
beta-BHC	ug/kg	<1.0	18.8	18.7	18.2	18.0	97	96	30-150	1	20
delta-BHC	ug/kg	<0.17	18.8	18.7	15.6	17.8	83	95	45-145	13	20
Dieldrin	ug/kg	1.3J	37.6	37.4	44.9	45.4	116	118	47-150	1	20
Endosulfan I	ug/kg	<0.15	18.8	18.7	16.5	16.3	88	87	35-145	1	20
Endosulfan II	ug/kg	<0.37	37.6	37.4	36.5	35.1	97	94	50-147	4	20
Endosulfan sulfate	ug/kg	0.37J	37.6	37.4	32.7	32.0	86	85	54-132	2	20
Endrin	ug/kg	<0.30	37.6	37.4	35.7	34.3	95	92	62-125	4	20
Endrin aldehyde	ug/kg	<0.36	37.6	37.4	35.3	33.5	94	89	33-150	5	20
Endrin ketone	ug/kg	<0.41	37.6	37.4	47.3	43.0	125	114	56-144	10	20
gamma-BHC (Lindane)	ug/kg	<0.13	18.8	18.7	17.4	17.4	93	93	63-125	0	20
gamma-Chlordane	ug/kg	0.34J	18.8	18.7	14.6	14.1	76	74	45-132	3	20
Heptachlor	ug/kg	<0.35	18.8	18.7	17.7	17.4	94	93	51-142	2	20
Heptachlor epoxide	ug/kg	<0.25	18.8	18.7	18.0	17.5	96	93	50-142	3	20
Methoxychlor	ug/kg	<2.3	188	187	170	163	90	87	58-139	4	20
Decachlorobiphenyl (S)	%						96	87	30-150		
Tetrachloro-m-xylene (S)	%						92	90	30-150		2M, D3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

QC Batch: 533842 Analysis Method: EPA 8082A
QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10428176001

METHOD BLANK: 2899574 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/24/18 11:29	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/24/18 11:29	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/24/18 11:29	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/24/18 11:29	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/24/18 11:29	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/24/18 11:29	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/24/18 11:29	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/24/18 11:29	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/24/18 11:29	
Decachlorobiphenyl (S)	%	125	30-134	04/24/18 11:29	CH
Tetrachloro-m-xylene (S)	%	88	48-125	04/24/18 11:29	

LABORATORY CONTROL SAMPLE: 2899575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	527	79	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	571	86	62-125	
Decachlorobiphenyl (S)	%			129	30-134	CH
Tetrachloro-m-xylene (S)	%			89	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2899651 2899652

Parameter	Units	10428176001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
PCB-1016 (Aroclor 1016)	ug/kg	ND	1850	1850	1550	1540	84	84	30-150	0	30	
PCB-1260 (Aroclor 1260)	ug/kg	ND	1850	1850	1580	1560	86	84	30-138	2	30	
Decachlorobiphenyl (S)	%						93	76	30-134			CH
Tetrachloro-m-xylene (S)	%						78	68	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

QC Batch: 534113 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10428176001

METHOD BLANK: 2901626 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/25/18 17:49	
1,2-Dichlorobenzene	ug/kg	ND	330	04/25/18 17:49	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/25/18 17:49	
1,3-Dichlorobenzene	ug/kg	ND	330	04/25/18 17:49	
1,4-Dichlorobenzene	ug/kg	ND	330	04/25/18 17:49	
1-Methylnaphthalene	ug/kg	ND	330	04/25/18 17:49	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/25/18 17:49	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/25/18 17:49	
2,4-Dichlorophenol	ug/kg	ND	330	04/25/18 17:49	
2,4-Dimethylphenol	ug/kg	ND	330	04/25/18 17:49	
2,4-Dinitrophenol	ug/kg	ND	330	04/25/18 17:49	
2,4-Dinitrotoluene	ug/kg	ND	330	04/25/18 17:49	
2,6-Dinitrotoluene	ug/kg	ND	330	04/25/18 17:49	
2-Chloronaphthalene	ug/kg	ND	330	04/25/18 17:49	
2-Chlorophenol	ug/kg	ND	330	04/25/18 17:49	
2-Methylnaphthalene	ug/kg	ND	330	04/25/18 17:49	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/25/18 17:49	
2-Nitroaniline	ug/kg	ND	330	04/25/18 17:49	
2-Nitrophenol	ug/kg	ND	330	04/25/18 17:49	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/25/18 17:49	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/25/18 17:49	
3-Nitroaniline	ug/kg	ND	330	04/25/18 17:49	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/25/18 17:49	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/25/18 17:49	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/25/18 17:49	
4-Chloroaniline	ug/kg	ND	330	04/25/18 17:49	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/25/18 17:49	
4-Nitroaniline	ug/kg	ND	330	04/25/18 17:49	
4-Nitrophenol	ug/kg	ND	330	04/25/18 17:49	
Acenaphthene	ug/kg	ND	330	04/25/18 17:49	
Acenaphthylene	ug/kg	ND	330	04/25/18 17:49	
Anthracene	ug/kg	ND	330	04/25/18 17:49	
Benzo(a)anthracene	ug/kg	ND	330	04/25/18 17:49	
Benzo(a)pyrene	ug/kg	ND	330	04/25/18 17:49	
Benzo(b)fluoranthene	ug/kg	ND	330	04/25/18 17:49	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/25/18 17:49	
Benzo(k)fluoranthene	ug/kg	ND	330	04/25/18 17:49	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/25/18 17:49	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/25/18 17:49	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/25/18 17:49	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/25/18 17:49	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

METHOD BLANK: 2901626 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/25/18 17:49	
Carbazole	ug/kg	ND	330	04/25/18 17:49	
Chrysene	ug/kg	ND	330	04/25/18 17:49	
Di-n-butylphthalate	ug/kg	ND	330	04/25/18 17:49	
Di-n-octylphthalate	ug/kg	ND	330	04/25/18 17:49	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/25/18 17:49	
Dibenzofuran	ug/kg	ND	330	04/25/18 17:49	
Diethylphthalate	ug/kg	ND	330	04/25/18 17:49	
Dimethylphthalate	ug/kg	ND	330	04/25/18 17:49	
Fluoranthene	ug/kg	ND	330	04/25/18 17:49	
Fluorene	ug/kg	ND	330	04/25/18 17:49	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/25/18 17:49	
Hexachlorobenzene	ug/kg	ND	330	04/25/18 17:49	
Hexachloroethane	ug/kg	ND	330	04/25/18 17:49	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/25/18 17:49	
Isophorone	ug/kg	ND	330	04/25/18 17:49	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/25/18 17:49	
N-Nitrosodimethylamine	ug/kg	ND	330	04/25/18 17:49	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/25/18 17:49	
Naphthalene	ug/kg	ND	330	04/25/18 17:49	
Nitrobenzene	ug/kg	ND	330	04/25/18 17:49	
Pentachlorophenol	ug/kg	ND	670	04/25/18 17:49	
Phenanthrene	ug/kg	ND	330	04/25/18 17:49	
Phenol	ug/kg	ND	330	04/25/18 17:49	
Pyrene	ug/kg	ND	330	04/25/18 17:49	
2,4,6-Tribromophenol (S)	%	87	60-125	04/25/18 17:49	
2-Fluorobiphenyl (S)	%	84	30-132	04/25/18 17:49	
2-Fluorophenol (S)	%	80	40-125	04/25/18 17:49	
Nitrobenzene-d5 (S)	%	79	43-125	04/25/18 17:49	
p-Terphenyl-d14 (S)	%	97	62-125	04/25/18 17:49	
Phenol-d6 (S)	%	79	48-125	04/25/18 17:49	

