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January 10, 1996		N. C. Dist. Hdqtrs. Rhinelander, WI	
Ms. Janet Kazda, Program Assistant		ar a view decar	
Wis. Dept. of Natural Resources 107 Sutliffe Avenue	5	A A A A A A A A A A A A A A A A A A A	
P. O. Box 818	di (second		
Rhinelander, WI 54501		JAN 251996	
Re: Quearm Oil Company, Ashland, WI DNR UID No. 975	dencad)	DHR BINLE ATEA HEADOLIARTERS	
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Dear Janet:

On behalf of Mr. Fred Gygi, Mid-State Associates, Inc. (MSA) is submitting the subject site's Site Investigation Work Plan to satisfy the submittal requirement of NR 716.09. The site is located at 105 W. 6th Street, Ashland, Wisconsin. MSA will proceed with the site investigation upon your approval.

If you have any questions regarding this submittal, please call me at the above number.

Sincerely,

MID-STATE ASSOCIATES, INC.

ohn Sager Project Hydrogeologist

JS:ab Enc. cc: Timothy Melka, MSA (w/out work plan)

Site Investigation Work Plan

Quearm Oil Leaking Underground Storage Tank (LUST) Site 105 W. 6th Street Ashland, Wisconsin

MCA Project No. 212365 DNR File No. 975

Prepared For:

Quearm Oil Company Ashland, Wisconsin 54806

Prepared By: Mid-State Associates, Inc. Rhinelander, Wisconsin 54501

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Site Investigation Work Plan

Quearm Oil Leaking Underground Storage Tank (LUST) Site 105 W. 6th Street Ashland, Wisconsin

MSA Project No. 212365 DNR File No. 975

SUBMITTAL CERTIFICATION

The conclusions and recommendations presented in this report are the professional opinions of Mid-State Associates, Inc. (MSA). These opinions are based upon currently accepted hydrogeologic, scientific, and engineering professional practices at this time and location. As a result, MSA does not guarantee nor warranty these opinions as to the potential environmental liability associated with this property.

The findings, conclusions, and opinions contained in this report are intended for exclusive use by Quearm Oil Company, and their designees, and are applicable only to Quearm Oil Company site. Ashland, Wisconsin. MSA has no obligations to other persons nor organizations who may use or rely upon this information.

I, John Sager, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03(1), Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct, and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

Report Prepared By:

John Sager Project Hydrogeologist

I, Brian J. Hegge, hereby certify that I am a scientist as that term is defined in s. NR 712.03(3). Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct, and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

Report Reviewed By:

Brian J. Hegge

Senior Environmental Specialist

1/9/96

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PURPOSE

This Site Investigation Work Plan has been prepared by Mid-State Associates, Inc., (MSA) for the Quearm Oil Company leaking underground storage tank (LUST) site at 105 W. 6th Street, Ashland, Wisconsin. The Work Plan describes site investigation activities to determine the nature and extent of petroleum hydrocarbon impacts to soil and groundwater resulting from a petroleum-product release at the site. In general, the Work Plan has been prepared to address the requirements of Chapter NR 716, Wisconsin Administrative Code (WAC), pertaining to site investigations required by the Wisconsin Department of Natural Resources (WDNR).

The information obtained during the site investigation will be used to examine the potential risks, if any, associated with petroleum-hydrocarbon impacts at the site, and to provide a basis for selecting a remedial action alternative for site environmental remediation. The Work Plan presents site background information, and describes the scope of the investigation and quality control procedures to be implemented during the site investigation. A Site Safety Plan is included in Appendix G for use during the investigation.

BACKGROUND INFORMATION

Table 1 presents pertinent information about the site including site contact person, location, and description.

TABLE 1 FACILITY DESCRIPTION ABSTRACT QUEARM OIL LUST SITE, ASHLAND, WI

Responsible Party:	Quearm Oil Company 105 W. 6th Street Ashland, WI 54806
Contact Person:	Mr. Fred Gygi Quearm Oil Company 631 E. McLeod Avenue Ironwood, MI 49938 (906) 932-1179
Site Location:	105 W. 6th Street Ashland, WI 54806 SE ¹ /4, SW ¹ /4, Section 33, Township 48 North, Range 4 West Ashland County
Site Description:	The site is operated as a retail fuel sales facility. Two 1,000 gallon gasoline underground storage tanks (USTs) were formerly located approximately 4 feet west of the main building on site. The two 1,000 gallon gasoline USTs were closed by removal on November 14, 1995. Seven aboveground storage tanks (ASTs) are located on the western portion of the property. A site investigation was conducted in the area of the ASTs between August 1992 and May 1993 by Ayres and Associates, Inc.
MSA Contact Person:	John Sager, Project Hydrogeologist and Brian Hegge, Client Liaison/Senior Environmental Scientist (715) 362-3244

SITE DESCRIPTION AND HISTORY

The site is located at 105 W. 6th Street, Ashland, Ashland County, Wisconsin. The location of the site is shown on Figure 1. The site is operated as a retail fuel sales facility. Two USTs were formerly located approximately 4 feet west of the main building on the site in a single tank basin. The layout of the site is presented on Figure 2. The two 1,000-gallon, gasoline USTs were closed by removal on November 14, 1995. The UST Closure Report prepared by MSA documenting the UST removal activities is presented in Appendix C.

A petroleum-hydrocarbon product release of unknown volume was identified at the site during the UST removal on November 14, 1995. The WDNR was subsequently notified of the petroleum-product release to the subsurface and has required an investigation to determine the extent of the petroleum-hydrocarbon impacts to the site.

REGIONAL GEOLOGIC AND HYDROGEOLOGIC SETTING

According to regional geologic references (Young and Skinner, 1974), the site is located in the Lake Superior Hydrogeologic Basin. Unconsolidated Quaternary age glacial outwash deposits in the vicinity of the site range from 0 to 250 feet thick and consist primarily of red-to-yellow clay overlying stratified sand and gravel deposits. Glacial deposits in the area of the site are greater than 80 to 100 feet thick based on water well records obtained from the Wisconsin Geological and Natural History Survey (WGNHS). A summary of the water well construction reports and geologic logs of wells located within 1,200 feet of the site are presented in Table 2. Copies of the logs and reports are contained in Appendix D. The majority of the potable water wells in the area use the Quaternary age deposits (water bearing sands and gravels) below surface clay deposits as the principal aquifer.

Surface elevations at the site are at an approximate elevation of 670 feet National Geodetic Vertical Datum of 1,929 (NGVD). Regional groundwater information indicates that groundwater flow in the area of Ashland is northeast toward Lake Superior, located approximately 2,300 feet northeast of the site. The approximate mean surface elevation of Lake Superior is 602 feet NGVD. Based on previous site investigation activities conducted to investigate the aboveground storage tank (AST) area, the depth to groundwater is approximately 9 to 18 feet below ground surface. Groundwater encountered during the site investigation conducted in the area of the ASTs was reported to have been in sand lenses within the clay.

SCOPE OF WORK

The scope of work for the site investigation has been selected using the following criteria:

- The site has been used as a retail fuel sales facility. Seven ASTs are located to the west of the building. An investigation to determine the extent of contamination from the ASTs was conducted by Ayres and Associates between August 1992 and May 1993.
- Leaded and unleaded gasoline were stored in the USTs.
- Soil and groundwater may potentially be impacted.
- The site investigation will be performed as a phased investigation with initial field activities performed on site.
- There are no known potential receptors located near the site. The water well survey presented in Table 2 indicates that six residential and commercial supply wells are located within a one mile radius of the site. A municipal water supply now serves the City of Ashland.
- Other items listed in NR 716.07 (Site Investigation Scoping) are not believed to be potentially impacted by this site.

The site investigation Scope of Work will consist of activities to determine the environmental impact (if any) of petroleum-hydrocarbon impacts to site media. Investigation activities will include determining the depth to, chemical quality, and flow direction of groundwater. Sampling and chemical analysis of soil samples will determine the extent of petroleum hydrocarbon impacts to soil.

The proposed scope of work will include:

- A soil sampling program consisting of 16 Geoprobe soil borings for characterizing the vertical and horizontal extent of unsaturated-zone, petroleum-hydrocarbon impacts to soil at the site. The Geoprobe borings will be advanced to the water table or to the vertical extent of petroleum-hydrocarbon impacts. Groundwater is expected to be encountered in sand seams within the clay. No monitoring wells are planned to be installed in the first phase. If petroleum-hydrocarbon impacts are evident at groundwater, a second phase will be initiated to characterize the soil and groundwater impacts, and determine groundwater flow direction and aquifer properties. In addition, if necessary, a downgradient piezometer will be installed adjacent to a shallow downgradient monitoring well, to determine additional aquifer hydraulic properties and assess groundwater quality with depth.
- If necessary, the second phase of investigation will consist of four to five soil borings converted to monitoring wells installed in the boreholes, provided petroleum-hydrocarbon impacts extend vertically to the water table. Additional soil borings may be required to define the horizontal and vertical extent of petroleum-hydrocarbon impacts.

- If necessary, the installation of four groundwater monitoring wells and one piezometer will be completed to characterize the hydrogeologic setting and determine the extent of petroleum hydrocarbon impacts to groundwater.
- If necessary, two rounds of groundwater sampling will be performed to determine the presence or absence of petroleum hydrocarbon impacts to groundwater will be performed.
- If necessary, three rounds of water level measurements will be performed to establish groundwater flow direction.
- If necessary, baildown hydraulic conductivity testing will be performed to evaluate the hydraulic conductivity of the geologic media investigated at the site.

SUBSURFACE INVESTIGATION

Unsaturated Zone Petroleum Hydrocarbon Impact Investigation

The proposed Geoprobe soil boring locations are shown on Figure 3. Sixteen Geoprobe borings are proposed to examine unsaturated zone conditions at locations around the UST facilities at the site (refer to Figure 2). Additional borings may be performed if conditions warrant. The borings will be advanced until either uncontaminated soil or the groundwater table is encountered. The borings will be installed laterally to examine the horizontal extent of petroleum-hydrocarbon impacts. Soil samples will be continuously collected at 2-foot intervals using a pneumatic-driven, 1-inch-diameter sampling tool. Soil samples will be classified according to the Unified Soil Classification System (USCS) and screened for volatile organic vapors in the field with a flame ionization detector (FID) or a photoionization detector (PID) using field, head-space techniques. The field screening procedures to be used at the site are found in Appendix E. Organic vapor screening with a FID or PID field instrument will be used to select samples for laboratory analysis.

To the extent possible, the unsaturated zone samples chosen for laboratory analysis will be selected to bracket the vertical extent of petroleum hydrocarbon impact in each borehole, based on field FID or PID results. Two soil samples from each borehole will be submitted to a State of Wisconsin certified, analytical laboratory and analyzed for gasoline range organics (GRO), either volatile organic compounds (VOCs) or petroleum volatile organic compounds (PVOCs), and lead. One soil sample will be selected for laboratory analysis from the highest PID soil sample interval and a second soil sample may be analyzed from an area in the borehole where distinct visual changes in the soil and PID values are observed. For boreholes that appear to be uniformly clean (based on PID, field, and head-space measurements), only one soil sample will be analyzed to confirm the results. Analytical soil samples will be collected in bottles provided by the laboratory, appropriately preserved, and stored on ice in coolers after collection, for transport to the laboratory.

