

**REPORT ON THE REMEDIATION
SYSTEM PERFORMANCE**

AT

**WISDOT - SHELL LAKE SITE
SHELL LAKE, WISCONSIN**

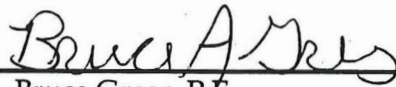
Prepared For
Wisconsin Department of Transportation
Madison, Wisconsin

Prepared By
RMT, Inc.
Madison, Wisconsin

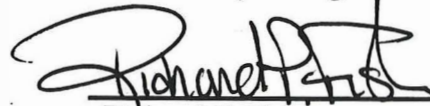
April 1997



Mary Caplon
Project Engineer



Bruce Greer, P.E.
Senior Project Engineer



Richard P. Fish
Vice President
Government & Infrastructure Services





Table of Contents

Executive Summary	iii
1. Background	1
1.1 Site History	1
1.2 Aboveground Storage Tank Removal	1
1.3 Remedial Investigation	1
1.3.1 Geology	1
1.3.2 Hydrogeology	4
1.3.3 Soil Quality	4
1.3.4 Groundwater Quality	4
1.3.5 Remedial Approach	4
2. Remedial Action	10
2.1 Closure Soil Sampling	10
2.2 SVE System	10
2.3 Groundwater Quality	14
3. Findings, Conclusions, and Recommendations	15
4. References	16

List of Tables

Table 1	Soil Analytical Results	5
Table 2	Groundwater Analytical Results	7
Table 3	Soil Closure Sample Analytical Results	11
Table 4	SVE Operations Log	12

List of Figures

Figure 1	Site Location Map	2
Figure 2	Site Plan/Groundwater Flow Map	3
Figure 3	Site Plan/Closure Boring Locations	8
Figure 4	Geological Cross-Section	9
Figure 5	SVE System Performance Graph (TPH)	13

List of Appendices

- Appendix A Groundwater Monitoring Laboratory Reports
- Appendix B Soil Closure Sample Laboratory Reports
- Appendix C SVE Off-Gas Laboratory Reports



Executive Summary

The Wisconsin Department of Transportation (WisDOT) has operated a soil vapor extraction (SVE) system at the WisDOT - Shell Lake site along STH 63 since March 1995. Unsaturated soil at the site had been impacted with petroleum from prior activities associated with five aboveground storage tanks formerly located at the site. The data from the monitoring of the SVE system operation indicate that the system has effectively removed the VOCs from the unsaturated soil. RMT recommends that the site be closed by the WDNR with no further action required. Groundwater at the site has not been impacted.



Section 1

Background

1.1 Site History

The Wisconsin Department of Transportation (WisDOT) acquired a parcel of property along USH 63 in Shell Lake, Wisconsin, in order to facilitate future highway improvements (Figure 1). A portion of this property was the former Allen Gas and Oil bulk fuel storage facility that contained five 15,000-gallon aboveground storage tanks (ASTs) that were used to store gasoline, aviation fuel, and fuel oil. The WisDOT retained RMT, Inc. (RMT), of Madison, Wisconsin, to remove the five tanks and perform a closure assessment of the site.

1.2 Aboveground Storage Tank Removal

RMT and its contractors abandoned the five ASTs at the site the week of July 20, 1992. As part of the closure assessment, soil samples were collected, field-screened with a Thermo-environmental photoionization detector (PID), and analyzed in the laboratory for petroleum volatile organic compounds (PVOCs), gasoline range organics (GRO), and diesel range organics (DRO). Field-screening and laboratory analytical results indicated that soil at the site had been impacted by petroleum constituents from one or more of the former ASTs (RMT, 1992). Subsequently, the WisDOT notified the Wisconsin Department of Natural Resources (WDNR) of the findings and conclusions of this investigation.

1.3 Remedial Investigation

Following the tank abandonment, RMT investigated the nature and extent of impacts. The investigation included the installation of five water table monitoring wells and four soil vapor extraction (SVE) wells. The monitoring and SVE well locations are shown on Figure 2. The results of the investigation were submitted to the WDNR (RMT, 1993a and RMT, 1993b) and are summarized below.

1.3.1 Geology

On the basis of the borings installed at the site, the soil stratigraphy consists primarily of fine to coarse sand from ground surface to approximately 70 feet below ground surface. Clay and silt seams of 2 to 8 inches occur intermittently in the sand unit at varying depths in all of the borings. Underlying the sand unit is a clay unit that occurs to a depth of at least 76 feet, where the deepest boring was terminated.



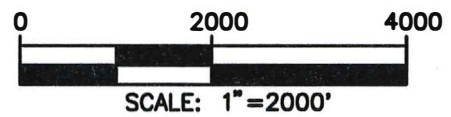
26570 Bytes
 Friday, March 28, 1997
 3:25:4587 PM
 Attached Xref's: No xref's Attached.

Dwg Size:
 Plot Date:
 Plot Time:
 Attached Xref's:

J:\10318\05\0505.DWG
 RBM
 1" = 1'

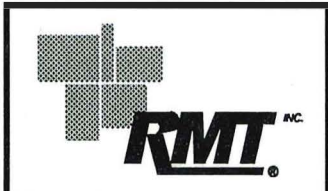


STATE LOCATION



SITE LOCATION MAP
SHELL LAKE, WISCONSIN
WisDOT PROJECT #302-73-12

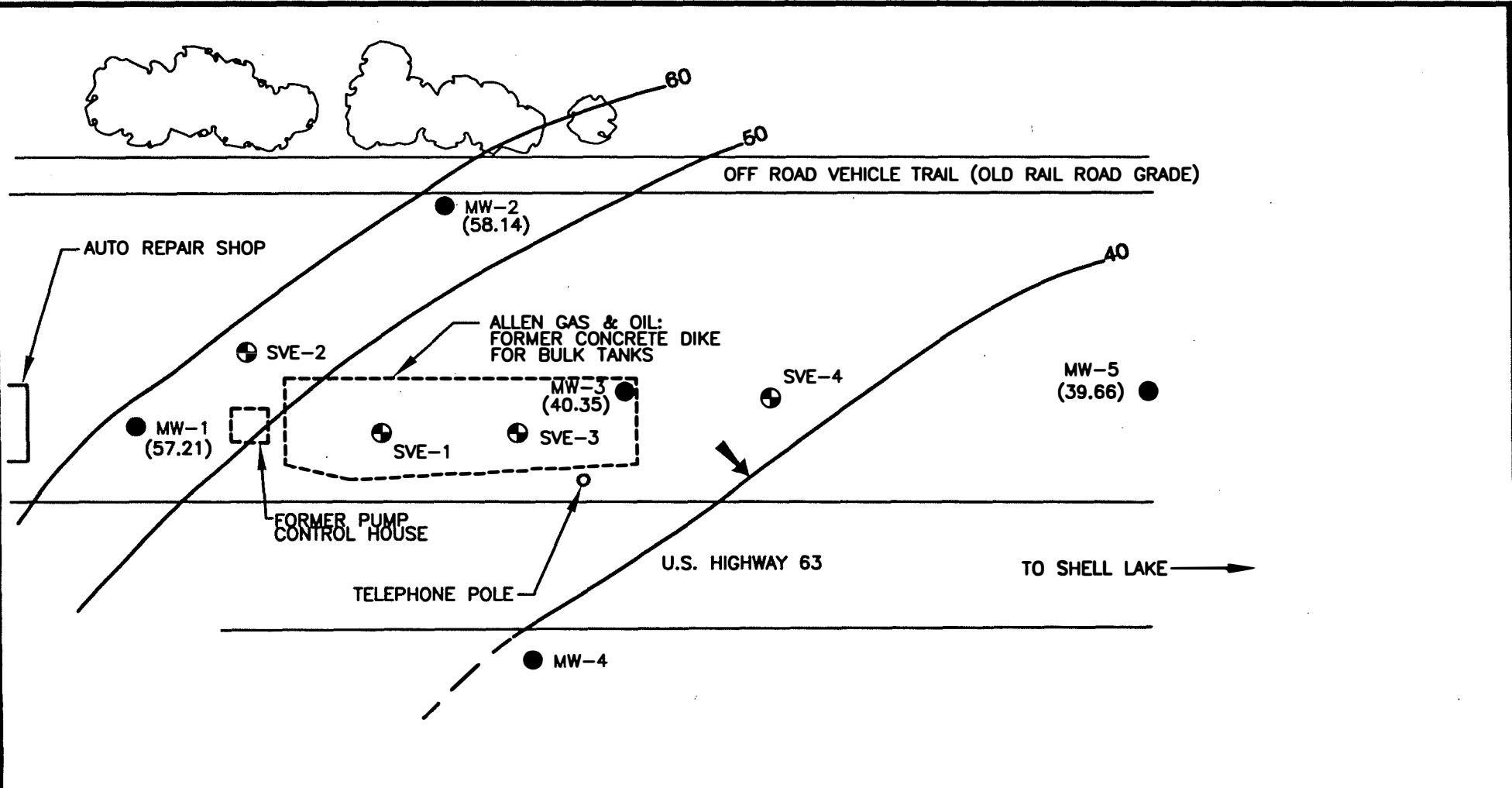
SOURCE: BASE MAP FROM SHELL LAKE, WISCONSIN
 7.5 MIN. USGS QUADRANGLE.