LABORATORY CONTROL SAMPLE: 2901627

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1340	80	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1330	80	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1450	87	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1280	77	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1290	77	39-125	
1-Methylnaphthalene	ug/kg	1670	1400	84	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1480	89	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1490	89	61-125	
2,4-Dichlorophenol	ug/kg	1670	1450	87	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

LABORATORY CONTROL SAMPLE: 2901627

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1400	84	51-125	
2,4-Dinitrophenol	ug/kg	1670	1400	84	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1760	105	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1630	98	63-125	
2-Chloronaphthalene	ug/kg	1670	1440	86	61-125	
2-Chlorophenol	ug/kg	1670	1380	83	46-125	
2-Methylnaphthalene	ug/kg	1670	1380	83	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1350	81	50-125	
2-Nitroaniline	ug/kg	1670	1470	88	61-125	
2-Nitrophenol	ug/kg	1670	1450	87	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1400	84	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1530	92	47-125	
3-Nitroaniline	ug/kg	1670	1480	89	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1670J	100	30-141	
4-Bromophenylphenyl ether	ug/kg	1670	1460	88	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1510	90	64-125	
4-Chloroaniline	ug/kg	1670	1190	71	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1490	90	64-125	
4-Nitroaniline	ug/kg	1670	1490	89	59-125	
4-Nitrophenol	ug/kg	1670	1440	86	54-125	
Acenaphthene	ug/kg	1670	1440	87	62-125	
Acenaphthylene	ug/kg	1670	1430	86	61-125	
Anthracene	ug/kg	1670	1480	89	66-125	
Benzo(a)anthracene	ug/kg	1670	1610	97	69-125	
Benzo(a)pyrene	ug/kg	1670	1590	95	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1570	94	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1650	99	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1590	96	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1340	80	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1270	76	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1130	68	37-125 3M	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1850	111	69-131	
Butylbenzylphthalate	ug/kg	1670	1770	106	69-129	
Carbazole	ug/kg	1670	1600	96	66-125	
Chrysene	ug/kg	1670	1580	95	68-125	
Di-n-butylphthalate	ug/kg	1670	1710	102	69-125	
Di-n-octylphthalate	ug/kg	1670	1870	112	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1690	101	64-125	
Dibenzofuran	ug/kg	1670	1490	90	65-125	
Diethylphthalate	ug/kg	1670	1610	97	67-125	
Dimethylphthalate	ug/kg	1670	1580	95	67-125	
Fluoranthene	ug/kg	1670	1570	94	66-125	
Fluorene	ug/kg	1670	1500	90	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1280	77	40-125	
Hexachlorobenzene	ug/kg	1670	1480	89	62-125	
Hexachloroethane	ug/kg	1670	1310	79	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1660	99	64-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

LABORATORY CONTROL SAMPLE: 2901627

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1350	81	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1350	81	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1350	81	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1550	93	65-125	
Naphthalene	ug/kg	1670	1330	80	48-125	
Nitrobenzene	ug/kg	1670	1310	79	48-125	
Pentachlorophenol	ug/kg	1670	1140	68	41-125	
Phenanthrene	ug/kg	1670	1480	89	66-125	
Phenol	ug/kg	1670	1320	79	46-125	
Pyrene	ug/kg	1670	1620	97	69-125	
2,4,6-Tribromophenol (S)	%			86	60-125	
2-Fluorobiphenyl (S)	%			75	30-132	
2-Fluorophenol (S)	%			73	40-125	
Nitrobenzene-d5 (S)	%			70	43-125	
p-Terphenyl-d14 (S)	%			91	62-125	
Phenol-d6 (S)	%			71	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2901628 2901629

