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PHASE I AND II ENVIRONMENTAL SITE ASSESSMENT
JACK'S SERVICE AND MINI MART PROPERTY
USH 141, MARINETTE COUNTY
MIDDLE INLET, WISCONSIN

WDOT PROJECT #1490-11-01

PREPARED FOR
WISCONSIN DEPARTMENT OF TRANSPORTATION
MADISON, WISCONSIN

PREPARED BY
RMT, INC.
MADISON, WISCONSIN

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6/28/91

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10104.01 0000:RTH:jack0624

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1. INTRODUCTION

1.1 Background

The Wisconsin Department of Transportation (WDOT) is planning to conduct highway improvements to United States Highway (USH) 141 from Crivitz to Wausaukee, beginning in 1993. As a part of this improvement project (WDOT Project # 1490-11-01), the WDOT will be conducting work along the USH 141 right-of-way, located in Middle Inlet, Wisconsin, approximately 400 feet north of the County Trunk Highway (CTH) "X" and USH 141 intersection.

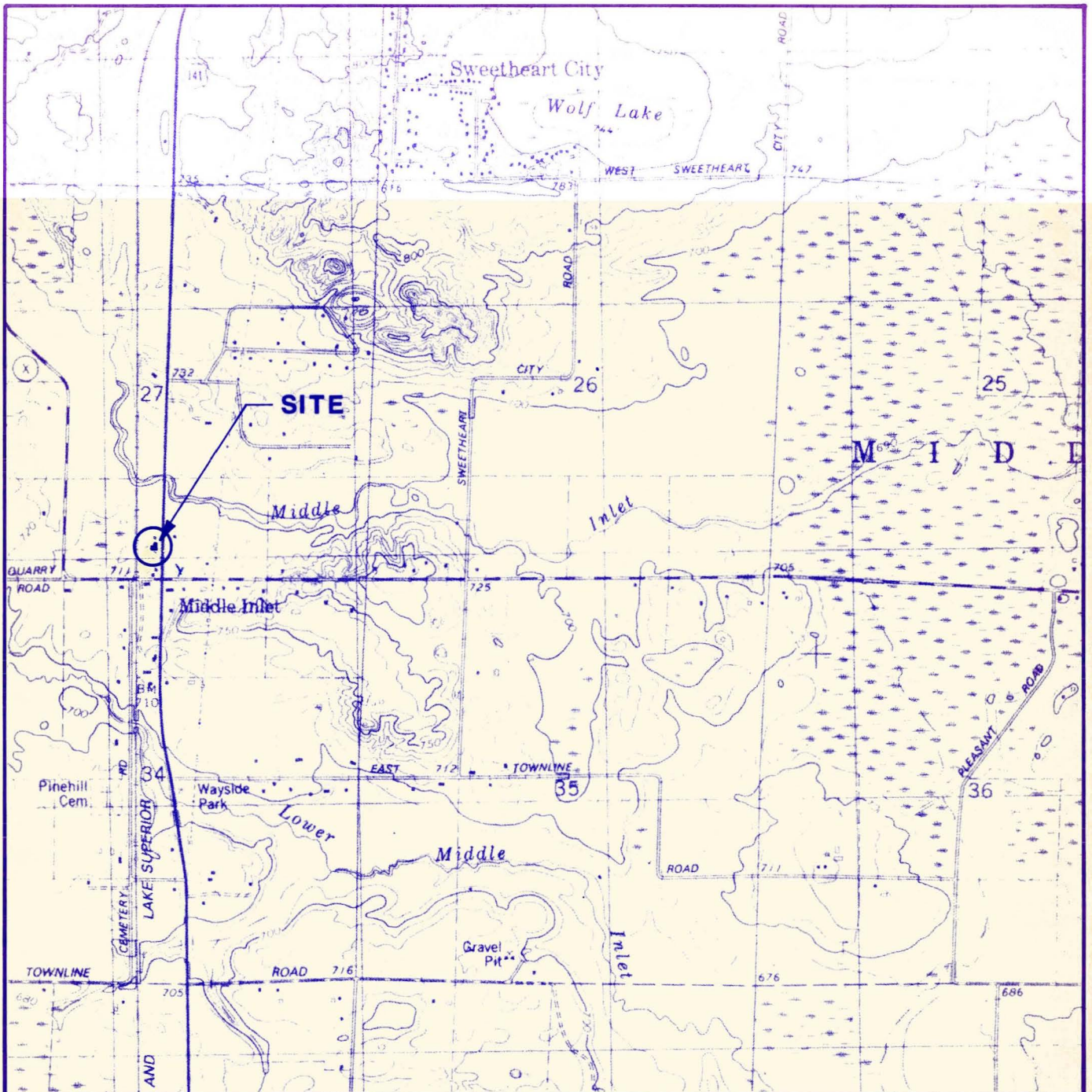
The USH 141 right-of-way borders the Jack's Mini Mart property owned by Jack Kapalczynski (Middle Inlet, Wisconsin 54148). Figure 1-1 shows the approximate property location. Because the WDOT had information that indicated this property is an active gasoline station, the WDOT retained RMT, Inc. (RMT), to perform a Phase I and II Environmental Assessment of the WDOT right-of-way property adjacent to the Jack's Mini Mart property.

1.2 Purpose and Scope

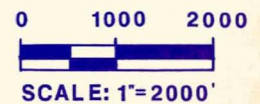
The objective of this Phase I and II Environmental Assessment was to provide the WDOT with information with respect to potential environmental liabilities associated with the WDOT right-of-way adjacent to the Jack's Mini Mart property. The purpose of this report is to present the findings and conclusions of the environmental assessment.