DWN. BY: RBM
APPROVED BY:
DATE: APRIL 1997
PROJ. # 10318.05
FILE # 0505.DWG

FIGURE 1

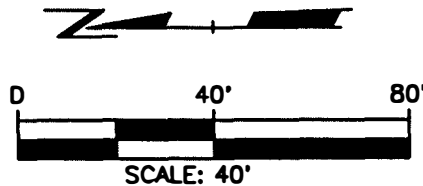
RMT COMPUTER AIDED DESIGN & DRAFTING



**SITE PLAN AND
 WATERTABLE MAP - JANUARY 21, 1997
 SHELL LAKE, WISCONSIN
 WisDOT PROJECT #302-73-12**

LEGEND

- ⊕ SVE-2 EXISTING SOIL VAPOR EXTRACTION WELL
- MW-1 EXISTING GROUNDWATER MONITORING WELL
(40.35) WATERTABLE ELEVATION
- 50 — WATERTABLE CONTOUR
- ➔ GROUNDWATER FLOW DIRECTION



	DWN. BY: RBM
	APPROVED BY: <i>llc</i>
	DATE: APRIL 1997
	PROJ. / 10318.05
	FILE / 0502.DWG

FIGURE 2

1.3.2 Hydrogeology

On the basis of water level measurements from July 1993 and January 1997, the water table occurs approximately 43 feet below ground surface (bgs) at MW-2, and drops to approximately 62 feet bgs at MW-5. Historically, the groundwater has flowed in a southwesterly direction. The groundwater elevations and flow from January 1997 are shown on Figure 2.

1.3.3 Soil Quality

The results of the Phase III investigation performed in 1993 indicated that petroleum-impacted soil was encountered from the surface to approximately 35 feet below ground surface in SVE-1 boring, and in a zone associated with fine-grained soil encountered from 26 to 44 feet below ground surface in SVE-3, MW-3, and SVE-4 borings. A summary of the soil field-screening and laboratory analysis results is provided in Table 1. A geological cross-section, showing the approximate area of pre-remediation impacted soil, is presented on Figures 3 and 4.

1.3.4 Groundwater Quality

During the Phase III investigation, the monitoring wells were sampled and analyzed for VOCs, GRO, DRO, and dissolved lead. Neither the WDNR Enforcement Standards (ES) or the Preventive Action Limits (PALs) were exceeded for petroleum-derived compounds in any of the monitoring wells. In June 1993, MW-1, MW-2, and MW-4 contained no detectable levels and MW-3 and MW-5 contained near-detection limit levels of petroleum constituents. A summary of the groundwater analysis results is included in Table 2. The laboratory reports from the January 1997 sampling round are in Appendix A.

On the basis of these results, it was concluded that the groundwater was not impacted by the ASTs' release, and thus no groundwater remedial action was warranted.

1.3.5 Remedial Approach

Given the results of the investigation, RMT recommended that the impacted unsaturated soil at the site be remediated by an SVE system (RMT, 1993c).

Table 1
Soil Analytical Results - Pre-Remediation
WisDOT - Shell Lake

WELL/DATE	SAMPLE DEPTH (feet)	PID READING (i.u.)	DRO (mg/kg)	GRO (mg/kg)	TOTAL PVOCS (µg/kg)	LEAD (µg/kg)
MW-1 11/10/92	1.0-10.5	<2				
	11.0-13.0	<2	4.5	<5.6	ND	
	13.5-52.0	<2				
MW-2 11/11/92	1.0-27.0	<2				
	30.0-32.0	<2	<4.8	<5.8	ND	0.80
	32.5-47.0	<2				
MW-3 11/12/92	1.0-22.0	<2				
	25.0-27.0	11				
	30.0-32.0	450				
	35.0-37.0	275	560	160	1,800	1.1
	40.0-42.0	70				
	45.0-47.0	6				
	50.0-52.0	<2				
	55.0-57.0	<2	<4.1	<5.5	ND	0.82
	60.0-62.0	<2				
MW-4 11/13/92	1.0-47.0	<2				
	50.0-52.0	<2	<4.3	NA	ND	<0.62
	55.0-67.0	<2				
SVE-1 11/10/92	1.0-3.0	22				
	3.5-5.5	20				
	6.0-8.0	42				
	8.5-10.5	30	2,300	70	1,970	
	11.0-13.0	85				
	13.5-15.5	56				
	16.0-18.0	42				
	18.5-20.5	40				
	21.0-23.0	35				
	25.0-27.0	100	430	850	121,800	
	30.0-32.0	7				
	35.0-37.0	4				
	40.0-42.0	<2				

Table 1 (Continued)
Soil Analytical Results - Pre-Remediation
WisDOT - Shell Lake

WELL/DATE	SAMPLE DEPTH (feet)	PID READING (i.u.)	DRO (mg/kg)	GRO (mg/kg)	TOTAL PVOCS (µg/kg)	LEAD (µg/kg)
SVE-2 11/10/92	1.0-15.5	<2				
	16.0-18.0	<2	<4.2	<5.3	ND	0.77
	25.0-35.0	<2				
SVE-3 11/11/92	1.0-22.0	<2				
	25.0-27.0	480	1,400	720	71,700	1.1
	30.0-32.0	90				
	32.5-34.5	60				
	35.0-37.0	35				
	37.5-39.5	25				
SVE-4 11/12/92	1.0-32.0	<2				
	35.0-37.0	370				
	37.0-39.0	550	1,200		67,300	1.0
	39.0-41.0	45				
	41.0-43.0	22				
	45.0-47.0	9				
	50.0-52.0	<2	<4.2		ND	0.72
MW-5 6/29/93	1.0-50.0	<3				
	51.0-53.0	<3		<5.7	ND	
	53.0-67.0	<3				
	69.0-71.0	<3		<5.2	ND	
	73.0-76.0	<3				

ND Not Detected

Table 2
Groundwater Analytical Results
WisDOT - Shell Lake

PARAMETER	WELL IDENTIFICATION												ENFORCEMENT STANDARD	PREVENTIVE ACTION LIMIT
	MW-1		MW-2			MW-3			MW-4		MW-5			
	11/92	6/93	11/92	6/93	1/97	11/92	6/93	1/97	11/92	6/93	6/93	1/97		
GRO ⁽¹⁾	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1	< 0.1	--	< 0.1	< 0.1	< 0.1	--	NA	NA
DRO ⁽¹⁾	< 0.1	< 0.1	< 0.1	< 0.1	--	0.13	0.3	--	0.26	< 0.1	< 0.1	--	NA	NA
Lead, total ⁽²⁾	5.4	< 3.0	3.1	< 3.0	--	8.8	< 3.0	--	5.6	< 3.0	< 3.0	--	50	5
Toluene ⁽²⁾	< 1.0	< 1.0	5.2	< 1.0	< 0.16	7.3	< 1.0	< 0.16	3.6	< 1.0	1.4	< 0.16	343	68.6
1,2,4-Trimethylbenzene ⁽²⁾	< 1.0	< 1.0	< 1.0	< 1.0	< 0.13	1.1	< 1.0	< 0.13	< 1.0	< 1.0	< 1.0	< 0.13	NA	NA
n-Butylbenzene ⁽²⁾	< 1.0	< 1.0	< 1.0	< 1.0	--	< 1.0	< 1.0	--	< 1.0	< 1.0	1.2	--	NA	NA

Notes:

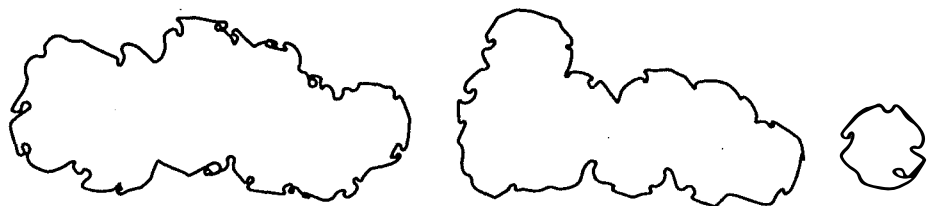
(1) Concentration expressed as mg/L

(2) Concentration expressed as µg/L

NA Not applicable

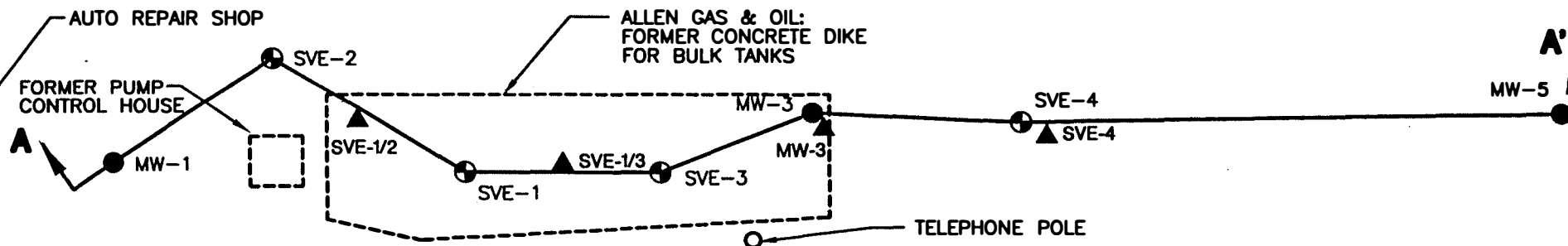
-- Not analyzed

Only VOC compounds which have or had detectable concentrations are listed in Table 2.



OFF ROAD VEHICLE TRAIL (OLD RAIL ROAD GRADE)

● MW-2



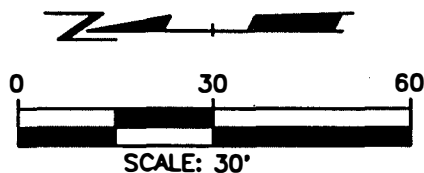
U.S. HIGHWAY 63

TO SHELL LAKE

LEGEND

- ⊕ SVE-2 EXISTING SOIL VAPOR EXTRACTION WELL
- MW-1 EXISTING GROUNDWATER MONITORING WELL
- ▲ SVE-1/2 CLOSURE SAMPLE LOCATIONS

● MW-4

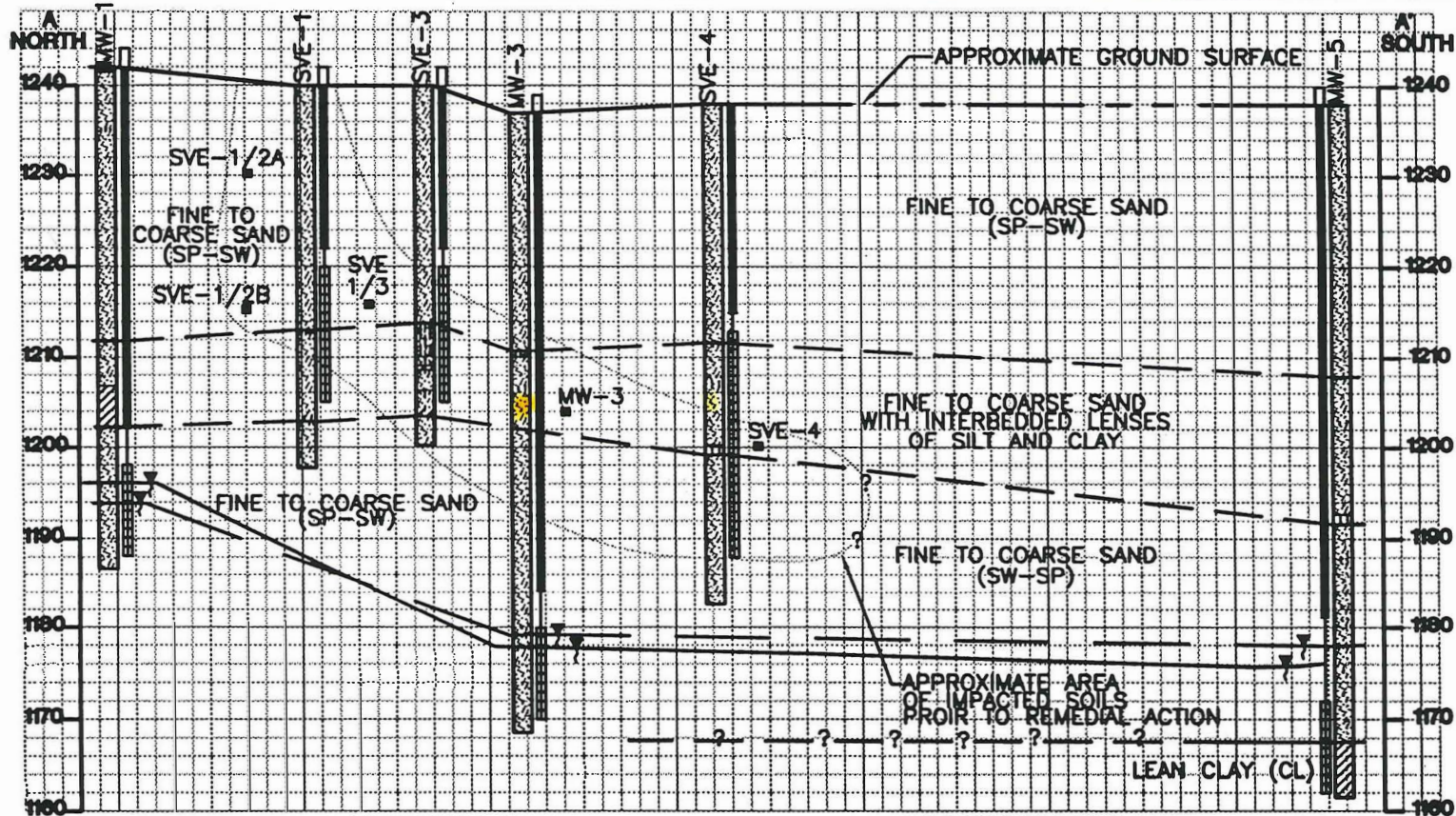


**SITE PLAN AND CROSS SECTION LOCATION MAP
 SHELL LAKE, WISCONSIN
 WisDOT PROJECT #302-73-12**



DWN. BY:	RBM
APPROVED BY:	<i>MRP</i>
DATE:	APRIL 1997
PROJ. #	10318.05
FILE #	0503.DWG

FIGURE 3



LEGEND

- GROUND SURFACE
- - - STRATIGRAPHIC BOUNDARY (DASHED WHERE INFERRED)
- ▽— WATER TABLE ELEVATION 7/93
- ▽— WATER TABLE ELEVATION 1/97
- 9/97 CLOSURE SAMPLE LOCATION

WELL CONSTRUCTION

- WELL STICK-UP
- WELL SEAL
- SCREENED INTERVAL

LITHOLOGIC UNITS

- FINE TO COARSE SAND (SP-SW)
- LEAN CLAY (CL)
- SAND WITH SILT & CLAY LENSES

HORIZONTAL SCALE: 1"=60'
 VERTICAL SCALE: 1"=20'

GEOLOGIC CROSS SECTION A-A'
SHELL LAKE, WISCONSIN
WisDOT PROJECT #302-73-12

NOTES

1. ELEVATION REFERENCED TO USGS MEAN SEA LEVEL DATUM, 1929.
2. SEE FIGURE 3 FOR LOCATION OF CROSS SECTION.
3. APPROXIMATE AREA OF IMPACTED SOILS BASED ON PID READING ABOVE 10 PPM AND LABORATORY REPORTS.

	DWN. BY: RBM
	APPROVED BY: <i>[Signature]</i>
	DATE: APRIL 1997
	PROJ. # 10318.05
	FILE # 0504.DWG

FIGURE 4



Section 2

Remedial Action

The WisDOT operated the Shell Lake SVE remediation system from March 21, 1995, through January 9, 1997. During its operation, the system recovered approximately 1,252 pounds of total petroleum hydrocarbons (TPH) and 0.63 pound of benzene. RMT has submitted three progress reports to the WDNR on the system operations. This section provides a summary and an update of the remediation activities and an evaluation of the overall performance of the remediation system at the site through January 1997.