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10427377010 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,2,4-Trichlorobenzene	ug/kg	<760	1970	1970	1360J	1370J	69	69	30-127		30	
1,2-Dichlorobenzene	ug/kg	<739	1970	1970	1450J	1360J	73	69	30-125		30	
1,2-Diphenylhydrazine	ug/kg	<707	1970	1970	1310J	1300J	66	66	30-150		30	
1,3-Dichlorobenzene	ug/kg	<730	1970	1970	1440J	1320J	73	67	30-125		30	
1,4-Dichlorobenzene	ug/kg	<713	1970	1970	1410J	1380J	71	70	30-125		30	
1-Methylnaphthalene	ug/kg	<615	1970	1970	1490J	1420J	75	72	42-125		30	
2,4,5-Trichlorophenol	ug/kg	<764	1970	1970	1250J	1360J	63	69	30-150		30	
2,4,6-Trichlorophenol	ug/kg	<556	1970	1970	1380J	1310J	70	66	30-150		30	
2,4-Dichlorophenol	ug/kg	<738	1970	1970	1390J	1330J	71	67	30-135		30	
2,4-Dimethylphenol	ug/kg	<1470	1970	1970	ND	ND	73	74	30-148		30	
2,4-Dinitrophenol	ug/kg	<880	1970	1970	ND	ND	0	0	30-125		30	M1
2,4-Dinitrotoluene	ug/kg	<530	1970	1970	904J	789J	46	40	30-150		30	
2,6-Dinitrotoluene	ug/kg	<546	1970	1970	1050J	867J	53	44	30-150		30	
2-Chloronaphthalene	ug/kg	<556	1970	1970	1480J	1410J	75	72	30-138		30	
2-Chlorophenol	ug/kg	<778	1970	1970	1390J	1400J	70	71	30-130		30	
2-Methylnaphthalene	ug/kg	<607	1970	1970	1460J	1440J	74	73	46-125		30	
2-Methylphenol(o-Cresol)	ug/kg	<986	1970	1970	1420J	1380J	72	70	30-133		30	
2-Nitroaniline	ug/kg	<865	1970	1970	1630J	1670J	82	84	30-150		30	
2-Nitrophenol	ug/kg	<737	1970	1970	825J	ND	42	33	30-134		30	
3&4-Methylphenol(m&p Cresol)	ug/kg	<883	1970	1970	1430J	1390J	72	70	30-138		30	
3,3'-Dichlorobenzidine	ug/kg	<936	1970	1970	1190J	1310J	60	66	30-149		30	
3-Nitroaniline	ug/kg	<959	1970	1970	1810J	1880J	92	95	30-150		30	
4,6-Dinitro-2-methylphenol	ug/kg	<1580	1970	1970	ND	ND	0	0	30-133		30	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2901628			2901629								
Parameter	Units	10427377010	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
4-Bromophenylphenyl ether	ug/kg	<660	1970	1970	1360J	1300J	69	66	44-125	30	
4-Chloro-3-methylphenol	ug/kg	<543	1970	1970	1440J	1350J	73	68	30-150	30	
4-Chloroaniline	ug/kg	<1100	1970	1970	ND	ND	52	56	30-125	30	
4-Chlorophenylphenyl ether	ug/kg	<536	1970	1970	1390J	1440J	70	73	44-125	30	
4-Nitroaniline	ug/kg	<698	1970	1970	1710J	1610J	87	81	30-150	30	
4-Nitrophenol	ug/kg	<1130	1970	1970	ND	ND	46	53	30-150	30	
Acenaphthene	ug/kg	<641	1970	1970	1380J	1400J	70	71	40-125	30	
Acenaphthylene	ug/kg	<537	1970	1970	1480J	1450J	75	73	30-150	30	
Anthracene	ug/kg	<564	1970	1970	1470J	1400J	74	71	30-150	30	
Benzo(a)anthracene	ug/kg	<455	1970	1970	1570J	1600J	79	81	30-150	30	
Benzo(a)pyrene	ug/kg	<443	1970	1970	1520J	1460J	77	74	30-150	30	
Benzo(b)fluoranthene	ug/kg	<474	1970	1970	1570J	1570J	79	79	30-150	30	
Benzo(g,h,i)perylene	ug/kg	<339	1970	1970	1630J	1520J	83	77	30-150	30	
Benzo(k)fluoranthene	ug/kg	<474	1970	1970	1510J	1500J	77	76	30-150	30	
bis(2-Chloroethoxy)methane	ug/kg	<760	1970	1970	1390J	1360J	70	69	30-134	30	
bis(2-Chloroethyl) ether	ug/kg	<858	1970	1970	1360J	1250J	69	63	30-125	30	
bis(2-Chloroisopropyl) ether	ug/kg	<909	1970	1970	1330J	1270J	67	64	30-125	30	
bis(2-Ethylhexyl)phthalate	ug/kg	<1000	1970	1970	1950J	1980J	99	100	30-150	30	
Butylbenzylphthalate	ug/kg	<867	1970	1970	1740J	1710J	88	87	30-150	30	
Carbazole	ug/kg	<526	1970	1970	1520J	1480J	77	75	41-125	30	
Chrysene	ug/kg	<393	1970	1970	1680J	1610J	85	82	30-150	30	
Di-n-butylphthalate	ug/kg	<536	1970	1970	1680J	1540J	85	78	30-150	30	
Di-n-octylphthalate	ug/kg	<1200	1970	1970	1820J	1780J	92	90	30-150	30	
Dibenz(a,h)anthracene	ug/kg	<404	1970	1970	1550J	1530J	78	78	30-150	30	
Dibenzofuran	ug/kg	<569	1970	1970	1480J	1460J	75	74	45-125	30	
Diethylphthalate	ug/kg	<464	1970	1970	1500J	1500J	76	76	30-150	30	
Dimethylphthalate	ug/kg	<603	1970	1970	1450J	1460J	73	74	30-150	30	
Fluoranthene	ug/kg	<418	1970	1970	1580J	1540J	74	72	30-150	30	
Fluorene	ug/kg	<546	1970	1970	1510J	1450J	77	73	30-150	30	
Hexachloro-1,3-butadiene	ug/kg	<903	1970	1970	1350J	1360J	68	69	30-128	30	
Hexachlorobenzene	ug/kg	<506	1970	1970	1450J	1410J	73	71	30-150	30	
Hexachloroethane	ug/kg	<801	1970	1970	ND	ND	33	26	30-125	30	M1
Indeno(1,2,3-cd)pyrene	ug/kg	<456	1970	1970	1580J	1420J	80	72	30-150	30	
Isophorone	ug/kg	<898	1970	1970	1460J	1410J	74	72	30-140	30	
N-Nitroso-di-n-propylamine	ug/kg	<1200	1970	1970	1440J	1400J	73	71	30-147	30	
N-Nitrosodimethylamine	ug/kg	<1020	1970	1970	1430J	1420J	72	72	30-125	30	
N-Nitrosodiphenylamine	ug/kg	<481	1970	1970	1460J	1480J	74	75	30-150	30	
Naphthalene	ug/kg	<745	1970	1970	1460J	1420J	74	72	44-125	30	
Nitrobenzene	ug/kg	<787	1970	1970	1410J	1240J	71	63	30-136	30	
Pentachlorophenol	ug/kg	<1160	1970	1970	ND	ND	15	15	30-150	30	M1
Phenanthrene	ug/kg	<537	1970	1970	1610J	1570J	82	80	30-150	30	
Phenol	ug/kg	<757	1970	1970	1430J	1380J	72	70	30-129	30	
Pyrene	ug/kg	<412	1970	1970	1820J	1860J	81	83	30-150	30	
2,4,6-Tribromophenol (S)	%						59	58	60-125		S0
2-Fluorobiphenyl (S)	%						68	64	30-132		
2-Fluorophenol (S)	%						63	61	40-125		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Parameter	Units	2901628		2901629		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Nitrobenzene-d5 (S)	%.					58	57	43-125			P3
p-Terphenyl-d14 (S)	%.					78	77	62-125			
Phenol-d6 (S)	%.					64	60	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

QC Batch: 533722

Analysis Method: EPA 8270D by SIM

QC Batch Method: EPA 3550

Analysis Description: 8270D Solid PAH by SIM MSSV

Associated Lab Samples: 10428176001

METHOD BLANK: 2899091

Matrix: Solid

Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/24/18 15:03	
Acenaphthylene	ug/kg	ND	10.0	04/24/18 15:03	
Anthracene	ug/kg	ND	10.0	04/24/18 15:03	
Benzo(a)anthracene	ug/kg	ND	10.0	04/24/18 15:03	
Benzo(a)pyrene	ug/kg	ND	10.0	04/24/18 15:03	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/24/18 15:03	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/24/18 15:03	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/24/18 15:03	
Chrysene	ug/kg	ND	10.0	04/24/18 15:03	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/24/18 15:03	
Fluoranthene	ug/kg	ND	10.0	04/24/18 15:03	
Fluorene	ug/kg	ND	10.0	04/24/18 15:03	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/24/18 15:03	
Naphthalene	ug/kg	ND	10.0	04/24/18 15:03	
Phenanthrene	ug/kg	ND	10.0	04/24/18 15:03	
Pyrene	ug/kg	ND	10.0	04/24/18 15:03	
2-Fluorobiphenyl (S)	%	93	42-125	04/24/18 15:03	
p-Terphenyl-d14 (S)	%	92	57-125	04/24/18 15:03	

