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January 10, 1996

Ms. Janet Kazda, Program Assistant
Wis. Dept. of Natural Resources
107 Sutcliffe Avenue
P. O. Box 818
Rhineland, WI 54501

Re: Quearm Oil Company, Ashland, WI
DNR UID No. 975

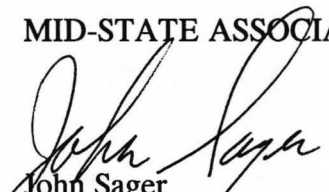
Dear Janet:

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,

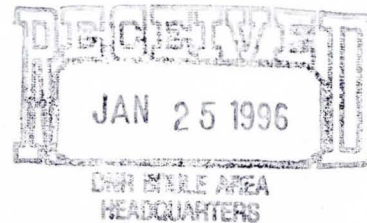
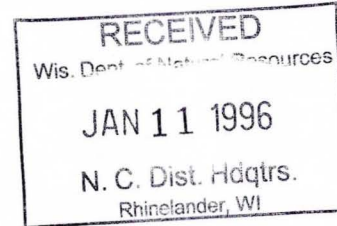
MID-STATE ASSOCIATES, INC.


John 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

M&A Project No. 212365
DNR File No. 975

Prepared For:

Quearm Oil Company
Ashland, Wisconsin 54806

Prepared By:

Mid-State Associates, Inc.
Rhineland, Wisconsin 54501



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Quearm Oil Leaking Underground Storage Tank (LUST) Site
105 W. 6th Street
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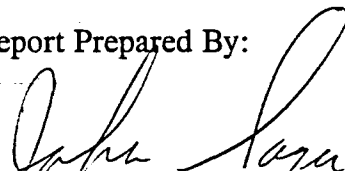
SUBMITTAL CERTIFICATION

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:



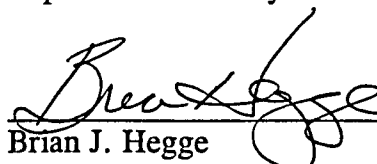
John Sager
Project Hydrogeologist

1/9/96

Date

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

Date

TABLE OF CONTENTS

	Page
PURPOSE	1
BACKGROUND INFORMATION	2
Site Description and History	3
Regional Geologic and Hydrogeologic setting	3
SCOPE OF WORK	4
Subsurface Investigation	5
Environmental Sampling and Analysis	7
QUALITY CONTROL	8
Investigative Waste Management	8
Remedial Actions Options Report and Remedial Action Plan	8
Reporting	9
REFERENCES	9

LIST OF TABLES

Table 1	Facility Description Abstract
Table 2	Water Well Survey

LIST OF FIGURES

Figure 1	Site Location Map
Figure 2	Site Layout
Figure 3	Proposed Soil Boring Locations

LIST OF APPENDICES

Appendix A	Figures
Appendix B	Tables
Appendix C	Closure Assessment Report
Appendix D	Water Well Construction Reports and Geologic Logs
Appendix E	Field Screening Procedures
Appendix F	Soil Sampling and Preservation Procedures
Appendix G	Site Safety Plan

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 $\frac{1}{4}$, SW $\frac{1}{4}$, SW $\frac{1}{4}$, 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 sediment-free 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 than 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:

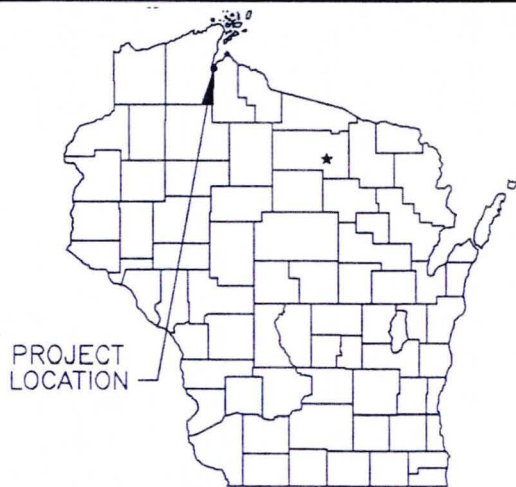
- Executive Summary
- Introduction
- Background Information
- Site Investigation Methods
- Results
- Discussion and Interpretations
 - Nature and Extent of Contamination
 - Petroleum Hydrocarbon Migration and Exposure Pathways
 - Receptors of Petroleum Hydrocarbons
- Conclusions and Recommendations
- 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



PROJECT LOCATION

2000 0 2000

SCALE IN FEET

1 INCH = 2000 FT.



Ashland West & Ashland East Quadrangle
 Wisconsin—Ashland Co.
 7.5 Minute Series (Topographic)
 NW/4 Ashland 15' Quadrangle
 Contour Interval 10 Feet

NSA

**FIGURE I
 SITE LOCATION MAP**

QUEARM OIL COMPANY, ASHLAND, WI



1835 N. Stevens
Rhineclnder, Wisconsin
54501
715-362-3244

Engineers - Architects - Planners - Surveyors - Scientists
© 1995 MID-STATE ASSOCIATES