The scope of services performed for this project included the following:

- Reviewed available site information supplied by the WDOT.
- Interviewed available persons who are knowledgeable about past and present activities at the site.
- Reviewed the WDOT site and the Jack's Mini Mart site for evidence of spills or leaks, such as discolored soils, barren ground, vegetative stress, unusual odors, disturbed soils, surface debris; and for indications of the presence of underground storage tanks (USTs). Site photographs were taken to document the condition of the property at the time the investigation was conducted.



NOTE: BASE MAP FROM USGS 7.5 MIN. QUAD.
 WAUSAUKEE SOUTH, WI-MI, 1982.



SITE LOCATION MAP

	DWN. BY: BLF
	DATE: MAY, 1991
	PROJ. # 10104.01

FIGURE 1-1

- Reviewed contiguous land uses to visually identify possible sources of surface migration of hazardous constituents onto the WDOT property.
- Reviewed the National Priorities List (NPL) and available Comprehensive Environmental Response, Compensation, and Liability Index System (CERCLIS) listings for known or suspected contaminated sites within 1 mile of the subject property.
- Reviewed the Wisconsin Department of Industry, Labor and Human Relations (WDILHR) UST data base, the State of Wisconsin Spills Report, and the WDNR Leaking Underground Storage Tank (LUST) Case Tracking System listing for information on USTs on the Jack's Mini Mart property.
- Contacted state and local agencies to obtain the following information (if available):
 - Correspondence regarding environmental issues at the Jack's Mini Mart property (enforcement actions, compliance inspections, hazardous material/waste activities, spills, etc.).
 - List of active and inactive municipal waste landfills to determine if the Jack's Mini Mart property was previously a known municipal waste disposal site.
 - Aerial photographs of the property.
- Subcontracted with Environmental and Foundation Drilling, Inc. (EFD), of Madison, Wisconsin, to drill and sample two soil borings.
- Coordinated the location and clearing of underground utilities and conduits.
- Prepared a site-specific Health and Safety plan.
- Observed and documented the drilling of two soil borings in the WDOT right-of-way adjacent to the Jack's Mini Mart property, conducted field-screening of soil samples with an Hnu photoionization detector (PID), and collected soil samples for laboratory analysis.
- Described soil samples according to the Unified Soil Classification System, and prepared soil boring log forms.
- Laboratory-analyzed soil samples that had the highest PID reading for total petroleum hydrocarbons (TPH) as gasoline and TPH as diesel.
- Laboratory-analyzed one ground water sample for BTEX compounds.
- Evaluated the field and laboratory testing results.

2. FINDINGS AND CONCLUSIONS

1. The Jack's Mini Mart property is located approximately 400 feet north of the intersection of CTH "X" and USH 141 in Middle Inlet, Wisconsin, and currently consists of an approximately 100-foot by 150-foot lot which contains a building (the gasoline station and mini mart), four USTs, and a pump island.
2. The Jack's Mini Mart property has operated as a gasoline station since 1946. Mr. Jack Kapalczynski has owned and operated the property since 1978. Aerial photographs of the site in 1958 and 1968 confirm the presence of the building.
3. Contiguous property uses are as follows:
 - To the north is a private residence owned by Mr. Jack Kapalczynski.
 - To the south is a small creek.
 - To the west is a vacant lot.
 - To the east are private residences, the creek, and the Baldor Electrical Motor Service Company.
4. At the time of the site visit, the only visual evidence of spills or leaks on the Jack's Mini Mart property was some minor surface staining in front of the garage service door.
5. At the time of the site visit, four USTs were identified. These include the following:
 - One 2,000-gallon UST containing regular leaded gasoline, buried to the south of the existing building. The UST was installed in 1981.
 - One 3,000-gallon UST containing unleaded gasoline, buried to the south of the existing building. The UST was installed in 1977.
 - Two empty 550-gallon USTs manifolded together, buried to the north of the existing building. These USTs were installed in 1946, and have not been in use since Mr. Kapalczynski has operated the gasoline station (1978).
6. According to Mr. Jack Kapalczynski, the present owner, the site has been used as a gasoline station since 1946, and has had three owners since then.
7. According to the Wisconsin Department of Industry, Labor and Human Relations (WDILHR) data base, there are no USTs registered for the Jack's Mini Mart property.
8. A review of the WDNR spills data base indicated that no reported spills have occurred at the Jack's Mini Mart or adjacent WDOT properties, or in the immediate vicinity. However, Mr. Kapalczynski stated that a gasoline tanker truck had tipped over across USH 141 approximately 11 years ago. No documentation of that spill could be obtained.

RP RESIDENCE

DILHR LIST
(3-21-91) LISTS
3 TANKS UNDER
"JACK'S STANDARD"

