ENVIRO-RISK
CONSULTING GROUP, INC.

Enviro-Risk Consulting Group, Inc.
1176 Silverwood Bay
St. Paul, Minnesota 55125
Phone: 651.735.7001
Toll Free: 866.311.7475
Fax: 651.738.3039
www.enviro-risk.com

April 24, 2003

Ms. Jessica Ebertz
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, MN 55155

Re: Annual Monitoring Report & CAD System Monitoring Worksheet
Jordan Texaco, 255 Triangle Lane, Jordan, MN
LEAK #11991

Dear Ms. Ebertz:

Enclosed is the Annual Monitoring Report and the Corrective Action Design System Monitoring Worksheet for the Jordan Texaco site in Jordan, MN (LEAK #11991). The free product recovery system is currently off and free product has not been detected in the two recovery wells (MW-2 and MW-3) over the last 5 months of 2002. However, free product was recently discovered in monitoring well MW-1, which had not historically exhibited free product. MW-1 is located immediately adjacent to the UST basin on site and is upgradient of MW-2 and MW-3.

Following your review and approval of the recommendations in the report, Enviro-Risk will prepare a proposal for the responsible party (Yocum Oil) to address whether free product observed in MW-1 is associated with the September 1998 release, or whether it is due to an unrelated release.

In the interim, Enviro-Risk will be measuring free product levels from monitoring wells on a monthly basis to observe whether free product returns to MW-2 or MW-3. The next quarterly groundwater sampling round is scheduled for June 2003.

If you have any questions, please contact me at 651-735-7001.

Sincerely,

Enviro-Risk Consulting Group, Inc.

Brad M. Burke, PE
Senior Consultant / Principal

c/enc: T. Yocum, Yocum Oil Company
S. Joynson, Strusinski & Associates, PA

ENVIRO-RISK
CONSULTING GROUP, INC.

RECEIVED
APR 25 2003
MPCA, MAR Division
PLR/SS Section

ANNUAL MONITORING REPORT
&
CAD SYSTEM MONITORING WORKSHEET
(MPCA Fact Sheet #3.26 & #3.31)

JORDAN TEXACO
(YOCUM OIL COMPANY)
255 TRIANGLE LANE
JORDAN, MN

MPCA LEAK # 11991

Prepared for:

Yocum Oil Company
2719 Stillwater Road
St. Paul, MN 55119

Prepared by:

Enviro-Risk Consulting Group, Inc.
1176 Silverwood Bay
St. Paul, MN 55125
(651) 735-7001

January 2003

Leaking Petroleum Storage Tanks

Minnesota Pollution Control Agency

http://www.pca.state.mn.us/programs/lust_p.html

Annual Monitoring Report

Fact Sheet 3.26

After the Corrective Action Design (CAD) has been approved, update and submit this worksheet annualy. If a remedial system has been installed, submit fact sheet 3.31 *CAD System Monitoring Worksheet* along with this worksheet.

Under certain circumstances Minnesota Pollution Control Agency (MPCA) staff may request submittal of the monitoring information on a quarterly schedule. This should be conducted according to fact sheet 3.25, *Quarterly Monitoring Report*.

MPCA Site ID: Leak000 ***11991*** Date: ***12/31/02***

Responsible Party: **Yocum Oil Company** R.P. phone #: ***651-739-9141***

Consultant: ***Enviro-Risk Consulting Group, Inc.*** Consultant phone #: ***651-735-7001***

Facility Name: ***Jordan Texaco Oil Company***

Facility Address: ***255 Triangle Lane*** City: ***Jordan***

County: ***Scott*** Zip Code: ***55352***

Site location: The required coordinate scheme for reporting site location is Universal Transverse Mercator (UTM), Extended Zone 15, 1983 North American Datum (NAD83). Refer to **http://www.ot.state.mn.us/ot_files/handbook/standard/std17-1.html** for Minnesota spatial data standards, or **http://mac.usgs.gov/mac/isb/pubs/factsheets/fs15799.html** for more information about UTM Coordinates.

X coordinate (Easting) ***449475*** meters
Y coordinate (Northing) ***4946352*** meters

What feature does the coordinate represent? (i.e. center of parcel, approximate center of source area, etc. Please describe) ***The retail gasoline station building at Jordan Texaco.***

What method was used to determine the coordinate? (i.e. GPS receiver, map interpolation, address matching, etc. Please describe) ***UTM coordinates were obtained utilizing on-line mapping at www.maptech.com to pinpoint the location of the Jordan Texaco site.***

If a paper map, digital map, aerial photo or digital orthophotoquad was used to find the site location, please provide the scale of the map or photo (i.e. 1:24,000, etc.)
1:24,000

Section 1. GROUND WATER MONITORING

Discuss the groundwater monitoring results, including water level measurements and analytical results, performed since the remedial investigation (RI) report or the last progress report submitted. Indicate whether samples were purged or unpurged (see fact sheet 3.23). If purged, indicate purging method.

Water Level Elevations
Recent water elevation data, summarized in Table 2, indicates that groundwater levels were at a high during the June 29, 2002 monitoring event and gradually decreased to their lowest levels as measured during the December 6, 2002 monitoring event. Enviro-Risk obtained MDH well records for the monitoring wells to determine monitoring well construction details. All wells were constructed using 10 feet of screen and the depth to bottom of wells were measured in the field during monitoring events. Based on this information, it appears that the water levels were above the top of the screen in MW-1 for all 8 of the monitoring events, MW-2 for 6 of 8 monitoring events, and MW-3 for 4 of 8 monitoring events.

The free product collection system at the site consists of two pneumatic submersible pumps installed in MW-2 and MW-3, which are designed to automatically remove free product from the wells and discharge into an aboveground storage tank located on site. Monitoring well MW-2 has had no free product detected since Enviro-Risk began monitoring, and MW-3 has had decreasingly minor detections of free product and no detectable free product for the last 5 monitoring events. MW-1 historically has not contained free product however free product levels have increased in MW-1 since it was first detected in the July 23, 2002 monitoring event. It is unclear at this point whether the free product in MW-1 is related to the September 1998 release, or if this constitutes a new release. It is interesting to note that MW-1 is located immediately adjacent to the underground storage tank (UST) basin at the site and upgradient of MW-2 and MW-3.

Groundwater Analytical Data

Enviro-Risk collected groundwater samples from site monitoring wells in September and December 2002. Wells sampled were purged of at least 3 well volumes prior to collecting a groundwater sample. Based on groundwater analytical data, summarized in Table 3, dissolved-phase contaminant concentrations have decreased slightly in MW-2 and increased slightly in MW-3. Contaminant levels in MW-2 and MW-3 were significantly above HRLs for both sampling rounds.

As mentioned above, free product has been recently discovered in MW-1, located immediately adjacent to the station's UST basin and upgradient of MW-2 and MW-3. The thickness of free product has steadily increased in MW-1 since it's initial discovery on July 23, 2002. Because MW-1 is located upgradient and immediately adjacent to the station's UST basin, it is unclear whether the free product in MW-1 is related to the September 1998 release, or if this is associated with a potential new release.

Section 2. VAPOR IMPACT MONITORING

If vapor impacts were detected during previous assessments, discuss the results of follow-up vapor monitoring. Include in your discussion the sampling instrument and sampling method.

NO VAPOR MONITORING PERFORMED

NOTE: If vapor concentrations exceed 10 percent of the lower explosive limit, exit the building and contact the local fire department immediately. Then contact the Minnesota Duty Officer (24 hours) at 651/649-5451 (metro and outside Minnesota) or 1-800/422-0798 (Greater Minnesota). TTY users call 651/297-5353 (V/TTY) or 1-800/627-3529 (V/TTY).

Section 3. RECOMMENDATIONS

Discuss your recommendations. Your recommendation should be based on fact sheet #3.1, *Leaking Underground Storage Tank Program.*

Based on the above, Enviro-Risk recommends leaving the free product recovery system off and collecting monthly free product measurements in monitoring wells through June 2003 to see whether free product returns to MW-2 or MW-3 (see attached CAD System Monitoring Worksheet). Furthermore, Enviro-Risk recommends collecting a free product sample from MW-1 for fingerprint analysis to determine whether it is associated with the September 1998 release or whether it is a new release associated with the UST basin. In addition, the existing tank owner (Holiday Companies) should be informed of the potential new release following fingerprint analysis.

If it is determined that free product in MW-1 is associated with the September 1998 release, or if significant levels of free product returns to MW-2 or MW-3, then the free

product recovery system may be repaired and reconfigured for product collection from existing wells. If it is determined that free product in MW-1 is not associated with the September 1998 release, and if free product does not return to MW-2 or MW-3, then an update report and request for closure will be prepared and submitted to the MPCA following the June 2003 monitoring event.

If additional corrective action is recommended, please provide your justification.

If significant reduction of risk has been achieved at the site, recommendations and rationale for the reduction or termination of corrective actions may be presented.

The free product recovery system has removed greater than 2,430 gallons of free product since the release (see attached CAD System Monitoring Worksheet). Because the total quantity released was undetermined, but believed to be in excess of 1,000 gallons, it is very feasible that the free product recovery system has removed all product associated with the 1998 release. Given this possibility, and the lack of measured free product in MW-2 and MW-3, resuming operation of the free product recovery system may not be justified.

If additional monitoring is recommended, indicate the proposed monitoring schedule and frequency.

Free product recovery / monitoring should continue on a monthly basis for monitoring wells MW-1, MW-2, and MW-3 at least through June 2003.

Enviro-Risk will continue collecting groundwater samples from MW-1, MW-2, and MW-3 for laboratory analysis on a quarterly basis, at least through June 2003. Groundwater samples will be analyzed for BTEX, MTBE, & GRO.

Enviro-Risk also recommends collecting a free product sample from MW-1 for fingerprint analysis to determine the source of free product.

If closure is recommended, summarize significant site investigative events and describe how site specific risk issues have been adequately addressed or minimized to acceptable low risk levels.

Section 4: CONSULTANT (OR OTHER) INFORMATION

By signing this document, I/we acknowledge that we are submitting this document on behalf of and as agents of the responsible person or volunteer for this leaksite. I/we acknowledge that if information in this document is inaccurate or incomplete, it will delay the completion of remediation and may harm the environment and may result in reduction of reimbursement awards. In addition, I/we acknowledge on behalf of the responsible person or volunteer for this leaksite that if this document is determined to contain a false material statement, representation, or certification, or if it omits material information, the responsible person or volunteer may be found to be in violation of Minn. Stat. § 115.075 (1994) or Minn. Rules 7000.0300 (Duty of Candor), and that the responsible person or volunteer may be liable for civil penalties.