LABORATORY CONTROL SAMPLE: 2899092

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	26.7	80	52-125	
Acenaphthylene	ug/kg	33.3	26.2	79	50-125	
Anthracene	ug/kg	33.3	29.7	89	65-125	
Benzo(a)anthracene	ug/kg	33.3	27.0	81	60-125	
Benzo(a)pyrene	ug/kg	33.3	23.6	71	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	27.4	82	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	24.6	74	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	26.9	81	67-125	
Chrysene	ug/kg	33.3	27.8	83	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	21.8	65	63-125	
Fluoranthene	ug/kg	33.3	30.7	92	75-125	
Fluorene	ug/kg	33.3	26.4	79	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	24.3	73	63-125	
Naphthalene	ug/kg	33.3	26.3	79	49-125	
Phenanthrene	ug/kg	33.3	27.8	84	65-125	
Pyrene	ug/kg	33.3	24.8	74	64-125	
2-Fluorobiphenyl (S)	%			87	42-125	
p-Terphenyl-d14 (S)	%			82	57-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2899093		2899094		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10428180001 Result	MS Spike Conc.	MSD Spike Conc.									
Acenaphthene	ug/kg	ND	35.7	35.7	30.3	29.4	85	82	30-125	3	30		
Acenaphthylene	ug/kg	ND	35.7	35.7	26.0	29.8	73	83	30-133	13	30		
Anthracene	ug/kg	ND	35.7	35.7	42.2	36.4	118	102	30-150	15	30		
Benzo(a)anthracene	ug/kg	0.020 mg/kg	35.7	35.7	67.8	46.1	135	74	30-150	38	30	R1	
Benzo(a)pyrene	ug/kg	0.019 mg/kg	35.7	35.7	59.8	43.3	113	67	30-150	32	30	R1	
Benzo(b)fluoranthene	ug/kg	0.028 mg/kg	35.7	35.7	68.5	51.4	113	65	30-150	29	30		
Benzo(g,h,i)perylene	ug/kg	0.018 mg/kg	35.7	35.7	63.9	51.6	128	94	30-150	21	30		
Benzo(k)fluoranthene	ug/kg	0.012 mg/kg	35.7	35.7	38.9	37.9	76	74	30-150	3	30		
Chrysene	ug/kg	0.022 mg/kg	35.7	35.7	65.9	46.5	121	67	30-150	35	30	R1	
Dibenz(a,h)anthracene	ug/kg	ND	35.7	35.7	38.4	37.7	107	105	30-131	2	30		
Fluoranthene	ug/kg	0.044 mg/kg	35.7	35.7	109	66.2	182	63	30-150	49	30	M1,R1	
Fluorene	ug/kg	ND	35.7	35.7	28.1	28.4	79	79	30-147	1	30		
Indeno(1,2,3-cd)pyrene	ug/kg	0.016 mg/kg	35.7	35.7	57.8	47.7	117	89	30-150	19	30		
Naphthalene	ug/kg	ND	35.7	35.7	21.8	26.9	61	75	30-131	21	30		
Phenanthrene	ug/kg	0.020 mg/kg	35.7	35.7	81.1	49.7	171	84	30-150	48	30	M1,R1	
Pyrene	ug/kg	0.034 mg/kg	35.7	35.7	98.8	58.0	181	67	30-150	52	30	M1,R1	
2-Fluorobiphenyl (S)	%.						70	84	42-125				
p-Terphenyl-d14 (S)	%.						73	80	57-125				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

QC Batch: 533864

Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO

Analysis Description: WIDRO GCS

Associated Lab Samples: 10428176001

METHOD BLANK: 2899660

Matrix: Solid

Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	04/25/18 13:36	
n-Triacontane (S)	%.	95	50-150	04/25/18 13:36	

LABORATORY CONTROL SAMPLE & LCSD: 2899661

2899662

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	66.3	60.3	83	75	70-120	9	20	
n-Triacontane (S)	%.				93	93	50-150			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

QC Batch: 439469

Analysis Method: EPA 7196A

QC Batch Method: EPA 3060A

Analysis Description: 7196 Chromium, Hexavalent

Associated Lab Samples: 10428176001

METHOD BLANK: 2030574

Matrix: Solid

Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/30/18 13:42	

LABORATORY CONTROL SAMPLE: 2030575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1100	980	89	80-120	

SAMPLE DUPLICATE: 2030580

Parameter	Units	10427642002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

QC Batch: 287059

Analysis Method: EPA 9012

QC Batch Method: EPA 9012A

Analysis Description: 9012 Cyanide

Associated Lab Samples: 10428176001

METHOD BLANK: 1679101

Matrix: Solid

Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/26/18 14:20	

LABORATORY CONTROL SAMPLE: 1679102

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.0	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1679103 1679104

Parameter	Units	10428176001		1679103		1679104		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result				
Cyanide	mg/kg	ND	10.3	10.3	8.3	10.9	71	95	80-120	27	20 M0,R1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

QC Batch: 141540 Analysis Method: EPA 9056A
QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
Associated Lab Samples: 10428176001

METHOD BLANK: 559769 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	0.99	04/30/18 17:39	

LABORATORY CONTROL SAMPLE: 559768

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	50.3	51.9	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559770 559771

Parameter	Units	10428096003 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Fluoride	mg/kg	ND	50	49.3	11.4	12.3	23	25	80-120	7	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559772 559773

Parameter	Units	10428159006 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Fluoride	mg/kg	0.97 U	49.7	48.9	35.9	41.7	72	85	80-120	15	20	M1

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth

PASI-G Pace Analytical Services - Green Bay

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10428176

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

ANALYTE QUALIFIERS

1M Sample was brown in color.

2M Sample was yellow in color.

3M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

D4 Sample was diluted due to the presence of high levels of target analytes.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

ANALYTE QUALIFIERS

- L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- N2 The lab does not hold NELAC/TNI accreditation for this parameter.
- N3 Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
- P3 Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
- P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
- R1 RPD value was outside control limits.
- S0 Surrogate recovery outside laboratory control limits.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.
- T6 High boiling point hydrocarbons are present in the sample.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10428176001	FL-TT-08 (1-7 WM)	EPA 1630 (1998)	142287	EPA 1630 (1998)	142288
10428176001	FL-TT-08 (1-7 WM)	EPA 3550	534409	EPA 8081B	534839
10428176001	FL-TT-08 (1-7 WM)	EPA 3550	533842	EPA 8082A	533945
10428176001	FL-TT-08 (1-7 WM)	WI MOD DRO	533864	WI MOD DRO	534349
10428176001	FL-TT-08 (1-7 WM)	EPA 5030 Medium Soil	535880	WI MOD GRO	535956
10428176001	FL-TT-08 (1-7 WM)	EPA 3050	533686	EPA 6010C	534230
10428176001	FL-TT-08 (1-7 WM)	EPA 3050B	438855	EPA 6020	439080
10428176001	FL-TT-08 (1-7 WM)	EPA 3050	533687	EPA 6020A	533858
10428176001	FL-TT-08 (1-7 WM)	EPA 7471	533683	EPA 7471	533810
10428176001	FL-TT-08 (1-7 WM)	ASTM D2974	535536		
10428176001	FL-TT-08 (1-7 WM)	EPA 3550	534113	EPA 8270D	534319
10428176001	FL-TT-08 (1-7 WM)	EPA 3550	533722	EPA 8270D by SIM	534081
10428176001	FL-TT-08 (1-7 WM)	EPA 5035/5030B	535771	EPA 8260B	536093
10428176001	FL-TT-08 (1-7 WM)	EPA 3060A	439469	EPA 7196A	439714
10428176001	FL-TT-08 (1-7 WM)	Trivalent Chromium Calculation	440734		
10428176001	FL-TT-08 (1-7 WM)	EPA 9012A	287059	EPA 9012	287085
10428176001	FL-TT-08 (1-7 WM)	EPA 300.0	141540	EPA 9056A	141561