Monitoring Wells

The proposed monitoring well locations at this time are not known. If necessary, four monitoring wells and, potentially, one piezometer, will be installed in a second investigative phase in accordance with Chapter NR 141, WAC requirements. The boreholes for the wells will be drilled with 4 1/4-inch-inside-diameter, hollow-stem augers. The wells will be built as water table observation wells with well screens intersecting the site water table. The piezometer will be installed to observe groundwater approximately 15 to 25 feet below the water table.

During drilling of the boreholes, split-spoon samples will be collected at 2-foot intervals using Standard Penetration Test procedures (ASTM D1586) and screened using a PID or FID using the field headspace method. Soil samples will be field classified according to the USCS (ASTM D2487). Soil field screening procedures are found in Appendix E. Results of the field screening of soil samples will be recorded on the boring logs. Soil sampling and preservation procedures are found in Appendix F.

Monitoring wells and the piezometer will be constructed of 2-inch-inside-diameter, Schedule 40, threaded flush joint, PVC riser pipe. The water table observation wells and piezometer will have 5 and 10 foot, No. 10 slot, PVC well screens, respectively. The annular space will be backfilled with washed, medium- to coarse-silica sand to a level approximately 2 to 3 feet above the top of the well screen. A 2-foot layer of clean, fine sand will be placed above the sand filter pack seal. The annular space will be backfilled with granular or chipped bentonite or bentonite slurry pumped with a tremie pipe as required by NR 141. A concrete surface seal with a protective-cover pipe equipped with a lock will be installed at each well.

To minimize the potential for cross-contamination of boreholes by the drilling equipment, steam cleaning equipment will be used for decontamination of equipment. The drill rig and drilling tools will be steam cleaned immediately prior to mobilization onto the site. Drilling tools that come into contact with site soils will be steam cleaned between borings. Split-spoon samplers will be cleaned in an Alconox solution and rinsed with clean water between samples.

The monitoring wells and piezometer will be developed according to the requirements in NR 141.21. Wells will be developed by alternately surging and purging the well for a minimum of 30 minutes. Surging and purging will be performed using a PVC bailer. After surging and purging, the well will be pumped or bailed until ten well volumes have been removed or until the well produces sedimentfree water. Documentation of well installation and development will be prepared in accordance with WDNR requirements.

Baildown Hydraulic Conductivity Testing

In-situ hydraulic conductivity tests, if necessary, conducted using single well test methods, will be performed in select monitoring wells and the piezometer. Data obtained during baildown testing will be analyzed with single-well, bail test methodology (Bouwer and Rice, 1976). Results of the

analyses will be used to evaluate the hydraulic conductivity of the geologic media investigated at the site and assess potential effects on petroleum-hydrocarbon movement in groundwater.

ENVIRONMENTAL SAMPLING AND ANALYSIS

After installation and development of the monitoring wells and piezometer, groundwater from the wells will be sampled and chemically analyzed. Groundwater samples will be analyzed according to the *WDNR LUST and Petroleum Analytical and Quality Assurance Guidance* (July 1993). The first round of groundwater samples will be analyzed for:

- Gasoline range organics (GRO), using WDNR modified GRO method;
- Volatile organic compounds (VOCs), using EPA-8021 (LUST) method (59 compounds); and
- Lead (Pb), using EPA-3020/6010 method.

Natural Biodegradation Assessment Sampling

Soil samples will be laboratory analyzed to assess natural biodegradation as a remedial action option. The selected sampling will be based on the WDNR revised interim guidance dated August 1994. The selected soil samples will be analyzed for nutrients (total organic nitrogen, total organic carbon, total phosphorus, ammonia nitrogen, and total iron), pH, and possible bioenumeration assay.

QUALITY CONTROL

Sampling equipment will be decontaminated to prevent cross-contamination between each sample. Split spoons, bailers, and other sampling equipment will be scrubbed with a detergent (Alconox) solution, rinsed with water, and then triple rinsed with distilled water. Downhole drilling equipment will be steam cleaned between each boring.

One duplicate sample will be collected for each batch of ten samples. One trip blank provided by the laboratory will be analyzed for each batch of VOC groundwater samples. Methanol trip blanks will accompany soil samples in each shipping cooler. An equipment blank (field blank) consisting of distilled water collected in a manner similar to the regular sampling will be collected for each batch of ten or fewer groundwater samples. Quality control samples will be analyzed for the parameters applicable to each batch of samples.

Chain of custody procedures will be maintained for all samples. Samples will be collected in bottles provided by the laboratory. Samples will be placed on ice in a cooler after collection for transport to the laboratory.

INVESTIGATIVE WASTE MANAGEMENT

Petroleum-hydrocarbon impacted soil and groundwater generated during well installation and development will be collected and stored on site. Soil will be screened periodically with a PID during drilling operations. Soils exhibiting greater then ten PID units measuring volatile organic vapors using the field headspace technique (refer to Appendix E) will be collected for later disposal. The method of disposal will be determined after receipt of the analytical results for the site.

REMEDIAL ACTIONS OPTIONS REPORT AND REMEDIAL ACTION PLAN

The information from the site investigation will be used to conduct a feasibility study to identify and evaluate remedial action alternatives. Alternatives will be screened for technical acceptability and cost. The objective of the feasibility study is to provide sufficient information to select an appropriate method for remediating the site.

The recommended remedial action will be described in further detail in a remedial action plan. The remedial action plan will be submitted to WDNR and possibly Department of Industry, Labor, and Human Resources (DILHR) for review and approval prior to initiating the plan.

REPORTING

A site investigation report summarizing MSA's methods and findings will be prepared following the completion of the field work and receipt of the analytical results. The site investigation report will be prepared to address report requirements in NR 716.15. The report will consist of the following sections, as appropriate:

- Executive Summary
- Introduction
- Background Information
- Site Investigation Methods
- Results
- Discussion and Interpretations

Nature and Extent of Contamination Petroleum Hydrocarbon Migration and Exposure Pathways Receptors of Petroleum Hydrocarbons

- Conclusions and Recommendations
- Remedial Action Options Report (if combined submittal)
- Remedial Action Plan
- Supporting Tables and Drawings
- Appendices with WDNR documentation forms and other information

REFERENCES

Skinner, E.H. & Young, H.L. (1971). *Water Resources of Lake Superior Basin*. Wisconsin Geological and Natural History Survey. University of Wisconsin-Extension. Hydrologic Investigations Atlas HA-367.

APPENDIX A

FIGURES





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1835 N. Stevens Rhinelonder, Wisconsin 54501 715-362-3244
Engineers Architects Planners Surveyors Scientists
LEGEND
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FIGURE 2
OUEARM OIL CO.
ASLAND, WI



ELLIS AVE.



APPENDIX B

TABLES

TABLE 1FACILITY DESCRIPTION ABSTRACTQUEARM OIL LUST SITE, ASHLAND, WI

Responsible Party:	Quearm Oil Company 105 W. 6th Street Ashland, WI 54806
Contact Person:	Mr. Fred Gygi Quearm Oil Company 631 E. McLeod Avenue Ironwood, MI 49938 (906) 932-1179
Site Location:	105 W. 6th Street Ashland, WI 54806 SE ¹ / ₄ , SW ¹ / ₄ , Section 33, Township 48 North, Range 4 West Ashland County
Site Description:	The site is operated as a retail, fuel-sales facility. Two 1,000 gallon gasoline USTs were formerly located approximately 4 feet west of the main building on site. The two 1,000 gallon gasoline USTs were closed by removal on November 14, 1995. Seven above ground storage tanks (ASTs) are located on the western portion of the property. A site investigation was conducted in the area of the ASTs between August 1992 and May 1993 by Ayres and Associates, Inc.
MSA Contact Person:	John Sager, Project Hydrogeologist and Brian Hegge, Client Liaison/Senior Environmental Scientist (715) 362-3244

TABLE 2 WATER WELL SURVEY QUEARM OIL COMPANY, ASHLAND, WI

Well/Log Identification No./Name	Year Well Installed	Depth of Well (feet)	Depth to Ground water (feet)	Elevation in Mean Sea Level (feet)	Yield (gpm)	Draw down (feet)	Specific Capacity (gpm/ft)	Aquifer	Use	Comments
Northern States Power Co. NE1/4, NW1/4 Sec. 5, T47N, R4W	1987	183	Flowing 21 GPM	nm	4			Q	Commercial Boiler	Artesian
Pioneer Creamery Co. 909 2nd Street W.	1939	188	18	лm	40	82	.48	Q	Commercial	
Reiss Coal Co. 6th Avenue W. Front St.	1948	81	Flowing 50 GPM	nm	50				Commercial	Artesian
St. Joseph Hospital	1942	112	48	nm	90					
Wisconsin Bell #1 NW1/4, SW1/4 Sec. 33, T48N, R4W	1985	130	nm	nm	50	7	7.14	Q	Cooling Water	
Wisconsin Bell #2 same location as well #1	1985	128	33	nm	50	7	7.14	Q	Cooling Water	

nm = not measured or available

Q = Quaternary Age glacial sediments (stratified sand/gravel and with some silt and clay)

PC = Precambrian Age granitic bedrock

APPENDIX C

CLOSURE ASSESSMENT REPORT

Underground Storage Tank Closure Assessment Report

Quearm Oil Company 105 W. 6th Street Ashland, Wisconsin 54806

MSA Project No. 212360

Prepared For:

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Quearm Oil Company Ashland, WI 54806

Prepared By:

Mid-State Associates, Inc. Rhinelander, WI 54501

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Appendix B	Checklist for Underground Tank Closure
Appendix C	Soil Sampling and Field Screening Procedures

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INTRODUCTION

Mid-State Associates, Inc. (MSA) performed an underground storage tank (UST) closure assessment on November 14, 1995, at the Quearm Oil Company, located at 105 W. 6th Street, Ashland, Wisconsin. The property is located in the SE1/4, SW1/4, SW1/4, Section 33, T48N, R4W, City of Ashland, Ashland County, Wisconsin. Figure 1 indicates the site location. The purpose of the closure assessment was to determine if petroleum products stored on the site had been released into the environment, and if additional investigation was needed to determine the extent and degree of the contamination. This report presents the results of the closure assessment.

SCOPE OF SERVICES

MSA's scope of services included collecting background information, making field observations, collecting and analyzing soil samples, and subsequent report preparation. The site work was performed in accordance with Wisconsin Department of Industry, Labor, and Human Relations and Wisconsin Department of Natural Resources (WDNR) guidance documents.