MPCA staff are instructed to reject unsigned monitoring reports or if the report form has been altered.

Name and Title:	Signature:	Date signed:
Brad M. Burke, PE Proj Mgr Enviro-Risk Consulting Group, Inc.		12/31/2002

Company and mailing address:

Enviro-Risk Consulting Group, Inc.
1176 Silverwood Bay
St. Paul, MN 55125

Phone: (651) 735-7001
Fax: (651) 738-3039

Attach Tables:

- Table 1 - Monitoring Well Completion Information
- Table 2 - Summary of Water Levels Measurements
- Table 3 - Analytical Results of Water Samples
- Table 4 - Other Contaminants Detected in Water Samples (Petroleum or Non-petroleum Derived)
- Table 5 - Results of Natural Attenuation
- Table 6 - Results of Vapor Monitoring

Table 1
Monitoring Well Completion Information

Well Number	Unique Well Number	Date Installed	Surface Elevation	Top of Riser Elevation	Bottom of Well (Elevation)	Screen Interval (Elev. - Elev.)
MW-1	616539	11/2/98	752 (est)	751.5 (est)	731.6	731.6 – 741.6
MW-2	616538	11/2/98	752 (est)	751.5 (est)	734.2	734.2 - 744.2
MW-3	616540	11/2/98	752 (est)	751.5 (est)	734.2	734.2 – 744.2

Notes: 1) *Above elevations expressed in feet above MSL; Surface elevations estimated based USGS Topographic Map. No surveyed well elevations available.*
2) *Construction details on wells MW-1 through MW-3 obtained through MDH Well and Boring Records; All wells are flush mounted construction.*
3) *Bottom of Well depths measured in the field (MW-1: 19.85 feet btoc; MW-2: 17.30 feet btoc; MW-3: 17.35 feet btoc).*

Table 2
Water Level Measurements

Well Number	Date	Depth of Water from Top of Riser (feet)	Product Thickness (feet)	Depth of Water Below Grade (feet)	Relative Groundwater Elevation (feet above MSL)	Water Level Above Screen (Y/N)
MW-1	06/13/02	7.77	0	8.3	743.73	Y
	06/29/02	6.37	0	6.9	745.13	Y
	07/10/02	6.57	0	7.1	744.93	Y
	07/23/02	7.90	0.15	8.4	743.60 *	Y
	09/30/02	7.69	0.25	8.2	743.81 *	Y
	10/30/02	7.82	0.38	8.3	743.68 *	Y
	11/20/02	8.65	0.63	9.2	742.85 *	Y
	12/06/02	8.97	0.80	9.5	742.53 *	Y
MW-2	06/13/02	6.86	0	7.4	744.64	Y
	06/29/02	5.47	0	6.0	746.03	Y
	07/10/02	5.83	0	6.3	745.67	Y
	07/23/02	6.95	0	7.5	744.55	Y
	09/30/02	6.62	0	7.1	744.88	Y
	10/30/02	6.67	0	7.2	744.83	Y
	11/20/02	7.30	0	7.8	744.20	N
	12/06/02	7.45	0	8.0	744.05	N

MW-3	06/13/02	7.48	0.11	8.0	744.02 *	N
	06/29/02	6.01	0.02	6.5	745.49 *	Y
	07/10/02	6.85	0.01	7.4	744.65 *	Y
	07/23/02	7.44	0	7.9	744.06	N
	09/30/02	7.13	0	7.6	744.37	Y
	10/30/02	7.15	0	7.7	744.35	Y
	11/20/02	7.82	0	8.3	743.68	N
	12/06/02	7.97	0	8.5	743.53	N

Describe the methods and procedures used to measure water levels and product thickness.

Notes: *1) Water level data collected from Nov. 1998 until Dec. 2001 not available; obtained by Arden Environmental & IT Corporation.*
2) Water level data collected June 2002 to present was collected with a Solinst Water Level Meter or Oil/Water Interface Probe referenced to top of casing elevations; 2001 & 2002 data based on new site survey conducted in September 2001.
*3) * = Groundwater elevation inaccurate due to existence of free product.*

Table 3
Analytical Results of Water Samples

Well #	Date	Benzene	Toluene	Ethyl Benzene	Xylenes	MTBE	GRO	DRO	Lab Type
MW-1	9/30/02		*Not Sampled due to Free Product*						
	12/30/02		*Not Sampled due to Free Product*						
MW-2	9/30/02	28,000	27,000	1700	8900	<40	110,000	NA	
	12/30/02	23,000	19,000	1800	9700	<400	80,000	NA	
MW-3	9/30/02	9200	16,000	870	5100	<40	46,000	NA	
	12/6/02	9100	17,000	1200	7400	<400	51,000	NA	
Trip Blk	12/6/02	<1.0	<1.0	<1.0	<3.0	<4.0	<100	NA	
Lab Blank HRL(ug/L)		10	1000	700	10000				

Notes: 1) Pre-2002 data from previous reports submitted by others.
2) All values expressed in micrograms per liter (ug/L).
3) *NA = Not Analyzed.*

Table 4
Other Contaminants Detected in Water Samples
(Petroleum or Non-petroleum Derived)

Well Number	Date Sampled	1,2 DCA	EDB				
MW-1							
MW-2							
		NO OTHER CONTAMINANTS IDENTIFIED					
MW-3							
Field Blank							
Trip Blank							
Lab Blank							
HRL (ug/L)		4	0.004				

Report results in ug/L. Indicate other contaminants (either petroleum or non-petroleum derived) detected in water samples collected from the borings, temporary wells or push probes.
Notes:

Table 5
Natural Attenuation Parameters

Monitoring Well	Sample Date	Temp. °C	PH	Dissolved Oxygen (mg/L)	Nitrate (mg/L)	(Fe II) (mg/L)	(H_2S, HS^-) (mg/L)
MW-1							
MW-2							
MW-3							

Notes:

Table 6
Results of Vapor Monitoring

Location #	Date	PID reading (ppm)	Percent of the LEL

Notes:

Attach Figures:

Figures - (all maps are to include a north arrow, scale and legend) *Approximate scales are not acceptable.*

- Site location map. Adapt this map from a U.S. Geological Survey 7.5 minute quadrangle and identify the name of the 7.5 minute quadrangle.
- Site map showing the locations of all ground water and vapor monitoring points.
- Updated ground water contour maps, using water level elevations from all rounds of water level measurements since the last report. Show all wells at the site, and differentiate wells constructed in different aquifers. Label ground water contours and elevations at each data point used for contouring.
- Hydrograph for all monitoring and recovery wells.
- Graph(s) showing contaminant concentrations over time for all monitoring and recovery wells.

Attach Appendices:

The appendix section of the report contains sufficient information to document all activities completed since the last report. All reproduced data must be legible.

- Copies of most recent laboratory reports for ground water analyses, including a copy of the Chain of Custody and the MDH laboratory certification number.
- Sample collection information, including procedure, equipment, and decontamination.
- Field or sampling data sheets.

Web pages and phone numbers

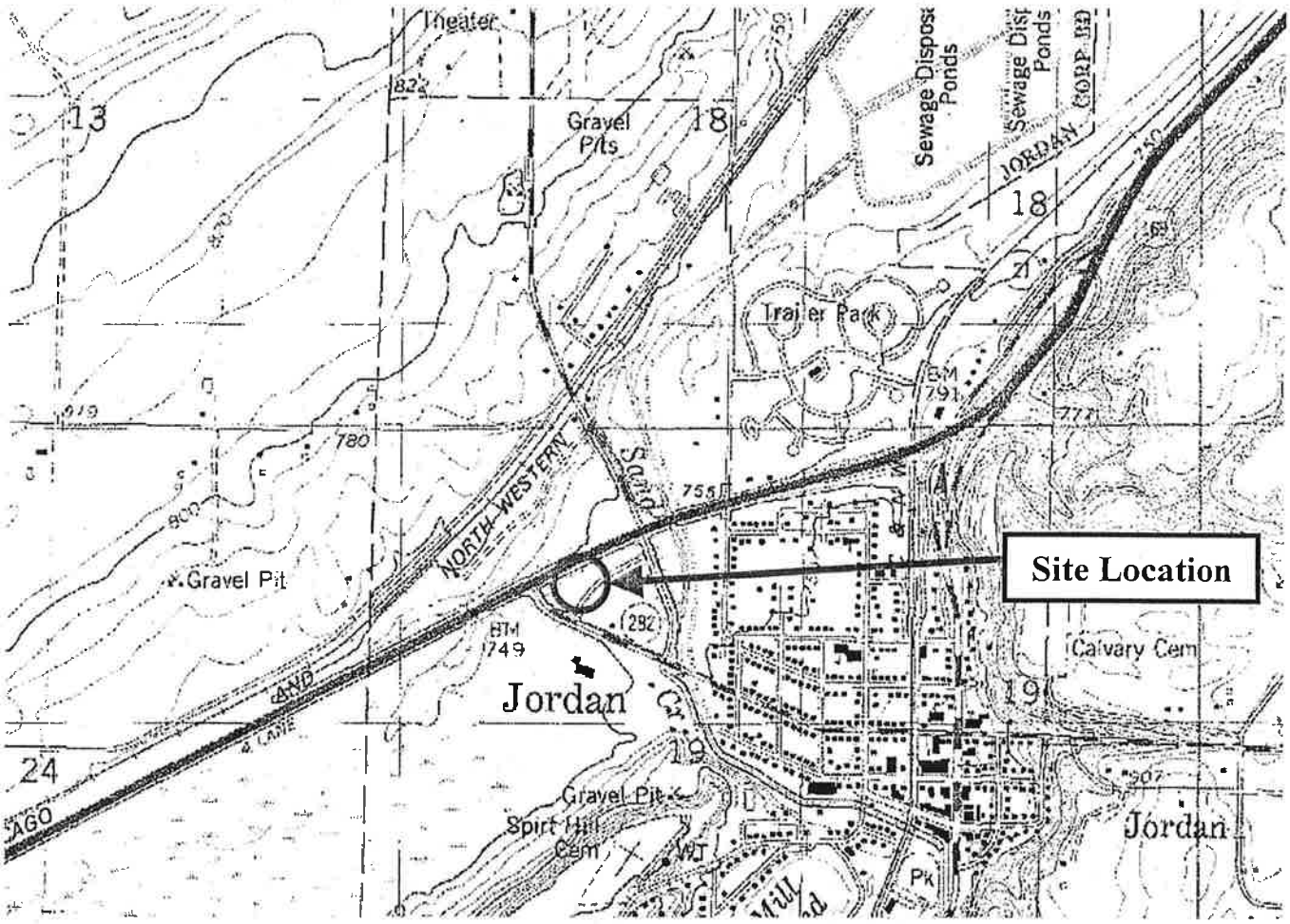
MPCA staff	http://data.pca.state.mn.us/pca/emplsearch.html
MPCA toll free	**1-800-657-3864**
LUST web page	http://www.pca.state.mn.us/programs/lust_p.html
MPCA Infor. Request	http://www.pca.state.mn.us/about/inforequest.html
PetroFund Web Page	http://www.commerce.state.mn.us/mainpf.htm
PetroFund Phone	**651-297-1119, or 1-800-638-0418**
State Duty Officer	**651-649-5451 or 1-800-422-0798**