LEGEND

- ==== CURB & GUTTER
- PIPING

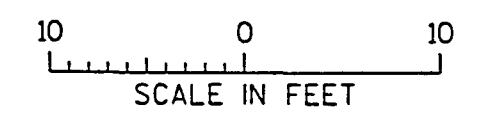
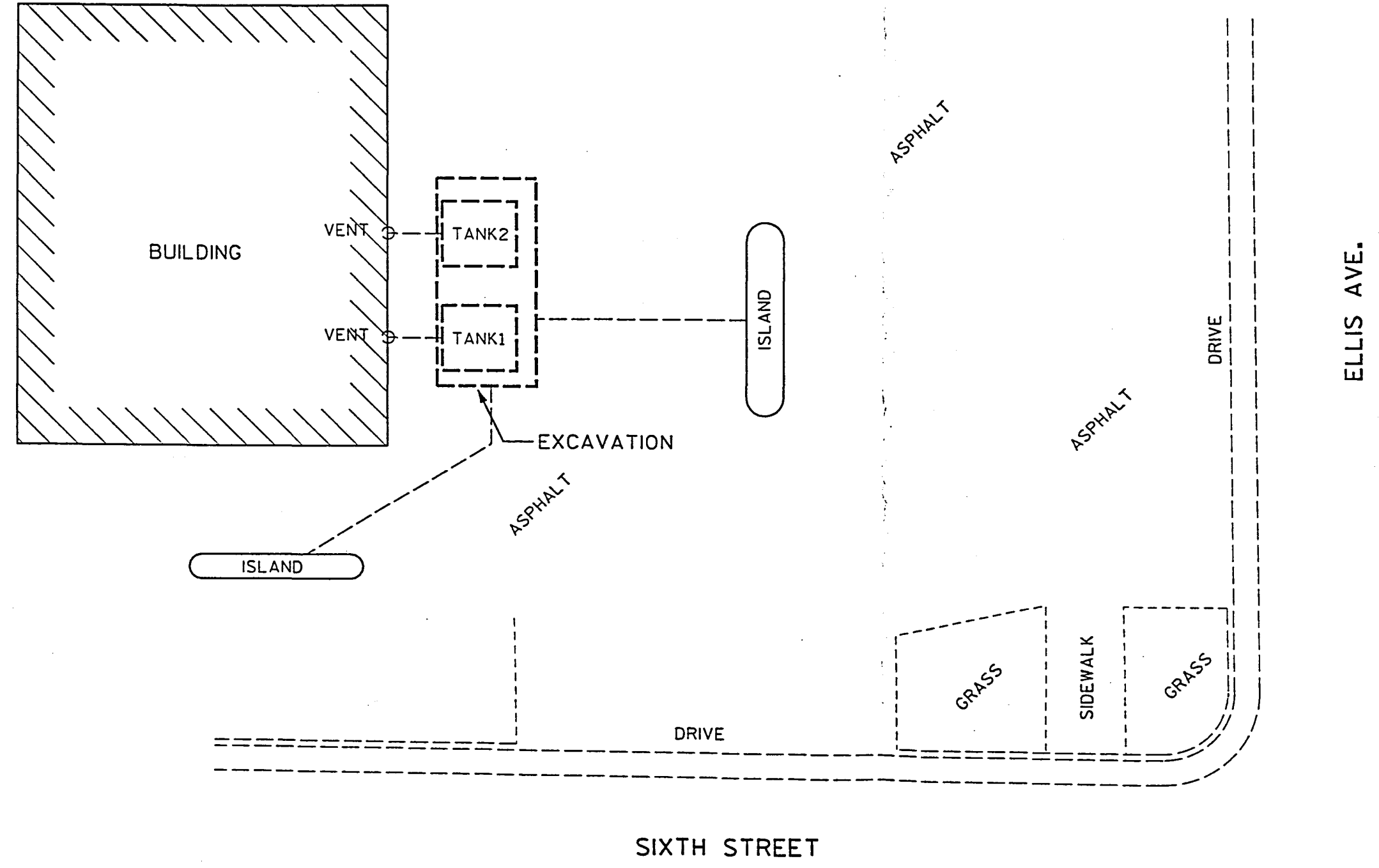
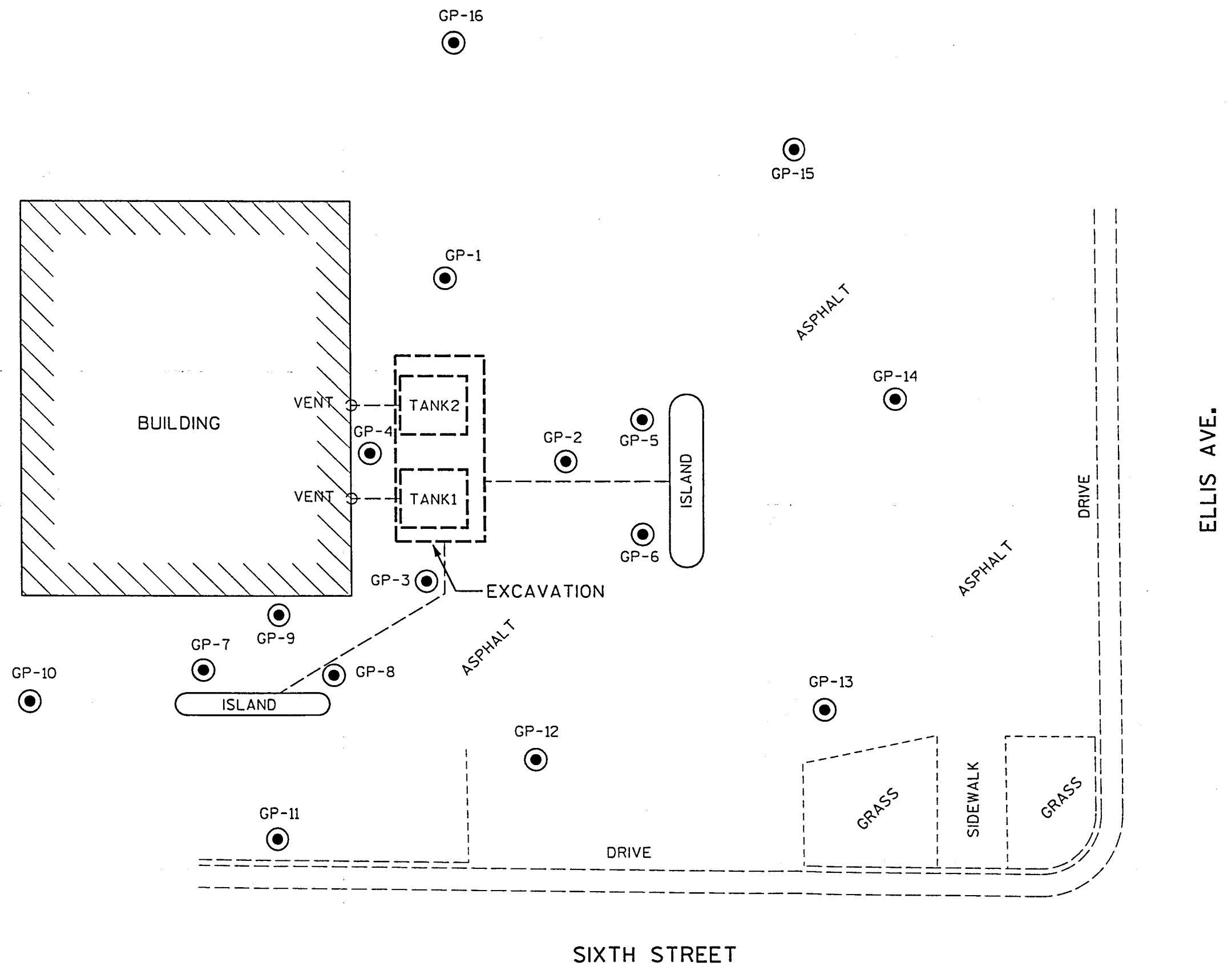