Responsible Party: Quearm Oil Company 105 W. 6th Street Ashland, WI 54806	Tank Excavator: Advanced Tank Service, Inc. Scott Lau P.O. Box 1072 Eau Claire, WI 54702-1072 (715) 831-8484
Site Contact:	DILHR Representative:
Mr. Fred Gygi	Mr. Thomas Grahek
Gygi Heating Company	Ashland Fire Department
631 E. McLoed Avenue	300 Stuntz Avenue
Ironwood, MI 49938	Ashland, WI 54806
(906) 932-1179	(715) 682-7052
Tank Degassing/Cleaning:	Closure Assessment Firm:
Advanced Tank Service, Inc.	Mid-State Associates, Inc.
Scott Lau	Brian J. Hegge (Certificate #02843)
P.O. Box 1072	1835 N. Stevens Street, P.O. Box 1026
Eau Claire, WI 54702-1072	Rhinelander, WI 54501
(715) 831-8484	(715) 362-3244
Tank Disposal:	Sludge Disposal:
Toy's Scrap and Salvage	Waste Research and Reclamation Co., Inc.
Route 1	5200 Highway 93
Eau Claire, WI 54703	Eau Claire, WI 54701
(715) 834-6677	(715) 834-9624

PROJECT CONCERNED PARTIES

SITE INFORMATION

<u>UST Information</u>

One 1,000 gallon leaded gasoline storage tank and one 1,000 gallon unleaded gasoline storage tank and associated piping were removed from the site on November 14, 1995. Two pump islands for USTs are located approximately 17 feet to the east and 20 feet southwest of the USTs. The vent pipes for the system were located approximately 4 feet west of the USTs adjacent to the main building. The pump dispensers had been previously removed from the site. Appendix B contains the Underground Petroleum Product Tank Inventory Form and Checklist for Underground Tank Closure.

Description of Present Property Use

The site was formerly operated as a retail fuel sales facility. Seven above ground storage tanks (ASTs) are located on the western portion of the property. A site investigation was conducted in the area of the ASTs between August 1992 ad May 1993 by Ayres and Associates, Inc. The USTs removed during these closure activities were used as part of the retail gasoline sales.

Underground Tanks Remaining On Site

A 300 gallon fuel oil UST remains on site in the area of the above ground storage tanks.

Previously Removed Tanks

According to DILHR records, one 550 gallon diesel fuel UST was removed from the site in 1988. The location of the UST and its condition upon removal is unknown at this time.

Previous Geotechnical Investigations

Ayres and Associates, Inc. conducted a subsurface investigation between August 1992 and May 1993 in the area of the ASTs to the west of the main building. The investigation did not include the UST locations discussed in this closure assessment.

Past System Leaks or Repairs

The closed USTs were installed in 1982. The delivery piping to the east island was fiberglass and the piping to the southwest island was steel. Although no information was available regarding tank upgrades, it appears that the tanks were connected to the existing system during an upgrade. There are no recorded leaks nor repairs on the removed tank facilities.

Tank Tightness Tests

Tightness tests are not known to have been conducted on the removed tank nor piping.

Other Tanks/Gas Stations Nearby

Seven above ground storage tanks are located to the west of the main building.

PROCEDURES

Tank Removal and Cleaning Procedures

The soil overburden was removed from the USTs and the explosive vapors in the tank were measured. The UST was then purged with carbon monoxide until the atmosphere was below 10 percent of the lower explosive limit (LEL). The UST vents, dispenser pipes, and fill pipes were also removed. The USTs were then removed from the excavation, placed on the ground, and blocked to prevent rolling.

After removal of the tanks from the excavation, the tank was then inspected for pitting, holes, or other obvious problem and none were detected. The LELs were then rechecked and holes were cut in the tanks to remove the remaining product into a Department of Transportation-approved, 50-gallon drum. The piping and pumps associated with the tanks were removed by the remover/cleaner during the closure. The tanks were cleaned on site, transported to, and scrapped at Toy's Scrap and Salvage, Route 1, Eau Claire, WI 54703.

Soil Sampling Methods and Procedures

Freshly exposed soil was obtained from the tank excavation using a shovel to bring soil to the surface. Field headspace measurements were conducted. Due to obvious petroleum odors, laboratory samples were not analyzed. Appendix C contains soil sampling and field screening procedures.

Sample Locations

One headspace sample was collected from approximately 4 feet below ground surface (bgs), from the sidewall of the excavation. Two headspace samples were also collected from beneath the product piping leading to the eastern pump island.

Equipment Cleaning Methods

The sampling equipment (nitrile gloves) used by MSA during the closure assessment were disposed after collecting the sample.

OBSERVATIONS

Soil Type

The soil profile in the tank bed was observed as follows:

0 to 7 feet bgs dense red clay

Bedrock

Bedrock was not encountered during the closure activities.

<u>Groundwater</u>

Water was observed within the UST excavation. This water is suspected either to be surface runoff trapped in the sand backfill surrounding the former USTs or water trapped in lenses of higher permeability soil within the clay.

Excavation Dimensions

The scale drawing (Figure 2) graphically shows the sample locations and excavation limits. The excavation was approximately 8 feet by 17 feet by 7 feet deep. The tank was 5 feet 4 inches in diameter and 6 feet long.

Tank Condition

Minor surface corrosion was noted on the tanks and piping. The tanks were in very good condition with no obvious holes.

Contamination Indicators

Petroleum odor and soil staining were noted in the soil.

Environmental Response Action

The soil excavated from, around, and above the tank was placed back into the excavation.

RESULTS

The field screening results from the closure assessment are summarized in Table 1. Soil samples were not analyzed for gasoline range organics due to the strong petroleum odor and headspace screening results.

> TABLE 1 SOIL SCREENING RESULTS

Quearm Oil C	ompany, Ashl	and, WI
Sample I.D.	Depth (ft)	PID Headspace Result
Stockpile from UST excavation	NA	4,000
Piping to eastern pump island	Fill 1 ft below pipe	930
Piping to eastern pump island	Clay 2 ft below pipe	282

NA - Not Applicable

NOTIFICATION TO DEPARTMENT OF NATURAL RESOURCES

Based on the petroleum odors, soil staining, and headspace screening results, in accordance with the Wisconsin Spills Law, the WDNR was notified of the petroleum release. Mr. Chris Saari, WDNR Brule, Wisconsin, was notified of the release on November 14, 1995.

CONCLUSIONS AND RECOMMENDATIONS

The results of this closure assessment indicate that further environmental investigative work is required. Following regulatory guidelines, a copy of this report has been forwarded to the appropriate WDNR office for tank closures.

APPENDIX A

FIGURES





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APPENDIX B

CHECKLIST FOR UNDERGROUND TANK CLOSURE UNDERGROUND STORAGE TANK INVENTORY FORMS

	isconsin Department of bor and Human Relatio	Industry, ns	CHECKLIST	RETURN COM	COMPLETED CHECKLIST TO: Buildings Division					
	omplete one for ach site closure.	m for	ne information you p overnment agency p	rovide may be used by c rograms [Privacy Law A	other	torage Tan 0. Box 79	k Son tind		207	
ÎI	IDENTIFICATION: (Ple	ase Print) 1	ndicate whether	closure is for: 2 2. Owner Na	Tank System me 491 + to A	Tank O	niy 🗋	Piping O	nly	
Si	ile Streer Address (not P.O. Bo	DX16D	St.	Owner Street	Address/	c/coch	HUE	1995		
_†⊒	City ASHANG	ge		City	Village Toyn	of: State	T	19938	>	
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	HDVANCE TANK losure Company Telepone N	E Selvic	CP, TNC Cho	Sure Company City, Star	tc, Zip,Code	HAD				
	Name of Company Performin	ng Closure Asse	ssment As	Sessment Company Street	et Address, City, Sta	te, Zip Code	[0]	2	<u> </u>	
	Plice Starle 45 elephone # (include area con 715 367 3744	Certified As:	sessor Name (Print)	Assessed	NG 54. Phi	<u>ulcncUR</u>	Assessor	54 <u>50</u> Certification	No.	
=	Tank ID #	Closure	Temp. Closure	Closure In Place	Tank Sapacity	Contents	* Closu	ire Assess	ment	
1_	020100132	X			1000	03	,	KY DN		
<u>2.</u>	620100137	×	<u> </u>	<u>_</u>	1000	02				
· -	····									
								<u>ארן דר</u> ארז צר		
 _	• •									
الية. مرجع	ndicate which product by 11-Waste oil; 13-Chemica	numeric code	: 01-Diesel; 02-Le chemical name(s)	aded; 03-Unleaded; 0 or numbers(s)	4-Fuel Oil; 05-Gas	sohol; 06-Oth	er; 09-Uni 14-Keros	known; 10-F ene; 15-Avi	Premix; ation.	
	ritten notification was prov local permits were obtain	ided to the loc ed before beg	al agent 15 days i inning closure.	n advance of closure	date		X	П м П м [NA NA	
្ឋ៍	neck applicable box at TEMPORARILY OUT	right in res	ponse to all sta E	tements in Section	ns B - E.	<u>R</u>	emover /erified	Inspector Verified	<u>NA</u>	
	is effective until (provide	val of tempora e date)	ry closure obtained	d, which		C			· 🗖	
	 Product Removed a. Product lines drain 	ned into tank (or other container)	and resulting liquid r	emoved, AND	г	א דו אר	П	П	
	b. All product remov	ed to bottom o	of suction line, OR		•••••					
	 C. All product remov 2. Fill pipe, gauge pipe 	ed to within T	por recovery fitting	is, and vapor return li	nes capped.	· · · · · · · · ·				
-	 All product lines at the A Dispensers/ournes let 	he islands or p	umps located else	where are removed a	nd capped, OR .					
	5. Vent lines left open.		·····		•••••	· · · · · · · · ·	N D Y	, <u> </u>		
鼝	6. Inventory form filed i	ndicating tem	oorary closure	· · · · · · · · · · · · · · · · · · ·	••••••		JY []N			
્⊥U	CLOSURE BY REMO Product from piping	DVAL draiged into ta	ank (or other contai	iner)	· · · ·	· •		Chan		
ि=: - ℃ -	2. Piping disconnected	from tank and	I removed.		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·				
-	3. All liquid and residue 4. All pump motors and	e removed from I suction hose	n tank using explo s bonded to tank o	sion proof pumps or l ir otherwise grounded	nand pumps I	····· •		400		
	5. Fill pipes, gauge pip NOTE: DROP TUBE	es, vapor reco SHOULD NO	very connections, OT BE REMOVED	submersible pumps a	and other fixtures a BE PURGED THR	OUGH	אם צ <u>ו</u> א		- 🗆	
	THE USE OF AN FL						A			
•	6. Vent lines left conne	cted until tank	s purged.		•••••			A a		
1	 6. Vent lines left conne 7. Tank openings temp 8. Tank atmosphere red 	cted until tank orarily plugge duced to 10%	s purged d so vapors exit th of the lower flamm	rough vent.	ee Section F.					
:	 THE USE OF AN EL Vent lines left conne Tank openings temp Tank atmosphere red Tank removed from to prevent movement 	cted until tank orarily plugge duced to 10% excavation aft	s purged	rough vent. hable range (LEL) - <u>se</u> TING: placed on leve	ee Section F.	ked				
:	 6. Vent lines left conne 7. Tank openings temp 8. Tank atmosphere red 9. Tank removed from to prevent movemen 10. Tank cleaned before 	cted until tank orarily plugge duced to 10% excavation aft t	s purged	rough vent. hable range (LEL) - <u>se</u> TING; placed on leve from site.	ee Section F.	ked				