REPORT OF LABORATORY ANALYSIS

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WO#: 10428176



10428176

Body Form

Work Order Number:

COC Type:

Page: 1 of 1

Turnaround Time:

COC ID:

FOR LAB USE ONLY

CLIENT INFO

LABORATORY

Facility Code:	MNSW-057/MPCA Freeway LF	Program Code (MDH Lab Only):	Lab Name:
Project Name:	MPCA Freeway LF Solids	Project Task Code:	Address: 18-00383
Project Manager:			EPIC Profile # 38716
Potential Hazard?	If yes, add information to Sampler Comments Section		Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES				LAB MATRIX CODES				FIELD MATRIX CODES				PRESERV.	ANALYSIS	Lab Sample No.	#				
Sample	QC-FB=Field Blank Sample	QC-FR=Field Replicate Sample	QC-TB=Trip Blank Sample	DW=Drinking Water	NW=Non-potable Water	SD=Soil/Solid	WP=Wipe	AR=Air	BL=Biological Material	OT=Other	TS=Tissue					Wtr-Ground=Groundwater	Wtr-Surf=Surface Water	QC-BLANK=Artificial Blank Water	Leachate=Leachate Sample
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont								
FL-77-08 (1-7 Wm)	S	4/20/18		1	7	C	SD				13	X	See attached for solids/waste Includ. Dioxin				001	1	
JAK 4/20/18																			
																			2
																			3
																			4
																			5
																			6
																			7
																			8
																			9
																			10

Sampled By: Jack Kobkinnon/Zack Eckstrom Sampler's Signature: *[Signature]* Phone #: 612-437-5651

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
<i>[Signature]</i>	4/20/18 1730	<i>[Signature]</i>	4/20/18 17:30

T=6.5°C

Sample Condition Upon Receipt

Client Name: MPCA

Project #: _____

WO#: 10428176

PM: JMA

Due Date: 05/07/18

CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____

Temp Blank? Yes No

Thermometer 151401163
Used: G87A9155100842

Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 6.5 Cooler Temp Corrected (°C): 6.5

Biological Tissue Frozen? Yes No N/A

Temp should be above freezing to 6°C

Correction Factor: True

Date and Initials of Person Examining Contents: JE 4-20-18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No

Did samples originate from a foreign source (internationally including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12. <u>No time on COC or Sample</u>
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>0305183</u>		No Trip Blank Received JMA 4/23/18

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: Brad Jacobson

Date/Time: _____

Comments/Resolution: Confirmed collected time for samples is 14:30.

Project Manager Review: [Signature]

Date: 04/23/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigaiton Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Litium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI-GRO
DRO	WI-DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Sample Condition Upon Receipt

Client Name: Pace MN

Project #

WO# : 12107527
 PM: HRZ Due Date: 05/07/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.1 Cooler Temp Corrected °C: 2.4 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 90.3 Date and Initials of Person Examining Contents: HRZ 4/18 DC

Comments: BM 4/25/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 4/25/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

WO#: 12107527



Page 51 of 67

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10428176 Workorder Name: 18-00383 MPCA Freeway LF Solid Owner Received Date: 4/20/2018 Results Requested By: 5/7/2018

Report To		Subcontract To				Requested Analysis																								
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Duluth 4730 Oneota St. Duluth, MN 55807 Phone (218)727-6380				<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Methyl Mercury by 1630</div> <div style="border: 1px solid black; width: 100%; height: 100%; text-align: center;"> <p style="margin: 0;">LAB USE ONLY</p> </div> </div>																								
Preserved Containers																														
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix												Unpreserved													
1	FL-TT-08 (1-7 WM)	PS	4/20/2018 14:30	10428176001	Solid												1													
2																														
3																														
4																														
5																														
Comments																														
Transfers	Released By	Date/Time	Received By	Date/Time																										
1	<i>[Signature]</i>	4/23/18 1810	<i>[Signature]</i>	4-24-18 1900																										
2	<i>[Signature]</i>	4-24-18 2315	<i>[Signature]</i>	4/25/18 0230																										
3																														
Cooler Temperature on Receipt		Custody Seal		Received on Ice		Samples Intact																								
0.8 °C		Y or N		Y or N		Y or N																								

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace MN Project #: _____

WO# : 12107527
 PM: HRZ Due Date: 05/07/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.5 Cooler Temp Corrected °C: 0.8 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 5°C Correction Factor: ±0.3 Date and Initials of Person Examining Contents: 4-24-18 DL

Comments: Bm 4/25/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____

Angela Loisel

Date: 4/25/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

40167846
 Pace Analytical
 www.pacelabs.com

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10428176 Workorder Name: 18-00383 MPCA Freeway LF Solid Owner Received Date: 4/20/2018 Results Requested By: 5/7/2018

Report To		Subcontract To				Requested Analysis													
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Green Bay 1241 Bellevue Street Suite 9 Green Bay, WI 54302 Phone (920)469-2436																	
						Preserved Containers						Total Cyanide by 9012						LAB USE ONLY 001	
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved													
1	FL-TT-08 (1-7 WM)	PS	4/20/2018 14:30	10428176001	Solid	1													
2																			
3																			
4																			
5																			
Transfers												Comments							
Released By	Date/Time	Received By	Date/Time																
<i>[Signature]</i>	4/23/18 17:20	<i>[Signature]</i>	4/24/18 08:15																
<i>[Signature]</i>		<i>[Signature]</i>	4/24/18 08:15																
Cooler Temperature on Receipt		Custody Seal		Received on Ice		Samples Intact													
3 °C		Y		Y		Y													

**In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace, MN

Project #: _____

WO#: 40167896

Courier: CS Logistics Fed Ex Speedee UPS ~~Waltco~~
 Client Pace Other: _____



Tracking #: 16999608

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Custody Seal on Samples Present: yes no Seals intact: yes no

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR - 4 Type of Ice Wet Blue Dry None

Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 35 / Corr: 3

Temp Blank Present: yes no

Biological Tissue is Frozen: yes no

Person examining contents:

Date: 4-24-18
Initials: SCU

Temp should be above freezing to 6°C.

Biota Samples may be received at ≤ 0°C.