9. The Wisconsin Department of Natural Resources (WDNR) Area Office in Marinette, Wisconsin, does not have a file regarding environmental problems at the Jack's Mini Mart property. Furthermore, the WDNR is not aware of any environmental problems in the vicinity of the Jack's Mini Mart property.
10. The property is not an NPL, CERCLIS, EERP, LUST, or abandoned landfill site.
11. Based on available information, the closest known waste disposal site to the WDOT property is the Town of Middle Inlet Landfill, which is approximately 1.5 miles from the Jack's Mini Mart property.
12. Two soil borings were drilled in the WDOT right-of-way. Borings were drilled to a depth of 8.5 feet, and ground water was encountered at approximately 7 feet below the ground surface. *GW*
13. Field-screening of soil samples during the installation of two soil borings (B-1 and B-2) in the WDOT right-of-way bordering the Jack's Mini Mart property revealed detected concentrations of volatile organic compounds (VOCs). Results of the field-screening are as follows: *PIDS*
 - 0 to 60 parts per million by volume (ppmv) in boring B-1.
 - 0 to 180 ppmv in boring B-2.
14. One soil sample from boring B-1 and two soil samples from boring B-2 were analyzed for total petroleum hydrocarbons (TPH) as gasoline and diesel. Results of the analyses are as follows:
 - The TPH as diesel samples did not result in detected concentrations.
 - The TPH as gasoline samples from boring B-1 did not result in detected concentrations.
 - One of the two TPH as gasoline samples analyzed from boring B-2, sample B-2,1, taken from 1 to 3 feet, had detected concentrations of TPH as gasoline of 97 mg/kg.
15. A ground water sample was collected and analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX). The laboratory analyses revealed detected concentrations of 5,600 $\mu\text{g/L}$ (ppb), 13,000 $\mu\text{g/L}$, <500 $\mu\text{g/L}$, and 6,600 $\mu\text{g/L}$ for benzene, toluene, ethylbenzene, and xylenes, respectively. *SHOULD RUN FULL VOC SCAN*
16. Based upon field observations and field-screening results, there is evidence that limited soil contamination may exist at or near the surface in soils on the WDOT right-of-way adjacent to the Jack's Mini Mart property. *NOT NEAR TANKS. MINOR SPILL?*
17. Based upon field observations and the results of laboratory analysis of a ground water sample, there is evidence of ground water contamination in the WDOT right-of-way adjacent to the Jack's Mini Mart property.

18. A Phase I and II environmental site assessment was conducted concurrently by RMT under a separate Scope of Service at the Webers Mahogany Ridge property (located approximately 400 feet south on USH 141). Although field-screening results indicated the presence of petroleum contamination, TPH as gasoline and as diesel were not detected in the soil samples analyzed. Furthermore, no detected concentrations of BTEX were identified in the ground water samples collected and analyzed from the WDOT right-of-way adjacent to the Webers Mahogany Ridge Property.

3. RECOMMENDATIONS

The results of the soil sampling and analysis indicate the presence of petroleum-contaminated soils and ground water on the WDOT right-of-way adjacent to the Jack's Mini Mart property. The WDOT has indicated that USH 141 improvement activities will not require excavation to a depth greater than 4 feet. Since evidence of contamination was observed at a depth between 1 and 3 feet, contamination could be encountered in the WDOT right-of-way during the planned construction activities, unless construction activities are changed. RMT recommends that further investigations be conducted to determine the source of contamination and to delineate the nature and extent of the contamination. The additional investigation would likely include drilling six to eight soil borings and installing approximately three ground water monitoring wells.

WHO WOULD PERFORM THIS WORK? DOT?

4. DISCUSSION

4.1 Phase I Activities

4.1.1 General Approach

In conducting the Phase I activities of the environmental assessment, RMT representatives reviewed USH 141 plan sets and other information supplied by the WDOT; visited the site; interviewed persons knowledgeable about the site; reviewed Wisconsin Department of Natural Resources (WDNR) files; and reviewed local, county, state, and federal information.

4.1.2 Site Visit

On March 28, 1991, RMT representatives visited the site and reviewed the property. The Jack's Mini Mart property is located on the west side of USH 141, approximately 400 feet north of the USH 141 and CTH "X" intersection in Middle Inlet, Wisconsin.

The Jack's Mini Mart property consists of approximately a 100-foot by 150-foot parcel. The property contains a building (the gasoline station and mini mart), four USTs (located in front of the building), and a pump island. Figure 4-1 contains a map of the Jack's Mini Mart site, and Appendix A contains site photographs.

Contiguous property uses are residential, commercial, and agricultural. To the north is a private residence owned by Mr. Kapalczynski. To the south and southeast is a small creek. Approximately 400 feet south is the Webers Mahogany Ridge property, a former gasoline station. To the west are vacant wooded lots. To the east are private residences and the Baldor Electrical Motor Service Company. The land in the surrounding area is used for commercial, agricultural, and residential purposes.

Concurrent with this investigation, but under a separate Scope of Services, RMT conducted a Phase I and II environmental site assessment at the Webers Mahogany Ridge property (located approximately 400 feet south of the Jack's Mini Mart property). Petroleum

STILL IN SERVICE
INSTALLED 1945'

RED A/D'S = SOIL LAB TPH (ppm)
AND LAB P/B (P/B)

▽ @ ≈ 7'

2-550 GAL USTS
MANIFOLDED TOGETHER

BUILDING

PUMP LOCATION

3000-GAL UNLEADED
GASOLINE UST
1977

2000-GAL REGULAR
GASOLINE UST
INSTALLED 1981

DOT RIGHT-OF-WAY

HIGHWAY 141

B-1

ND @ 7'

B-2

97 @ 2'
ND @ 7'

B - 5600
T - 13,000
E - < 500
X - 6600

Groundwater

LEGEND

- ⊕ BORING
- DOT RIGHT-OF-WAY

NOTE: UNDERGROUND STORAGE TANK
LOCATIONS ARE APPROXIMATE.



NOT TO SCALE

BORING LOCATION MAP



Dwn. by:	BLF
Date:	MAY, 1991
Proj. #:	10104.01

FIGURE 4-1

contamination was not detected in the soil or ground water samples analyzed. However, field-screening of soil samples revealed the presence of volatile organic compounds (VOCs).