				• • •
di (CLOSURE BY REMOVAL (continued)	Verified	ve)ifjed	NA
11	. Tank labeled in 2" high letters after removal but before being moved from site.	V IN	ZIV	
. 1	FORMER CONTENTS; VAPOR STATE; VAPOR FREEING TREATMENT; DATE.	/	/	
्र ∎2	. Tank vent hole (1/8 th " in uppermost part of tank) installed prior to moving the tank from site			X-
13	. Inventory form filed by owner with Safety and Buildings Division indicating closure by removal	N D N	2	1
- 14	. Site security is provided while the excavation is open.	KLY LIN		
	CLOSURE IN PLACE	1		. :
5. 1-1	NOTE: CLOSURES IN PLACE ARE ONLY ALLOWED WITH THE PRIOR WRITTEN APPROVAL OF THE DEPARTMENT OF INDUSTRY, LABOR AND HUMAN RELATIONS OF LOCAL AGENT			•
	. Product from piping drained into tank (or other container).			
	. Piping disconnected from tank and removed.			
} +	All liquid and residue removed from tank using explosion proof pumps or hand pumps.			
	Fill pipes, gauge pipes, vapor recovery connections, submersible pumps and other fixtures removed.		H	Н
Ξ	NOTE: DROP TUBE SHOULD NOT BE REMOVED IF THE TANK IS TO BE PURGED THROUGH			
- 6	THE USE OF AN EDUCTOR - EDUCTOR OUTPUT 12 FT ABOVE GRADE.			-
से है	. Tank openings temporarily plugged so vapors exit through vent.		H	H
<u>ः</u> । १	B. Tank atmosphere reduced to 10% of the lower flammable range (EL) - see Section F. F.		Ō	Ō
%_ { ¶/	Tank property cleaned to remove all sludge and residue. Solid is at material (and evaluate balles also acque) commanders introduced and tag's filled			
	Vent line disconnected or removed.		Н	Н
墨口	Inventory form filed by owner with Safety and Buildings Division indicating closure in place.		d	
	CLOSURE ASSESSMENTS		وسترغد يتهذون والم	
Ē	NOTE: DETERMINE IF A CLOSURE ASSESSMENT IS REQUIRED BY REFERRING TO ILHR 10.	· .		
[]].	I. Individual conducting the assessment has a closure assessment plan (written) which			-
	2. Do points of obvious contamination exist?		100m	Н
遣 :	3. Are there strong odors in the soils?			
	4. Was a field screening instrument used to pre-screen soil sample locations?	DY DN		
	Was a closure assessment omitted because of obvious contamination?		CPA	
	Agency, office and person contacted: Chris SAARL, BRULL DNR		1.	
	7. Contamination suspected because of: POdor PSoil Staining - Free Product Sheen On Groundw	ater PField Ir	nstrument	Fest
Î	METHOD OF ACHIEVING 10% LEVEL DESCRIPTION	•		
	Educator Or Diffused Air Blower	of 12 feet abo	in around	
	Diffused air blower bonded and drop tube removed. Air pressure not exceeding 5 psig.		e ground.	
<u>.</u>	Dry Ice	· .		
	Dry ice introduced at 1.5 pounds per 100 gallons of tank capacity. Dry ice crushed and distributed	over the greate	est possible	e tarik
976°	Varea. Dry ice evaporated before proceeding. IN Inert Gas (CO/2 or N/2) NOTE: INERT GASSES PRODUCE AN OXYGEN DEFICIENT ATMOSPHE	RE. THE TAN		OT BE
劉	ENTERED IN THIS STATE WITHOUT SPECIAL EQUIPMENT		•	· · · ·
霽./	Gas introduced through a single opening at a point near the bottom of the tank at the end of the tank	k opposite the	vent.	
	As introduced under low pressure not to exceed 5 psig to reduce static electricity. Gas introducin	ig device grour	ided.	
;;≣ ::	Calibrate combustible gas indicator. Drop tube removed prior to checking atmosphere. Tank space	ce monitored a	t bottom, m	niddle
	and upper portion of tank. Readings of 10% or less of the lower flammable range (LEL) obtained b	efore removing	tank from	
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• • • •	Sale and the and the and the and the second	1/	1. 1.1	h
	Stott fithe XIM an 0962	16	<u> 4 </u>	<u>75</u>
	Remover Name (print) Remover Signature Remover Cer	tification No. I	Date Signe	d
ू । इ.स.	INSPECTOR INFORMATION		•	,
	Thomas Excated Kommetticall	00316		
: - !	Inspector Name (print) Thspector Signature	Inspector Cer	tification N	0.
· · ·	02011 ASHLOW 715-682-7051	11-14-95		
.	FUID # For Location Where Inspection Performed Inspector Telephone Number	Date Signed		
	SAFETY AND BUILDINGS			

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Micconsin Department of Industry			Como	Completed Form To:
Labor and Human Relations	PETROL	EUM PRODUCT	Safe Safe	ty & Buildings Division Box 7969
For Office Use Only: Tank ID # $D20/00132$	TANK Information Require	C INVENTORY A	Stats. Tele	ison, WI 53707 phone: (608) 267-5280
Underground tanks in Wisconsin that I Please see the reverse side for addition with at least 10 percent of its total volu- each tank. Send each completed form this tank by submitting a form? X The information you provide may be used by ot	have stored or currently nal information on this p ume (included piping) lo to the agency designat ES INO If yes, are y her government agency progr	store petroleum or regi rogram. An undergrou cated below ground le ed in the top right corn you correcting/updatin ams (Privacy Law, s. 15.04 (1	ulated substance und storage tank vel. A separate t er. Have you pro g information on) (m)].	s must be registered. is defined as any tank form is needed for eviously registered ly?
In Use or 1B. Newly Installed 4. A. Abandoned With Product 6/	ong): Closed - Tank Removed	8. 🔲 Changed Ownership (Indicate new owner	Fire Department Pr Where Tank Locate	oviding Fire Coverage d:
3. Abandoned No Product (empty) or With Water 7.	Inert Material Out of Service - Provide Da	below) • ite:	ASHAND	. <u>.</u>
T. IDENTIFICATION: (Please Print) 1. Tank Site Name) ULLARM	Site Add	ress/05.W. 6	3 Street	Site Telephone No.
City ASh LAND Village	_ 🗌 Town of:	State $U \equiv 2$	ip Code 54 806	County / AND
2. Owner Name (mail sery/here/inless indicat 6 491 Herting	ed otherwise in #3 below)	Owner Mailing Adasess (ma F2 31 EAST	NC400	ficated otherwise in #3) かん
City TLONWOOD	Town of:	State MI Z	10 Code 49938	County
3. Alternate Mailing Name If Different Than	#2	Alternate Mailing Street Ac	idress If Different Fro	m #2
City 🖸 Village	🔲 Town of:	State Z	ip Code	County
4. Tank Age (date installed, if known: or year	sold) 5. Tank Capacity (gal	lons) 6. Tank Manufactur	er's Name (if known)	
TYPE OF USER (check one): . X Gas Station 2. . B . Industrial . Agricultural 10. C	ulk Storage overnment other (specify):	3. 🔲 Utility 7. 🔲 School	4. [] 8. []	Mercantile Residential
Image: TANK CONSTRUCTION: Image: Bare Steel 2. Image: Bare Steel 2. Image: Bare Steel 2. Image: Bare Steel 2. Image: Bare Steel 4. Image: Bare Steel 4. Image: Bare Steel 4. Image: Bare Steel 4. Image: Bare Steel 7.	athodically Protected and Coa iberglass teel - Fiberglass Reinforced Pla	nted Steel (A. 🗌 Sacrificial A 5. 🗌 Oth astic Composite 9. 🗌 Unk	nodes or B. 🗌 Impr er (specify):	essed Current)
	Other:		Is Tank Doubl	e Walled? Yes No
Tank leak detection method: 1. Automatic jghtness testing S. Interstitial monitori	c tank gauging 2. 🗌 Vapo ng 6. 🗌 Not required at pr	r monitoring 3. 🗌 Grour esent 7. 🗌 Manual Tanl	dwater monitoring k Gauging (only for ta	4. Inventory control and anks of 1,000 gallons or less)
PIPING CONSTRUCTION General Steel 2. Cathodically Protect 4. Series Steel 5. Other (specify):	ted and Coated or Wrapped St	eel (A. 🔲 Sacrificial Anodes	or B. 🗌 Impressed C	Surrent) 3. 🗌 Coated Steel 9. 🗌 Unknown
Sining System Type: 1. Pressurized piping v 3. Suction piping with	with: A. 🗋 auto shutoff; B. 🗍 check valve at pump and insp	alarm; or C. [] flow restrict	or 2. 🗌 Suction pi	ping with check valve at tank
ing leak detection method: used if pressuriz	ed or check valve at tank: 1.] Tightness testing 5.	Vapor monitoring	2. 🗌 Interstitial moni 6. 🗌 Not Required	toring
proval: 1. 🖸 Nat'l Std 2. 🗆 UL 3	. 🗋 Other:		Double Walled:	TYes No
TANK CONTENTS 1. Diesel 2. L 5. Gasohol 6. 0. Unknown 10. 10. Chemical *	leaded Other Premix	3. Unleaded 7. Empty 11. Waste Oil 14. Kerosene	4. [8. [12. [15. [] Fuel Oil] Sand/Gravel/Slurry] Propane] Aviation
The second s	he(s) of humber(s) of the chem	lical or waste.	······································	
ank Closed, Give Date (mo/day/yr):	14/95	Has a site assessment beer	Yes No	verse side for details)
Firstallation of a new tank is being reported, i	ndicate who performed the in DILHR	istallation inspection: 3. 📋 Other (identify)		
Name of Owner or Operator (please print):	i Hesting	Indicat	e Whether:	Operator
Senature of Owner or Operator:	Frusher 1	Dates 113nes	igned: 11/14/9	<u></u>
-7437 (R. 05/94) / IMPORTANT:	Complete as many ite information may cau	ms on this form as poss se vou to fall under add	sible./ Failure to litional regulatio	provide sufficient ns.