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time: _____
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>S</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution:

If checked, see attached form for additional comments

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: CW

Date: 4/24/18



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50195169

Date/Time and Initials of person examining contents: JH 4-24-18 1232

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 2803

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 39/3.9 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		<input checked="" type="checkbox"/>	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			<input checked="" type="checkbox"/>
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		<input checked="" type="checkbox"/>	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
Chain of Custody Present:	<input checked="" type="checkbox"/>		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>		Dissolved Metals field filtered?:			<input checked="" type="checkbox"/>
Short Hold Time Analysis (<72hr)? Analysis:		<input checked="" type="checkbox"/>	Headspace Wisconsin Sulfide			<input checked="" type="checkbox"/>
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	<u>Present</u>	<u>Absent</u>	<input checked="" type="checkbox"/>
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			<input checked="" type="checkbox"/>
Rush TAT Requested:		<input checked="" type="checkbox"/>	Headspace in VOA Vials (>6mm):			<input checked="" type="checkbox"/>
Containers Intact?:	<input checked="" type="checkbox"/>		Trip Blank Present?:		<input checked="" type="checkbox"/>	
Sample Labels Match COC? Except TCs, which only require sample ID	<input checked="" type="checkbox"/>		Trip Blank Custody Seals?:		<input checked="" type="checkbox"/>	

Comments:

Sample Container Count

WO#: 50195169



50195169

CLIENT: Pace mn

COC PAGE ___ of ___

COC ID# _____

Project # 50195169

SBS
Bulk DI
Kit

Matrix S/W
(Soil/Water/
Aqueous Liq

Sample Line Item	DG9H VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	Matrix S/W (Soil/Water/ Aqueous Liq	pH <2	pH >9	pH >12
1							1											SC			
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
WG9U	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

May 04, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Solid - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/24/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kari-Ann Killian For Jessica Esser
Project Manager

Certification List

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10428176
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FL-TT-08 (1-7 WM) (10428176001)	A181703-01	Solid	04/20/2018	04/24/2018

CASE NARRATIVE

Sample Receipt Information:

One sample was received on April 24, 2018. Sample was received at 3.1 degrees Celsius. Sample was received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.



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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10428176
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804197 - EPA 3570

Blank (A804197-BLK1)		Prepared: 04/26/2018 Analyzed: 04/27/2018 01:46								
2,4-D	ND	0.10	mg/kg wet							
2,4-D [2C]	ND	0.10	mg/kg wet							
2,4-DB	ND	0.10	mg/kg wet							
2,4-DB [2C]	ND	0.10	mg/kg wet							
2,4,5-T	ND	0.10	mg/kg wet							
2,4,5-T [2C]	ND	0.10	mg/kg wet							
2,4,5-TP	ND	0.10	mg/kg wet							
2,4,5-TP [2C]	ND	0.10	mg/kg wet							
Bentazon	ND	0.10	mg/kg wet							
Bentazon [2C]	ND	0.10	mg/kg wet							
Dicamba	ND	0.10	mg/kg wet							
Dicamba [2C]	ND	0.10	mg/kg wet							
MCPA	ND	0.10	mg/kg wet							
MCPA [2C]	ND	0.10	mg/kg wet							
Picloram	ND	0.10	mg/kg wet							
Picloram [2C]	ND	0.10	mg/kg wet							
Triclopyr	ND	0.10	mg/kg wet							
Triclopyr [2C]	ND	0.10	mg/kg wet							
Surrogate: DCAA	21.3		mg/kg wet	20.00		107	70.8-116			
Surrogate: DCAA [2C]	20.2		mg/kg wet	20.00		101	62.3-114			

LCS (A804197-BS1)		Prepared: 04/26/2018 Analyzed: 04/26/2018 23:32								
2,4-D	1.91	0.10	mg/kg wet	2.000		95.3	81.6-107			
2,4-D [2C]	1.87	0.10	mg/kg wet	2.000		93.4	71.8-120			
2,4-DB	1.75	0.10	mg/kg wet	2.000		87.5	76.4-107			
2,4-DB [2C]	1.90	0.10	mg/kg wet	2.000		95.1	62.2-129			
2,4,5-T	1.94	0.10	mg/kg wet	2.000		97.1	81.2-110			
2,4,5-T [2C]	1.99	0.10	mg/kg wet	2.000		99.6	70.6-125			
2,4,5-TP	1.89	0.10	mg/kg wet	2.000		94.3	79.1-106			
2,4,5-TP [2C]	1.93	0.10	mg/kg wet	2.000		96.3	68.2-118			
Bentazon	1.03	0.10	mg/kg wet	1.000		103	82.5-119			
Bentazon [2C]	0.898	0.10	mg/kg wet	1.000		89.8	73.3-125			
Dicamba	2.00	0.10	mg/kg wet	2.000		99.9	85.1-108			
Dicamba [2C]	2.03	0.10	mg/kg wet	2.000		101	71.4-115			
Picloram	0.993	0.10	mg/kg wet	1.000		99.3	86.1-106			
Picloram [2C]	0.891	0.10	mg/kg wet	1.000		89.1	74.5-114			
Triclopyr	1.84	0.10	mg/kg wet	2.000		91.8	78.6-106			
Triclopyr [2C]	1.90	0.10	mg/kg wet	2.000		95.1	69.4-118			
Surrogate: DCAA	20.6		mg/kg wet	20.00		103	70.8-116			
Surrogate: DCAA [2C]	19.8		mg/kg wet	20.00		98.8	62.3-114			

LCS (A804197-BS2)		Prepared: 04/26/2018 Analyzed: 04/27/2018 00:39								
MCPA	2.14	0.10	mg/kg wet	2.000		107	79.4-116			
MCPA [2C]	2.26	0.10	mg/kg wet	2.000		113	77-123			



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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10428176
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804197 - EPA 3570

LCS (A804197-BS2)

Prepared: 04/26/2018 Analyzed: 04/27/2018 00:39

Surrogate: DCAA	21.0		mg/kg wet	20.00		105	70.8-116			
Surrogate: DCAA [2C]	22.4		mg/kg wet	20.00		112	62.3-114			

Matrix Spike (A804197-MS1)

Source: A181702-02

Prepared: 04/26/2018 Analyzed: 05/01/2018 17:33

2,4-D	2.39	0.10	mg/kg dry	2.682	ND	89.2	71.4-105			
2,4-D [2C]	2.16	0.10	mg/kg dry	2.682	0.0340	79.1	50.5-123			
2,4-DB	2.20	0.10	mg/kg dry	2.682	ND	82.2	46.4-117			
2,4-DB [2C]	2.12	0.10	mg/kg dry	2.682	0.0486	77.3	44.5-121			
2,4,5-T	2.46	0.10	mg/kg dry	2.682	0.0528	89.8	66.2-110			
2,4,5-T [2C]	2.28	0.10	mg/kg dry	2.682	ND	85.0	43.6-126			
2,4,5-TP	2.37	0.10	mg/kg dry	2.682	ND	88.5	52.4-114			
2,4,5-TP [2C]	2.21	0.10	mg/kg dry	2.682	0.0443	80.7	47.6-117			
Bentazon	1.25	0.10	mg/kg dry	1.341	0.0694	88.0	61.5-117			
Bentazon [2C]	0.896	0.10	mg/kg dry	1.341	0.0365	64.1	50.7-127			
Dicamba	2.06	0.10	mg/kg dry	2.682	ND	76.6	48.4-111			
Dicamba [2C]	1.95	0.10	mg/kg dry	2.682	0.0300	71.6	43.3-108			
Picloram	0.852	0.10	mg/kg dry	1.341	ND	63.5	26.7-110			
Picloram [2C]	0.565	0.10	mg/kg dry	1.341	0.00941	41.4	10.8-110			
Triclopyr	2.34	0.10	mg/kg dry	2.682	ND	87.2	56-113			
Triclopyr [2C]	2.29	0.10	mg/kg dry	2.682	0.0413	83.7	47.9-120			
Surrogate: DCAA	25.5		mg/kg dry	26.82		95.0	70.8-116			
Surrogate: DCAA [2C]	21.9		mg/kg dry	26.82		81.8	62.3-114			