FIGURE 2
SITE LAYOUT
QUEARM OIL CO.
ASLAND, WI



LEGEND

- ==== CURB & GUTTER
 - PIPING
 - PROPOSED SOIL BORING LOCATION
- GP-14

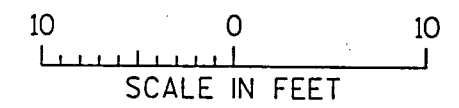
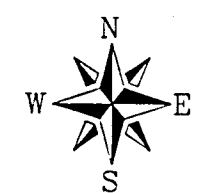


FIGURE 3
PROPOSED SOIL BORING LOCATIONS
QUEARM OIL CO.
ASLAND, WI

APPENDIX B

TABLES

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 $\frac{1}{4}$, SW $\frac{1}{4}$, SW $\frac{1}{4}$, 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	nm	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:

Quearm Oil Company
Ashland, WI 54806

Prepared By:

Mid-State Associates, Inc.
Rhineland, WI 54501

TABLE OF CONTENTS

	Page
INTRODUCTION	1
SCOPE OF SERVICES	1
PROJECT CONCERNED PARTIES	2
SITE INFORMATION	2
PROCEDURES	5
OBSERVATIONS	6
RESULTS	7
NOTIFICATION TO DEPARTMENT OF NATURAL RESOURCES	7
CONCLUSIONS AND RECOMMENDATIONS	7

LIST OF ILLUSTRATIONS

Table 1	Soil Field Screening Results
Figure 1	Site Location Map
Figure 2	Site Layout

APPENDICES

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

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.

PROJECT CONCERNED PARTIES

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

SITE INFORMATION

UST Information

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 and 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.

Groundwater

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 Company, Ashland, 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

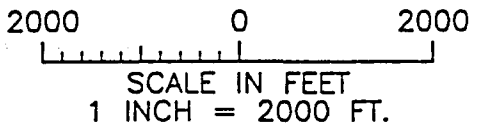
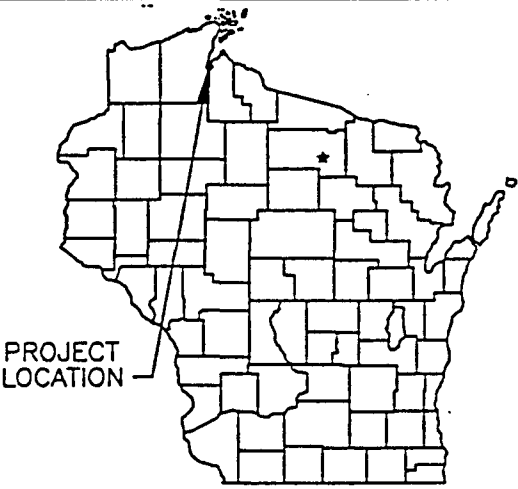
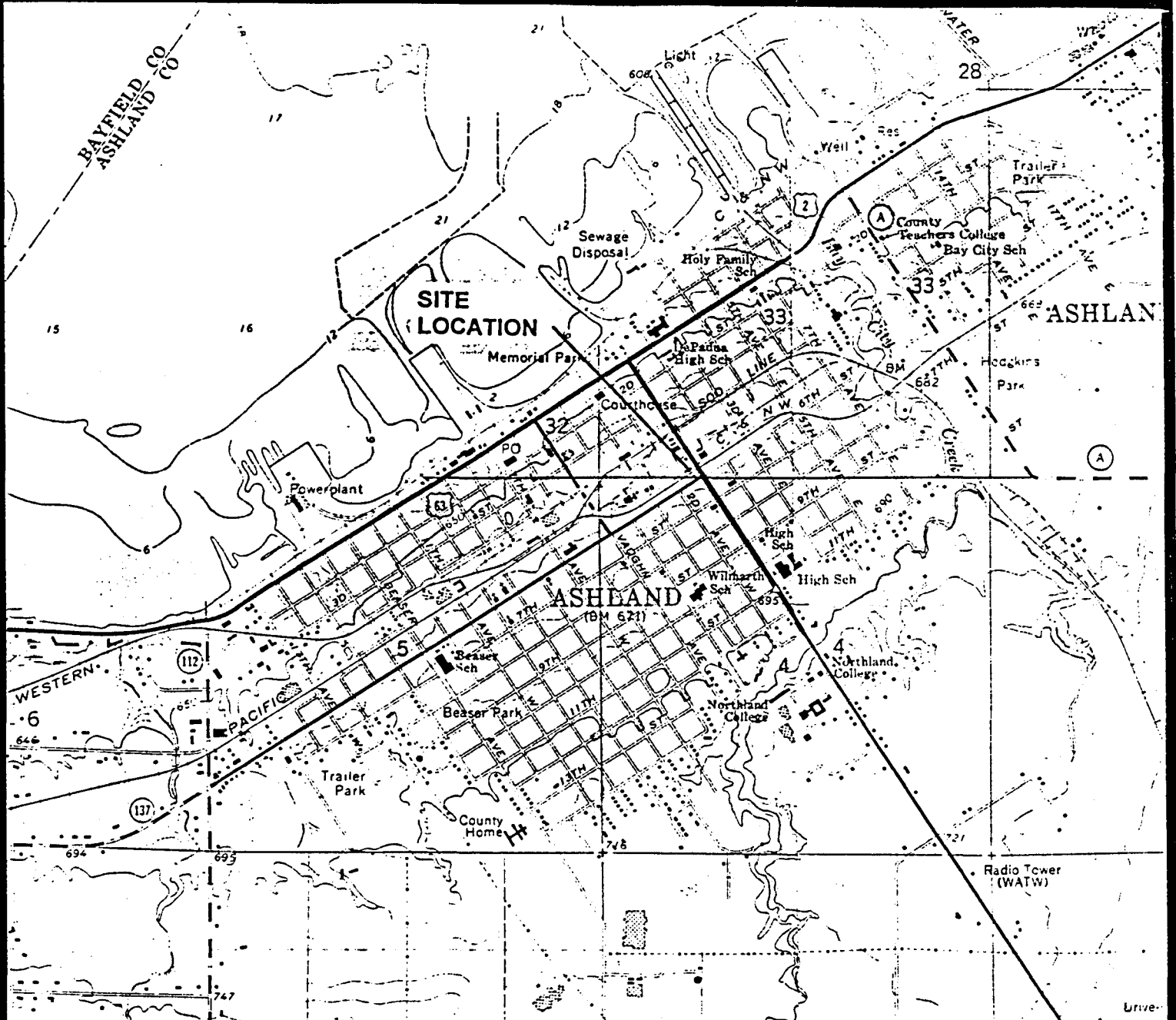
Based on the petroleum odors, soil staining, and headspace screening results, in accordance with the Wisconsin Spills Law, the WDNR was notified of the petroleum release. Mr. Chris Saari, WDNR Brule, Wisconsin, was notified of the release on November 14, 1995.