During the site visit, the RMT representatives viewed the subject property for indications of the presence of an UST, such as vent or fill pipes. Four USTs were identified. Two of the four USTs located on the property are currently in use. All four USTs are located on the east side of the building; two are north of the building, and two are south of the building. They are approximately 60 to 65 feet from the centerline of USH 141, and are approximately within 5 feet from the WDOT right-of-way. The pump island is located east of the building, approximately 10 feet from the WDOT right-of-way.

The property was also viewed for evidence of spills or leaks. At the time of the site visit, minor surface staining in front of the garage service door was the only evidence of spills on the Jack's Mini Mart property or on the WDOT right-of-way.

4.1.3 Site History

In an effort to investigate previous land uses of the Jack's Mini Mart property, aerial photographs were reviewed by RMT from the years 1958 and 1968. A review of these photographs indicated that the site has not changed significantly in appearance since 1958.

During an interview, Mr. Jack Kapalczynski, the current property owner, stated that he purchased the property and business in 1978. The property has been operated as a gasoline station since 1946. The original owner was a Mr. Louis Policello. Mr. Policello built the gasoline station in 1946. The two USTs manifolded together located on the northeast side of the property are the original USTs installed by Mr. Policello. Mr. Policello sold the property to a Mr. Ralph Lapetina in 1978. Mr. Lapetina installed the 3,000-gallon unleaded UST in 1978. According to Mr. Kapalczynski, he purchased the property after Mr. Lapetina's death in 1978. Mr. Kapalczynski installed the 2,000-gallon regular UST in 1981. The 2,000-gallon and 3,000-

gallon USTs are the only USTs currently in use on the property. Mr. Kapalczynski stated that they are empty, and that he planned on removing the two original USTs in the near future.

4.1.4 Regulatory Review

On March 27, 1991, RMT representatives visited the WDNR Marinette Area Office in Marinette, Wisconsin, to review files for the Middle Inlet area. While at the Marinette office, RMT representatives spoke with Mr. Matt Hostak regarding known environmental problems in the subject area. At that time, Mr. Hostak indicated that he was unaware of any environmental problems at the Jack's Mini Mart property.

A review of the Wisconsin Department of Industry, Labor and Human Relations (WDILHR) data base indicated that there are no USTs registered with the WDILHR for the Jack's Mini Mart property.

A review of available information indicated that neither the WDOT right-of-way property nor the Jack's Mini Mart property is an NPL, CERCLIS, EERP, LUST, or abandoned landfill site.

A review of the WDNR spills data base indicated that no reported spills have occurred at the Jack's Mini Mart or adjacent WDOT right-of-way properties, or in the immediate vicinity.

Based on a review of available information, the closest waste disposal site to the WDOT property is the Middle Inlet Landfill located in Middle Inlet, Wisconsin, which is located approximately 1.5 miles from the Jack's Mini Mart property.

4.2 Phase II Activities

4.2.1 Boring and Sampling Program

To investigate if there was evidence of petroleum contamination associated with the former gasoline station on the Jack's Mini Mart property which could potentially be impacting the WDOT right-of-way, two soil borings (B-1 and B-2) were drilled in the WDOT right-of-way bordering the Jack's Mini Mart property. Figure 4-1 and photographs provided in Appendix A

show the approximate locations of the soil borings. During the drilling of these borings, soil samples were collected at 2.5-foot intervals and field-screened with an Hnu photoionization detector for the presence of volatile organic compounds (VOCs).

A description of the soil sampling procedure is contained in Appendix B. Appendix C contains the boring logs for borings B-1 and B-2, Appendix D contains boring abandonment forms, and Appendix E contains the soil sample chain-of-custody forms.

4.2.2 Geology

The soils underlying the Jack's Mini Mart property from a depth of 0 to 8 feet generally consist of a brown fine silty sand with trace amounts of fine gravel. The soil was visually classified as fill from a depth of 0 to approximately 3.5 feet. Below a depth of 3.5 feet, the soil is poorly graded sand (SP). Surface material from a depth of 0 to 0.8 feet at borings B-1 and B-2 is fill material consisting of fine to medium gravel used to construct the shoulder of the highway. A slight fuel-like odor was detected in the soil sample collected from a depth of 6 to 8 feet at boring B-2.

Ground water was encountered in both borings at a depth of approximately 7 feet. Soil boring logs are included in Appendix C.

4.2.3 Sampling and Analysis Program

Soil and ground water samples were selected for laboratory analysis based upon field-screening results and visual observation. The soil sample from each boring which had the highest field-screening result was laboratory-analyzed for TPH using USEPA Method 8015 (modified), and for TPH as diesel using USEPA Method 8100 (modified) according to the California Method. If no VOCs were detected during field-screening, the soil sample collected at the ground water interface was selected for analysis.

One ground water sample, collected from the boring which had the highest soil sample field-screening results, was laboratory-analyzed for BTEX according to USEPA Method 602/8020. Ground water samples were collected from within the hollow-stemmed augers using a clean bailer.

4.2.4 Sampling and Analysis Results

The results of the laboratory analyses and field-screening are summarized in Table 4-1. The laboratory data sheets are contained in Appendix F.

The results of the field-screening reveal detected concentrations of VOCs. Samples collected from boring B-1 had readings below background concentrations with the exception of sample 3, from 6 to 8 feet, which had a detected concentration of 60 ppmv. Samples collected from boring B-2 had detected concentrations in sample 1, from 1 to 3 feet, at 7.4 ppmv; less than detect in sample 2, from 3.5 to 5.5 feet, and in sample 3, from 6 to 8 feet, at 200 ppmv. A slight fuel-like odor was detected in the soil sample collected from boring B-2 at a depth of 6 to 8 feet. It should be noted that field-screening provides a qualitative evaluation of samples to be selected for laboratory analysis, and is not intended to provide a quantitative measure of the level of contamination.