2.1 Closure Soil Sampling

Four soil borings were advanced in the location of the source area September 1996, as defined in previous investigations (Figure 3). The purpose of the borings was to collect soil samples for further documentation of effectiveness of SVE system for closure under NR 720. Five soil samples were collected at depths that had the historically high PID readings between the SVE wells. Each soil sample was laboratory-analyzed for GRO, DRO, and PVOCs. All samples, except for that from boring MW-3, were below NR 720 generic Residual Contaminant Levels (RCLs) for GRO, DRO, and BTEX compounds. The MW-3 soil sample, collected 30 to 32 feet below the ground surface, had BTEX concentrations below the NR 720 RCL. However, GRO and DRO concentrations of 390 mg/kg and 1,900 mg/kg, respectively, from boring MW-3 are above the NR 720 RCL of 100 mg/kg. The analytical results are summarized in Table 3. The laboratory reports are in Appendix B. The soil sample locations are included on the site map and geological cross-section on Figures 3 and 4. Based on these results, the SVE system at the site continued to operate an additional 4 months.

2.2 SVE System

The SVE system included four vertical soil vapor extraction wells (SVE-1, SVE-2, SVE-3, and SVE-4) screened in the vadose zone (25 feet to 50 feet below ground surface), and located in the area of the former ASTs. The objective of the SVE system was to remove petroleum constituents from the vadose zone.

The system operated continuously from startup on March 21, 1995, to January 9, 1997. During its operation, the system recovered approximately 1,252 pounds of total petroleum hydrocarbons (TPH) and 0.63 pound of benzene (see Table 4 and Figure 5).

Table 3
Soil Closure Sample Analytical Results - Collected September 9, 1996
WisDOT - Shell Lake

PARAMETER	BORING AND DEPTH OF SAMPLE				
	SVE-4 37'-39'	MW-3 30'-32'	SVE-1/3 25'-27'	SVE-1/2A 8'-10'	SVE-1/2B 25'-27'
GRO	ND	390	ND	ND	ND
DRO	ND	1900	16	50	3.8
Benzene	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND
MTBE	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND
Xylene, M+P	ND	440	ND	ND	ND
Xylene, O	ND	250	ND	ND	ND
1,2,4-Trimethylbenzene	ND	6800	ND	ND	ND
1,3,5-Trimethylbenzene	ND	2600	ND	ND	ND

NOTE:

ND No detection above detection limit.

Table 4
SVE Operations Log

OPERATIONAL DATA					LABORATORY DATA		CALCULATED DATA					COMMENTS
DATE	BLOWER VACUUM (in w.c.)	DIFF. PRESSURE (in w.c.)	SYSTEM TEMP. (deg. f)	CUMULATIVE OPERATION (hours)	BENZENE (lb/cf)	TOTAL GASOLINE (lb/cf)	AIRFLOW RATE (cfm)	EMISSION RATE		CUM. EMISSIONS		
								BENZENE (lbs/hr)	GASOLINE (lbs/hr)	BENZENE (lbs)	TPH (lbs)	
21-Mar-95	68	4.0	89	3.66	1.3E-08	1.1E-06	530	4.0E-04	3.6E-02	0.00	0.1	Note 2.
22-Mar-95	67	3.5	89	24.29	8.1E-08	6.3E-06	495	2.4E-03	1.9E-01	0.05	4.0	Note 2.
23-Mar-95	68	3.8	89	50.3	7.5E-08	9.4E-06	516	2.3E-03	2.9E-01	0.16	18	Note 2.
29-Mar-95	70	4.0	94	195.61	6.3E-08	1.5E-05	534	2.0E-03	4.7E-01	0.45	85	
11-Apr-95	68	3.5	89	485.08	2.1E-08	3.4E-05	495	6.2E-04	1.0E+00	0.63	376	
10-May-95	66	3.5	92	688.30	ND ¹	8.9E-06	495	0	2.6E-01	0.63	430	
19-Jun-95	69	3.8	90	850.35	ND	1.4E-05	514	0	4.3E-01	0.63	499	
20-Jul-95	54	1.5	108	1594.86	ND	1.7E-05	323	0	3.2E-01	0.63	737	
24-Aug-95	77	2.5	110	2410.93	ND	1.9E-06	432	0	5.0E-02	0.63	778	Note 2.
22-Sep-95	72	1.5	82	3099.35	ND	2.2E-06	324	0	4.3E-02	0.63	808	
06-Nov-95	58	1.5	100	4210.76	ND	2.9E-06	323	0	5.7E-02	0.63	871	Note 3.
22-Jan-96	58	1.8	90	4210.76	ND	2.1E-06	346	0	4.4E-02	0.63	948	
19-Feb-96	58	1.8	92	5974.24	ND	ND	346	0	0.0E+00	0.63	948	
19-Mar-96	58	1.3	94	6657.27	ND	1.6E-06	293	0	2.8E-02	0.63	967	
29-May-96	59	1.8	104	8361.31	ND	4.9E-06	351	0	1.0E-01	0.63	1,143	Note 4.
11-Sep-96	64	1.3	104	10881.00	ND	1.3E-06	304	0	2.4E-02	0.63	1,203	Notes 5. and 6.
15-Nov-96	60	1.3	96	12443.00	ND	6.2E-08	300	0	1E-03	0.63	1,205	Note 7.
17-Dec-96	67	1.3	98	13207.20	ND	3.1E-06	304	0	6E-02	0.63	1,249	Note 8.
09-Jan-97	65	1.3	96	13756.40	ND	3.7E-07	303	0	7E-03	0.63	1,252	Note 9.

- NOTES:
1. ND = Not Detected
 2. Total gasoline was reported as total petroleum hydrocarbons on laboratory reports.
 3. System was down December 1995.
 4. VE-1,2,3, and 4 were open from 3/21/96 to 6/20/96. VE-1,3 closed on 6/20/96.
 5. Differential pressure gauge not working due to moisture accumulation in the gauge. Values were estimated based on previous readings.
 6. 9/11/96 - VE-1,3 open on arrival. Opened VE-2,4.
 7. 11/15/96 - VE-1,2,3,4 open on arrival. VE-2,4 closed during site visit. Emissions calculated from VE-1,2,3,4 sample.
 8. 12/17/96 - VE-1,3 open on arrival. VE-2,4 opened during site visit. Emissions calculated from VE-1,3 sample.
 9. 1/9/96 - VE-1,3 open on arrival. VE-2,4 opened during site visit. Emissions calculated from VE-1,3 sample.