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

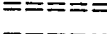
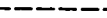


Ashland West & Ashland East Quadrangle
 Wisconsin—Ashland Co.
 7.5 Minute Series (Topographic)
 NW/4 Ashland 15' Quadrangle
 Contour Interval 10 Feet



FIGURE I
SITE LOCATION MAP
 QUEARM OIL COMPANY, ASHLAND, WI

LEGEND

- 
 CURB & GUTTER
- 
 PIPING

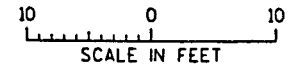
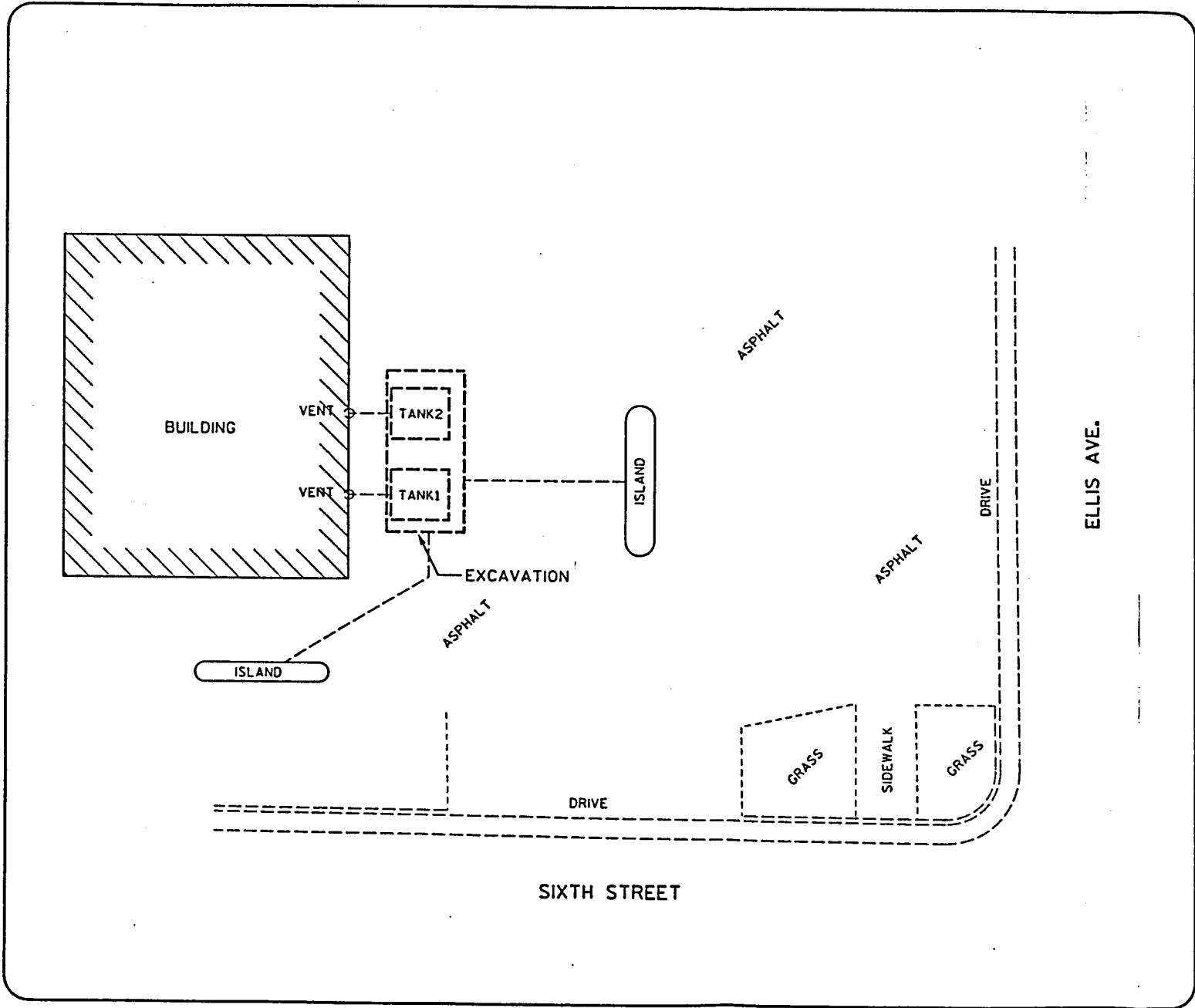


FIGURE 2
SITE LAYOUT
 QUEARM OIL CO.
 ASLAND, WI



APPENDIX B

**CHECKLIST FOR UNDERGROUND TANK CLOSURE
UNDERGROUND STORAGE TANK INVENTORY FORMS**

CHECKLIST FOR UNDERGROUND TANK CLOSURE

RETURN COMPLETED CHECKLIST TO:
Safety & Buildings Division
Fire Prevention & Underground
Storage Tank Section
P.O. Box 7969, Madison, WI, 53707

Complete one form for
each site closure.