Matrix Spike (A804197-MS2)

Source: A181702-02

Prepared: 04/26/2018 Analyzed: 05/01/2018 19:47

MCPA	2.69	0.10	mg/kg dry	2.682	ND	100	74.2-114			
MCPA [2C]	2.57	0.10	mg/kg dry	2.682	0.0400	94.5	60.9-122			
Surrogate: DCAA	26.5		mg/kg dry	26.82		98.8	70.8-116			
Surrogate: DCAA [2C]	26.3		mg/kg dry	26.82		98.2	62.3-114			

Matrix Spike Dup (A804197-MSD1)

Source: A181702-02

Prepared: 04/26/2018 Analyzed: 05/01/2018 18:40

2,4-D	2.40	0.10	mg/kg dry	2.682	ND	89.3	71.4-105	0.174	20	
2,4-D [2C]	2.16	0.10	mg/kg dry	2.682	0.0340	79.1	50.5-123	0.0217	20	
2,4-DB	2.19	0.10	mg/kg dry	2.682	ND	81.5	46.4-117	0.805	20	
2,4-DB [2C]	2.14	0.10	mg/kg dry	2.682	0.0486	78.0	44.5-121	0.882	20	
2,4,5-T	2.44	0.10	mg/kg dry	2.682	0.0528	89.0	66.2-110	0.921	20	
2,4,5-T [2C]	2.28	0.10	mg/kg dry	2.682	ND	85.1	43.6-126	0.192	20	
2,4,5-TP	2.40	0.10	mg/kg dry	2.682	ND	89.4	52.4-114	1.02	20	
2,4,5-TP [2C]	2.17	0.10	mg/kg dry	2.682	0.0443	79.3	47.6-117	1.71	20	
Bentazon	1.39	0.10	mg/kg dry	1.341	0.0694	98.4	61.5-117	10.6	20	
Bentazon [2C]	1.03	0.10	mg/kg dry	1.341	0.0365	74.2	50.7-127	14.1	20	
Dicamba	2.18	0.10	mg/kg dry	2.682	ND	81.4	48.4-111	6.02	20	
Dicamba [2C]	2.12	0.10	mg/kg dry	2.682	0.0300	77.9	43.3-108	8.30	20	
Picloram	0.927	0.10	mg/kg dry	1.341	ND	69.1	26.7-110	8.41	20	
Picloram [2C]	0.611	0.10	mg/kg dry	1.341	0.00941	44.9	10.8-110	7.94	20	



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10428176
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch A804197 - EPA 3570

Matrix Spike Dup (A804197-MSD1)		Source: A181702-02			Prepared: 04/26/2018 Analyzed: 05/01/2018 18:40					
Triclopyr	2.32	0.10	mg/kg dry	2.682	ND	86.3	56-113	1.05	20	
Triclopyr [2C]	2.16	0.10	mg/kg dry	2.682	0.0413	78.9	47.9-120	5.78	20	
Surrogate: DCAA	26.2		mg/kg dry	26.82		97.8	70.8-116			
Surrogate: DCAA [2C]	23.6		mg/kg dry	26.82		88.1	62.3-114			
Matrix Spike Dup (A804197-MSD2)		Source: A181702-02			Prepared: 04/26/2018 Analyzed: 05/01/2018 20:54					
MCPA	2.68	0.10	mg/kg dry	2.682	ND	99.8	74.2-114	0.430	20	
MCPA [2C]	2.53	0.10	mg/kg dry	2.682	0.0400	92.7	60.9-122	1.83	20	
Surrogate: DCAA	25.9		mg/kg dry	26.82		96.7	70.8-116			
Surrogate: DCAA [2C]	26.3		mg/kg dry	26.82		98.0	62.3-114			



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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10428176
 Project Manager: Jennifer Anderson

Classical Chemistry Parameters - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch A804195 - % Solids

Duplicate (A804195-DUP1)	Source: A181708-01	Prepared: 04/25/2018	Analyzed: 04/27/2018 09:07
% Solids	79.2	0.00 % by Weight	79.6
			0.516
			20



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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10428176
Project Manager: Jennifer Anderson

Notes and Definitions

- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

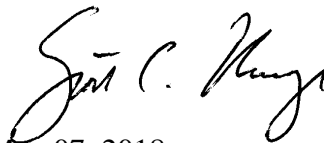
PaceProject#: 10428177
Sample Receipt Date: 04/20/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



May 07, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

May 7, 2018

DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of Pace Analytical Services, Inc. The sample was analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The sample was received above the recommended temperature range of 0-6 degrees Celsius.

The isotopically-labeled TCDD internal standard in the sample extract was recovered at 56%. All of the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 118%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE	MN002
Arkansas	88-0680	New York (NEL	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10428177

Appendix A

Sample Management

WO#: 10428177



10428177

Report No.: 10428177_8290TCDD_DFR

Client Form	Work Order Number:	COC Type:	Page: 1 of 1
	Turnaround Time:	COC ID:	

CLIENT INFO		LABORATORY		FOR LAB USE ONLY Lab Work Order Sticker
Facility Code:	MNSW-057/MPCA Freeway LF	Program Code (MDH Lab Only):	Lab Name:	
Project Name:	MPCA Freeway LF Solids	Project Task Code:	Address: 18-00383	
Project Manager:			EPIC Profile # 38716	
Potential Hazard?	If yes, add information to Sampler Comments Section		Phone No:	

SAMPLE DETAILS										ANALYSIS REQUESTED												
SAMPLE TYPE CODES					LAB MATRIX CODES					FIELD MATRIX CODES					PRESERV.	ANALYSIS	Lab Sample No.	#				
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	Wtr-Ground=Groundwater	Wtr-Surf=Surface Water	QC-BLANK=Artificial Blank Water					Leachate=Leachate Sample			
16-PT-08 (1.5 m)	S	4/20/18		1	7	C	SD				13						X	See attached for solids/waste incl. Diesel	001	1		
																					2	
																						3
																						4
																						5
																						6
																						7
																						8
																						9
																						10

Sampled By: Jack Kobberhen/Zack Eckstrom
 Sampler's Signature: *[Signature]*
 Phone #: 612-437-5657

Receiving Comments:			
Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) <i>[Signature]</i>	4/20/18 1730	<i>[Signature]</i> Face	4/20/18 17:30

T=6.5°C

Page 5 of 11

Sample Condition
Upon Receipt

Client Name:

Project #:

MPCA

WO# : 10428177
 PM: SCU Due Date: 05/07/18
 CLIENT: PAST-MINFIELD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 6.5 Cooler Temp Corrected (°C): 6.5 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: True Date and Initials of Person Examining Contents: HE 4-20-18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	12. <u>No time on COC or Sample</u>
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N Sample # _____ Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>0-2019-3 ME 4/20/18</u>	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Received during cool down phase.