SVE TPH EMISSIONS
WisDOT-SHELL LAKE, WISCONSIN

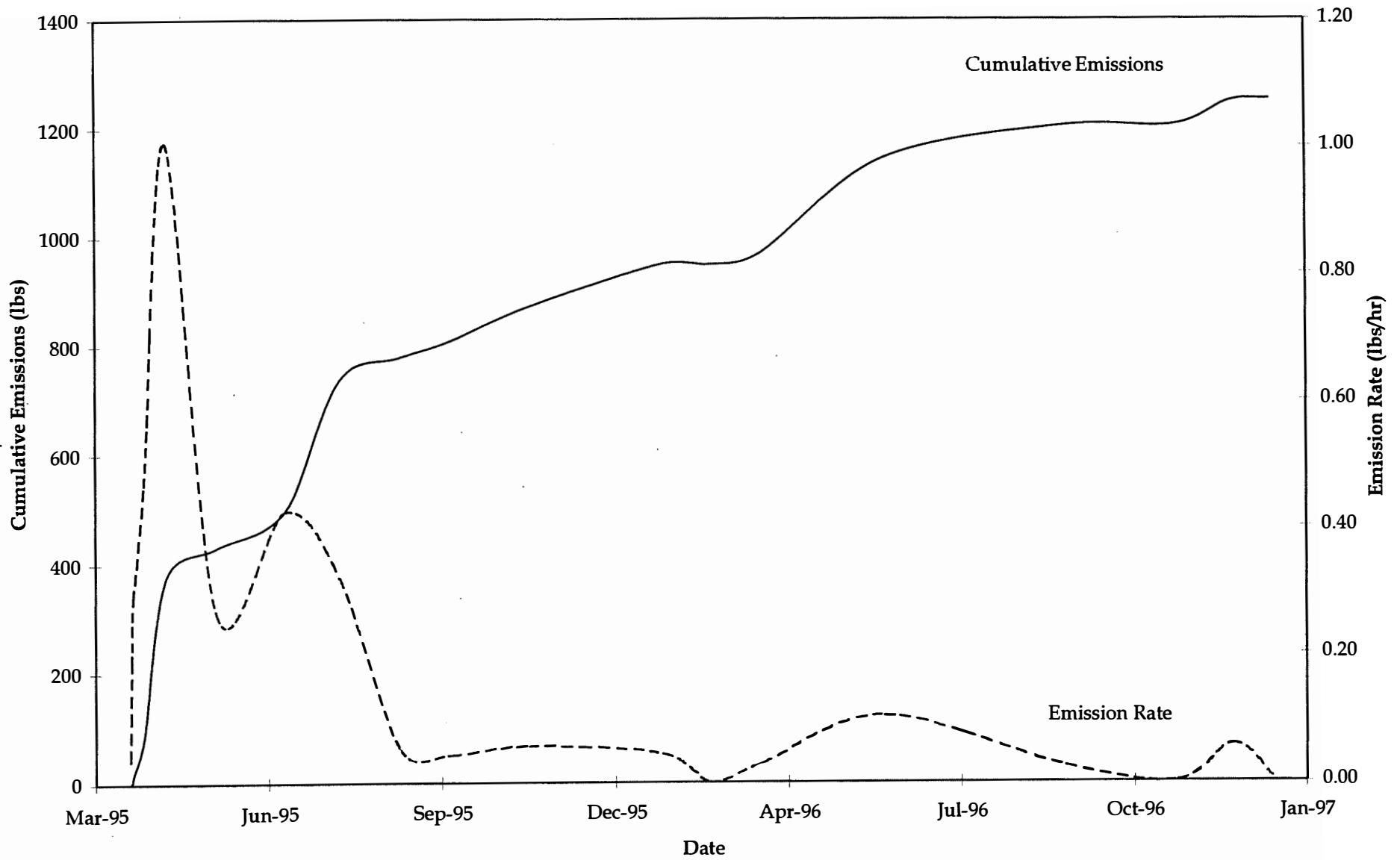


Figure 5

Off-gas samples collected from the system were analyzed for benzene, ethylbenzene, toluene, and xylene (BETX) and for total petroleum hydrocarbon (TPH) analysis. Benzene concentrations in the SVE emissions have been below detection limits since May 1995. TPH emissions have always been below the WDNR limits, and appeared to reach near asymptotic levels in August 1995.

All vapor extraction wells were open from startup to June 20, 1996. On June 20, SVE-1 and SVE-3 remained open, and SVE-2 and SVE-4 were closed. On the basis of the results of the closure soil samples, the SVE wells were cycled each month, beginning September 1996, to influence the unsaturated soil in the area of MW-3 where no-flow conditions may have existed during previous SVE well operations.

The emission sampling results during well cycling between September 1996 and January 1997 indicate that an additional 50 pounds of TPH were removed from the unsaturated soil in the area of MW-3. The January 9, 1997, sample indicated that the SVE removal rate of TPH had decreased to near-nondetectable levels. The system was shut off on January 9, 1997, following the emission sampling. The SVE laboratory reports from samples collected September 1996 through January 1997 are in Appendix C.

On the basis of the long-term SVE emission monitoring data, RMT believes that the SVE system has effectively removed the petroleum constituents to the extent practicable from the unsaturated subsurface at the site.

2.3 Groundwater Quality

Water levels were measured, and monitoring wells MW-2, MW-3, and MW-5 were sampled on January 21, 1997, for PVOCs using Wisconsin LUST Method 8020. Table 2 presents a summary of historical groundwater sampling results at the site. MW-1 was damaged and MW-4 was not located due to the snow cover; thus, these wells were not sampled. Laboratory reports for the January 1997 sampling event are included in Appendix A. The laboratory results indicate that the monitoring wells sampled at the site have no detectable levels of PVOCs.



Section 3

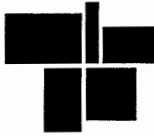
Findings, Conclusions, and Recommendations

The following is a summary of the present status of the site:

- The SVE system recovered 1,252 pounds of total petroleum hydrocarbons during operation.
- Following the closure sampling, an additional 50 pounds of TPH were removed from the impacted zone of MW-3.
- The SVE system has removed petroleum constituents to the extent practicable. TPH emission concentrations indicate that a maximum removal rate of less than 0.007 lbs/hr may be achieved by continued operations of the SVE system.
- Groundwater monitoring wells have no detectable levels of PVOCs.

The present status indicates that the remediation system has effectively removed VOCs from the unsaturated zone at the site and is no longer cost-effective to operate. Thus, RMT recommends that the system be shut down permanently and removed from the site.

On the basis of data presented, the remediation work performed at the site, and the long-term monitoring data collected, we also recommend that no further action be required at this site and that the site be closed by the WDNR. Upon site closure, existing monitoring wells and SVE wells would be abandoned in accordance with NR 141.



Section 4 References

RMT, 1992. Aboveground storage tank closure assessment, Shell Lake bulk storage tanks, City of Shell Lake, Washburn County, Wisconsin. November 1992.

RMT, 1993a. Phase III site investigation of the WisDOT Shell Lake property, Shell Lake, Wisconsin. May 3, 1993.

RMT, 1993b. Phase III environmental site investigation, former Allen Gas and Oil bulk fuel storage facility, USH 63, Washburn County, Shell Lake, Wisconsin. October 1993.

RMT, 1993c. Remedial Action Plan for former Allen Gas and Oil bulk fuel storage facility, USH 63, Washburn County, Shell Lake, Wisconsin. November 1993.



Appendix A Groundwater Monitoring Laboratory Reports

Madison Office & Laboratory
802 Deming Way
Madison, WI 53717
608-827-5501 • Fax: 608-827-5503
1-888-5-ENCHEM



Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
414-469-2436 • Fax: 414-469-8827
1-800-7-ENCHEM

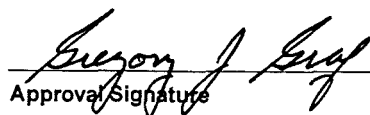
- Analytical Report -

Project Name : WDOT - SHELL LAKE
Project Number : 10318.05
WI DNR LAB ID : 113138520

Submitter # : 1000.99
Submitter : RMT - MADISON
Report Date : 2/5/97

Sample No.	Station ID	Collection Date	Sample No.	Station ID	Collection Date
970178-01	MW-2	1/21/97			
970178-02	MW-3	1/21/97			
970178-03	MW-5	1/21/97			
970178-04	TB 01	1/21/97			

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and Laboratory Standard Operating Procedure. Exceptions, if any, are discussed in the accompanying sample narrative. Release of this final report is authorized by Laboratory management, as is verified by the following signature.


Approval Signature

2-5-97
Date

Madison Office & Laboratory
802 Deming Way
Madison, WI 53717
608-827-5501 • Fax: 608-827-5503
1-888-5-ENCHEM



Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
414-469-2436 • Fax: 414-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name : WDOT - SHELL LAKE
Project Number : 10318.05
Lab Sample Number : 970178-04
Station ID : TB 01
WI DNR LAB ID : 113138520

Submitter # : 1000.99
Submitter : RMT - MADISON
Report Date : 2/5/97
Collection Date : 1/21/97
Matrix Type : BLANK

Volatile Organic Results

PVOC - WILUST LIST

Prep Method: SW846 5030

Analyte	Result	LOD	LOQ	Units	Code	Analysis Date	Analysis Method
1,2,4-Trimethylbenzene	< 0.25	0.25	0.80	ug/L		1/30/97	SW846 8020
1,3,5-Trimethylbenzene	< 0.13	0.13	0.41	ug/L		1/30/97	SW846 8020
Benzene	< 0.14	0.14	0.45	ug/L		1/30/97	SW846 8020
Ethylbenzene	< 0.14	0.14	0.45	ug/L		1/30/97	SW846 8020
Methyl-tert-butyl-ether	< 0.18	0.18	0.57	ug/L		1/30/97	SW846 8020
Toluene	< 0.16	0.16	0.51	ug/L		1/30/97	SW846 8020
Xylene, total	< 0.44	0.44	1.4	ug/L		1/30/97	SW846 8020

Madison Office & Laboratory
802 Deming Way
Madison, WI 53717
608-827-5501 • Fax: 608-827-5503
1-888-5-ENCHEM



Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
414-469-2436 • Fax: 414-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name : WDOT - SHELL LAKE

Submitter # : 1000.99

Project Number : 10318.05

Submitter : RMT - MADISON

Lab Sample Number : 970178-03

Report Date : 2/5/97

Station ID : MW-5

Collection Date : 1/21/97

WI DNR LAB ID : 113138520

Matrix Type : GROUNDWATER

Volatile Organic Results

Prep Method: SW846 5030

PVOC - WI LUST LIST

Analyte	Result	LOD	LOQ	Units	Code	Analysis Date	Analysis Method
1,2,4-Trimethylbenzene	< 0.25	0.25	0.80	ug/L		1/30/97	SW846 8020
1,3,5-Trimethylbenzene	< 0.13	0.13	0.41	ug/L		1/30/97	SW846 8020
Benzene	< 0.14	0.14	0.45	ug/L		1/30/97	SW846 8020
Ethylbenzene	< 0.14	0.14	0.45	ug/L		1/30/97	SW846 8020
Methyl-tert-butyl-ether	< 0.18	0.18	0.57	ug/L		1/30/97	SW846 8020
Toluene	< 0.16	0.16	0.51	ug/L		1/30/97	SW846 8020
Xylene, total	< 0.44	0.44	1.4	ug/L		1/30/97	SW846 8020