The results of the laboratory analyses conducted on soil samples revealed detected concentrations of TPH as gasoline of 97 mg/kg from boring B-2 at a depth of 1 to 3 feet.

The ground water sample collected and analyzed revealed detected concentrations of 5,600 $\mu\text{g/L}$ (ppb), 13,000 $\mu\text{g/L}$, <500 $\mu\text{g/L}$, and 6,600 $\mu\text{g/L}$ for benzene, toluene, ethylbenzene, and xylenes, respectively. It should be noted that, because the ground water sample was obtained from inside the auger after drilling, the sample may not be representative of ground water at the site. The results of the analyses provide a qualitative indication of the presence of potential contamination, and are not intended to provide a quantitative measure of the level of contamination.

TABLE 4-1

SUMMARY OF FIELD-SCREENING AND LABORATORY ANALYSES RESULTS

Soils

Sample ID (Boring #, Sample #)	Sample Depth (ft)	Hnu Reading (ppmv) ¹	TPH as Gasoline (mg/kg)	TPH as Diesel (mg/kg)
B-1, S-1	1-3	ND		
B-1, S-2	3.5-5.5	ND		
B-1, S-3	6-8	60	< 6.0	< 10.0
B-2, S-1	1-3	7.4	97	< 10.0
B-2, S-2	3.5-5.5	1.6		
B-2, S-3	6-8	200	< 6.0	< 10.0

Ground Water

Sample I.D.	Sample Depth (ft)	µg/L			
		Benzene	Toluene	Ethylbenzene	Xylenes
B-2	7.0	5,600	13,000	< 500	6,600

ND = not detected.

¹ Results of the headspace analysis conducted during field-screening. Units are parts per million by volume, based on isobutylene calibration.

Based upon the results of the field-screening and the laboratory analyses, there is evidence that soils and ground water which were sampled from the WDOT right-of-way adjacent to the Jack's Mini Mart property are contaminated with the petroleum compounds analyzed. RMT recommends that further investigation be conducted to determine the source and extent of the contamination.

5. DISCUSSION OF POTENTIAL FUTURE INVESTIGATION

The results of the Phase I and Phase II Environmental Assessment indicate that petroleum contamination is present in the soil and ground water on the WDOT right-of-way. Recommended follow-up investigative work is described below.

Phase III Investigation

The vertical and areal extent of soil and ground water contamination within the WDOT right-of-way is not known. The contamination is suspected to have resulted from spills and/or releases associated with USTs present at the Jack's Mini Mart property. If additional characterization is undertaken, either by the WDOT or by other parties, the following program is recommended:

1. Installation of 6 to 10 soil borings in the area of contamination, and analysis of one soil sample from each boring for gasoline range organics, diesel range organics, petroleum VOCs (EPA Method 8020), and compositional concentrations of lead. The purpose of these borings would be to characterize the areal extent of contamination.
2. Installation of approximately four ground water monitoring wells to establish local ground water flow conditions and help determine the extent of impacts to ground water. One round of ground water samples would be analyzed for gasoline range organics, diesel range organics, petroleum VOCs (EPA Method 8020 and 8021), and compositional concentrations of lead.
3. It is recommended that private water supply wells located in areas of potential ground water contamination be identified, sampled, and analyzed for VOCs concurrent with the recommended investigation above. In light of potential access restrictions for private entities, and uncertainties regarding the location of the source of the contamination, the WDNR should consider conducting the recommended private well identification, sampling, and analysis.

Costs for the field, subcontract, analytical data evaluation, and report writing work associated with this Phase III program (excluding the recommended private well survey) would range from \$24,000 to \$29,000 (costs may be higher if bedrock drilling is necessary).

A Phase III investigation conducted solely in the WDOT right-of-way would likely limit the adequacy of information necessary to determine local ground water flow direction and the

extent of soil contamination. Therefore, should the WDOT choose to undertake the additional investigation, it may wish to consider obtaining the consent of area property owners for the installation of monitoring wells and soil borings on their property.

Owners and operators of underground petroleum products storage systems may be eligible for coverage under the Wisconsin Department of Industry, Labor and Human Relations (WDILHR) Petroleum Environmental Cleanup Fund Act (PECFA) for reimbursement of costs incurred in investigating, assessing, remediating, removing, and/or monitoring contamination caused by the discharge of a petroleum product. Owners of eligible leaking underground storage tanks may be provided coverage up to \$1,000,000, with a \$5,000 deductible. Information regarding PECFA eligibility and funding can be obtained from the WDILHR by calling (608) 267-4545 or (608) 267-7538.

6. REFERENCES

- USEPA. 1989. Comprehensive Environmental Response, Compensation, and Liability Index System (CERCLIS). November 14, 1989.
- USEPA. 1990. National Priorities List. Federal Register. Volume 55, No. 169. August 30, 1990.
- WDILHR. 1990. Underground Storage Tank (UST) Data Base. May 1990.
- WDNR. 1990. Registry of Waste Disposal Sites. February 1990.
- WDNR. 1990. Spills Data Base. March 6, 1990.
- WDNR. 1991. Emergency Environmental Response Project List (EERP). June 1991.
- WDNR. 1991. Leaking Underground Storage Tank (LUST) List. January 3, 1991.