FIGURES

Drawing Number:

Checked By: Approved By:

Drawn By: KH



N

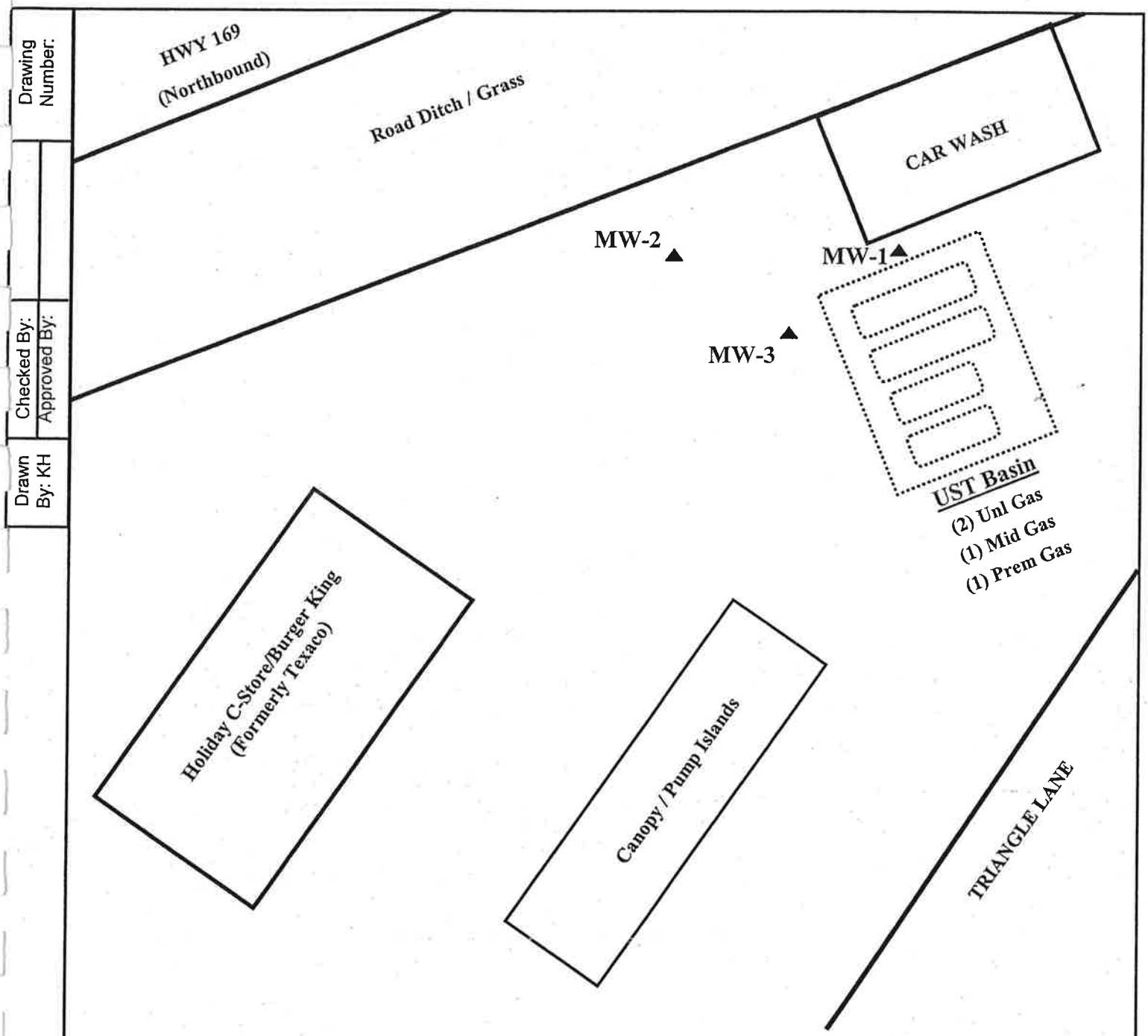
Approximate Scale:
1 inch = 1500 feet

Figure 1
Site Location Map

Jordan Texaco
255 Triangle Lane
Jordan, MN

ENVIRO-RISK
CONSULTING GROUP, INC.

"Do Not Scale Up Drawing"



Approximate Scale:
1 inch = 30 feet

Figure 2
Site Map

Jordan Texaco
255 Triangle Lane
Jordan, MN

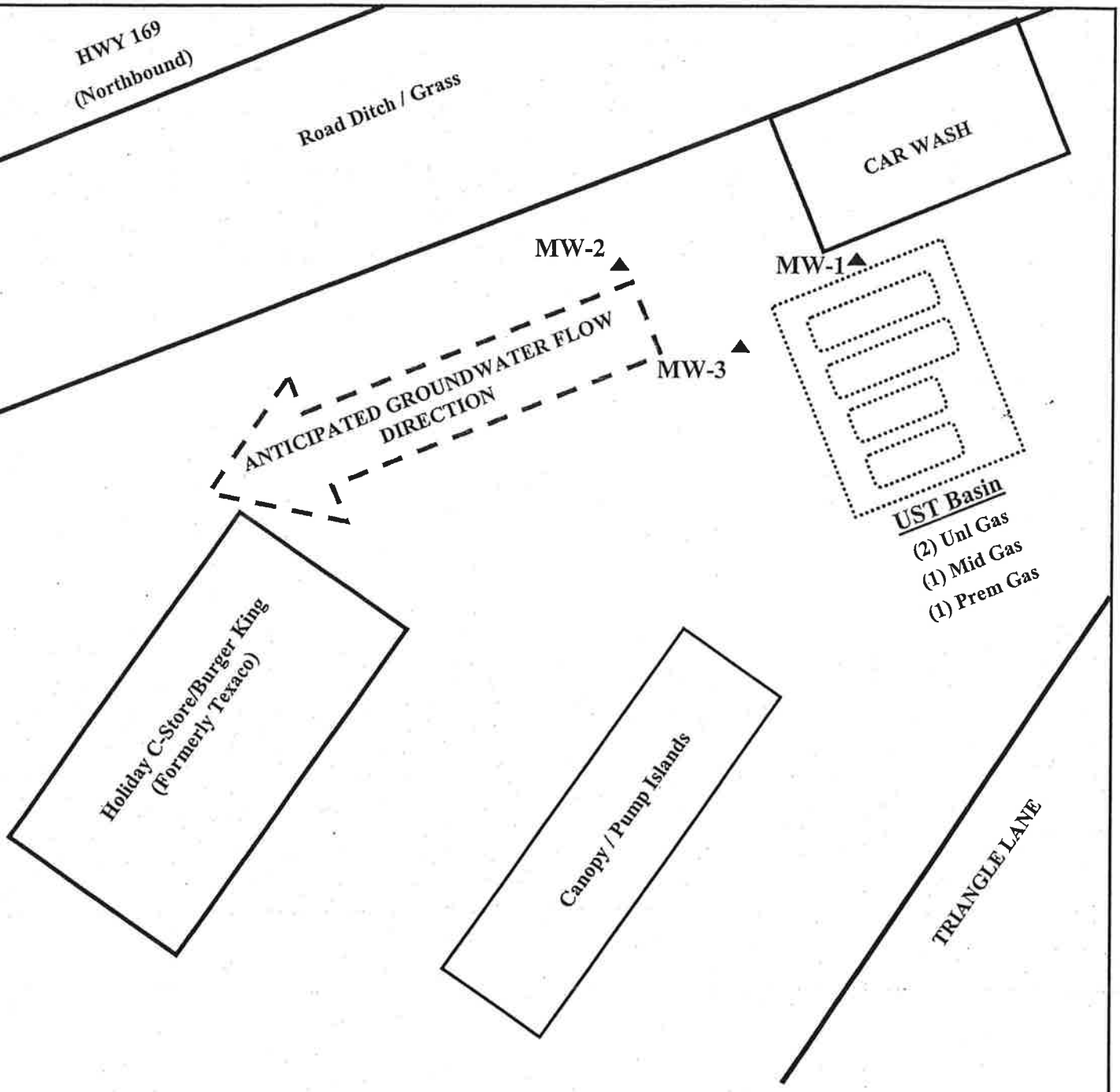
ENVIRO-RISK
CONSULTING GROUP, INC.

"Do Not Scale Up Drawing"

Drawing Number:

Checked By: Approved By:

Drawn By: KH



N

Approximate Scale:
1 inch = 30 feet

Figure 3
Groundwater Flow Direction

Jordan Texaco
255 Triangle Lane
Jordan, MN

ENVIRO-RISK
CONSULTING GROUP, INC.