Madison Office & Laboratory
802 Deming Way
Madison, WI 53717
608-827-5501 • Fax: 608-827-5503
1-888-5-ENCHEM



Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
414-469-2436 • Fax: 414-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name : WDOT - SHELL LAKE

Submitter # : 1000.99

Project Number : 10318.05

Submitter : RMT - MADISON

Lab Sample Number : 970178-02

Report Date : 2/5/97

Station ID : MW-3

Collection Date : 1/21/97

WI DNR LAB ID : 113138520

Matrix Type : GROUNDWATER

Volatile Organic Results

PVOC - WI LUST LIST

Prep Method: SW846 5030

Analyte	Result	LOD	LOQ	Units	Code	Analysis Date	Analysis Method
1,2,4-Trimethylbenzene	< 0.25	0.25	0.80	ug/L		1/30/97	SW846 8020
1,3,5-Trimethylbenzene	< 0.13	0.13	0.41	ug/L		1/30/97	SW846 8020
Benzene	< 0.14	0.14	0.45	ug/L		1/30/97	SW846 8020
Ethylbenzene	< 0.14	0.14	0.45	ug/L		1/30/97	SW846 8020
Methyl-tert-butyl-ether	< 0.18	0.18	0.57	ug/L		1/30/97	SW846 8020
Toluene	< 0.16	0.16	0.51	ug/L		1/30/97	SW846 8020
Xylene, total	< 0.44	0.44	1.4	ug/L		1/30/97	SW846 8020

Madison Office & Laboratory
802 Deming Way
Madison, WI 53717
608-827-5501 • Fax: 608-827-5503
1-888-5-ENCHEM



Corporate Office & Laboratory
1795 Industrial Drive
Green Bay, WI 54302
414-469-2436 • Fax: 414-469-8827
1-800-7-ENCHEM

- Analytical Report -

Project Name : WDOT - SHELL LAKE

Submitter # : 1000.99

Project Number : 10318.05

Submitter : RMT - MADISON

Lab Sample Number : 970178-01

Report Date : 2/5/97

Station ID : MW-2

Collection Date : 1/21/97

WI DNR LAB ID : 113138520

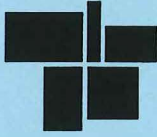
Matrix Type : GROUNDWATER

Volatile Organic Results

Prep Method: SW846 5030

PVOC - WI LUST LIST

Analyte	Result	LOD	LOQ	Units	Code	Analysis Date	Analysis Method
1,2,4-Trimethylbenzene	< 0.25	0.25	0.80	ug/L		1/30/97	SW846 8020
1,3,5-Trimethylbenzene	< 0.13	0.13	0.41	ug/L		1/30/97	SW846 8020
Benzene	< 0.14	0.14	0.45	ug/L		1/30/97	SW846 8020
Ethylbenzene	< 0.14	0.14	0.45	ug/L		1/30/97	SW846 8020
Methyl-tert-butyl-ether	< 0.18	0.18	0.57	ug/L		1/30/97	SW846 8020
Toluene	< 0.16	0.16	0.51	ug/L		1/30/97	SW846 8020
Xylene, total	< 0.16	0.16	0.51	ug/L		1/30/97	SW846 8020



Appendix B Soil Closure Sample Laboratory Reports



... chemistry for the environment

Superior Laboratory
 2231 Catlin Ave., Suite 420
 Superior, WI 54880
 715-392-5844
 1-800-837-8238
 Fax: 715-392-5843

Lab Certification No. 405132750
 Location : PRJ. 10318.05/WDOT-SHELL LAKE
 Your Sample ID:
 Sample Desc. : SUE-4 (37'-39')
 Sample Matrix : SOIL Date Collected: 09/11/1996
 En Chem Proj# : 0996026 Date Received : 09/13/1996
 En Chem Lab # : 502903 Date Reported : 09/18/1996

Report to: RMT, INC
 744 HEARTLAND TRAIL
 P.O. BOX 8923
 MADISON, WI 53708-8923

Bill to: RMT, INC

Analysis	Parameter	Result	Units	Detection Limit	Prep Method	Prep Date	Analysis Method	Analysis Date	Analysis By
PVOC-S-ME	Benzene	ND	ug/kg	25		09/17/1996	SW846 8020	09/17/1996	mdc
	Ethyl Benzene	ND	ug/kg	25					
	Methyl-tert-butyl ether	ND	ug/kg	25					
	Toluene	ND	ug/kg	25					
	1,2,4-trimethylbenzene	ND	ug/kg	25					
	1,3,5-trimethylbenzene	ND	ug/kg	25					
	Xylenes, m + p	ND	ug/kg	25					
	Xylene, o	ND	ug/kg	25					
	a,a,a-Trifluorotoluene (SS)	100 % recov			1				
GRO-S	Gasoline Range Organics(GRO)-Soil	ND	mg/kg	2.5		09/17/1996	WDNR MOD GRO	09/17/1996	mdc
	Soil spike	105 % RECOV		50					
	Soil spike duplicate	94 % RECOV		50					
DRO-S	Diesel Range Organics(DRO)-Soil	ND	mg/kg	3.6		09/16/1996	WDNR MOD DRO	09/17/1996	DLP
	Soil spike	94 % RECOV		50					
	Soil spike duplicate	95 % RECOV		50					

"ND" Indicates no detectable analyte at or above the listed detection limit. All results reported on a dry weight basis. All subcontracted analyses are performed by Wisconsin DNR certified laboratories.

These results have been reviewed and their authenticity verified by:

Corporate Office & Laboratory

1795 Industrial Drive • Green Bay, WI 54302 • 414-469-2436 • 800-736-2436 • FAX: 414-469-8827



... chemistry for the environment

Superior Laboratory
 2231 Catlin Ave., Suite 420
 Superior, WI 54880
 715-392-5844
 1-800-837-8238
 Fax: 715-392-5843

Lab Certification No. 405132750
 Location : PRJ. 10318.05/WDOT-SHELL LAKE
 Your Sample ID:
 Sample Desc. : MW-3 (30'-32')
 Sample Matrix : SOIL Date Collected: 09/11/1996
 En Chem Proj# : 0996026 Date Received : 09/13/1996
 En Chem Lab # : 502893 Date Reported : 09/19/1996

Report to: RMT, INC
 744 HEARTLAND TRAIL
 P.O. BOX 8923
 MADISON, WI 53708-8923

Bill to: RMT, INC

Analysis	Parameter	Result	Units	Detection Limit	Prep Method	Prep Date	Analysis Method	Analysis Date	Analyze By
PVOC-S-ME	Benzene	ND	ug/kg	130		09/17/1996	SW846 8020	09/17/1996	mdc
	Ethyl Benzene	ND	ug/kg	130					
	Methyl-tert-butyl ether	ND	ug/kg	130					
	Toluene	ND	ug/kg	130					
	1,2,4-trimethylbenzene	6800	ug/kg	130					
	1,3,5-trimethylbenzene	2600	ug/kg	130					
	Xylenes, m + p	440	ug/kg	130					
	Xylene, o	250	ug/kg	130					
	a,a,a-Trifluorotoluene (SS)	98 %	recov		1				
GRO-S	Gasoline Range Organics(GRO)-Soil	390	mg/kg	13		09/17/1996	WDNR MOD GRO	09/17/1996	mdc
	Soil spike	105 %	RECOV	50					
	Soil spike duplicate	94 %	RECOV	50					
DRO-S	Diesel Range Organics(DRO)-Soil	1900	mg/kg	73		09/16/1996	WDNR MOD DRO	09/18/1996	DLP
	Soil spike	94 %	RECOV	50					
	Soil spike duplicate	95 %	RECOV	50					

"ND" Indicates no detectable analyte at or above the listed detection limit. All results reported on a dry weight basis. All subcontracted analyses are performed by Wisconsin DNR certified laboratories.