The information you provide may be used by other
government agency programs (Privacy Law)

RECEIVED
MID-STATE ASSOCIATES

IDENTIFICATION: (Please Print) Indicate whether closure is for: Tank System Tank Only Piping Only

1. Site Name: Queen Oil 2. Owner Name: 649i Heating

Site Street Address (not P.O. Box): 105 W. 6th St. Owner Street Address: 631 East McLeod Ave NOV 17 1995

City: Ashland Village: Town of: City: Ironwood Village: Town of: State: MI Zip Code: 49738

State: WI Zip Code: 54806 County: Ashland County: Ironwood Telephone No. (include area code): (906) 932 1179

Closure Company Name (Print): Advanced Tank Service, Inc. Closure Company Street Address: P.O. Box 1072

Closure Company Telephone No. (include area code): 715 831 8484 Closure Company City, State, Zip Code: Earlville MI 54702-1072

Name of Company Performing Closure Assessment: Mid-State Associates Assessment Company Street Address, City, State, Zip Code: 1835 N. Stevens St. Plover WI 54501

Telephone # (include area code): 715 362 3244 Certified Assessor Name (Print): BRIAN HEGGER Assessor Signature: [Signature] Assessor Certification No.: 02843

Tank ID #	Closure	Temp. Closure	Closure In Place	Tank Capacity	Contents *	Closure Assessment
020100132	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1000	03	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
2. 020100137	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1000	02	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/> Y <input type="checkbox"/> N
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/> Y <input type="checkbox"/> N
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/> Y <input type="checkbox"/> N
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/> Y <input type="checkbox"/> N

Indicate which product by numeric code: 01-Diesel; 02-Leaded; 03-Unleaded; 04-Fuel Oil; 05-Gasohol; 06-Other; 09-Unknown; 10-Premix; 11-Waste oil; 13-Chemical (indicate the chemical name(s) or numbers(s)); 14-Kerosene; 15-Aviation.

Written notification was provided to the local agent 15 days in advance of closure date. Y N NA

Local permits were obtained before beginning closure. Y N NA

Check applicable box at right in response to all statements in Sections B - E.

TEMPORARILY OUT OF SERVICE

Written inspector approval of temporary closure obtained, which is effective until (provide date) _____

	Remover Verified	Inspector Verified	NA
1. Product Removed	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>
a. Product lines drained into tank (or other container) and resulting liquid removed, AND	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>
b. All product removed to bottom of suction line, OR	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>
c. All product removed to within 1" of bottom.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>
2. Fill pipe, gauge pipe, tank truck vapor recovery fittings, and vapor return lines capped.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>
3. All product lines at the islands or pumps located elsewhere are removed and capped, OR	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>
4. Dispensers/pumps left in place but locked and power disconnected.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>
5. Vent lines left open.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>
6. Inventory form filed indicating temporary closure.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>

CLOSURE BY REMOVAL

1. Product from piping drained into tank (or other container).	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Piping disconnected from tank and removed.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. All liquid and residue removed from tank using explosion proof pumps or hand pumps.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. All pump motors and suction hoses bonded to tank or otherwise grounded.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. Fill pipes, gauge pipes, vapor recovery connections, submersible pumps and other fixtures removed.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NOTE: DROP TUBE SHOULD NOT BE REMOVED IF THE TANK IS TO BE PURGED THROUGH THE USE OF AN EDUCTOR.			
6. Vent lines left connected until tanks purged.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7. Tank openings temporarily plugged so vapors exit through vent.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8. Tank atmosphere reduced to 10% of the lower flammable range (LEL) - see Section F.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9. Tank removed from excavation after PURGING/INERTING; placed on level ground and blocked to prevent movement.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10. Tank cleaned before being removed from site.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CLOSURE BY REMOVAL (continued)

Remover Verified	Inspector Verified	NA
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>
<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>

- Tank labeled in 2" high letters after removal but before being moved from site.
- Tank vent hole (1/8 th " in uppermost part of tank) installed prior to moving the tank from site.
- Inventory form filed by owner with Safety and Buildings Division indicating closure by removal.
- Site security is provided while the excavation is open.

NOTE: COMPLETE TANK LABELING SHOULD INCLUDE WARNING AGAINST REUSE; FORMER CONTENTS; VAPOR STATE; VAPOR FREEING TREATMENT; DATE.

CLOSURE IN PLACE

NOTE: CLOSURES IN PLACE ARE ONLY ALLOWED WITH THE PRIOR WRITTEN APPROVAL OF THE DEPARTMENT OF INDUSTRY, LABOR AND HUMAN RELATIONS OR 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.
- All pump motors and suction hoses bonded to tank or otherwise grounded.
- Fill pipes, gauge pipes, vapor recovery connections, submersible pumps and other fixtures removed.
- Vent lines left connected until tanks purged.
- Tank openings temporarily plugged so vapors exit through vent.
- Tank atmosphere reduced to 10% of the lower flammable range (LEL - see Section F).
- Tank properly cleaned to remove all sludge and residue.
- Solid inert material (sand, cyclone boiler slag; pea gravel recommended) introduced and tank filled.
- Vent line disconnected or removed.
- Inventory form filed by owner with Safety and Buildings Division indicating closure in place.

NOTE: DROP TUBE SHOULD NOT BE REMOVED IF THE TANK IS TO BE PURGED THROUGH THE USE OF AN EDUCTOR - EDUCTOR OUTPUT 12 FT ABOVE GRADE.

COPY

CLOSURE ASSESSMENTS

NOTE: DETERMINE IF A CLOSURE ASSESSMENT IS REQUIRED BY REFERRING TO ILHR 10.