"Do Not Scale Up Drawing"

FIGURE 4
Water Level Elevations
Jordan Texaco Monitoring Wells

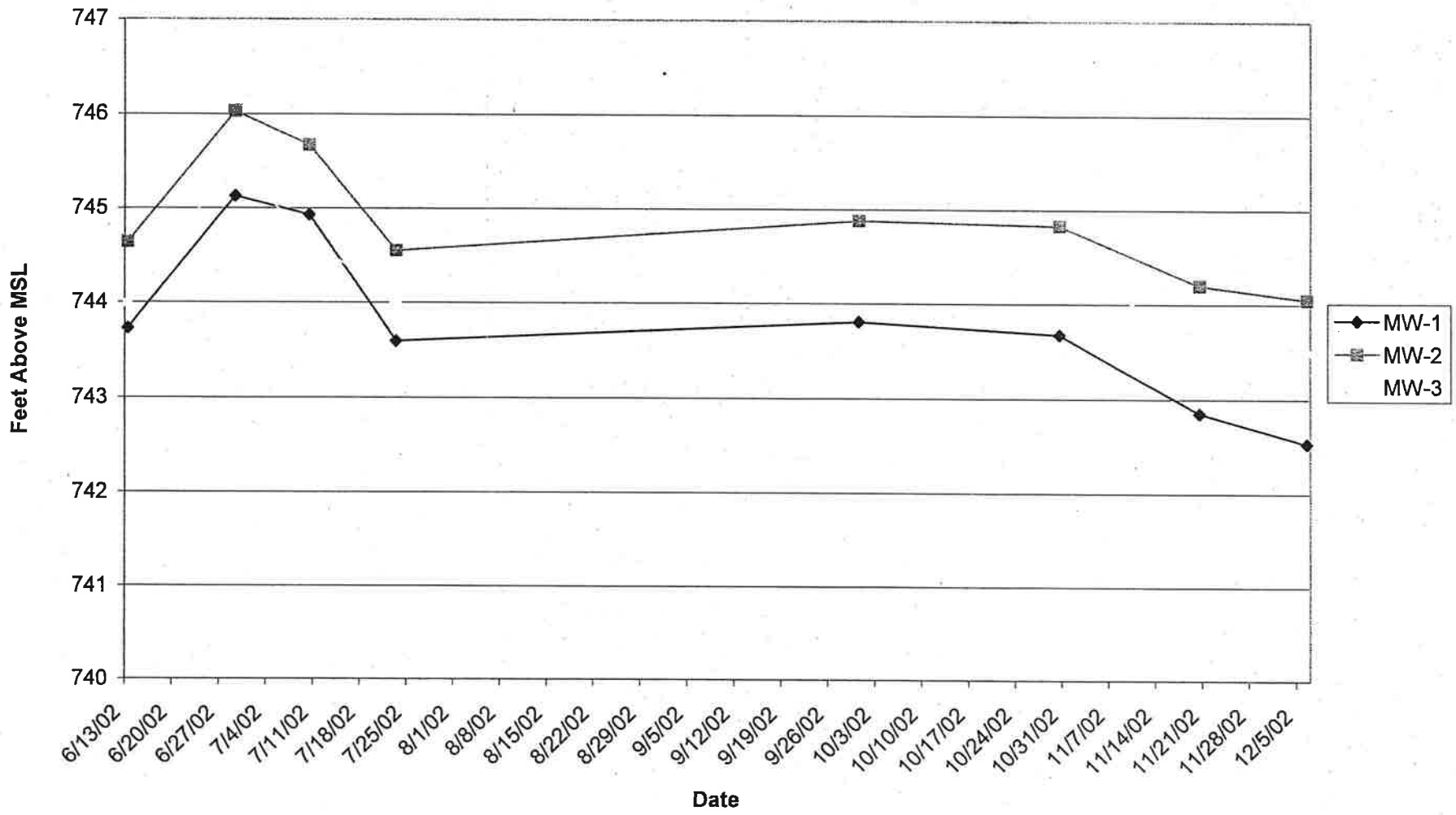


FIGURE 5
MW-2 Contaminant Trends
Jordan Texaco

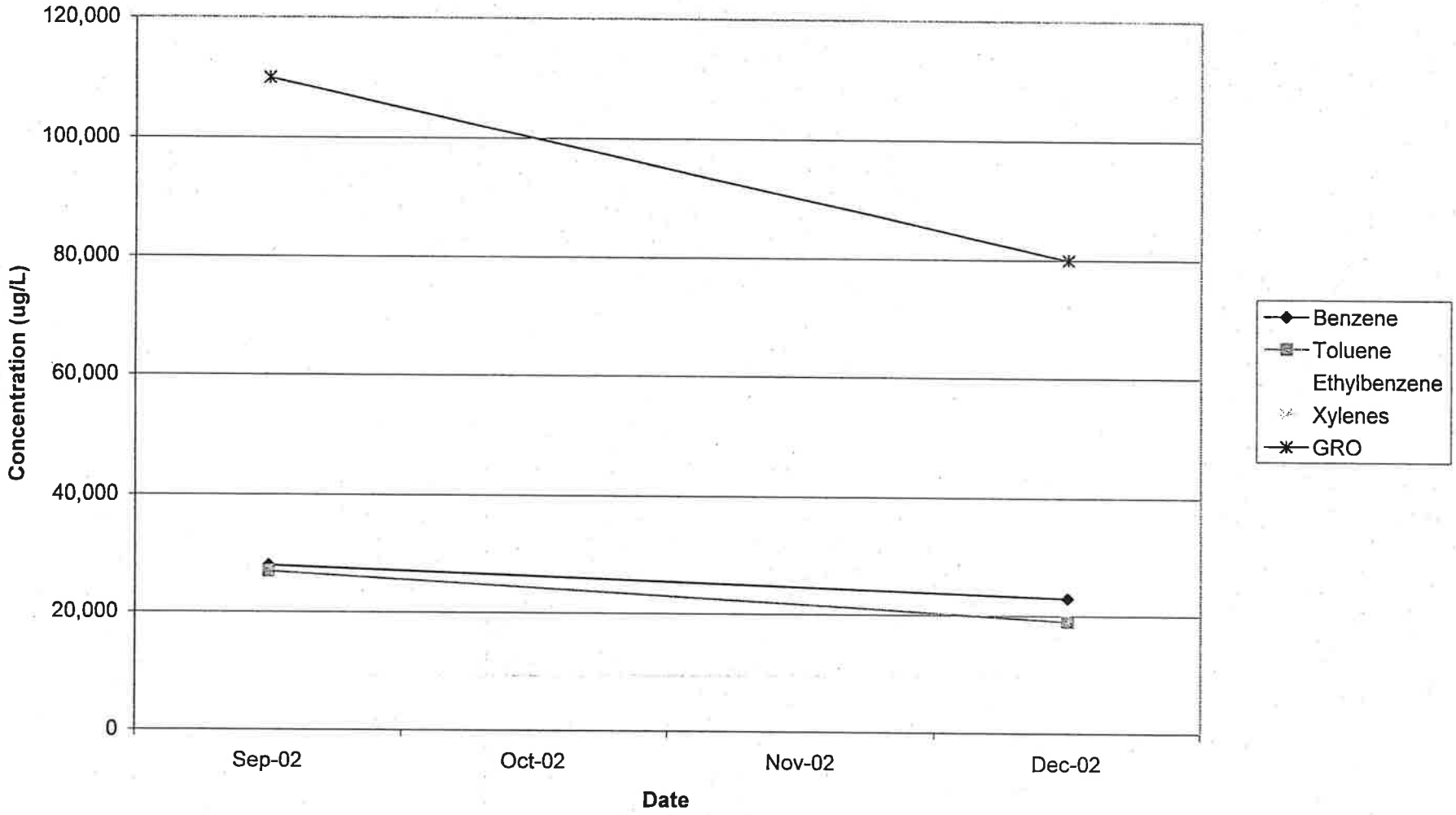
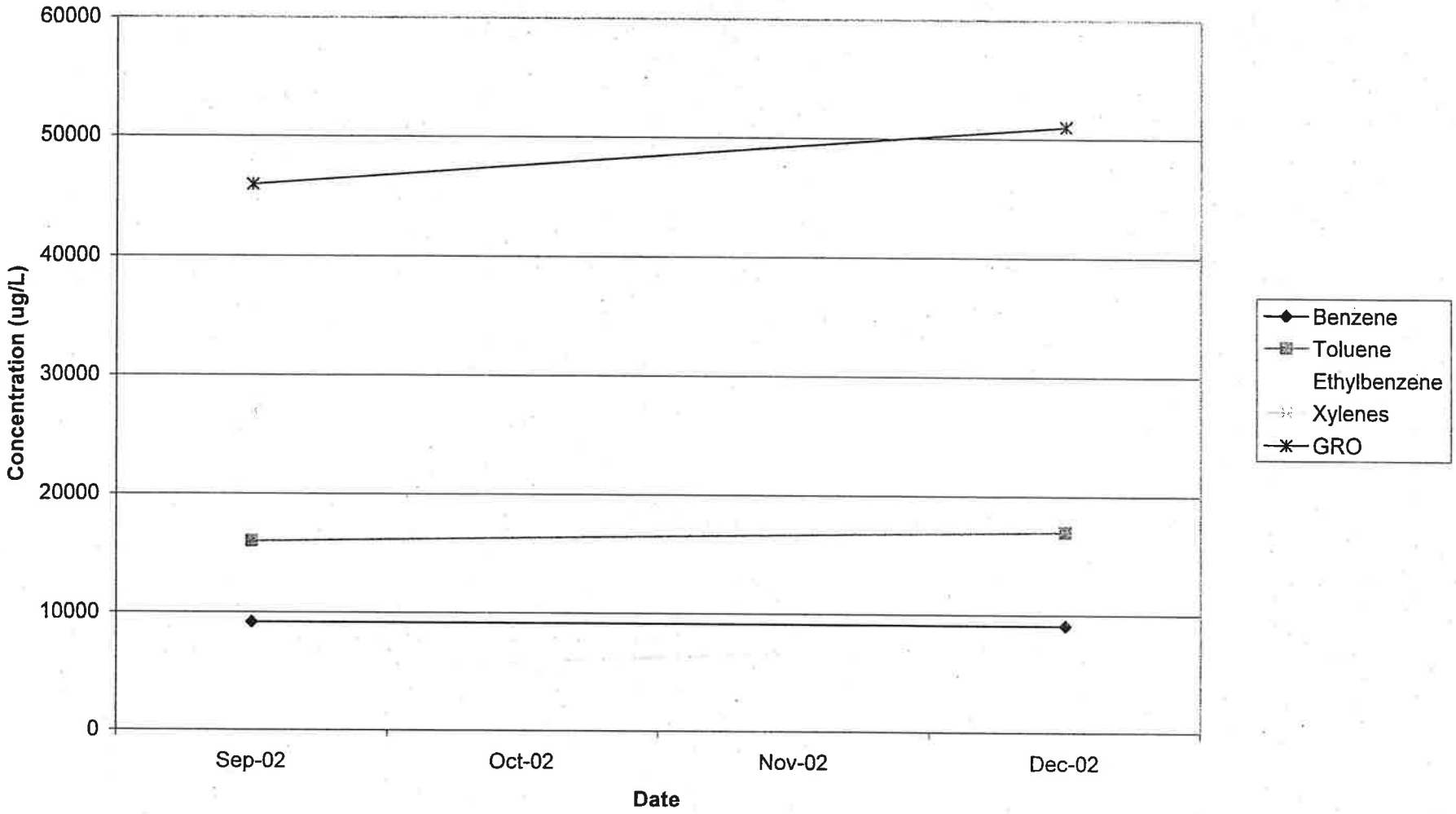


FIGURE 6
MW-3 Contaminant Trends
Jordan Texaco



APPENDIX 1

LABORATORY ANALYTICAL REPORTS

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

October 04, 2002

Mr. Brad Burke
Enviro-Risk Consulting
1176 Silverwood Bay
St. Paul, MN 55125

RE: Lab Project Number: 1063329
Client Project ID: Yocum Oil #20-02014

Dear Mr. Burke:

Enclosed are the analytical results for sample(s) received by the laboratory on October 1, 2002. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

Roxanne Patterson

Roxanne Patterson
Roxanne.Patterson@pacelabs.com
Project Manager

State of Minnesota laboratory 027-053-137

Enclosures

REPORT OF LABORATORY ANALYSIS

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Lab Project Number: 1063329
Client Project ID: Yocum Oil #20-02014

Lab Sample No: 103900510 Project Sample Number: 1063329-001 Date Collected: 09/30/02 13:15
Client Sample ID: MW-2 Matrix: Water Date Received: 10/01/02 12:45

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
GC Volatiles								
WI GRO and PVOC	Method: TPH GRO/PVOC WI							
Benzene	28000	ug/l	100	10/02/02 19:51	JPH1	71-43-2		
Ethylbenzene	1700	ug/l	10.	10/02/02 19:51	JPH1	100-41-4		
Toluene	27000	ug/l	100	10/02/02 19:51	JPH1	108-88-3		
Xylene (Total)	8900	ug/l	30.	10/02/02 19:51	JPH1	1330-20-7		
Methyl-tert-butyl ether	ND	ug/l	40.	10/02/02 19:51	JPH1	1634-04-4		
Gasoline Range Organics	110000	ug/l	10000	10/02/02 19:51	JPH1			
a,a,a-Trifluorotoluene (S)	95	%		10/02/02 19:51	JPH1	98-08-8		

Lab Sample No: 103900528 Project Sample Number: 1063329-002 Date Collected: 09/30/02 14:05
Client Sample ID: MW-3 Matrix: Water Date Received: 10/01/02 12:45

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
GC Volatiles								
WI GRO and PVOC	Method: TPH GRO/PVOC WI							
Benzene	9200	ug/l	100	10/02/02 20:23	JPH1	71-43-2		
Ethylbenzene	870	ug/l	10.	10/02/02 20:23	JPH1	100-41-4		
Toluene	16000	ug/l	100	10/02/02 20:23	JPH1	108-88-3		
Xylene (Total)	5100	ug/l	30.	10/02/02 20:23	JPH1	1330-20-7		
Methyl-tert-butyl ether	ND	ug/l	40.	10/02/02 20:23	JPH1	1634-04-4		
Gasoline Range Organics	46000	ug/l	1000	10/02/02 20:23	JPH1			
a,a,a-Trifluorotoluene (S)	81	%		10/02/02 20:23	JPH1	98-08-8		

REPORT OF LABORATORY ANALYSIS

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Lab Project Number: 1063329
Client Project ID: Yocum Oil #20-02014

PARAMETER FOOTNOTES

ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
(S)	Surrogate

REPORT OF LABORATORY ANALYSIS

ACCREDITED IN ACCORDANCE WITH nelac

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

QUALITY CONTROL DATA

Lab Project Number: 1063329
Client Project ID: Yocum Oil #20-02014

QC Batch: 79849 — Analysis Method: TPH GRO/PVOC WI
QC Batch Method: EPA 8015 — Analysis Description: WI GRO and PVOC
Associated Lab Samples: 103900510 103900528

METHOD BLANK: 103904710
Associated Lab Samples: 103900510 103900528

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Benzene	ug/l	ND	1.0	
Ethylbenzene	ug/l	ND	1.0	
Toluene	ug/l	ND	1.0	
Xylene (Total)	ug/l	ND	3.0	
Methyl-tert-butyl ether	ug/l	ND	4.0	
Gasoline Range Organics	ug/l	ND	100	
a,a,a-Trifluorotoluene (S)	%	107		

LABORATORY CONTROL SAMPLE & LCSD: 103904728 103904736

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	RPD	Footnotes
Benzene	ug/l	100.00	90.11	90.30	90	90	0	
Ethylbenzene	ug/l	100.00	92.73	92.98	93	93	0	
Toluene	ug/l	100.00	91.84	91.28	92	91	1	
Xylene (Total)	ug/l	300.00	272.5	271.7	91	91	0	
Methyl-tert-butyl ether	ug/l	100.00	88.37	90.82	88	91	3	
Gasoline Range Organics	ug/l	1000.00	942.6	1008	94	101	7	
a,a,a-Trifluorotoluene (S)					97	102		

SAMPLE DUPLICATE: 103904868

Parameter	Units	103904033 Result	DUP Result	RPD	Footnotes
Benzene	ug/l	200.0	210.0	4	
Toluene	ug/l	210.0	210.0	3	
Ethylbenzene	ug/l	26.00	27.00	3	
Xylene (Total)	ug/l	110.0	120.0	3	
Methyl-tert-butyl ether	ug/l	ND	ND	NC	

REPORT OF LABORATORY ANALYSIS

nelac

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www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

QUALITY CONTROL DATA

Lab Project Number: 1063329
Client Project ID: Yocum Oil #20-02014

SAMPLE DUPLICATE: 103904868

Parameter	Units	103904033 Result	DUP Result	RPD	Footnotes
Gasoline Range Organics	ug/l	1200	1200	1	
a,a,a-Trifluorotoluene (S)	%	97	95		

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Lab Project Number: 1063329
Client Project ID: Yocum Oil #20-02014

QUALITY CONTROL DATA PARAMETER FOOTNOTES

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

LCS(D)	Laboratory Control Sample (Duplicate)
MS(D)	Matrix Spike (Duplicate)
DUP	Sample Duplicate
ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
RPD	Relative Percent Difference
(S)	Surrogate

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CHAIN OF CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

591330

Page: 1 of 1

To Be Completed by Pace Analytical and Client

Required Client Information: **Section A**

Company: ENVIRO-RISK CONSULTING
Address: 1176 SILVERWOOD BAY
ST. PAUL, MN 55125
Phone: 651-735-7001 Fax: 651-738-3039

Required Client Information: **Section B**

Report To: BRAD BURKE
Copy To: 11
Invoice To: 11
P.O.: #20-02014
Project Name: YOCUM OIL
Project Number: #20-02014

Client Information (Check quote/contract):
Requested Due Date: *TAT:

* Turn around times less than 14 days subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.
Turn Around Time (TAT) in calendar days.

Section C

Quote Reference:
Project Manager:
Project #: 1063329
Profile #:

Section D **Required Client Information:**

SAMPLE ID

One character per box.
(A–Z, 0–9 / .–)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

Requested Analysis: BTEX, MTBE, GRO

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED (mm / dd / yy)	TIME COLLECTED (hh:mm a/p)	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Remarks / Lab ID
1	MW-2	WT	09/30/02	1:15 p	3				X				103900510
2	MW-3	WT	09/30/02	2:05 p	3				X				528
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													

SHIPMENT METHOD	AIRBILL NO.	SHIPPING DATE	NO. OF COOLERS

ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
1-2	B T B / ENVIRORISK	10/1/02	12:45	D. Zimmerman	10/1/02	12:45

Additional Comments:

Pace Project No.:

SAMPLE CONDITION

Temp: 6 °C | Received on Ice: (Y) N | Sealed Cooler: Y (N) | Samples Intact: (Y) N | pH

ORIGINAL

SEE REVERSE SIDE FOR INSTRUCTIONS

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Fax: 612.607.6444

December 19, 2002

Mr. Brad Burke
Enviro-Risk Consulting
1176 Silverwood Bay
St. Paul, MN 55125

RE: Lab Project Number: 1066448
Client Project ID: 20-02014 Yocum

Dear Mr. Burke:

Enclosed are the analytical results for sample(s) received by the laboratory on December 9, 2002. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

Roxanne Patterson

Roxanne Patterson
Roxanne.Patterson@pacelabs.com
Project Manager

State of Minnesota laboratory 027-053-137

Enclosures

REPORT OF LABORATORY ANALYSIS

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Lab Project Number: 1066448
Client Project ID: 20-02014 Yocum

Lab Sample No: 104100490 Project Sample Number: 1066448-002 Date Collected: 12/06/02 15:15
Client Sample ID: MW-3 Matrix: Water Date Received: 12/09/02 11:45

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
GC Volatiles								
WI GRO and PVOC	Method: TPH GRO/PVOC WI							
Benzene	9100	ug/l	100	12/13/02 00:29	JPH1	71-43-2		
Ethylbenzene	1200	ug/l	100	12/13/02 00:29	JPH1	100-41-4		
Toluene	17000	ug/l	100	12/13/02 00:29	JPH1	108-88-3		
Xylene (Total)	7400	ug/l	300	12/13/02 00:29	JPH1	1330-20-7		
Methyl-tert-butyl ether	ND	ug/l	400	12/13/02 00:29	JPH1	1634-04-4		
Gasoline Range Organics	51000	ug/l	10000	12/13/02 00:29	JPH1			
a,a,a-Trifluorotoluene (S)	88	%		12/13/02 00:29	JPH1	98-08-8		

Lab Sample No: 104100508 Project Sample Number: 1066448-003 Date Collected: 12/06/02 00:00
Client Sample ID: TRIP BLANK Matrix: Water Date Received: 12/09/02 11:45

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
GC Volatiles								
WI GRO and PVOC	Method: TPH GRO/PVOC WI							
Benzene	ND	ug/l	1.0	12/13/02 01:00	JPH1	71-43-2		
Ethylbenzene	ND	ug/l	1.0	12/13/02 01:00	JPH1	100-41-4		
Toluene	ND	ug/l	1.0	12/13/02 01:00	JPH1	108-88-3		
Xylene (Total)	ND	ug/l	3.0	12/13/02 01:00	JPH1	1330-20-7		
Methyl-tert-butyl ether	ND	ug/l	4.0	12/13/02 01:00	JPH1	1634-04-4		
Gasoline Range Organics	ND	ug/l	100	12/13/02 01:00	JPH1			
a,a,a-Trifluorotoluene (S)	109	%		12/13/02 01:00	JPH1	98-08-8		

Lab Sample No: 104100540 Project Sample Number: 1066448-004 Date Collected: 12/06/02 14:15
Client Sample ID: MW-2 Matrix: Water Date Received: 12/09/02 11:45

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
GC Volatiles								
WI GRO and PVOC	Method: TPH GRO/PVOC WI							
Benzene	23000	ug/l	100	12/13/02 01:30	JPH1	71-43-2		
Ethylbenzene	1800	ug/l	100	12/13/02 01:30	JPH1	100-41-4		
Toluene	19000	ug/l	100	12/13/02 01:30	JPH1	108-88-3		
Xylene (Total)	9700	ug/l	300	12/13/02 01:30	JPH1	1330-20-7		
Methyl-tert-butyl ether	ND	ug/l	400	12/13/02 01:30	JPH1	1634-04-4		