APPENDIX A
SITE PHOTOGRAPHS



PHOTO 1 - VIEW OF GAS STATION LOOKING NORTHWEST FROM USH 141



PHOTO 2 - LOCATION OF BORING B-1

APPENDIX B

SOIL SAMPLING AND FIELD-SCREENING PROCEDURES

APPENDIX B

SOIL SAMPLING AND FIELD-SCREENING PROCEDURES

The soil borings were drilled and sampled by Environmental and Foundation Drilling, Inc. (EFD), of Madison, Wisconsin. Soil borings were advanced using 4 1/4-inch inside diameter (I.D.) hollow-stemmed augers. Soil was sampled at 2.5-foot intervals using ASTM Method 1584-84 for the split-barrel (2-inch I.D. split-spoons) sampling of soils. Split-spoons were washed with a phosphate-free soap and tap water solution, and subsequently rinsed with tap water prior to sampling. Augers were cleaned between boring locations using a pressurized spray of hot water. All soil borings were abandoned by backfilling with coarse granular bentonite.

All soil samples were removed from the split-spoon by the RMT field representative and immediately placed into appropriate containers for field-screening and laboratory analysis. Soil to be analyzed for TPH as gasoline was placed into two 60-mL glass jars. Soil to be analyzed for TPH as diesel was placed into a 500-mL amber glass jar.

Each soil sample collected was classified according to the Unified Soil Classification System (USCS), and sample descriptions were recorded on boring logs.

A soil sample from each split-spoon was screened for volatile organic compounds using an Hnu photoionization detector, with a 10.2 eV probe. The soil sample to be screened was transferred immediately from the split-spoon to a glass jar, to prevent the volatilization of organics. A piece of aluminum foil was quickly placed over the jar opening, and the lid was screwed onto the jar. The sample jar was thoroughly shaken; and, approximately 15 minutes after the sample was collected, the cap of the jar was removed and the probe of the Hnu was inserted through the foil and into the jar. The Hnu probe was inserted into the container for a minimum of 15 seconds, to allow for gas in the jar to enter the Hnu probe. The maximum reading from the analog meter was recorded.

Sample containers for laboratory analysis were labeled with the boring and sample number, the date, the RMT project number, and the sample collector's name. All samples were placed on ice in a cooler. Chain-of-custody forms were completed and transported with the samples to RMT Laboratories in Madison, Wisconsin.

APPENDIX C
BORING LOGS



LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. B-1
 SHEET NO. 1 OF 1
 PROJECT NO. 10104.01
 INSTALLATION 04/25/91
 SURFACE ELEV. _____
 BOREHOLE DIA. 6 1/4 IN.

PROJECT NAME WDOT Jack's
 LOCATION Middle Inlet, WI
 CONTRACTOR E & F Drilling
 DRILLING METHOD HSA 2 1/4"

SAMPLING NOTES					VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE	
NO.	TYPE	N	IN	DEPTH	
1	SS	4	20		Fine to medium GRAVEL, (FILL). Fine SAND, some silt, trace fine gravel, dark brown 10YR 3/3, poorly graded, loose, moist, (SM) (FILL).
2	SS	6	22		Medium SAND, trace silt, dark yellowish brown 10YR 4/4, poorly graded, moist, (SP).
3	SS	4	24		Wet below 7.1 ft.
					End of Boring at 8 Ft.

GENERAL NOTES
 DATE STARTED 25 APR 91
 DATE COMPLETED 25 APR 91
 RIG CME-75
 CREW CHIEF B. Powers
 LOGGED R. Vaughn CHECKED D. Graff

WATER LEVEL OBSERVATIONS
 WHILE DRILLING ∇ 7.1 Ft.
 AT COMPLETION ∇ _____
 AFTER DRILLING _____
 CAVE-IN: DATE/TIME _____ DEPTH _____
 WATER: DATE/TIME _____ DEPTH _____



LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. B-2
 SHEET NO. 1 OF 1
 PROJECT NO. 10104.01
 INSTALLATION 04/25/91
 SURFACE ELEV. _____
 BOREHOLE DIA. 6 1/4 IN.

PROJECT NAME WDOT Jack's
 LOCATION Middle Inlet, WI
 CONTRACTOR E & F Drilling
 DRILLING METHOD Hsa 2 1/4"

SAMPLING NOTES					VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE	
NO.	TYPE	N	IN	DEPTH	
1	SS	9	20		Fine to medium GRAVEL, (FILL). Fine SAND, some silt, trace clay, trace fine gravel, brown 10YR 5/3, poorly graded, loose, moist, (SP-SM) (FILL).
2	SS	6	24		Fine SAND, trace silt, trace fine gravel, dark yellowish brown 10YR 4/4, poorly graded, loose, moist, (SP).
3	SS	3	24		Wet, slight solvent odor at 6 to 8 ft.
					End of Boring at 8.5 Ft.

GENERAL NOTES
 DATE STARTED 25 APR 91
 DATE COMPLETED 25 APR 91
 RIG CME-75
 CREW CHIEF B. Powers
 LOGGED R. Vaughn CHECKED D. Graff

WATER LEVEL OBSERVATIONS
 WHILE DRILLING 7.0 Ft.
 AT COMPLETION _____
 AFTER DRILLING _____
 CAVE-IN: DATE/TIME _____ DEPTH _____
 WATER: DATE/TIME _____ DEPTH _____

APPENDIX D
BORING ABANDONMENT FORMS

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

(1) GENERAL INFORMATION		(2) FACILITY NAME	
Well/Drillhole/Borehole Location B-1	County Marinette	Original Well Owner (If Known)	
1/4 of 1/4 of Sec. _____ : T. _____ N. R. _____ (If applicable)		Present Well Owner	
Gov't Lot	Grid Number	Jack's Service	
Grid Location		Street or Route	
_____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S.. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		400 Ft. N of CTH "X" & USH 141	
Civil Town Name		City, State, Zip Code	WI Unique Well No.
Crivitz		Crivitz, WI 54114	
Street Address of Well		Facility Well No. and/or Name (If Applicable)	
400 Ft. N of CTH "X" & USH 141		Reason For Abandonment	
City, Village		Stop potential ground water contamination	
Crivitz		Date of Abandonment	
		04-25-91	