- Individual conducting the assessment has a closure assessment plan (written) which is used as the basis for their work on the site.
 - Do points of obvious contamination exist?
 - Are there strong odors in the soils?
 - Was a field screening instrument used to pre-screen soil sample locations?
 - Was a closure assessment omitted because of obvious contamination?
 - Was the DNR notified of suspected or obvious contamination?
- Agency, office and person contacted: CHRIS SAARL, BRILL DNR
7. Contamination suspected because of: Odor Soil Staining Free Product Sheen On Groundwater Field Instrument Test

METHOD OF ACHIEVING 10% LEVEL DESCRIPTION

- Educator Or Diffused Air Blower
Eductor driven by compressed air, bonded and drop tube left in place; vapors discharged minimum of 12 feet above ground.
Diffused air blower bonded and drop tube removed. Air pressure not exceeding 5 psig.
- Dry Ice
Dry ice introduced at 1.5 pounds per 100 gallons of tank capacity. Dry ice crushed and distributed over the greatest possible tank area. Dry ice evaporated before proceeding.
- Inert Gas (CO/2 or N/2) **NOTE: INERT GASSES PRODUCE AN OXYGEN DEFICIENT ATMOSPHERE. THE TANK MAY NOT BE ENTERED IN THIS STATE WITHOUT SPECIAL EQUIPMENT**
Gas introduced through a single opening at a point near the bottom of the tank at the end of the tank opposite the vent.
Gas introduced under low pressure not to exceed 5 psig to reduce static electricity. Gas introducing device grounded.
- Tank atmosphere monitored for flammable or combustible vapor levels.
Calibrate combustible gas indicator. Drop tube removed prior to checking atmosphere. Tank space monitored at bottom, middle and upper portion of tank. Readings of 10% or less of the lower flammable range (LEL) obtained before removing tank from ground.

NOTE SPECIFIC PROBLEMS OR NONCOMPLIANCE ISSUES BELOW

REMOVER/CLEANER INFORMATION

Scott Law Remover Name (print) Scott Law Remover Signature 04686 Remover Certification No. 11/14/95 Date Signed

INSPECTOR INFORMATION

Thomas Eckhart Inspector Name (print) Thomas Eckhart Inspector Signature 00316 Inspector Certification No.
02011 Ashland FDID # For Location Where Inspection Performed 715-682-7052 Inspector Telephone Number 11-14-95 Date Signed

UNDERGROUND
PETROLEUM PRODUCT
TANK INVENTORY

Send Completed Form To:
Safety & Buildings Division
P.O. Box 7969
Madison, WI 53707
Telephone: (608) 267-5280

For Office Use Only:

Tank ID # 020100132

Information Required By Sec. 102.147, Wis. Stats.

Underground tanks in Wisconsin that have stored or currently store petroleum or regulated substances must be registered. Please see the reverse side for additional information on this program. An underground storage tank is defined as any tank with at least 10 percent of its total volume (included piping) located below ground level. A separate form is needed for each tank. Send each completed form to the agency designated in the top right corner. Have you previously registered this tank by submitting a form? YES NO If yes, are you correcting/updating information only? Yes No The information you provide may be used by other government agency programs [Privacy Law, s. 15.04 (1) (m)].

This registration applies to a tank that is (check one):			Fire Department Providing Fire Coverage Where Tank Located:
1. <input type="checkbox"/> In Use or 1B. <input type="checkbox"/> Newly Installed	4. <input checked="" type="checkbox"/> Closed - Tank Removed	8. <input type="checkbox"/> Changed Ownership	<u>Ashland</u>
2. <input type="checkbox"/> Abandoned With Product	6. <input type="checkbox"/> Closed - Filled With Inert Material	(Indicate new owner below)	
3. <input type="checkbox"/> Abandoned No Product (empty) or With Water	7. <input type="checkbox"/> Out of Service - Provide Date: _____		

A. IDENTIFICATION: (Please Print)

1. Tank Site Name Queen Oil Site Address 105 W. 6th Street Site Telephone No. _____

City Ashland Village Town of: _____ State WI Zip Code 54806 County Ashland

2. Owner Name (mail sent here unless indicated otherwise in #3 below) Eugi Heating Owner Mailing Address (mail sent here unless indicated otherwise in #3) 631 East McLeod Ave

City Ironwood Village Town of: _____ State MI Zip Code 49938 County _____

3. Alternate Mailing Name If Different Than #2 _____ Alternate Mailing Street Address If Different From #2 _____

City Village Town of: _____ State _____ Zip Code _____ County _____

4. Tank Age (date installed, if known: or years old) _____ 5. Tank Capacity (gallons) 1000 6. Tank Manufacturer's Name (if known) _____

TYPE OF USER (check one):

1. Gas Station 2. Bulk Storage 3. Utility 4. Mercantile

5. Industrial 6. Government 7. School 8. Residential

9. Agricultural 10. Other (specify): _____

TANK CONSTRUCTION:

1. Bare Steel 2. Cathodically Protected and Coated Steel (A. Sacrificial Anodes or B. Impressed Current)

3. Coated Steel 4. Fiberglass 5. Other (specify): _____

6. Relined - Date _____ 7. Steel - Fiberglass Reinforced Plastic Composite 9. Unknown

Approval: 1. Nat'l Std. 2. UL 3. Other: _____

Is Tank Double Walled? Yes No

Spill Containment? Yes No

Tank leak detection method: 1. Automatic tank gauging 2. Vapor monitoring 3. Groundwater monitoring 4. Inventory control and tightness testing 5. Interstitial monitoring 6. Not required at present 7. Manual Tank Gauging (only for tanks of 1,000 gallons or less)

PIPING CONSTRUCTION

1. Bare Steel 2. Cathodically Protected and Coated or Wrapped Steel (A. Sacrificial Anodes or B. Impressed Current) 3. Coated Steel

4. Fiberglass 5. Other (specify): _____ 9. Unknown

Piping System Type: 1. Pressurized piping with: A. auto shutoff; B. alarm; or C. flow restrictor 2. Suction piping with check valve at tank

3. Suction piping with check valve at pump and inspectable

Piping leak detection method: used if pressurized or check valve at tank: 1. Vapor monitoring 2. Interstitial monitoring

3. Groundwater monitoring 4. Tightness testing 5. Line Leak Detector 6. Not Required

Approval: 1. Nat'l Std 2. UL 3. Other: _____ Double Walled: Yes No

TANK CONTENTS

1. Diesel 2. Leaded 3. Unleaded 4. Fuel Oil

5. Gasohol 6. Other 7. Empty 8. Sand/Gravel/Slurry

Unknown 10. Premix 11. Waste Oil 12. Propane

Chemical * _____ 14. Kerosene 15. Aviation

If # 13 is checked, indicate the chemical name(s) or number(s) of the chemical or waste.