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⊯isconsin Department of Industry, Labor and Human Relations			Send Safet	Completed Form To:
or Office Use Only: ank ID # 172 0100137	TANK II	NVENTORY	P.O. Mad	Box 7969 ison, WI 53707 phone: (608) 267-5280
Underground tanks in Wisconsin that I Please see the reverse side for addition with at least 10 percent of its total volu- ach tank. Send each completed form this tank by submitting a form?	nave stored or currently sto al information on this prog ume (included piping) locat to the agency designated ES INO If yes, are you her government agency program	gram. An undergro ted below ground le in the top right corr correcting/updatin s (Privacy Law, s. 15.04 (ulated substances und storage tank evel. A separate f ner. Have you pre ig information on 1) (m)].	s must be registered. is defined as any tank form is needed for eviously registered ly? X Yes No
his registration applies to a tank that is (check 	one): Ø. Closed - Tank Removed 8. [🖸 Closed - Filled With	Changed Ownership (Indicate new owner	Fire Department Pri Where Tank Locate	oviding Fire Coverage d:
Abandoned No Product (empty) or With Water 7.	Inert Material Out of Service - Provide Date:	below)	Ashla	ND
A. IDENTIFICATION: (Please Print) Tank Site Name	/ Site Address	105 W. 1	3. Stheet	Site Telephone No.
City ASh A 24	Town of: Sta	ate 12 12	Zip Code 54 806	County ASH AND
2. Owner Name (mail sent nere inlessindirat	ed otherwise in #3 below) Ov	wher Mailing Address (m.	ausent here unless inc	dicated otherwise in #3)
City City Village	Town of: Sta	ate ME	Zip Code /9938	County
3. Alternate Malling Name If Different Than a	Alt	ternate Mailing Street A	ddress if Different Fro	m #2
City 🗋 Village	Town of: Sta	ate 2	Zip Code	County
4. Tank Age (date installed, if known: or year	sold) 5. Tank Capacity (gallons	s) 6. Tank Manufactur	rer's Name (if known)	
TYPE OF USER (check one): Gas Station 2. Gas Station 6. Garcial 6. Garcial 10.	ulk Storage 3 overnment 7 ther (specify):	1. 🔲 Utility 7. 🔲 School	,4. [] 8. []	Mercantile Residential
C TANK CONSTRUCTION:	athodically Protected and Coated berglass eel - Fiberglass Reinforced Plastic	Steel (A. 📋 Sacrificial A 5. 📋 Oth Composite 9. 🗍 Uni	Anodes or B. 🗌 Impro her (specify):	essed Current)
⇒proval: 1. □ Nat'l Std. 2. 🗗 UL 3.	Other:		Is Tank Double Spill Containm	e Walled? Yes VNO
Tank leak detection method: 1. Automatic	tank gauging 2. Vapor mo	onitoring 3. Ground	ndwater monitoring	4. Inventory control and hts of 1,000 gallons or less)
D PIPING CONSTRUCTION	ed and Coated or Wrapped Steel	(A. 🗋 Sacrificial Anodes	or B. [] Impressed C	urrent) 3. 🗌 Coated Steel 9. 🔲 Unknown
Preing System Type: 1. Pressurized piping with 3. Suction piping with	ith: A.] auto shutoff; B.] alar check valve at pump and inspecta	rm; or C. 🗌 flow restrict	or 2. 🗌 Suction pip	ing with check valve at tank
Plang leak detection method: used if pressuriz: 3.	ad or check valve at tank: 1 V Tightness testing 5 Li	apor monitoring	2. Interstitial monin 6. Not Required	oring
Arroval: 1. Nat'l Std 2. UL 3.	Other:		Double Walled:	Tres Drio
E TANK CONTENTS 1. Diesel 2. C I Gasohol I Unknown I Chemical *	eaded ther ther the the ther the	3. Unleaded 7. Empty 1. Waste Oil 4. Kerosene	4. [] 8. [] 12. [] 15. []	Fuel Oil Sand/Gravel/Slurry Propane Aviation
* If # 13 is checked, indicate the chemical nam	e(s) or number(s) of the chemical	or waste.		
If hk Closed, Give Date (mo/day/yr):	114/95 H	as a site assessment beer	n completed? (see rev Yes No	verse side for details)
If stallation of a new tank is being reported, in Fire Department 2.	idicate who performed the instal ILHR	lation inspection: 3. 🔲 Other (identify)		
ame of Owner or Operator (please print):	En: Hating		te Whether: . ØOwner or [Operator
Thurs of Owner or Operator	OY912 MEATING	Date (ioned:	
ature of Owner or Operator:	- Tan har	June Dates	igned: 11/14/94	5

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APPENDIX C

SOIL SAMPLING AND FIELD SCREENING PROCEDURES

SOIL SAMPLING AND PRESERVATION PROCEDURES (Rev. 8/94)

The following procedures conform to Wisconsin Department of Natural Resources' July 1993 Leaking Underground Storage Tank (LUST) and Petroleum Analytical and Quality Assurance Guidance, and Release News, Vol. 4, No. 3, July 1994.

- I. For soils sampled for:
 - Percent Solids
 - Lead
 - Cadmium
 - Polynuclear Aromatic Hydrocarbons (PAHs)
 - Sieve Analysis
 - Bioremediation
 - Polychlorinated Biphenyls (PCBs)
 - Dry Bulk Density

Soil samples are to be placed on ice, but do not need to be field preserved with methanol. The soil sample collection procedure for these analyses is as follows, using one jar per analysis:

- 1. A soil sample is transferred from the sampling tool (i.e., split-spoon or backhoe bucket) into an appropriate, clean, laboratory-supplied jar.
- 2. The soil is packed into the jar with a nitrile-gloved hand to minimize headspace. However, if there is not enough soil for all required analyses, an attempt will be made to place as much soil as possible into the jars for other analyses.
- 3. The jar is sealed with a teflon-lined, screw cap.
- 4. The sample is placed in a cooler with ice.
- 5. The procedure is repeated until samples are collected for all required analyses.
- 6. Field personnel will decide which samples are to be laboratory analyzed based upon field instrument readings and other field observations, such as petroleum odor and soil staining. Only the samples that will be laboratory analyzed are left in the cooler. All other samples are discarded.

II. For soil samples collected for:

- Volatile organic compound (VOCs)
- Petroleum volatile organic compound (PVOC)
- Diesel range organic (DRO)
- Gasoline range organic (GRO)
- GRO/PVOCs

Soil will be transferred from the sampling tool into clean, laboratory-supplied jars by the following soil sampling procedure, using two jars per analysis:

- 1. The brass tube is capped on both ends, labeled, and placed in a cooler with ice.
- 2. Within two hours of sample collection, the field personnel will decide which samples are to be laboratory analyzed. This decision is based upon field instrument readings and other field observations, such as petroleum odor and soil staining. Only the samples that will be laboratory analyzed are extracted and placed in jars. All other samples are discarded.
- 3. The soil is quickly extracted from the brass tube using a nitrile-gloved hand, syringe, or spatula, and placed into a pre-tared sample jar.
- 4. Approximately 25 grams of soil will be added to the jar.
- 5. The laboratory-analyzed DRO soil samples do not need to be field-preserved. The laboratory preserves the DRO sample within the DNR-required time frame. The GRO, GRO/PVOC, and VOC soil samples must be field-preserved when the decision is made to have the sample laboratory analyzed. The procedure is as follows:
 - The proper amount (25 ml) of purge-and-trap grade methanol is transferred into the jars containing the soil samples. A 1:1 ratio of grams of soil to mls of methanol is required.
 - The jars are capped with a teflon-lined septum, screw cap and the contents are agitated to coat the soil particles with methanol.
 - The jars are placed in the cooler with ice.

A Percent Solids analysis must always accompany GRO, DRO, GRO/PVOC, VOC and PVOC analyses.

All soil samples remain in a cooler with ice until transported to a laboratory.