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On		(4) Depth to Water (Feet) <u>7.1</u>	
(Date) <u>04-25-91</u>		Pump & Piping Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Liner(s) Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Screen Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Casing Left in Place? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If No, Explain <u>This is a soil boring.</u>	
<input type="checkbox"/> Monitoring Well <input type="checkbox"/> Water Well <input type="checkbox"/> Drillhole <input checked="" type="checkbox"/> Borehole	Construction Report Available? <input type="checkbox"/> Yes <input type="checkbox"/> No	Was Casing Cut Off Below Surface? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Did Sealing Material Rise to Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Material Settle After 24 Hours? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Was Hole Retopped? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Construction Type: <input checked="" type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug <input type="checkbox"/> Other (Specify) _____		(5) Required Method of Placing Sealing Material	
Formation Type: <input checked="" type="checkbox"/> Unconsolidated Formation <input type="checkbox"/> Bedrock		<input checked="" type="checkbox"/> Conductor Pipe-Gravity <input type="checkbox"/> Conductor Pipe-Pumped <input type="checkbox"/> Dump Bailer <input type="checkbox"/> Other (Explain) _____	
Total Well Depth (ft.) _____ Casing Diameter (ins.) _____ (From ground surface)		(6) Sealing Materials	
Casing Depth (ft.) <u>N/A</u>		For monitoring wells and monitoring well boreholes only	
Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown If Yes, To What Depth? <u>N/A</u> Feet		<input type="checkbox"/> Near Cement Grout <input type="checkbox"/> Sand-Cement (Concrete) Grout <input type="checkbox"/> Concrete <input type="checkbox"/> Clay-Sand Slurry <input type="checkbox"/> Bentonite-Sand Slurry <input type="checkbox"/> Chipped Bentonite	
		<input type="checkbox"/> Bentonite Pellets <input checked="" type="checkbox"/> Granular Bentonite <input type="checkbox"/> Bentonite - Cement Grout	

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
	Granular Bentonite	Surface	8.0	2-50# bags

(8) Comments: This is a soil boring, not a well.

(9) Name of Person or Firm Doing Sealing Work	
Environmental & Foundation Drilling, Inc.	
Signature of Person Doing Work	Date Signed
<i>[Signature]</i>	04-29-91
Street or Route	Telephone Number
217 Raemisch Road	(608) 349-9896
City, State, Zip Code	
Waukegan, WI 53597	

(10) FOR DNR OR COUNTY USE ONLY	
Date Received/Inspected	District/County
Reviewer/Inspector	
Follow-up Necessary	

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

(1) GENERAL INFORMATION		(2) FACILITY NAME	
Well/Drillhole/Borehole Location B-2	County Marinette	Original Well Owner (If Known)	
1/4 of 1/4 of Sec. _____; T. _____ N; R. _____ (If applicable)		Present Well Owner Jack's Service	
Gov't Lot _____	Grid Number _____	Street or Route 400 Ft. N of CTH "X" & USH 141	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S., _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code Crivitz, WI 54114	
Civil Town Name Crivitz		Facility Well No. and/or Name (If Applicable)	WI Unique Well No.
Street Address of Well 400 Ft. N of CTH "X" & USH 141		Reason For Abandonment Stop potential ground water contamination	
City, Village Crivitz		Date of Abandonment 04-25-91	

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date) 04-25-91 <input type="checkbox"/> Monitoring Well <input type="checkbox"/> Water Well <input type="checkbox"/> Drillhole <input checked="" type="checkbox"/> Borehole Construction Report Available? <input type="checkbox"/> Yes <input type="checkbox"/> No Construction Type: <input checked="" type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug <input type="checkbox"/> Other (Specify) _____ Formation Type: <input checked="" type="checkbox"/> Unconsolidated Formation <input type="checkbox"/> Bedrock Total Well Depth (ft.) _____ Casing Diameter (ins.) _____ (From ground surface) Casing Depth (ft.) N/A Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown If Yes, To What Depth? _____ N/A _____ Feet	(4) Depth to Water (Feet) 7.0 Pump & Piping Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Liner(s) Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Screen Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Casing Left in Place? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If No, Explain <u>This is a soil boring.</u> Was Casing Cut Off Below Surface? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Did Sealing Material Rise to Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Material Settle After 24 Hours? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Was Hole Retopped? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	(5) Required Method of Placing Sealing Material <input checked="" type="checkbox"/> Conductor Pipe-Gravity <input type="checkbox"/> Conductor Pipe-Pumped <input type="checkbox"/> Dump Bailer <input type="checkbox"/> Other (Explain) _____
	(6) Sealing Materials For monitoring wells and monitoring well boreholes only <input type="checkbox"/> Neat Cement Grout <input type="checkbox"/> Sand-Cement (Concrete) Grout <input type="checkbox"/> Concrete <input type="checkbox"/> Bentonite Pellets <input type="checkbox"/> Clay-Sand Slurry <input checked="" type="checkbox"/> Granular Bentonite <input type="checkbox"/> Bentonite-Sand Slurry <input type="checkbox"/> Bentonite - Cement Grout <input type="checkbox"/> Chipped Bentonite

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
Granular Bentonite	Surface	8.5	2-50# bags	Dry

(8) Comments: This is a soil boring, not a well.