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Lab Project Number: 1066448
Client Project ID: 20-02014 Yocum

Lab Sample No: 104100540 Project Sample Number: 1066448-004 Date Collected: 12/06/02 14:15
Client Sample ID: MW-2 Matrix: Water Date Received: 12/09/02 11:45

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Gasoline Range Organics	80000	ug/l	10000	12/13/02 01:30	JPH1			
a,a,a-Trifluorotoluene (S)	80	%		12/13/02 01:30	JPH1	98-08-8		

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Lab Project Number: 1066448
Client Project ID: 20-02014 Yocum

PARAMETER FOOTNOTES

ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
(S)	Surrogate

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QUALITY CONTROL DATA

Lab Project Number: 1066448
Client Project ID: 20-02014 Yocum

QC Batch: 83476 Analysis Method: TPH GRO/PVOC WI
QC Batch Method: EPA 8015 Analysis Description: WI GRO and PVOC
Associated Lab Samples: 104100490 104100508 104100540

METHOD BLANK: 104112479
Associated Lab Samples: 104100490 104100508 104100540

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Benzene	ug/l	ND	1.0	
Ethylbenzene	ug/l	ND	1.0	
Toluene	ug/l	ND	1.0	
Xylene (Total)	ug/l	ND	3.0	
Methyl-tert-butyl ether	ug/l	ND	4.0	
Gasoline Range Organics	ug/l	ND	100	
a,a,a-Trifluorotoluene (S)	%	87		

LABORATORY CONTROL SAMPLE & LCSD: 104112487 104112495

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	RPD	Footnotes
Benzene	ug/l	100.00	92.15	96.94	92	97	5	
Ethylbenzene	ug/l	100.00	93.96	97.19	94	97	3	
Toluene	ug/l	100.00	92.16	94.97	92	95	3	
Xylene (Total)	ug/l	300.00	282.9	293.5	94	98	4	
Methyl-tert-butyl ether	ug/l	100.00	108.8	113.7	109	114	4	
Gasoline Range Organics	ug/l	1000.00	975.6	1010	98	101	3	
a,a,a-Trifluorotoluene (S)					102	101		

SAMPLE DUPLICATE: 104112750

Parameter	Units	104104955 Result	DUP Result	RPD	Footnotes
Benzene	ug/l	ND	ND	NC	
Ethylbenzene	ug/l	ND	ND	NC	
Toluene	ug/l	ND	ND	NC	
Xylene (Total)	ug/l	ND	ND	NC	
Methyl-tert-butyl ether	ug/l	ND	ND	NC	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Lab Project Number: 1066448
Client Project ID: 20-02014 Yocum

SAMPLE DUPLICATE: 104112750

Parameter	Units	104104955 Result	DUP Result	RPD	Footnotes
Gasoline Range Organics	ug/l	ND	ND	NC	
a,a,a-Trifluorotoluene (S)	%	103	101		

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Lab Project Number: 1066448
Client Project ID: 20-02014 Yocum

QUALITY CONTROL DATA PARAMETER FOOTNOTES

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

LCS(D)	Laboratory Control Sample (Duplicate)
MS(D)	Matrix Spike (Duplicate)
DUP	Sample Duplicate
ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
RPD	Relative Percent Difference
(S)	Surrogate

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

704365

Page: 1 of 1

To Be Completed by Pace Analytical and Client

Required Client Information: Section A

Company: ENVIRO-RISK CONSULTANTS
Address: 1176 SILVERWOOD BAY
ST. PAUL, MN 55125
Phone: 651-735-7001 Fax: 651-738-3039

Required Client Information: Section B

Report To: BRAD BURKE
Copy To: —
Invoice To: SAME
P.O.: 20-02014
Project Name: ~~20~~ LOCUM
Project Number: 20-02014

Client Information ~~(Check quote/contract)~~:
Requested Due Date: *TAT: STANDARD

* ~~Turn around times less than 14~~ days subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.
Turn Around Time (TAT) in calendar days.

Section C

Quote Reference:
Project Manager:
Project #: 106448
Profile #:

Section D Required Client Information:

SAMPLE ID

One character per box.
(A–Z, 0–9 / .–)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED (mm / dd / yy)	TIME COLLECTED (hh:mm a/p)	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Requested Analysis: BTEX / MTBE GRO	Remarks / Lab ID
1	MW-2	WT	12/06/02	2:15	3				X					XX	10 4100548 ~~4100487~~
2	MW-3	WT	12/06/02	3:15	3				X					XX	10 4100490
3	TRIP BLANK	WT	—	—	2				X					XX	10 4100508
4															
5															
6															
7															
8															
9															
10															
11															
12															

SHIPMENT METHOD	AIRBILL NO.	SHIPPING DATE	NO. OF COOLERS

ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
1-3	BPB/ENVIRO	12/9/02	11:45	PACE	12/9	1145

SAMPLE CONDITION

Temp in °C	2.0
Received on Ice	(Y)/N
Sealed Cooler	Y/(N)
Samples Intact	(Y)/N

SAMPLE NOTES

Additional Comments:

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:
SIGNATURE of SAMPLER:
DATE Signed: (MM / DD / YY)

ORIGINAL

SEE REVERSE SIDE FOR INSTRUCTIONS

Form COC01 Rev 0402

APPENDIX 2

SAMPLE COLLECTION PROCEDURES

Groundwater Sampling & Analysis

All groundwater sampling and analysis was conducted in general accordance with MPCA Fact Sheet #3.23. The depth to groundwater was recorded using a Solinst oil-water interface probe capable of detecting free product and water to 0.01 foot. The Solinst probe was decontaminated with a soap/water mixture and then triple rinsed between each well.

Following collection of water level data, a minimum of 3 well volumes of water was purged from each monitoring well with a disposable bailer. Following well purging, a new disposable bailer (Aqua Bailer - polyethylene) was then utilized to collect a sample from the well. Water from the bailer was discharged from the bottom of the bailer into sampling glassware by unseating the bailer's ball check valve. This was done to minimize disturbance of the water sample and volatilization during transfer.

All water samples were collected in laboratory-provided containers, stored on ice in a cooler, and maintained under proper chain-of-custody until they were delivered to the analytical laboratory. Water samples were analyzed for benzene, toluene, ethyl benzene, xylenes (BTEX), methyl tertiary butyl ether (MTBE), and gasoline range organics (GROs).

APPENDIX 3

FIELD SAMPLING DATA SHEETS

GROUND WATER SAMPLING INFORMATION FORM*

Sheet ___ of ___
Side 1 of 2*

General Information

Location (Site/Facility Name)	~~Arner~~ Yocum Oil Co.	Sampling Point (common name)	MW-2
Project Name/#	#20-~~01028~~ 02014	Type (mon. well, spring, etc.)	Mon. Well
Field Personnel	B. Burke	Field Sample (Event) ID#*	LEAK #~~3493~~
Sampling Organization	Enviro-Risk	[redacted]	
Weather ☼?	73° Sunny/W10-15		

Sampling Station (Well) Details

Read from left to right ☞

Well Depth (ft. below MP)	17.30	Casing Diameter (inches)	2"	[redacted]	top -- bottom
Static Depth to Water (below MP) (0.01 ft.)	6.62	Static DTW (ft. below GS)		Date 9/30/02	Time (0.1 ft.)
Water Column Length (L) (ft.)	10.68	One WC Volume (cu. ft.) (0.1 ft.)	~~1.73~~	One WC Volume (gals)	1.73
Condition: Securely Locked?	Y or N	Station (Well) Damaged?	Y or N	Surface Contamination (visible)?	Y or N

0.16
9²

Purging

Read from left to right ☞

[redacted]

Free Product (circle: LNAPL or DNAPL)*		Detected/Sampled?	Y or (N) / Y or (N)	Appearance 👁	Clear
Well Purging Equipment		Pump, bailer?	Bailer	Type*	Aqua Bailer (PE)
Purging Date/Time		Start ⏱	9/30 1:05	Finish ⏱	9/30 1:15
[redacted]					
Amt. Purged before Sampling		Gals./WC Volumes	5 gal	Purge Protocol of 3 WCV's met?	(Y) or N

Field Water-Quality Measurements and Observations

Date/Time Measurements Began ____/____ [redacted]

Submersible Pump with direct line to Flow Cell used for all Field Water Quality Measurements? Y or (N)

All Field Measurement Instruments Calibrated according to Protocol? ~~(Y)~~ or (N)

All Field Water Quality Parameters Stabilized according to Protocol Criteria just before filling sample containers? ~~(Y)~~ or (N)

The Measurements below Represent: (1) stabilization, (2) sample water collected, (3) both 1 and 2, (4) other*: 2

Sample Appearance: 👁 Clear Odor: ?

Field Measurement	Value	Time (24 hour)	Comments*
Temperature			

Sample Collection

Sampling Device (type of pump/bailer)* Aqua Bailer (PE) Sample Medium (well water, LNAPL, etc.)* Water

Permanently Installed Pump? Y or (N) Dedicated Equipment? Y or (N) Used Same Equip. for Purge? (Y) or N

[redacted]

Date/Time Sampling Began	9/30/02 1:15	Date/Time Sampling Finished	9/30/02 1:15
Depth to Water (ft. below MP)	—	Depth to Water (ft. below MP)	—
QC Samples Collected?	Y or (N) (see reverse*)	Sample Withdrawal Rate	— gpm

[redacted]

Remarks (1)* (include protocol exceptions) None

[redacted]

60 → * Side 2 of this form contains definitions of abbreviations, protocol codes, additional room for equipment specification, QC sample description and other comments.