APPENDIX D

WATER WELL CONSTRUCTION REPORTS AND GEOLOGIC LOGS

Weine Corp. LUELL NO 3 Note: Corp. A SME LAND CHECK (A) ONE: Note: Corp. Note: Corp. AND Corp. Note: Corp. Note: Corp. <th></th> <th>Private</th> <th>.atura Water S</th> <th>.13111 11 Resourc upply</th> <th>es</th> <th></th> <th></th> <th>Whit</th> <th>te Copy</th> <th>NU</th> <th>ivision's (</th> <th>Сору</th> <th></th> <th></th> <th>00</th> <th>-15</th> <th></th> <th><u> </u></th> <th>UKT . 2-79</th>		Private	.atura Water S	.13111 11 Resourc upply	es			Whit	te Copy	NU	ivision's (Сору			00	-15		<u> </u>	UKT . 2-79
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OR - Grid or Street No. Street or Rank Nume Republic	<u>2. 100</u>	CATION	44 Sec		ov't. Lot	Sec	3 <u>3</u> 7	ownsh 	10 Range	3. N	AME L	LOWN	ER []. S 1 N	AGENT	AT TI BE	ме оғ <u>∟ ∟</u>	DRILLI	NG CHE	CK (V ONe
AND U Litty Post open M. Construct open	OR	- G	rid or Str	eet No.	Street or R	.oad Na	me		R4u	7 ^	DDRESS								
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4. Distancia field formality Biolog, 211 Sanitary Biolog, 213 Sanitary Biolog, 214 Child Other Sanitary Biolog, 214	 										BROC	OK F	EL	<u> </u>	w15	5	53	005	•
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C P P E R	10-15 15-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60		Clay 11 11 11 12 13 14 14 15 17 17 17 17 17 17 17 17 17 17	Ribntordaybr Red II II II Red brown II II II II II II II II II	н н н н н н н н н н н н н н н н н н н	Vfn/VC n n n n n n n n n n n n n	Dolic. (The Dolomitic. M Same. Dolomitic(cl Same. Same plus li Dolomitic(cl Same. " Same but gre Same but gre Same but gre	slqtly q fuch grav ay). Muc ttle cav ay). Muc avel(Gran avel(Gran	yr cls el(Grar h grave ed red h grave /L peb /M peb /L peb	are more calcus), h/S peb),sand,silt. el(Gran/M peb),silt gray brown clay(O- el(Gran/M peb),silt).	Mch_qv1((3ra <u>n/4 c</u> snd.s
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C P P E R F	$\begin{array}{r} 10-15 \\ 15-20 \\ 20-25 \\ 25-30 \\ 30-35 \\ 35-40 \\ 40-45 \\ 45-50 \\ 50-55 \\ 55-60 \\ 60-65 \\ 65-70 \\ 70-25 \end{array}$		Clay n Clay & sand n n n n n Gravel n Clay & sand	Rdbntordaybr Red II II II Red brown II II II II II II II II II II II II II	м/с п п п п п м&vC п п м&vC п п п м&vC	Vfn/VC n n n n n n Gran/M peb Gran/L peb Vfn Ar	Dolic. (The Dolomitic. M Same. Dolomitic(cl Same. Same plus li Dolomitic(cl Same. II Same but gre Same but gre Same but gre Same but gre Same. Dolomitic(cl	slqtly q Auch grav ay). Muc ttle cav ay). Muc avel(Gran avel(Gran avel(Gran avel(Gran	yr cls el(Grar h grave ed red h grave /L peb /M peb A peb r,gabbro	are more calcus), //S peb), sand, silt. el(Gran/M peb), silt gray brown clay(O el(Gran/M peb), silt).).).).).).).).).).	Mch qvl((3ra <u>n/4 c</u> snd.s
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C O P P E R F A L L S	10-15 15-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60-65 65-70 70-75 75-80 80-85 85-90 90-95 95-100		Clay " " " " " " " " " " " " " " " " " " "	Rdbntordaybr Red II II II Red brown II II II II II II II II II II II II II	M/C n n n m M&VC n Gran m M/C Gran S peb ii Gran n s	Vfn/VC n n n n n n n n n n n n n	Dolic. (The Dolomitic. M Same. Dolomitic(cl Same. Same plus li Dolomitic(cl Same. II Same but gre Same but gre Same but gre Same but gre Quartz,felds Same. Dolomitic(cl Quartz,felds Same. Same plus in Same. II	slqtly q fuch grav ay). Muc attle cav ay). Muc avel(Gran	yr cls el(Grar h grave ed red h grave /L peb /M peb /A peb .gabbro tion.	are more calcus), n/S peb), sand, silt. el(Gran/M peb), silt Gray brown clay(O el(Gran/M peb), silt).).).).). el(Gran/S peb), silt p, ss, trap, chert. Mo	Mch qvl((Sra <u>n/4 c</u> snd.s ilt.clay
COPPER ER FALLS	$\begin{array}{c} 10-15 \\ 15-20 \\ 20-25 \\ 25-30 \\ 30-35 \\ 35-40 \\ 40-45 \\ 45-50 \\ 50-55 \\ 55-60 \\ 60-65 \\ 65-70 \\ 70-75 \\ 75-80 \\ 80-85 \\ 85-90 \\ 90-95 \\ 95-100 \\ 100-105 \end{array}$		Clay n Clay & sand n Clay & sand n n n n Gravel n Clay & sand Gravel n Clay & sand Gravel n n n n n n n n n n n n n	Rdbntordaybr Red II II II Red brown II II II II II II II II II II II II II		Vfn/VC Vfn/VC	Dolic. (The Dolomitic. M Same. Dolomitic(cl Same. I Same plus li Dolomitic(cl Same. I Same but gre Same but gre Same but gre Same but gre Same. Dolomitic(cl Quartz,felds Same. Same plus in Same. I Quartz,felds Same. I Same. I Same plus in Same. I Same. I Same. I Same. I Same. I Same. I Same. I Same. Same. I Same. Same. I Same. I Same. I Same. I Quartz,felds Same. I I Same. I Same. I Same. I Same. I Same. I Same. I Same. I Same. I Same. I Same. I Same. I Same. I Same. I Same. I Same. I Same. I Same. I Same. I Same. Same. I I Same. I Same. I I I I I I I I I I I I I I I I I I I	slqtly q luch grav ay). Muc ttle cav ay). Muc avel(Gran avel(Gran avel(Gran avel(Gran spar,volc lay). Muc spar,volc non forma	yr cls el(Grar h grave ed red h grave /L peb /M peb /A peb .gabbro tion.	are more calcus), h/S peb), sand, silt. el(Gran/M peb), silt gray brown clay(O el(Gran/M peb), silt).).).).).).).).).).	Mch qv1((ilt.clay
C O P P E R F A L L S F	10-15 15-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60-65 65-70 70-75 75-80 80-85 85-90 90-95 95-100 100-105 100-105		Clay II Clav & sand II II II II II II II Clay & sand Gravel II Clay & sand Gravel II II II II II II II II II I	Rdbntordaybr Red " " Red brown " Red brown " " Mxd rd bn " Mxd rd bn " Mxd rd bn " Red brown " Mxd rd bn "	м/С п п п п м&VC п бran бran п S peb п бran ц т С бran	Vfn/VC IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Dolic. (The Dolomitic. M Same. Dolomitic(cl Same. Same plus li Dolomitic(cl Same. I Same but gre Same but gre Same but gre Quartz,felds Same. Dolomitic(cl Quartz,felds Same. Same plus in Same. I Quartz,feld Same. Same plus in Same.	slqtly q luch grav ay). Muc ttle cav ay). Muc avel(Gran ave) avel(Gran ave) avel(Gran ave) avel(Gran ave) avel(Gran ave) avel(Gran ave) avel(Gran ave) avel(Gran ave) avel(Gran ave) avel(Gran ave) ave) avel(Gran ave) ave) avel(Gran ave) ave) avel(Gran ave) ave) avel(Gran ave) ave) avel(Gran ave) avel(Gran ave) ave) ave) ave) ave) ave) avel(Gran ave) ave) ave) ave) ave) ave) ave) ave)	yr cls el(Grar h grave <u>ed red</u> h grave /L peb /M peb /M peb .gabbro tion. fm.gabbro	are more calcus), n/S peb), sand, silt. el(Gran/M peb), silt gray brown clay(O- el(Gran/M oeb), silt).).).). b. ss, trap, chert. Mo el(Gran/S peb), silt pro, ss, trap, chert. Mo pro, ss, trap, Mch so ittle silt, clay.	Mch qv1((Sran/4 c snd.s ilt.clay ilt.clay silt.cla
C O P P E R F A L L S F M	$\begin{array}{c} 10-15\\ 15-20\\ 20-25\\ 25-30\\ 30-35\\ 35-40\\ 40-45\\ 45-50\\ 50-55\\ 55-60\\ 60-65\\ 65-70\\ 70-75\\ 75-80\\ 80-85\\ 85-90\\ 90-95\\ 95-100\\ 100-105\\ 105-110\\ 110-115\\ 115-120\\ \end{array}$		Clay n n Clav & sand n Clav & sand n n n Gravel n Clay & sand Gravel n Clay & sand Gravel n n n Gravel n n Gravel n n n Gravel n n n Gravel n n n Gravel n n n Gravel n n n Gravel n n Gravel n n n Gravel n n n Gravel n n n Gravel n n n Gravel n n n Gravel n n n Gravel n n n Gravel n n n Gravel n n n Gravel n n n Gravel n n n n Gravel n n n n Gravel n n n n n Gravel n n n n n n Gravel n n n n n n Gravel n n n n n n n n Gravel n n n n n n n n n n n n n	Rdbntordaybr Red " " " Red brown " Red brown " " Red brown " Mxd rd bn " " Red brown " " Red brown " "		Vfn/VC n n n n n n n n n n n n n	Dolic. (The Dolomitic. M Same. Dolomitic(cl Same. Same plus li Dolomitic(cl Same. I Same but gre Same but gre Same but gre Same but gre Same but gre Same but gre Same. Dolomitic(cl Quartz,felds Same. I Quartz,feld Same. I Quartz,feld Much gravel Same. I	slqtly g luch grav ay). Muc ttle cav .ay). Muc avel(Gran	yr cls el(Grar h grave ed red h grave /L peb /M peb /A peb .gabbro .tion.	are more calcus), n/S peb), sand, silt. el(Gran/M peb), silt aray brown clay(O- el(Gran/M oeb), silt).).).). b. ss, trap, chert. Mon el(Gran/S peb), silt p, ss, trap, chert. Mon pro, ss, trap, chert. Mon sittle silt, clay.	Mch qv1((Sran/4 c snd.s snd.s ilt.clay ilt.clay silt.cla
C P P E R F A L L S F M.	$\begin{array}{c} 10-15\\ 15-20\\ \hline 20-25\\ 25-30\\ \hline 30-35\\ 35-40\\ 40-45\\ 45-50\\ 50-55\\ 55-60\\ 60-65\\ 65-70\\ \hline 70-75\\ \hline 75-80\\ 80-85\\ \hline 85-90\\ 90-95\\ 95-100\\ 100-105\\ 105-110\\ 110-115\\ 115-120\\ 120-125\\ \end{array}$		Clay "" " " " Clay & sand " " " " " " " " " " " " " " " " " " "	Rdbntordaybr Red II II Red brown II II II II II II II II II II II II II		Vfn/VC n n n n n n n n n n Gran/M peb Gran/L peb Vfn/VC Gran/S peb Gran/M peb 	Dolic. (The Dolomitic. M Same. Dolomitic(cl Same. Same plus li Dolomitic(cl Same. I Same but gra Same but gra Same but gra Same but gra Same. Dolomitic(cl Quartz,felds Same. Same plus in Same. I Quartz,feld Much gravel Same. I Little grave	slqtly g luch grav ay). Muc ttle cav ay). Muc avel(Gran avel(Gran avel(Gran avel(Gran avel(Gran bar, volc bar, volc con forma volc,Fe Gran/M p	yr cls el(Grar h grave ed red h grave /L peb /M peb /A peb .gabbro tion. fm,gabbro fm,gabbro tion.	are more calcus), n/S peb), sand, silt. el(Gran/M peb), silt aray brown clay(O- el(Gran/M peb), silt).).).).).).).).).).	Mch qvl((Sra <u>n/4 c</u> snd.s snd.s ilt.clay ilt.clay silt.cla
C O P P E R F A L L S F M. 115	$\begin{array}{r} 10-15 \\ 15-20 \\ 20-25 \\ 25-30 \\ 30-35 \\ 35-40 \\ 40-45 \\ 45-50 \\ 50-55 \\ 55-60 \\ 60-65 \\ 65-70 \\ 70-75 \\ 75-80 \\ 80-85 \\ 85-90 \\ 90-95 \\ 95-100 \\ 100-105 \\ 105-110 \\ 110-115 \\ 115-120 \\ 120-125 \\ 125-130 \end{array}$		Clay "" " " " " " " " " " " " " " " " " "	Rdbntordaybr Red II II II Red brown II II II II II Mxd rd bn II II II II Red brown II II II II II II II II II II II II II		Vfn/VC n vfn/VC n n n n n n fr Gran/M peb Gran/L peb Vfn/VC Gran/S peb Gran/M peb n n n n vfn/VC Gran/M peb Gran/M peb Gran/M peb n n n n n n n n n n n n n	Dolic. (The Dolomitic. M Same. Dolomitic(cl Same. Same plus li Dolomitic(cl Same. II Same but gre Same but gre Same but gre Same but gre Same but gre Same but gre Same but gre Same. Dolomitic(cl Quartz,felds Same. Same plus in Same. II Quartz,feld Much gravel Same. II Little grave Same.	slqtly g luch grav ay). Muc ttle cav ay). Muc avel(Gran avel(Gran avel(Gran avel(Gran bpar,volc tay). Muc apar,volc tay). Muc apar,volc fon forma volc,Fe Gran/M p	yr cls el(Grar h grave ed red h grave /L peb /M peb /M peb /L peb .,gabbro tion. fm,gabbro tion.	are more calcus), n/S peb), sand, silt. el(Gran/M peb), silt aray brown clay(O- el(Gran/M peb), silt).).).).).).).).).).	Mch qv1((Sra <u>n/4 c</u> snd,s snd,s ilt,clay ilt,clay silt,cla
C O P P P E R F A L L S F M. 115 ³	$\begin{array}{c} 10-15 \\ 15-20 \\ 20-25 \\ 25-30 \\ 30-35 \\ 35-40 \\ 40-45 \\ 45-50 \\ 50-55 \\ 55-60 \\ 60-65 \\ 65-70 \\ 70-75 \\ 75-80 \\ 80-85 \\ 85-90 \\ 90-95 \\ 95-100 \\ 100-105 \\ 105-110 \\ 110-115 \\ 115-120 \\ 120-125 \\ 125-130 \\ \end{array}$		Clay n Clay & sand n Clay & sand n n n n Gravel n Clay & sand Gravel n Clay & sand Gravel n Clay & sand Gravel n n n n n n n n n n n n n	Rdbntordaybr Red II II II Red brown II II II II II Red brown II II II II II II II II II II II II II	м/С п п п п п п м&VC п п м&VC п п бгал п бгал п бгал п п С с п п п и и и п п п п п п п п п п п п п	Vfn/VC n n n n n n n n Gran/M peb Gran/M peb Gran/M peb Gran/M peb Vfn/VC Gran/S peb Gran/M peb I I I I I I I I I I I I I	Dolic. (The Dolomitic. M Same. Dolomitic(cl Same. Same plus li Dolomitic(cl Same. I Same but gre Same but gre Same but gre Same but gre Same but gre Same but gre Same. Dolomitic(cl Quartz,felds Same. Same plus in Same. I Quartz,feld Much gravel Same. I Little grave	slqtly g luch grav ay). Muc ttle cav lay). Muc avel(Gran avel(Gran avel(Gran avel(Gran avel(Gran bpar,volc fon forma ,volc,Fe Gran/M p	yr cls el(Grar h grave ed red h grave /L peb /M peb /A peb .gabbro tion. fm.gabbro tion.	are more calcus), n/S peb), sand, silt. el(Gran/M peb), silt gray brown clay(O- el(Gran/M ceb), silt).).).).).).).).).).	Mch qv1((Sran/4 c snd,s snd,s ilt,clay ilt,clay silt,cla
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WELL CONSTRUCTOR'S REPORT TO WISCONSIN STATE BOARD OF HEALTH See Instructions on Reverse Side