Tank Closed, Give Date (mo/day/yr): 11/14/95 Has a site assessment been completed? (see reverse side for details) Yes No

If installation of a new tank is being reported, indicate who performed the installation inspection:

Fire Department 2. DILHR 3. Other (identify) _____

Name of Owner or Operator (please print): Eugi Heating Indicate Whether: Owner or Operator

Signature of Owner or Operator: [Signature] Date Signed: 11/14/95

UNDERGROUND
PETROLEUM PRODUCT
TANK INVENTORY

Send Completed Form To:
Safety & Buildings Division
P.O. Box 7969
Madison, WI 53707
Telephone: (608) 267-5280

For Office Use Only:

Tank ID # 020100137

Information Required By Sec. 102.142, Wis. Stats.

COPY

Underground tanks in Wisconsin that have stored or currently store petroleum or regulated substances must be registered. Please see the reverse side for additional information on this program. An underground storage tank is defined as any tank with at least 10 percent of its total volume (included piping) located below ground level. A separate form is needed for each tank. Send each completed form to the agency designated in the top right corner. Have you previously registered this tank by submitting a form? YES NO If yes, are you correcting/updating information only? Yes No The information you provide may be used by other government agency programs [Privacy Law, s. 15.04 (1) (m)].

This registration applies to a tank that is (check one):			Fire Department Providing Fire Coverage Where Tank Located:	
1. <input type="checkbox"/> In Use or	1B. <input type="checkbox"/> Newly Installed	4. <input checked="" type="checkbox"/> Closed - Tank Removed	8. <input type="checkbox"/> Changed Ownership	<u>Ashland</u>
2. <input type="checkbox"/> Abandoned With Product	6. <input type="checkbox"/> Closed - Filled With Inert Material	(Indicate new owner below)		
3. <input type="checkbox"/> Abandoned No Product (empty) or With Water	7. <input type="checkbox"/> Out of Service - Provide Date: _____			

A. IDENTIFICATION: (Please Print)

1. Tank Site Name Queam Oil Site Address 105 W. 63 Street Site Telephone No. _____

City Ashland Village Town of: _____ State WI Zip Code 54806 County Ashland

2. Owner Name (mail sent here unless indicated otherwise in #3 below) Cygnis Heating Owner Mailing Address (mail sent here unless indicated otherwise in #3) 631 E. McLeod Ave

City Therwil Village Town of: _____ State WI Zip Code 49938 County _____

3. Alternate Mailing Name If Different Than #2 _____ Alternate Mailing Street Address If Different From #2 _____

City _____ Village Town of: _____ State _____ Zip Code _____ County _____

4. Tank Age (date installed, if known: or years old) _____ 5. Tank Capacity (gallons) 1000 6. Tank Manufacturer's Name (if known) _____

B. TYPE OF USER (check one):

5. Gas Station 2. Bulk Storage 3. Utility 4. Mercantile

6. Industrial 7. Government 8. Residential

9. Agricultural 10. Other (specify): _____

C. TANK CONSTRUCTION:

1. Bare Steel 2. Cathodically Protected and Coated Steel (A. Sacrificial Anodes or B. Impressed Current)

3. Coated Steel 4. Fiberglass 5. Other (specify): _____

6. Relined - Date _____ 7. Steel - Fiberglass Reinforced Plastic Composite 9. Unknown

Approval: 1. Nat'l Std. 2. UL 3. Other: _____

Is Tank Double Walled? Yes No

Spill Containment? Yes No

Tank leak detection method: 1. Automatic tank gauging 2. Vapor monitoring 3. Groundwater monitoring 4. Inventory control and tightness testing 5. Interstitial monitoring 6. Not required at present 7. Manual Tank Gauging (only for tanks of 1,000 gallons or less)

D. PIPING CONSTRUCTION

1. Bare Steel 2. Cathodically Protected and Coated or Wrapped Steel (A. Sacrificial Anodes or B. Impressed Current) 3. Coated Steel

4. Fiberglass 5. Other (specify): _____ 9. Unknown

Piping System Type: 1. Pressurized piping with: A. auto shutoff; B. alarm; or C. flow restrictor 2. Suction piping with check valve at tank

3. Suction piping with check valve at pump and inspectable

Piping leak detection method: used if pressurized or check valve at tank: 1. Vapor monitoring 2. Interstitial monitoring

3. Groundwater monitoring 4. Tightness testing 5. Line Leak Detector 6. Not Required

Approval: 1. Nat'l Std. 2. UL 3. Other: _____ Double Walled: Yes No

E. TANK CONTENTS

1. Diesel 2. Leaded 3. Unleaded 4. Fuel Oil

5. Gasohol 6. Other 7. Empty 8. Sand/Gravel/Slurry

9. Unknown 10. Premix 11. Waste Oil 12. Propane

13. Chemical * _____ 14. Kerosene 15. Aviation

* If # 13 is checked, indicate the chemical name(s) or number(s) of the chemical or waste.

If Tank Closed, Give Date (mo/day/yr): 11/14/95 Has a site assessment been completed? (see reverse side for details) Yes No

If Installation of a new tank is being reported, indicate who performed the installation inspection:

Fire Department 2. DILHR 3. Other (identify) _____

Name of Owner or Operator (please print): Cygnis Heating Indicate Whether: Owner or Operator

Signature of Owner or Operator: Scott Jan for Owner Date Signed: 11/14/95

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.

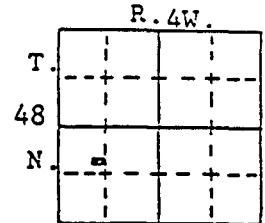
APPENDIX D

**WATER WELL CONSTRUCTION REPORTS
AND GEOLOGIC LOGS**

Well name Wisconsin Bell, Inc. Well #1
 City of Ashland
 Owner.... Wisconsin Bell, Inc.
 Address.. 220 East 2nd Street
 Ashland, WI 54806
 Driller.. Robert T. Melin
 Engineer.

County: Ashland

Completed... 3/28/85
 Field check.
 Altitude.... 655' ETM
 Use..... Cooling
 Static w.l.. 33'
 Spec. cap... 7 GPM/ft



Location: N½, SE½, SE½, NW½, SW½, sec. 33, T48N, R4W Quad. Ashland West 7½'

Drill Hole						Casing & Liner Pipe or Curbing							
Dia.	from	to	Dia.	from	to	Dia.	Wgt. & Kind	from	to	Dia.	Wgt. & Kind	from	to
12"	0	128'				6"	New black - steel T & C 20 lbs per foot ASTM-A-120 USS-			6"	10 slot Johnson ss screen	123'	128'
								+1'	123'				

Drilling method: Rotary
 Samples from 0 to 130' Rec'd: 4/15/85

Grout	from	to
Cement	0	123'

Studied by: Kathleen Massie-Ferch

Issued: 8/24/88

Formations: Miller Creek Formation, Copper Falls Formation.