(9) Name of Person or Firm Doing Sealing Work
 Environmental & Foundation Drilling, Inc.
 Signature of Person Doing Work: *[Signature]* Date Signed: 04-29-91
 Street or Route: 217 Raemisch Road Telephone Number: (608) 849-9896
 City, State, Zip Code: Waunakee, WI 53597

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected	District/County
Reviewer/Inspector	
Follow-up Necessary	

APPENDIX E
CHAIN-OF-CUSTODY FORMS



F-268 (R2/88)
(Use Black Ink Only)

Madison, WI 53717
744 Heartland Trail
Phone (608) 831-4444
FAX (608) 831-7530

Washington, D.C.

Santa Monica, CA

Grand Lodge, MI
Nashville, TN

Greenville, SC
Schaumburg, IL

CHAIN OF CUSTODY RECORD

Bottles Prepared by: E. PUTMAN	Date/Time 4-19-91	Office Code: (State) WI
Project No. 10103.01 10104.01 10056.01	Client: WDOT CRIVIZ	

Total Number
Of Containers

Sample Type (GW, WW, SW, Soil, Other) **No 021234**

Container Inventory	Filtered (Yes/No)
40ml VIAL	Preserved (Code)
500ml AMBER	Refrigerated (Yes/No)
60ml JAR	

Code: A - None
B - HNO3
C - H2SO4
D - NaOH
E - HCL

Comments:

RMT Lab NO.	Yr. <u>91</u> Date	Time	Sample Station ID	Total Number Of Containers	40ml VIAL	500ml AMBER	60ml JAR	Filtered (Yes/No)	Preserved (Code)	Refrigerated (Yes/No)	Code: A - None B - HNO3 C - H2SO4 D - NaOH E - HCL	Comments:
	4-25	-	B-2 #2	3	-	1	2					H ₂ O = 340 (10103.01) SOIL
	4-25	-	B-2 #3	3	-	1	2					H ₂ O = 480 (10103.01) SOIL
	4-25	-	B-2 #4	3	-	1	2					H ₂ O = 500 (10103.01) SOIL
	4-25	-	B-2 #5	3	-	1	2					H ₂ O = 480 (10103.01) SOIL
	4-25	9:45A	B-2	3	3	-	-					- (10103.01) WATER
	4-25	-	B-1 #1	3	-	1	2					H ₂ O = ND (10109.01) SOIL
	4-25	-	B-1 #2	3	-	1	2					H ₂ O = ND (10109.01) SOIL
	4-25	-	B-1 #3	3	-	1	2					H ₂ O = 60 (10109.01) SOIL
	4-25	-	B-2 #1	3	-	1	2					H ₂ O = 7.4 (10109.01) SOIL
	4-25	-	B-2 #2	3	-	1	2					H ₂ O = 1.6 (10109.01) SOIL
	4-25	-	B-2 #3	3	-	1	2					H ₂ O = 200 (10109.01) SOIL
	4-25	11:20A	B-2	3	3	-	-					- (10109.01) WATER
65861	4-25	-	T. BLANK	3	3	-	-					- (10056.01) WATER

SAMPLER Relinquished by (Sig.) ① <i>P. Long</i>	Date/Time 4-25-91 7:45P	Received by (Sig.) ②	Date/Time
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④	Date/Time
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ <i>Mat Lahr</i>	Date/Time 4/25/91 7:45

RECEIVED
APR 26 1991
By *MAL*

(For Lab Use Only)

Receipt Temp *good* Receipt pH _____

Client P.O. Number _____

Subsequent Analysis: _____ (Check)

Seal # _____ at'chd by Recvd. intact by Seal # _____ at'chd by Recvd. intact by Date Resubmitted _____

APPENDIX F
LABORATORY DATA SHEETS



CLIENT: WDOT - CRIVITZ (JACK'S)
PROJECT #: 10104.01
WORK ORDER #: 910429-1010401

REPORT DATE: 05/09/91
SAMPLE COLLECTOR: RHV

TOTAL PETROLEUM HYDROCARBONS

SAMPLE =====	DATE =====	STATION ID =====	GASOLINE =====	UNITS =====
65698	04/25/91	B-1 #3	<6.0	mg/kg dry wt.
65699	04/25/91	B-2 #1	97	mg/kg dry wt.
65701	04/25/91	B-2 #3	<6.0	mg/kg dry wt.

Mark A. Mieritz

Mark Mieritz, Organic Supervisor



CLIENT: WDOT - CRIVITZ (JACK'S)
PROJECT #: 10104.01
WORK ORDER #: 910429-1010401

REPORT DATE: 05/14/91
SAMPLE COLLECTOR: RHV

TOTAL PETROLEUM HYDROCARBONS

SAMPLE =====	DATE =====	STATION ID =====	DIESEL =====	UNITS =====
65698	04/25/91	B-1 #3	<10.0	mg/kg dry wt.
65699	04/25/91	B-2 #1	<10.0	mg/kg dry wt.
65701	04/25/91	B-2 #3	<10.0	mg/kg dry wt.


Mark Mieritz, Organic Supervisor



CLIENT: WDOT - CRIVITZ (JACK'S)
SAMPLE #: 65702
PROJECT #: 10104.01
WORK ORDER #: 910429-1010401

REPORT DATE: 05/17/91
COLLECTION DATE: 04/25/91
STATION ID: B-2
SAMPLE COLLECTOR: RHV

VOLATILE ORGANIC ANALYSIS REPORT

PARAMETER =====	RESULT =====	UNITS =====
BENZENE	5600	ug/l
TOLUENE	13000	ug/l
ETHYL BENZENE	<500	ug/l
XYLENES	6600	ug/l



Mark Mieritz, Organic Supervisor