Project Manager Review:

[Signature]

Date: 04/24/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10428177

Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-08 (1-7WM)		
Lab Sample ID	10428177001		
Filename	U180507A_07		
Injected By	BAL		
Total Amount Extracted	18.8 g	Matrix	Solid
% Moisture	64.0	Dilution	NA
Dry Weight Extracted	6.77 g	Collected	04/20/2018 00:01
ICAL ID	U180405	Received	04/20/2018 17:30
CCal Filename(s)	U180506B_16 & U180507A_16	Extracted	04/26/2018 14:55
Method Blank ID	BLANK-61977	Analyzed	05/07/2018 02:32

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	1.5	----	1.0	2,3,7,8-TCDD-13C	2.00	56
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	59

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61977	Matrix	Solid
Filename	U180507A_03	Dilution	NA
Total Amount Extracted	10.1 g	Extracted	04/26/2018 14:55
ICAL ID	U180405	Analyzed	05/06/2018 23:21
CCal Filename(s)	U180506B_16 & U180507A_16	Injected By	BAL

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	48
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	55

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61978	Matrix	Solid
Filename	U180503B_02	Dilution	NA
Total Amount Extracted	10.4 g	Extracted	04/26/2018 14:55
ICAL ID	U180405	Analyzed	05/03/2018 17:02
CCal Filename(s)	U180503A_13 & U180503B_16	Injected By	SMT
Method Blank ID	BLANK-61977		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.24	118	2,3,7,8-TCDD-13C	2.0	58
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	60

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Appendix F

Data Quality Summary

Appendix F

Data Quality Review

The quality assurance data from the 2018 sampling event were evaluated to determine the integrity of the sampling procedures and the validity of the analytical results. Review procedures were performed in accordance with Barr standard operating procedures (SOPs) and/or method QC requirements where no SOP was available.

Both laboratory and field sampling procedures were examined in the review of the sampling events. Field sampling procedures were examined utilizing field blank and field duplicate analysis; additionally, laboratory procedures were evaluated by examining technical holding times, precision and accuracy data, laboratory method blank analysis, duplicate analysis, and data package completeness.

1.1 Field Procedures

Two field duplicates were collected with this sampling event. Duplicate relative percent differences (RPDs) were calculated for all otherwise unqualified results greater than five times the reporting limit (RL). RPD values close to the reporting limit are not always good measures of precision, and were therefore not necessarily evaluated as part of the review. Several parameters were found to have high RPD values and both the source sample and the duplicate sample were qualified accordingly as estimated values. In two cases, target analytes had a non-detection or low result for one sample, and the associated duplicate had notably higher concentrations well above the 5x threshold. These results were also qualified accordingly as estimated values.

One field blank was collected in association with 2,3,7,8-TCDD and was non-detect for the target parameter. Another field blank collected and analyzed for most of the parameters associated with water samples had detectable concentrations of barium and manganese. As all concentrations for these target analytes were non-detect or greater than five times the detected values in the blank, no qualification was required.

1.2 Laboratory Procedures

1.2.1 Technical Holding Times

Technical holding times were evaluated for each sample and target compound based on the Environmental Protection Agency (EPA) recommendations listed in 40 CFR SW846 "Test Methods for Evaluating Hazardous Waste" or method recommendations. The pH was measured using field instruments at the time of sampling at each monitoring location, and field results are reported in the tables. The pH was also analyzed in the laboratory for confirmatory purposes and was generally

analyzed several days later. The EPA-recommended hold time for pH analysis is immediately after sample collection; as it is not feasible to meet this holding time with laboratory analysis, the field-measured pH appropriately taken at the time of sample collection is reported in the tables.

Hold times for short hold parameters such as chlorite, chlorine dioxide and formaldehyde were frequently analyzed outside of recommended guidelines and qualified accordingly as estimated values due to exceedance of hold times.

The remaining technical holding times were generally within recommendations for all of the samples.

1.2.2 Precision and Accuracy Data

The accuracy and precision of the analytical process were reviewed by comparing sample surrogate recoveries, matrix spike (MS) and matrix spike duplicate (MSD), laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) percent recoveries for spiked target compounds.

Accuracy was evaluated by comparing the percent recoveries of the target compounds to laboratory acceptance criteria. Precision was evaluated using the percent recoveries of the laboratory duplicate samples, LCS/LCSD and MS/MSD data and calculating duplicate relative percent differences (RPDs).

In general, surrogate recoveries on samples were acceptable when the results came from undiluted analyses. No action was taken for those surrogate results outside laboratory acceptance criteria if the sample was analyzed at dilution. In several cases, surrogate recoveries were low or non-detect for PCB analyses, presumably due to sample matrix. In those cases, all results were qualified as estimated values.

Laboratory duplicate samples displayed acceptable RPDs, except where noted in the tables. In general LCS/LCSD displayed acceptable percent recoveries and all RPDs met laboratory acceptance criteria; however, there were a few instances where this was not the case (largely SVOC analyses) and samples associated with the affected batch were qualified accordingly.

It is noted that MS/MSD sample results reported by the laboratory included project and non-project specific samples. Where MS/MSD recoveries and/or associated RPDs failed acceptance criteria and where the native sample was associated with another laboratory client, acceptance of the sample results were based on the acceptable LCS/LCSD data which generally indicated in-control analytical systems during this project. Results of MS/MSD samples not specific to this project are not discussed herein.

The MS/MSD recoveries for the several analytes, most often hexavalent chromium, occasionally reported no recoveries for the spike. Source samples associated with this observation were qualified

as rejected values. Recoveries for other MS/MSD analyses of target analytes were non-detect or below laboratory acceptance criteria. Because the parent sample concentrations were greater than four times the spike added, no qualification was required. In other cases where MS/MSD results were outside laboratory control limits, the source sample results were qualified accordingly as estimated values.

1.2.3 Laboratory Method Blank Results

No target compounds were detected in the laboratory method blanks.

1.2.4 Accreditations

With respect to all solid samples, there were a few parameters reported that Pace lacked accreditation in. In cases where there was no accreditation available for the target analyte, no qualification was applied for the sample results (methyl mercury). In other cases, sample accreditation is available, but the lab did not hold accreditation for the target parameter (namely, total chromium and for part of the sampling period, 1,1,2,2-Tetrachloroethane and Trichloroethene, in solids). Where the lab was not accredited for a target parameter, but accreditation was available, results were qualified as estimated values.

1.2.3 Completeness

Data completeness was evaluated by comparing the analysis requested with the data package as received. The data package received from the laboratory is complete.

1.2.3 Conclusion

All data met the data quality objectives of the project and are deemed acceptable for the purposes of this project, as qualified in the accompanying tables.