These results have been reviewed and their authenticity verified by:

Corporate Office & Laboratory



... chemistry for the environment

Superior Laboratory
 2231 Catlin Ave., Suite 420
 Superior, WI 54880
 715-392-5844
 1-800-837-8238
 Fax: 715-392-5843

Lab Certification No. 405132750
 Location : PRJ. 10318.05/WDOT-SHELL LAKE
 Your Sample ID:
 Sample Desc. : SUE-ONE THIRD (25'-27')
 Sample Matrix : SOIL Date Collected: 09/11/1996
 En Chem Proj# : 0996026 Date Received : 09/13/1996
 En Chem Lab # : 502894 Date Reported : 09/18/1996

Report to: RMT, INC
 744 HEARTLAND TRAIL
 P.O. BOX 8923
 MADISON, WI 53708-8923

Bill to: RMT, INC

Analysis	Parameter	Result	Units	Detection Limit	Prep Method	Prep Date	Analysis Method	Analysis Date	Analysis By
PVOC-S-ME	Benzene	ND	ug/kg	25		09/17/1996	SW846 8020	09/17/1996	mdc
	Ethyl Benzene	ND	ug/kg	25					
	Methyl-tert-butyl ether	ND	ug/kg	25					
	Toluene	ND	ug/kg	25					
	1,2,4-trimethylbenzene	ND	ug/kg	25					
	1,3,5-trimethylbenzene	ND	ug/kg	25					
	Xylenes, m + p	ND	ug/kg	25					
	Xylene, o	ND	ug/kg	25					
	a,a,a-Trifluorotoluene (SS)	98 % recov			1				
GRO-S	Gasoline Range Organics(GRO)-Soil	ND	mg/kg	2.5		09/17/1996	WDNR MOD GRO	09/17/1996	mdc
	Soil spike	105 % RECOV		50					
	Soil spike duplicate	94 % RECOV		50					
DRO-S	Diesel Range Organics(DRO)-Soil	.16	mg/kg	3.6		09/16/1996	WDNR MOD DRO	09/16/1996	DLP
	Soil spike	94 % RECOV		50					
	Soil spike duplicate	95 % RECOV		50					

"ND" Indicates no detectable analyte at or above the listed detection limit. All results reported on a dry weight basis. All subcontracted analyses are performed by Wisconsin DNR certified laboratories.

These results have been reviewed and their authenticity verified by:

Corporate Office & Laboratory



... chemistry for the environment

Superior Laboratory
 2231 Catlin Ave., Suite 420
 Superior, WI 54880
 715-392-5844
 1-800-837-8238
 Fax: 715-392-5843

Lab Certification No. 405132750
 Location : PRJ. 10318.05/WDOT-SHELL LAKE
 Your Sample ID:
 Sample Desc. : SUE-ONE HALF A (8'-10')
 Sample Matrix : SOIL Date Collected: 09/11/1996
 En Chem Proj# : 0996026 Date Received : 09/13/1996
 En Chem Lab # : 502895 Date Reported : 09/18/1996

Report to: RMT, INC
 744 HEARTLAND TRAIL
 P.O. BOX 8923
 MADISON, WI 53708-8923

Bill to: RMT, INC

Analysis	Parameter	Result	Units	Detection Limit	Prep Method	Prep Date	Analysis Method	Analysis Date	Analysis By
PVOC-S-ME	Benzene	ND	ug/kg	25		09/17/1996	SW846 8020	09/17/1996	mdc
	Ethyl Benzene	ND	ug/kg	25					
	Methyl-tert-butyl ether	ND	ug/kg	25					
	Toluene	ND	ug/kg	25					
	1,2,4-trimethylbenzene	ND	ug/kg	25					
	1,3,5-trimethylbenzene	ND	ug/kg	25					
	Xylenes, m + p	ND	ug/kg	25					
	Xylene, o	ND	ug/kg	25					
	a,a,a-Trifluorotoluene (SS)	98 % recov			1				
GRO-S	Gasoline Range Organics(GRO)-Soil	ND	mg/kg	2.5		09/17/1996	WDNR MOD GRO	09/17/1996	mdc
	Soil spike	105 % RECOV		50					
	Soil spike duplicate	94 % RECOV		50					
DRO-S	Diesel Range Organics(DRO)-Soil	50	mg/kg	3.8		09/16/1996	WDNR MOD DRO	09/16/1996	DLP
	Soil spike	94 % RECOV		50					
	Soil spike duplicate	95 % RECOV		50					

"ND" Indicates no detectable analyte at or above the listed detection limit. All results reported on a dry weight basis. All subcontracted analyses are performed by Wisconsin DNR certified laboratories.

These results have been reviewed and their authenticity verified by:



... chemistry for the environment

Superior Laboratory
 2231 Catlin Ave., Suite 420
 Superior, WI 54880
 715-392-5844
 1-800-837-8238
 Fax: 715-392-5843

Lab Certification No. 405132750
 Location : PRJ. 10318.05/WDOT-SHELL LAKE
 Your Sample ID:
 Sample Desc. : SUE-ONE HALF B (25'-27')
 Sample Matrix : SOIL Date Collected: 09/11/1996
 En Chem Proj# : 0996026 Date Received : 09/13/1996
 En Chem Lab # : 502896 Date Reported : 09/19/1996

Report to: RMT, INC
 744 HEARTLAND TRAIL
 P.O. BOX 8923
 MADISON, WI 53708-8923

Bill to: RMT, INC

Analysis	Parameter	Result	Units	Detection Limit	Prep Method	Prep Date	Analysis Method	Analysis Date	Analysis By
PVOC-S-ME	Benzene	ND	ug/kg	25		09/17/1996	SW846 8020	09/17/1996	mdc
	Ethyl Benzene	ND	ug/kg	25					
	Methyl-tert-butyl ether	ND	ug/kg	25					
	Toluene	ND	ug/kg	25					
	1,2,4-trimethylbenzene	ND	ug/kg	25					
	1,3,5-trimethylbenzene	ND	ug/kg	25					
	Xylenes, m + p	ND	ug/kg	25					
	Xylene, o	ND	ug/kg	25					
	a,a,a-Trifluorotoluene (SS)	98 %	recov	1					
GRO-S	Gasoline Range Organics(GRO)-Soil	ND	mg/kg	2.5		09/17/1996	WDNR MOD GRO	09/17/1996	mdc
	Soil spike	105 %	RECOV	50					
	Soil spike duplicate	94 %	RECOV	50					
DRO-S	Diesel Range Organics(DRO)-Soil	3.8	mg/kg	3.6		09/16/1996	WDNR MOD DRO	09/17/1996	DLP
	Soil spike	94 %	RECOV	50					
	Soil spike duplicate	95 %	RECOV	50					

"ND" Indicates no detectable analyte at or above the listed detection limit. All results reported on a dry weight basis. All subcontracted analyses are performed by Wisconsin DNR certified laboratories.

These results have been reviewed and their authenticity verified by:

Corporate Office & Laboratory

1795 Industrial Drive • Green Bay, WI 54302 • 414-469-2436 • 800-736-2436 • Fax: 414-469-8827



... chemistry for the environment

Superior Laboratory
2231 Catlin Ave., Suite 420
Superior, WI 54880
715-392-5844
1-800-837-8238
Fax: 715-392-5843

Lab Certification No. 405132750
Location : PRJ. 10318.05/WDOT-SHELL LAKE
Your Sample ID:
Sample Desc. : TRIP BLANK
Sample Matrix : METHANOL Date Collected:
En Chem Proj# : 0996026 Date Received : 09/13/1996
En Chem Lab # : 502897 Date Reported : 09/16/1996

Report to: RMT, INC
744 HEARTLAND TRAIL
P.O. BOX 8923
MADISON, WI 53708-8923

Bill to: RMT, INC

Analysis	Parameter	Result	Units	Detection Limit	Prep Method	Prep Date	Analysis Method	Analysis Date	Analysis By
ADMIN	ADMINISTRATIVE HOLD	CANCELED LABORAT						09/13/1996	CLC

"ND" Indicates no detectable analyte at or above the listed detection limit. All results reported on a dry weight basis. All subcontracted analyses are performed by Wisconsin DNR certified laboratories.

These results have been reviewed and their authenticity verified by:

Corporate Office & Laboratory

1795 Industrial Drive • Green Bay, WI 54302 • 414-469-2436 • 800-736-2436 • Fax: 414-469-8827

Company Name: RMT, INC.
 Branch or Location: MADISON
 Project Contact: BRUCE GREEN
 Telephone: 608-831-4444
 Project Number: 10318.05
 Project Name: WDOT - SHELL LAKE
 Project Location: SHELL LAKE, WI
 Sampled By (Print): LEO H. TRAMM
 Regulatory Program (circle): UST RCRA CLP SDWA
 NPDES/WPDES CAA NR _____
 Other _____
 NR720 Confirmation Analysis Required? (circle): Y N
 (En Chem will confirm unless otherwise instructed.)