Form GWS #4
Revised 1-12-95

GROUND WATER SAMPLING INFORMATION FORM*

Sheet ____ of ____
Side 1 of 2*

General Information

Location (Site/Facility Name) ~~Arrow~~ Yocum Oil Co.
Project Name/# #20-~~01028~~ 02014
Field Personnel B. Burke
Sampling Organization Enviro-Risk
Weather ☼? 73° Sunny/W 10-15

Sampling Point (common name) MW-3
Type (mon. well, spring, etc.) Mon. Well
Field Sample (Event) ID#* LEAK #3493
[redacted]

Sampling Station (Well) Details

Read from left to right

Well Depth (ft. below MP) 17.35
Static Depth to Water (below MP) 7.13 (0.01 ft.)
Water Column Length (L) (ft.) 10.22
Condition: Securely Locked? Y or N

Casing Diameter (inches) 2"
Static DTW (ft. below GS) ____ (0.1 ft.)
One WC Volume (cu. ft.) ____
Station (Well) Damaged? Y or N

[redacted]
Date 9/30/02 Time ____ (0.1 ft.)
One WC Volume (gals) 1.67 — 0.16 ga
Surface Contamination (visible)? Y or N

Purging

Read from left to right

[redacted]

Free Product (circle: LNAPL or DNAPL)* Detected/Sampled? Y or (N) / Y or (N) Appearance
Well Purging Equipment Pump, bailer? Bailer Type* Aqua Bailer (PE)
Purging Date/Time Start 1:55 / 9/30 Finish 2:05 / 9/30
[redacted]
Amt. Purged before Sampling Gals./WC Volumes 5 Gal / Purge Protocol of 3 WCV's met? (Y) or N

Field Water-Quality Measurements and Observations

Date/Time Measurements Began ____ / ____ [redacted]
Submersible Pump with direct line to Flow Cell used for all Field Water Quality Measurements? Y or (N)
All Field Measurement Instruments Calibrated according to Protocol? (Y) or N
All Field Water Quality Parameters Stabilized according to Protocol Criteria just before filling sample containers? (Y) or N
The Measurements below Represent: (1) stabilization, ((2) sample water collected) (3) both 1 and 2, (4) other*: 2
Sample Appearance: ____ Odor: ____

Field Measurement	Value	Time (24 hour)	Comments*
Temperature			

Sample Collection

Sampling Device (type of pump/bailer)* Aqua Bailer (PE) Sample Medium (well water, LNAPL, etc.)* Water
Permanently Installed Pump? Y or (N) Dedicated Equipment? Y or (N) Used Same Equip. for Purge? (Y) or N
[redacted]
Date/Time Sampling Began 9/30/02 2:05 Date/Time Sampling Finished 9/30/02 2:08
Depth to Water (ft. below MP) ____ Depth to Water (ft. below MP) ____
QC Samples Collected? Y or N (see reverse*) Sample Withdrawal Rate ____ gpm
[redacted]
Remarks (1)* (include protocol exceptions) None
[redacted]

* Side 2 of this form contains definitions of abbreviations, protocol codes, additional room for equipment specification, QC sample description and other comments

Form GWS #4
Revised 1-12-95

GROUND WATER SAMPLING INFORMATION FORM*

Sheet ___ of ___
Side 1 of 2*

General Information

Location (Site/Facility Name) YOUNG ARNEL OIL CO.
Project Name/# #20-01028 02014
Field Personnel B. BURKE
Sampling Organization ENVIRO-RISK
Weather ☼ ? 31° / P. Cldy / W. 5 mph

Sampling Point (common name) MW-3
Type (mon. well, spring, etc.) MON. WELL
Field Sample (Event) ID#* LEAK #3493 11991

Sampling Station (Well) Details

Read from left to right ☞ top → bottom

Well Depth (ft. below MP) 17.35
Static Depth to Water (below MP) (0.01 ft.) 7.97
Water Column Length (L) (ft.) (0.01 ft.) 9.38
Condition: Securely Locked? Y or N

Casing Diameter (inches) 2
Static DTW (ft. below GS) (0.1 ft.) —
One WC Volume (cu. ft.) —
Station (Well) Damaged? Y or N

Date 12/6/02 Time (0.1 ft.)
One WC Volume (gals) 1.53
Surface Contamination (visible)? Y or N

0.16 9²

Purging

Read from left to right ☞

Free Product (circle LNAPL or DNAPL)* Detected/Sampled? Y or N / Y or N
Well Purging Equipment Pump, bailer? BAILER
Purging Date/Time Start 12/6/02 3:00
Pump/Bailer Intake Set at Feet below MP
Amt. Purged before Sampling Gals./WC Volumes 5GAL / 3.3

Background Conc. ppm
Appearance ☁ CLOUDY
Type* AQUA BAILER (PE)
Finish 12/6/02 / 3:15
Avg. Purge Rate gpm
Purge Protocol of 3 WCV's met? Y or N

Field Water-Quality Measurements and Observations

Date/Time Measurements Began ___/___
Purge Rate for Measurements (gpm) ___
Submersible Pump with direct line to Flow Cell used for all Field Water Quality Measurements? Y or (N)
All Field Measurement Instruments Calibrated according to Protocol? (Y) or N
All Field Water Quality Parameters Stabilized according to Protocol Criteria just before filling sample containers? (Y) or N
The Measurements below Represent: (1) stabilization, (2) sample water collected, (3) both 1 and 2, (4) other*: 2
Sample Appearance: ☁ CLOUDY Odor: PETROLEUM

Field Measurement	Value	Time (24 hour)	Comments*
Temperature			

Sample Collection

Sampling Device (type of pump/bailer)* AQUA BAILER (PE)
Sample Medium (well water, LNAPL, etc.)* WATER
Permanently Installed Pump? Y or (N)
Dedicated Equipment? Y or (N)
Used Same Equip. for Purge? (Y) or N

Date/Time Sampling Began 12/6/02 / 3:15
Depth to Water (ft. below MP)
QC Samples Collected? Y or (N) (see reverse*)

Intervals Represent (ft. below GS)
Date/Time Sampling Finished 12/6/02 3:15
Depth to Water (ft. below MP)
Sample Withdrawal Rate gpm

Were Protocols followed with no exceptions (Y, N); Enter Protocol Codes 1. 2.
Remarks (1)* (include protocol exceptions) NONE

60 ➡ * Side 2 of this form contains definitions of abbreviations, protocol codes, additional room for equipment specification, QC, sample description and other comments

PennTAWS #4
Revised 1-12-95

MPCA Fact Sheet 3.31

CAD SYSTEM MONITORING WORKSHEET

Leaking Petroleum Storage Tanks
Minnesota Pollution Control Agency
http://www.pca.state.mn.us/programs/lust_p.html

Corrective Action Design System Monitoring Worksheet

Fact Sheet #3.31

This worksheet documents ongoing system emissions and efficiency, in part to fulfill U.S. Environmental Protection Agency (EPA) requirements. Complete and submit this monitoring worksheet quarterly for the first year and annually thereafter. Submit an annual monitoring report as described in fact sheet 3.26, *Annual Monitoring Report.* [Note: Minnesota Pollution Control Agency (MPCA) staff may vary the frequency of progress reporting on a site specific basis.]

For several remedial technologies, you are asked to provide contaminant mass removal rates in terms of gallons/day. To aid you in calculating these values, we provide a standard equation and have calculated the gallon/kilogram (gal/kg) values for various petroleum products. Please use these values in your calculations:

Product	gal/kg
gasoline	0.37
kerosene, JP4	0.33
fuel oil #1, diesel	0.31
fuel oil #2	0.30
fuel oil #4	0.29

MPCA Site ID #: Leak000*11991* Date Form Completed: ***12/31/02***
Site Name: ***Jordan Texaco***
Facility address***: 255 Triangle Lane, Jordan, MN***

Responsible party: ***Yocum Oil Company*** RP phone: ***651-739-9141***
Consultant: ***Enviro-Risk Consulting Group, Inc.*** Consultant phone: ***651-735-7001***

For all sites, attach a table showing uptime and downtime for each treatment system at the site. Include explanations for any downtime that occurred during the reporting period, and a discussion of actions taken to remedy operational problems.

FREE PRODUCT RECOVERY SYSTEMS

Attach a table of free product thickness in all monitoring and recovery wells (to 0.1 feet).

Free product recovery rate: ***0.0 gallons/day (no recoverable free product observed recently)***
Total product recovered to date: ***greater than 2,430 gallons***

GROUND WATER PUMP-OUT SYSTEMS

Influent/Effluent concentrations

☐ Attach a table of cumulative ground water influent and effluent discharge concentrations (in ug/L).

Operating parameters

Pumping rate: gallons per minute
Amount of water table drawdown: feet

Contaminant mass removal

Estimated contaminant mass removal rate: gallons/day
Estimated contaminant mass removal to date: gallons
Cumulative mass removal vs. time (plot)

SOIL VENTING SYSTEMS

Emission concentrations

☐ Attach a table containing field screening results for each vapor extraction point.
☐ Attach a table of soil vent system emissions concentrations. Include all analytical samples collected since system startup. Collect the samples from a sampling port located upstream of the blower. Analyze the samples for benzene, ethyl benzene, toluene and xylene using EPA Method 18. Include the Screening Emission Rates (SERs) for each compound on the table.

Operating parameters

Extraction airflow rate: standard cubic feet/minute (scfm)

☐ Attach a table of cumulative vacuum data from vent points and monitoring points.

Bioactivity measurements

☐ Attach a table of cumulative extraction system CO_2 and O_2 concentrations.

Contaminant mass removal:

Estimated contaminant mass removal rate: kg/day x gal/kg = gal/day
Estimated contaminant mass removal to date: gallons
Cumulative mass removal vs time (plot)

SOIL VENTING/AIR SPARGING SYSTEMS

(Complete the soil venting systems section above for all air sparge/soil venting combination systems)

☐ Attach a table of air injection rates for each sparge point in the system.

Total air injection rate: scfm
Total air removal rate scfm

TOTAL SITE CONTAMINANT MASS REMOVAL

Fill out this section if ground water pump-out is used in combination with a soil venting system or a soil venting/air sparging system.

Total estimated contaminant mass removal rate for the site: gallons/day
Total estimated contaminant mass removal to date for the site: gallons
Cumulative mass removal vs time (plot).

SYSTEM CHANGES

Describe in detail any changes in system operation or configuration made during this reporting period (attach additional pages if needed). Also explain any periods during which the system was not operating.

The free product collection system consists of two pneumatic submersible pumps installed in MW-2 and MW-3, which is designed to automatically remove free product from the wells and discharge into an aboveground storage tank located on site. A site map is attached for your reference. During our initial site visit on June 13, 2002, it was discovered that the air compressor, which operates the product recovery pumps, was inoperable. It appears that a new compressor would be needed, at a minimum, to resume operation of the free product collection system. It is unknown how long the free product system had not been running and currently the system is not operating. Because no free product has been measured recently in MW-2 and MW-3, the submersible pumps have been temporarily removed to aid in determining whether free product will return to MW-2 or MW-3.

RECOMMENDATIONS

List recommendations for modifying the monitoring schedule, system operation, system configuration or site closure (attach additional pages if needed):

Based on measured free product levels, resuming operation of the system (and replacement of the air compressor) may not be needed since free product levels in the two recovery wells (MW-2 and MW-3) are relatively minor, and recently non-existent. Also, free product recently discovered in MW-1 may be attributed to a new release, not associated with the September 1998 release.