-{Town [] Village []_ City [] 1. County ASLLAnd 20 4-5 2. Location 70077 Are, W ASLLAND WI Name of street and number of premise or Section, Town and Range numbers 3. Owner [] or Agent [] _ Reiss Co-al Co-Name of individual, partnership or firm 4. Mail Address 65 ave W. Front Str. Complete address required 2 <u>1 MTT 5 66</u> EYODROD 5. From well to nearest: Building 40 ft; sewer 60 ft; drain 60 ft; septic tank 100 ft; dry well or filter bed 125 ft; abandoned well 200 ft. 6. Well is intended to supply water for: ______ 7. DRILLHOLE: **10. FORMATIONS:** From (IL) Dia. (in.) | From (it.) | To (it.) || Dia. (in.) | From (it.) | To (ft.) To (L) Kind 20 5 6 20 D 81 34 0 34 61 8. CASING AND LINER PIPE OR CURBING: 61 75 From (ft.) Dis. (in.) Kind and Weight To (ft) use 75 81 Standard Weigh ଟା ٥ 9. GROUT: Kind From (IL) To (ft.) 20 0 NY Construction of the well was completed on: 7-3/ 1948 11. MISCELLANEOUS DATA: The well is terminated _____I6_____ inches Yield test: 1 Jouring Hrs. at _ 50 GPM. Depth from surface to water-level: ______ ft. Dabove, below 🗋 the permanent ground surface. Was the well disinfected upon completion? Water-level when pumping: 10_Pump___ft. Yes____ No____ Water sample was sent to the state laboratory at: Was the well sealed watertight upon completion? Superior on 8-4 - 1948 Yes_____ No____ City 1104-Front Str. W. aspland Wis Signature T.A. 91 Registered Well Driller Complete Mail Address Please do not write in space below 10 ml 10 ml 10 ml10 ml10 ml Rec'd___ No. Gas-24 hrs. _____ _ ____ Ans'd ____ 48 hrs. Interpretation _____ _ ____ Ē Confirm - ----- -----B. Coli Examiner__

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WELL LOG and REPORT WELL DIAGRAM In this column indicate the kind In this column state the kind of formations penetrated, their thickness Use a red line to show casing or liner pipe. Use black for drill or borehole. Record of of casing, liner, shoe and other accessories used. FINAL in feet and if water bearing. Pumping test Inches Diameter Filling + Top Soil Depth Std. wt 2 3 4 5 8 8 10 12 14 16 18 Duration of test Hours _____ 18 wroy steel 4 Pipe 25 4/ 86. national tube Pumping rate 13 40 G.P.M. Red Clay 83' Depth of pump in well Ft ______ 106 8" alrive shoe 50 Forged steel Standing water-level (from surface) <u>/1</u>' Ft _____ 8" Johnson 75 Water-level when pumping Ft ______ 00 welded well 87 screen bross. Water. End of test. 8 - Secher. Hardpan. - 56 Clear . 100 Cloudy _____ - wedged Turbid _. 143 IHH Dirty Sand Was the well_sterilized? Mate: When pump Hardpan -8 Yes ____ No -150 rstalled, 16 "conciet Fine Sand -Pace. Piemp plate an Hardpan -16 To which laboratory w2 growtest and bottest sample sent? Ð Sand into place. water bearing 13 Pomona Turbine Date approx. May 71 200 pump installed Broin. Propine. Was the well sealed o: completion? Yes V No 400 = Sercent. 8-1" 39.52 How high did you leave th = mud Grout. casing-pipe above grade? -----11 800 Well was completed May 8 Date : Casing Pipe 1200 Draw the diagram to show the right half only

WELL CONSTRUCTION REPORT WISCONSIN STATE BOARD OF HEALTH WELL DRILLING DIVISION JUN 27 1939

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Additional copies of this form may be obtained in lots of 12 for 25¢. Send remittance with order to State Board of Health, Well Drilling Division, Madison, Wis.

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WELL LOG and REPORT For method of making report, refer to bulletin entitled "Well Construction Report." 7-5-39. WELL DIAGRAM In this column state the kind of formations penetrated, their thickness in feet and if water bearing. In this column indicate the kind Record of Use a red line to show ensing or liner pipe. Use black for drill FINAL ⊐ľ casing, liner, shoe and other Pumping test accessories used. or borehoue. Diameter Inches Depth 2 3 4 5 6 8 10 12 14 16 18 "" std Duration of test Hours 10 rillon spec sandy clay Pumping rate G.Р.М. 90 25 Depth of pump in well. Ft. 6.0. 50 Standing water-level (from surface) 20 Ft..... re Boulden Druty San Water-level when 75 pumping Ft. 25 til shoe Water. End of test. 96 1 Parlin Clear..... 100 Clean sand Cloudy __ _____ Turbid_____ ALLON 119 Bale in Partim Was the well sterilized? 150 Yes Mo To which laboratory was sample sent? 200 Dato Mol Was the well sealed on completion? No., Yes 400 • : How high did you leave the casing-pipe sbove grade? it : 1 800 a second data pro Well was completed Date Oct 29-4/ • • • 2272 1200 artin. Draw the diagram to show the right half only Signature

APPENDIX E

HEADSPACE SCREENING PROCEDURES

Standard Operating Procedure: Soil Sample Headspace Screening Using Field Instruments

Organic vapor concentrations in the headspace of a bag or jar partially filled with soil shall be measured using the procedure described below.

A. All field instruments must be maintained and calibrated following a schedule recommended by the manufacturer. MSA uses either a Foxboro Model 128 OVA (FID), a Thermo Environmental Instruments Model 580B OVM (PID), or HNu Model PI 101 (PID).

The initial OVA calibration is done by the manufacturer using methane in air. Additional calibration is required following repairs. Calibration for specific organic vapors is not necessary for screening samples, because the Model 128 OVA is capable of responding to the organic vapors of interest. The intent of headspace screening is to measure relative concentrations between different samples, not absolute concentrations of specific compounds. If absolute vapor concentrations of specific compounds are required, then commercial standards for that compound <u>in an air matrix</u> shall be used to calibrate the instrument (according to the procedure given on page 10 of the instrument instruction manual).

The OVA calibration should be checked twice daily. The concentration should read to within 10 percent of the actual concentration. If not, the filters should be cleaned, the sample line should be checked for air leaks, and the calibration should be rechecked.

Routine maintenance of the Model 128 OVA shall be performed as necessary to enable proper air flow through the instrument for combustion of the sample. Procedures for cleaning filters and sampling fixtures are given on page 15 of the instrument instruction manual. Although not specified by the manufacturer, filters shall be cleaned at least annually, when background concentrations appear to be unusually high, or when air flow through the instrument is below normal.

The OVM calibration shall be checked at least twice daily using zero air and a 100 ppm isobutylene standard.

The HNU calibration shall be checked at least twice daily using a 100 ppm isobutylene standard in an air matrix.

- B. Start the OVA, OVM, and HNU following the instructions provided with the instrument. Adjust the "Calibrate Adjust" knob on the OVA or the "Zero Set" control on the HNU to "zero out" background concentrations at the location the headspace analysis is performed. If background fluctuations make this impractical, the field technician will adjust the background as nearly as possible to an arbitrary datum, 1 ppm for example, and subtract this datum from each reading. (All readings should reflect the concentration of vapor in the headspace of the sample without including background concentrations.) The OVM should be operated in the "MAX HOLD" mode.
- C. If a sample is to be screened using a field instrument and possibly submitted for laboratory analysis, then two containers must be filled with sample collected from the same location. The first sample must be collected, labeled and cooled according to the established protocol

for the applicable analyses. The second sample, collected for headspace measurements, shall be collected by filling one-half of a clean jar fitted with a tight-fitting, capped septum. Background concentrations in the jars shall be measured at the start of the job to verify that jars are free of vapors.

- D. Once collected and sealed, the headspace samples shall be agitated to break the soil clods and release the vapors, unless the soil is moist and cohesive. Headspace samples in containers sealed with aluminum foil shall first be capped to allow agitation without damage to the foil seal. Foil seals shall be left in place during warming and shall not be pierced until the headspace is analyzed.
- E. Headspace samples must be allowed to equilibrate prior to analysis. Minimum equilibration times are dependent upon ambient air temperature and shall conform to the following specifications:

<u>Ambient Air Temp.</u>	Min. Equilibration Time
<40°F	40 min.
41° - 55°	20 min.
56° - 69°	10 min.
>70°	5 min.

During equilibration, the jar should be placed in a warm place but out of direct sunlight. Equilibration times can be reduced to ten minutes if samples are placed in a 70° water bath.

- F. Measure the vapor concentration by puncturing the aluminum foil with the field instrument probe and inserting the probe half-way between the foil and soil surface. Record the highest reading observed on the instrument, less the background concentration.
- G. Minimum requirements for documenting organic vapor field screening are as follows:
 - 1. Record weather conditions, including outside temperature, temperature where samples are stored during equilibration, and general weather conditions (i.e., sunny, partly cloudy, light rain, windy, blizzard, etc.).
 - 2. Record instrument data, including make and model, date of last factory calibration, type of calibration gas and concentration used to check calibration, date and time of last field calibration, lamp energy in Ev, instrument gain setting (if applicable), erratic readings (if applicable), and field repairs (if applicable).
 - 3. Record field observations for each sample, including maximum concentration of each sample, relative moisture, noticeable odors, stains, and instrument quenching.
- References: Attachment 2, "Closure Assessments for Underground Storage Tanks," WDNR, September 1990, and ILHR 10, May 1991.

Leaking Underground Storage Tank (LUST) and Petroleum Analytical and Quality Assurance Guidance, WDNR, July 1993.

APPENDIX F

SOIL SAMPLING AND PRESERVATION PROCEDURES

SOIL SAMPLING AND PRESERVATION PROCEDURES (Rev. 8/94)

The following procedures conform to Wisconsin Department of Natural Resources' July 1993 Leaking Underground Storage Tank (LUST) and Petroleum Analytical and Quality Assurance Guidance, and Release News, Vol. 4, No. 3, July 1994.

- I. For soils sampled for:
 - Percent solids
 - Lead
 - Cadmium
 - Polynuclear aromatic hydrocarbons (PAHs)
 - Sieve analysis
 - Bioremediation
 - Polychlorinated biphenyls (PCBs)
 - Dry bulk density

Soil samples are to be placed on ice, but do not need to be field preserved with methanol. The soil sample collection procedure for these analyses is as follows, using one jar per analysis:

- 1. A soil sample is transferred from the sampling tool (i.e., split-spoon or backhoe bucket) into an appropriate, clean, laboratory-supplied jar.
- 2. The soil is packed into the jar with a nitrile-gloved hand to minimize headspace. However, if there is not enough soil for all required analyses, an attempt will be made to place as much soil as possible into the jars for other analyses.
- 3. The jar is sealed with a teflon-lined, screw cap.
- 4. The sample is placed in a cooler with ice.
- 5. The procedure is repeated until samples are collected for all required analyses.
- 6. Field personnel will decide which samples are to be laboratory analyzed based upon field instrument readings and other field observations, such as petroleum odor and soil staining. Only the samples that will be laboratory analyzed are left in the cooler. All other samples are discarded.