1241 Bellevue St., Suite 9
 Green Bay, WI 54302
 414-469-2436 • 1-800-736-2436
 FAX 414-469-8827

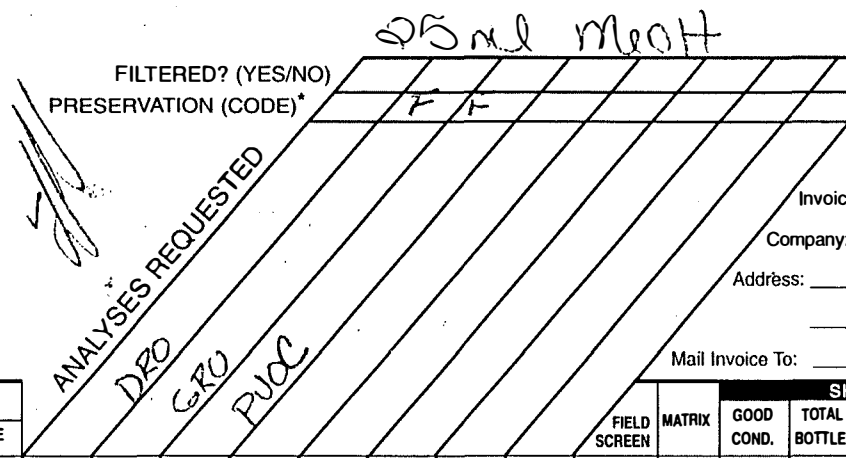
802 Deming Way
 Madison, WI 53717
 608-827-5501 • 1-888-536-2436
 Fax: 608-827-5503

2231 Catlin Ave., Suite 420
 Superior, WI 54880
 715-392-5844 • 1-800-837-8238
 FAX 715-392-5843

CHAIN OF CUSTODY

2605

Page 1 of 1
 P.O. # _____ Quote # _____
 Mail Report To: _____
 Company: RMT, INC.
 Address: 744 HARTLAND TRAIL
MADISON, WI 53711
 Invoice To: DICK FISH
 Company: _____
 Address: _____
 Mail Invoice To: _____



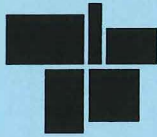
FILTERED? (YES/NO) _____
 PRESERVATION (CODE)* _____

FIELD ID	SAMPLE DESCRIPTION	COLLECTION		DRO	GRO	PUOC	FIELD SCREEN	MATRIX	SHADED AREA FOR LABORATORY USE ONLY		LABORATORY NUMBER	
		DATE	TIME						GOOD COND.	TOTAL BOTTLES		COMMENTS
	SUC-4 (37'-39')	9/11	1200	✓	✓	✓			✓	3-208	3 BOTTLES	502890
	MW-3 (30'-32')	9/11	1330	✓	✓	✓			✓		(2 PRESERVED)	502892
	SUC-1/3 (25'-27')	9/11	1500	✓	✓	✓			✓		" "	502894
	SUC-1/2A (8'-10')	9/11	1530	✓	✓	✓			✓		" "	502895
	SUC-1/2B (25'-27')	9/11	1700	✓	✓	✓			✓		" "	502896
	Ship Blank								✓	2-40 ml	Empty	502897

***Preservation Code**
 A=None B=HCL C=H2SO4
 D=HN03 E=EnCore F=Methanol**
 G=NaOH O=Other (Indicate)

**If not using En Chem's methanol, indicate volume of methanol added and mark the appropriate samples.

Relinquished By: <u>[Signature]</u>	Date/Time: <u>9/11 @ 9:30</u>	Received By: <u>[Signature]</u>	Date/Time: <u>9/11 @ 9:30</u>	En Chem Project No. <u>(996) 026</u>
Relinquished By: <u>[Signature]</u>	Date/Time: <u>9/23 10:00</u>	Received By: <u>[Signature]</u>	Date/Time: <u>9/23/96</u>	Sample Receipt Temp. <u>ROT</u>
Relinquished By: <u>[Signature]</u>	Date/Time: _____	Received By (En Chem): <u>[Signature]</u>	Date/Time: _____	Sample Receipt pH (Wet/Metals) _____



Appendix C SVE Off-Gas Laboratory Reports

Report No.: 97.007
Report Date: January 13, 1997
ECCS PN: 1245

Client Name: RMT, Inc.
744 Heartland Trail
P.O. Box 8923
Madison, WI 53708-8923

Attention: Bruce Grear

Project Name: WDOT - Shell Lake
RMT Project: 10318.05

Date Collected: 01/09/97
Date Received: 01/10/97
Date Analyzed: 01/10/97

<u>Sample Description</u>	<u>Benzene (0.2 ug/L)</u>	<u>Toluene (0.2 ug/L)</u>	<u>Ethyl Benzene (0.2 ug/L)</u>	<u>Xylenes (0.4 ug/L)</u>	<u>Total Hydrocarbon* (0.4 ug/L*)</u>
SVE 1 & 3	< 0.2	< 0.2	< 0.2	< 0.4	6
SVE 1, 2, 3 & 4	< 0.2	< 0.2	< 0.2	< 0.4	5

Method detection limit given in parenthesis below compound name.
ug/L = micro-grams per liter (weight/volume) = mg/cubic meter

* Calculated based on the average response factor of benzene.

Analysis by GC-FID.

Approved by:



Michael J. Linskens
Senior Chemist

Environmental Chemistry Consulting Services, Inc.

Report No.: 96.338
Report Date: December 19, 1996
ECCS PN: 1245

Client Name: RMT, Inc.
744 Heartland Trail
P.O. Box 8923
Madison, WI 53708-8923

Attention: Bruce Greer

Project Name: WDOT - Shell Lake
RMT Project: 10318.XX

Date Collected: 12/17/96
Date Received: 12/18/96
Date Analyzed: 12/18/96

<u>Sample Description</u>	<u>Benzene</u> <u>(0.2 ug/L)</u>	<u>Toluene</u> <u>(0.2 ug/L)</u>	<u>Ethyl</u> <u>Benzene</u> <u>(0.2 ug/L)</u>	<u>Xylenes</u> <u>(0.4 ug/L)</u>	<u>Total</u> <u>Hydrocarbon*</u> <u>(2 ug/L*)</u>
E1 & E3	< 0.2	0.4	0.2	1.7	50
E2 & E4	< 0.2	0.3	< 0.2	1.6	15

Method detection limit given in parenthesis below compound name.

ug/L = micro-grams per liter (weight/volume) = mg/cubic meter

* Calculated based on the average response factor of benzene.

Analysis by GC-FID.

Approved by:



Michael J. Linskens
Senior Chemist

Environmental Chemistry Consulting Services, Inc.



Report No.: 96.309
Report Date: November 18, 1996
ECCS PN: 1245

Client Name: RMT, Inc.
744 Heartland Trail
P.O. Box 8923
Madison, WI 53708-8923

Attention: Bruce Greer

Project Name: WDOT - Shell Lake
RMT Project: 10318.05

Date Collected: 11/15/96
Date Received: 11/16/96
Date Analyzed: 11/16/96

<u>Sample Description</u>	<u>Benzene</u> <u>(0.2 ug/L)</u>	<u>Toluene</u> <u>(0.2 ug/L)</u>	<u>Ethyl</u> <u>Benzene</u> <u>(0.2 ug/L)</u>	<u>Xylenes</u> <u>(0.4 ug/L)</u>	<u>Total</u> <u>Hydrocarbon*</u> <u>(.2 ug/L*)</u>
All Wells	<0.2	<0.2	<0.2	<0.4	1
Wells 1 & 3	<0.2	<0.2	<0.2	<0.4	0

Method detection limit given in parenthesis below compound name.

ug/L = micro-grams per liter (weight/volume) = mg/cubic meter

* Calculated based on the average response factor of benzene.

Analysis by GC-FID.

Approved by:

Michael J. Linskens
Senior Chemist



Report No.: 96.244
Report Date: September 16, 1996
ECCS PN: 1245

Client Name: RMT, Inc.
744 Heartland Trail
P.O. Box 8923
Madison, WI 53708-8923

Attention: Bruce Greer

Project Name: WDOT - Shell Lake
RMT Project: 10318.03

Date Collected: 9/11/96
Date Received: 9/12/96
Date Analyzed: 9/13/96

<u>Sample Description</u>	<u>Benzene</u> <u>(0.2 ug/L)</u>	<u>Toluene</u> <u>(0.2 ug/L)</u>	<u>Ethyl</u> <u>Benzene</u> <u>(0.2 ug/L)</u>	<u>Xylenes</u> <u>(0.4 ug/L)</u>	<u>Total</u> <u>Hydrocarbon*</u> <u>(.2 ug/L*)</u>
SVE - 1 & 3	<0.2	<0.2	<0.2	<0.4	0
SVE - 1, 2, 3 & 4	<0.2	<0.2	<0.2	<0.4	21

Method detection limit given in parenthesis below compound name.

ug/L = micro-grams per liter (weight/volume) = mg/cubic meter

* Calculated based on the average response factor of benzene.

Analysis by GC-FID.

Approved by:

Michael J. Linskens
Senior Chemist

Environmental Chemistry Consulting Services, Inc.