Based on the above, Enviro-Risk recommends leaving the free product recovery system off and collecting monthly free product measurements in monitoring wells through June 2003 to see whether free product returns to MW-2 or MW-3. Furthermore, Enviro-Risk recommends collecting a free product sample from MW-1 for fingerprint analysis to determine whether it is associated with the September 1998 release or whether it is a new release associated with the UST basin.

If it is determined that free product in MW-1 is associated with the September 1998 release, or if significant levels of free product returns to MW-2 or MW-3, then the free product recovery system may be repaired and reconfigured for product collection from existing wells. If it is determined that free product in MW-1 is not associated with the September 1998 release, and if free product does not return to MW-2 or MW-3, then an update report and request for closure will be prepared and submitted to the MPCA following the June 2003 monitoring event.

OBSERVATIONS

Please provide observations made at the site and describe unusual circumstance that may have influenced the sampling results:

The total quantity of gasoline actually released has never been clearly determined. Based on MPCA records, stated quantities ranged between 0.2 gal per hour (5 gal /day) to as much as 100 gal /day. The release apparently occurred over a 30 to 40 day period in September / October 1998 and the total quantity released was in excess of 1,000 gallons.

Based on past reports submitted by Arden Environmental, at least 2,230 gallons of free product was removed from the wells during the period of November 1998 through January 1999. Additional product was likely removed during 1999, however Enviro-Risk could not locate any additional 1999 data during our MPCA file search. IT Corporation took over free product monitoring / removal activities in 2000 through 2001. During this period, only product level measurements were obtained from the free product aboveground storage tank (AST) on site and no known removal of free product occurred from the site.

In 2002, Enviro-Risk was assigned to monitor / recover free product at the site. No additional free product has been recovered since the air compressor is inoperable. However, based on level measurements taken in the free product AST, Enviro-Risk estimates that approximately 200 gallons of free product is contained in the tank.

Summary:	***Potential Release Quantity:***	***greater than 1,000 gallons***
	Documented Quantity Recovered:	***2,430 gallons***

Given that additional free product recovery probably occurred in 1999, for which data is not readily available, it is likely that the actual quantity of free product removed is closer to 3,000 gallons. Therefore, it is feasible that the free product recovery system has removed all product associated with the 1998 release. Given this possibility, and the lack of measured free product in MW-2 and MW-3, resuming operation of the free product recovery system may not be justified.

TABLES & GRAPHS

Tables and graphs as requested above.

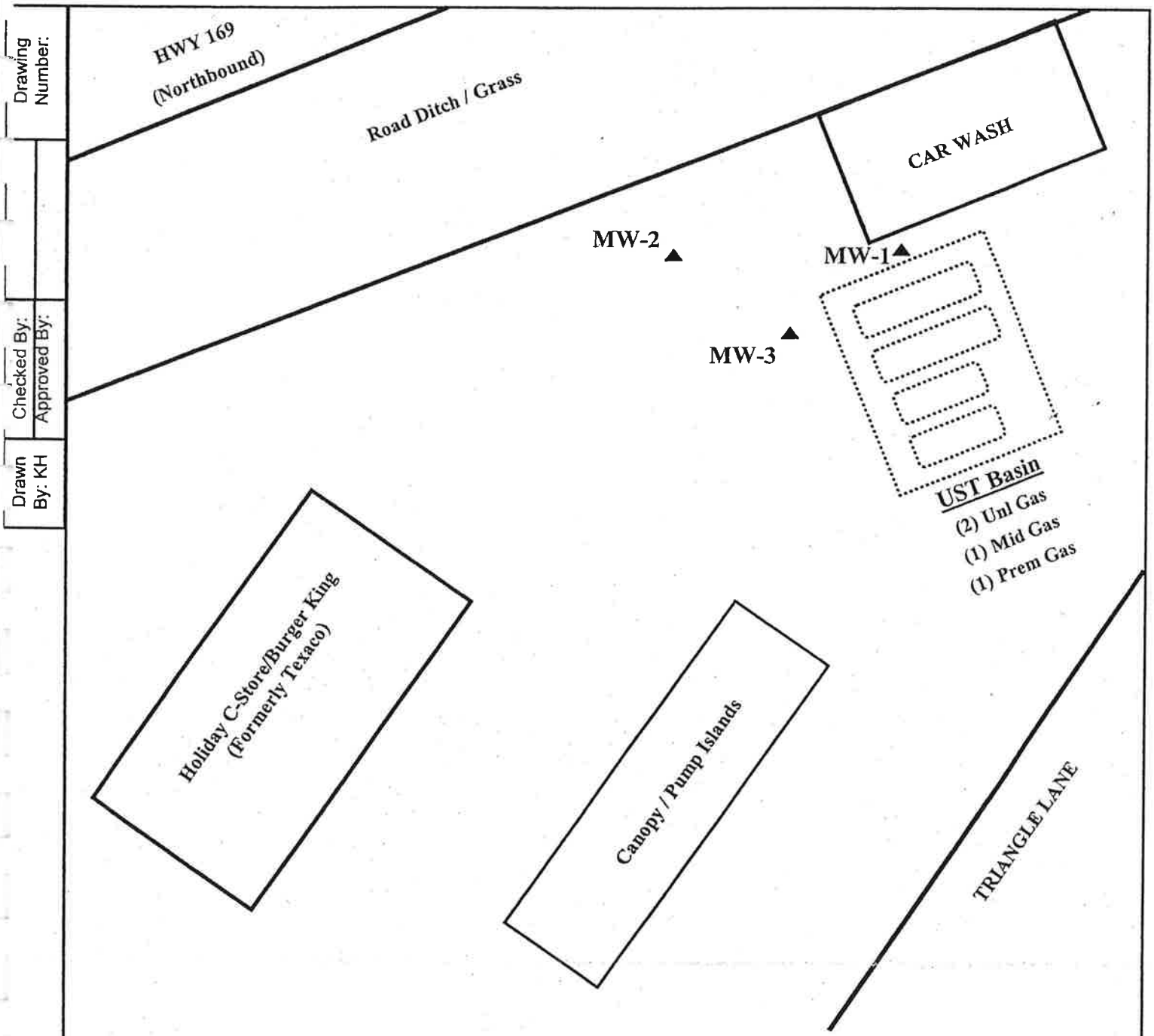
Web pages and phone numbers

MPCA staff	http://data.pca.state.mn.us/pca/emplsearch.html
MPCA toll free	**1-800-657-3864**
LUST web page	http://www.pca.state.mn.us/programs/lust_p.html
MPCA Infor. Request	http://www.pca.state.mn.us/about/inforequest.html
PetroFund Web Page	http://www.commerce.state.mn.us/mainpf.htm
PetroFund Phone	**651-297-1119**, or **1-800-638-0418**
State Duty Officer	**651-649-5451 or 1-800-422-0798**

YOCUM OIL COMPANY
Free Product Levels

Date	MW-1	MW-2	MW-3
6/13/2002	0	0	0.11
6/29/2002	0	0	0.02
7/10/2002	0	0	0.01
7/23/2002	0.15	0	0
9/30/2002	0.25	0	0
10/30/2002	0.38	0	0
11/20/2002	0.63	0	0
12/6/2002	0.80	0	0

Note: Above values expressed in feet.



Approximate Scale:
1 inch = 30 feet

Figure 2
Site Map

Jordan Texaco
255 Triangle Lane
Jordan, MN

ENVIRO-RISK
CONSULTING GROUP, INC.

"Do Not Scale Up Drawing"

GROUND WATER SAMPLING INFORMATION FORM*

Sheet ___ of ___
Side 1 of 2*

General Information

Location (Site/Facility Name)	~~ARNEL~~ YOCUM OIL CO.	Sampling Point (common name)	MW-2
Project Name/#	#20-~~01028~~-02014	Type (mon. well, spring, etc.)	MON. WELL
Field Personnel	B. BURKE	Field Sample (Event) ID#*	LEAK #3493
Sampling Organization	ENVIRO-RISK	[redacted]	11991
Weather	31° / P.Cldy / W-Smpl	[redacted]	

Sampling Station (Well) Details

Read from left to right

Well Depth (ft. below MP)	17.30	Casing Diameter (inches)	2	[redacted]	
Static Depth to Water (below MP)	7.45	Static DTW (ft. below GS)		Date	12/6/02 Time
Water Column Length (L) (ft.)	9.85	One WC Volume (cu. ft.)		One WC Volume (gals)	1.61
Condition: Securely Locked?	(Y) or N	Station (Well) Damaged?	Y or N	Surface Contamination (visible)?	Y or N

0.16
92

Purging

Read from left to right

[redacted]

Free Product (circle LNAPL or DNAPL)*		Detected/Sampled?	Y or (N) / Y or N	Appearance	CLOUDY
Well Purging Equipment		Pump, bailer?	BAILER	Type*	AQUA BAILER (PE)
Purging Date/Time		Start	12/6/02 12:00	Finish	12/6/02 2:15
[redacted]					
Amt. Purged before Sampling		Gals./WC Volumes	5 GAL / 3.1	Purge Protocol of 3 WCV's met?	Y or N

Field Water-Quality Measurements and Observations

Date/Time Measurements Began ___ / ___ [redacted]

Submersible Pump with direct line to Flow Cell used for all Field Water Quality Measurements? Y or (N)

All Field Measurement Instruments Calibrated according to Protocol? (Y) or N

All Field Water Quality Parameters Stabilized according to Protocol Criteria just before filling sample containers? (Y) or N

The Measurements below Represent: (1) stabilization, (2) sample water collected, (3) both 1 and 2, (4) other*: 2

Sample Appearance: CLOUDY Odor: PETROLEUM

Field Measurement	Value	Time (24 hour)	Comments*
Temperature			

Sample Collection

Sampling Device (type of pump/bailer)*: AQUA BAILER (PE) Sample Medium (well water, LNAPL, etc.)*: WATER

Permanently Installed Pump? Y or (N) Dedicated Equipment? Y or (N) Used Same Equip. for Purge? (Y) or N

[redacted]

Date/Time Sampling Began	12/6/02 2:15	Date/Time Sampling Finished	12/6/02 2:15
Depth to Water (ft. below MP)	—	Depth to Water (ft. below MP)	
QC Samples Collected?	Y or (N) (see reverse*)	Sample Withdrawal Rate	gpm

[redacted]

Remarks (1)* (include protocol exceptions) None

[redacted]

60 → * Side 2 of this form contains definitions of abbreviations, protocol codes, additional room for equipment specification, QC sample description and other comments

Form GWS #4
Revised 1-12-95