II. For soil samples collected for:

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- Volatile organic compound (VOCs)
- Petroleum volatile organic compound (PVOCs)
- Diesel range organic (DRO)
- Gasoline range organic (GRO)
- GRO/PVOCs

Soil will be transferred from the sampling tool into clean, laboratory-supplied jars by the following soil sampling procedure, using two jars per analysis:

- 1. The brass tube is capped on both ends, labeled, and placed in a cooler with ice.
- 2. Within two hours of sample collection, the field personnel will decide which samples are to be laboratory analyzed. This decision is based upon field instrument readings and other field observations, such as petroleum odor and soil staining. Only the samples that will be laboratory analyzed are extracted and placed in jars. All other samples are discarded.
- 3. The soil is quickly extracted from the brass tube using a nitrile-gloved hand, syringe, or spatula, and placed into a pre-tared sample jar.
- 4. Approximately 25 grams of soil will be added to the jar.
- 5. The laboratory-analyzed DRO soil samples do not need to be field-preserved. The laboratory preserves the DRO sample within the DNR-required time frame. The GRO, GRO/PVOC, and VOC soil samples must be field-preserved when the decision is made to have the sample laboratory analyzed. The procedure is as follows:
 - The proper amount (25 ml) of purge-and-trap grade methanol is transferred into the jars containing the soil samples. A 1:1 ratio of grams of soil to mls of methanol is required.
 - The jars are capped with a Teflon-lined septum, screw cap and the contents are agitated to coat the soil particles with methanol.
 - The jars are placed in the cooler with ice.

A Percent Solids analysis must always accompany GRO, DRO, GRO/PVOC, VOC and PVOC analyses.

All soil samples remain in a cooler with ice until transported to a laboratory.

APPENDIX G

SITE SAFETY PLAN

Site Safety Plan

Quearm Oil Leaking Underground Storage Tank (LUST) Site 105 W. 6th Street Ashland, Wisconsin

MSA Project No. 212365 DNR File No. 975

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IV.	HAZARD EVALUATION F-1
V.	PROCEDURES F-3
VI.	CONTINGENCY PLAN F-5
VI	. CERTIFICATION

I. GENERAL INFORMATION

CLIENT: PROJECT MANAGER: SITE NAME: PURPOSE OF FIELD VISIT(S): DATE OF VISIT(S): OVERALL HAZARD SUMMARY:

Quearm Oil Company Tim Melka Quearm Oil Company LUST Site Soil and Groundwater Investigation January 1995 through July 1996 Low

II. SITE CHARACTERISTICS

FACILITY DESCRIPTION: Site is a convenience store with retail unleaded and leaded gasoline sales. See Work Plan for additional details and site map.

<u>SITE STATUS</u>: A product release to the subsurface was identified during the removal of two 1,000 gallon underground storage tanks on November 14, 1995.

<u>HISTORY:</u> The site has been historically used as a retail petroleum product distribution facility.

III. WASTE CHARACTERISTICS

<u>WASTE TYPE(S):</u> Gasoline impacted soil

<u>CHARACTERISTICS(S):</u> Potentially ignitable and toxic

IV. HAZARD EVALUATION

CHEMICAL HAZARDS:

Petroleum fuels are comprised mainly of aromatic and aliphatic hydrocarbons. The toxic effects of the chemical hazards that could be encountered during work activities are listed below:

• <u>Benzene</u> is highly flammable with a strong pleasant odor. The low boiling point and high vapor pressure of benzene causes rapid evaporation of vapors that are three times heavier than air. Benzene exposure is known to be associated with bone marrow malignancies, blood abnormalities (aplastic anemia, an often fatal blood disease), and leukemia in animal studies and in occupationally exposed workers. Benzene has also been associated with damage of genetic material resulting in chromosomal aberrations. Symptoms of overexposure to benzene through inhalation include irritation of the eyes, nose, and respiratory system. Continued exposure could result in headache, nausea,

staggered gait, and fatigue. Benzene can usually be detected by the nose at 2 ppm; however, this is above the OSHA PEL of 1 ppm.

- <u>Ethylbenzene</u> is a colorless, flammable liquid that has a pungent odor. The vapors are heavier than air and could be an explosion hazard near the ground. It is absorbed only slightly through the skin, but its vapors are readily absorbed through inhalation. At lower concentrations it is an irritant to the respiratory tract, and at higher concentrations (considerably above the TLV) it may cause central nervous system effects.
- <u>Toluene</u> is closely related to benzene, without the toxic properties to blood. It has a sweet, pungent odor like that of benzene, is heavier than air, but volatilizes rapidly. It can be smelled at 2 ppm in the air. It is absorbed into the body through inhalation, ingestion, and dermal contact. It causes irritation to the skin on contact and may result in dermatitis. Inhalation of high concentrations (600 ppm) can result in nausea, laziness, drowsiness, and impaired balance. The OSHA PEL is 200 ppm and the ACGIH TLV is 100 ppm.
- <u>Xylene</u> is approximately the same weight as air. Its odor is detectable in air at low concentrations, about 0.5 ppm and in water at about 2 ppm. Inhalation of high concentrations can result in flushing and reddening of the face and a feeling of increased body heat, disturbed vision, dizziness, salivation, etc. Inhalation of lower concentrations of vapors will result in respiratory tract irritation. The OSHA PEL is 100 ppm as is the ACGIH TLV, although ACGIH has specified skin as the primary route of absorption.

PHYSICAL HAZARDS:

- <u>Heat/Cold Stress</u> may cause health-related problems. A combination of rain and temperatures below 55°F can promote hypothermia and requires warm-up breaks to prevent fatigue and inattention. Temperatures above 70°F require heat stress prevention because protective clothing promotes heat stress.
- <u>Slips, Trips and Falls</u> are common problems around construction sites. Be alert for potential accidents. Keep the work site organized.

HAZARDS POSED BY SITE ACTIVITIES:

- <u>Drilling</u> poses safety hazards to personnel in the immediate vicinity of the drill rig. Hazards include falling objects and rotating equipment. The driller is responsible for safety around the drill rig during drilling activities.
- <u>Excavations</u> pose hazards from collapse and burial, and from safety hazards associated with the operation of heavy equipment.

V. PROCEDURES

PROJECT TEAM: Brian Hegge, Jim Small, Amy Nebel, John Sager

LEVEL OF PROTECTION: D

<u>LEVEL D</u>: Hard hats and steel toe shoes or boots when in the vicinity of operating drilling rig or backhoe. Waterproof gloves and coveralls (either disposable or washable) when collecting soil or groundwater samples.

<u>LEVEL C:</u> Add full face piece APR with cartridges for protection against organic vapors, acid gases, dusts, fumes, and mists (MSA-GMC-H). Use nose cup in cold climate.

<u>AMBIENT AIR MONITORING</u>: Carefully inspect and calibrate, if required, each piece of monitoring equipment prior to work start-up. Failure of any of the equipment listed below to work properly must be reported to Project Manager immediately.

• <u>OVA/OVM</u>: Check calibration prior to each day's activities according to manufacturer's instructions. Record calibration in site notebook. Measure headspace organic vapor concentrations for each soil or water sample using standard procedure. Measure ambient air for organic vapors during drilling, excavating, and sampling at least twice per hour and when odors are detected. Record all measurements on appropriate field log.

Action Level: Sustained reading of 1 ppm to 5 ppm above background in the breathing zone for five minutes.

Action: Upgrade to Level C if qualified staff and equipment are available or evacuate work area until levels subside to below 1 ppm. Attempt to adjust work to avoid elevated vapors in the breathing zone (i.e. work upwind of contamination, obtain blowers, move contaminated stockpiles, etc.). Stop work and evacuate work area if Level C personnel not available and not possible to adjust environment work environment. Inform project manager.

Action Level: Greater than 5 ppm above background for 5 minutes.

Action: Evacuate work area until levels subside to below 1 ppm above background. Adjust work area if possible to reduce breathing zone concentrations. Stop work and evacuate work area if not possible to reduce concentrations to acceptable levels. Inform project manager.

Action Level: Greater than 100 ppm above background for 5 minutes.

Action: Evacuate work area. Re-evaluate work task and implement control measure that reduce exposures to below 100 ppm. Do not work in concentrations exceeding 100 ppm in Level B without authorization from plan approver.

SITE ENTRY (to be done at any time prior to starting work)

- Locate nearest available telephone.
- Notify fire department if work includes tank removal.
- Locate nearest emergency medical facility.

WORK LIMITATIONS

- Daylight hours only for on-site work unless adequate lighting is provided.
- No eating, drinking, or smoking in the work area.
- All respirator wearers must be fit tested and medically certified to wear respirators with the past 12 months.
- Avoid handling, kneeling in, or walking through areas of obvious contamination.
- Stop work during electrical storms or heavy rainfall (typically, this decision is left to the subcontractor when site activities include drilling and excavating).
- Control dust emissions by wetting the soil with water, as necessary.

DECONTAMINATION PROCEDURES

<u>Personnel:</u> Remove dirty coveralls, remove mud and dirt from boots, remove and/or wash gloves. Wash hands.

<u>Samples:</u> Remove all mud or dirt from the outside of sample containers and rinse in clear water prior to packaging containers for delivery to the laboratory.

<u>Sampling Equipment:</u> Equipment shall be cleaned and decontaminated according to the procedures in the Work Plan.

VI. CONTINGENCY PLAN

If an injury occurs, take the following steps:

- Take necessary actions to prevent further injury.
- Initiate first aid and get medical attention for the injured immediately.
- Notify the Health and Safety Manager (Olson).
- Notify the injured person's personnel office.
- Prepare an incident report.

If a chemical release, fire, or explosion occurs, take the following steps:

- Evacuate area.
- If possible without risking injury, stop the release.
- Notify the fire department. Give location, details, do not hang up until directed to do so.

EMERGENCY PHONE NUMBERS:

Ambulance Rescue Squad:	911 or (715) 682-7050
Hospital:	Memorial Medical Center, Ashland, Wisconsin General Information (715) 682-4563
Poison Control Center:	(608) 262-3702
Sheriff:	Ashland County Sheriff (715) 682-7023
Police:	911 or (715) 682-7062
Fire:	911 or (715) 682-7050
Diggers Hotline:	(800) 242-8511
Electric Company:	Northern States Power Company (715) 682-6969
Gas Company:	Northern States Power Company (715)682-6969 After Hours Gas Emergency (800) 446-2868
Water Company:	Ashland Water Utility (715) 682-7056 24 Hour Emergency Repair (715)682-7054 Ashland Waste Water Treatment Plant (715) 682-7058
MSA Health and Safety Manager:	Kevin Olson (800) 362-4505 (Work) (608) 356-2771 (Work) (608) 356-8992 (Home)
Medical Clinic:	Dean Medical Center 1313 Fish Hatchery Road Madison, Wisconsin 53715
Occupational Physician:	Dr. Alison S. Wilmeth (608) 252-8003 (Work) (608) 845-8458 (Home)
Personnel Office:	Wayne Gilmour (608) 356-2771 (Work) (800) 362-4505 (Work)

VII. CERTIFICATION

This site safety plan has been written for the use of MSA employees, only. MSA claims no responsibility for its use by others. The plan is written for the specific site conditions, purpose, dates, and personnel specified and must be amended if these conditions change.

PLAN PREPARED BY (signature and date)

APPROVED BY: (signature and date)

1/9/96

(Attach local map showing route to hospital.)



HOSPITAL LOCATION MAP

QUEARM OIL COMPANY, ASHLAND, WI