Remarks: Well tested for 2 hours at 50 GPM with 7 feet of drawdown.
 Driller reports total well depth of 128'.
 Well is located on the southern corner of the intersection of East 2nd Street and Third Avenue East.

LOG OF WELL:

	Depths	Graphic Section	Rock Type	Color	Grain Size		Miscellaneous Characteristics
					Mode	Range	
M.	0-5		Clay	Red to gray	—	—	Dolc. (The slaty qvr cls are more calcus), Mch qvl(Gran/M c
C.	5-10		"	Red	—	—	Dolomitic. Much gravel(Gran/S peb), sand, silt. \ snd, s
15'	10-15		"	"	—	—	Same.
	15-20		Clay & sand	"	M/C	Vfn/VC	Dolomitic(clay). Much gravel(Gran/M peb), silt.
	20-25		"	"	"	"	Same.
C	25-30		"	"	"	"	Same plus little caved red gray brown clay(0-5')
O	30-35		"	Red brown	"	"	Dolomitic(clay). Much gravel(Gran/M oeb), silt.
P	35-40		"	"	"	"	Same.
P	40-45		"	"	"	"	"
E	45-50		"	"	M&VC	"	Same but gravel(Gran/L peb).
R	50-55		"	"	"	"	Same but gravel(Gran/M peb).
	55-60		"	"	"	"	Same but gravel(Gran/L peb).
F	60-65		Gravel	"	Gran	Gran/M peb	Quartz, feldspar, volc, gabbro, ss, trap, chert. Mch sand, silt, clay
	65-70		"	"	"	Gran/L peb	Same.
A	70-75		Clay & sand	Dk rd bn	M/C	Vfn/VC	Dolomitic(clay). Much gravel(Gran/S peb), silt.
L	75-80		Gravel	Red brown	Gran	Gran/S peb	Quartz, feldspar, volc, gabbro, ss, trap, chert. Mch sand, silt, clay
L	80-85		"	Mxd rd bn	S peb	Gran/M peb	Same.
S	85-90		"	"	"	"	Same plus iron formation.
	90-95		"	"	Gran	"	Same.
	95-100		"	"	"	"	"
	100-105		"	"	"	"	Quartz, feld, volc, Fe fm, gabbro, ss, trap, Mch sand, ltl silt, cla
F	105-110		Sand	Red brown	VC	Vfn/VC	Much gravel(Gran/M peb). Little silt, clay.
	110-115		"	"	C	"	Same.
M.	115-120		"	"	"	"	"
	120-125		"	"	"	"	Little gravel(Gran/S peb), silt, clay.
115'	125-130		"	"	"	"	Same.

END OF LOG

WELL CONSTRUCTOR'S REPORT TO WISCONSIN STATE BOARD OF HEALTH
See Instructions on Reverse Side

Sec 4-5
T 47
R 46J

1. County Ashtland Town Village City Ashtland
Check one and give name

2. Location Foot of 7th Ave, W Ashtland Wis
Name of street and number of premise or Section, Town and Range numbers

3. Owner or Agent Reis Coal Co
Name of individual, partnership or firm

4. Mail Address 6th ave W. Front St.
Complete address required

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: Plant

7. DRILLHOLE:

Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)
8	0	20	6	20	81

8. CASING AND LINER PIPE OR CURBING:

Dia. (in.)	Kind and Weight	From (ft.)	To (ft.)
8	Standard Weight	0	81

9. GROUT:

Kind	From (ft.)	To (ft.)
Clay Slurry	0	20

11. MISCELLANEOUS DATA:

Yield test: Flowing Hrs. at 50 GPM.
Depth from surface to water-level: above ground ft.
Water-level when pumping: No Pump ft.
Water sample was sent to the state laboratory at:
Superior City on 8-4-1948

10. FORMATIONS:

Kind	From (ft.)	To (ft.)
Red Clay	0	34
Soft yellow Clay	34	61
Hard Pan	61	75
Coarse water gravel	75	81

Construction of the well was completed on:
7-31-1948

The well is terminated 16 inches
 above, below the permanent ground surface.

Was the well disinfected upon completion?
Yes No

Was the well sealed watertight upon completion?
Yes No

Signature T.A. Melin
Registered Well Driller

1104-Front St. W. Ashtland Wis
Complete Mail Address

Rec'd _____ No. _____
Ans'd _____
Interpretation _____

10 ml 10 ml 10 ml 10 ml 10 ml
Gas—24 hrs. _____
48 hrs. _____
Confirm _____
B. Coli _____
Examiner _____

Please do not write in space below

NOTE:

White Copy - Division's Copy
 Green Copy - Driller's Copy
 Yellow Copy - Owner's Copy

MAR 17 1987

1. COUNTY ASHLAND		CHECK (✓) ONE: <input type="checkbox"/> Town <input type="checkbox"/> Village <input checked="" type="checkbox"/> City		Name ASHLAND								
2. LOCATION OR - Grid or Street No. NE 1/4 NW 1/4 AND - If available subdivision name, lot & block No. ASHLAND WIS		Section 5 Township T47N Range R4W		3. NAME <input type="checkbox"/> OWNER <input type="checkbox"/> AGENT AT TIME OF DRILLING CHECK (M/C) NORTHERN STATES POWER CO. ADDRESS 101 WEST SECOND ST. POST OFFICE ASHLAND ZIP CODE WIS 54806								
4. Distance in feet from well to nearest: (Record answer in appropriate block)		Building	Sanitary Bldg. Drain	Sanitary Bldg. Sewer	Floor Drain Connected To:	Storm Bldg. Drain	Storm Bldg.					
10		C.I. NONE Other	C.I. NONE Other	C.I. 30 Other	C.I. 30 Other	C.I. 30 Other	C.I. 30 Other					
Street Sewer		Other Sewers	Foundation Drain Connected to:	Sewage Sump	Clearwater Sump	Septic Tank	Holding Tank	Sewage Absorption Unit:	Manure Hopper or Retention or Pneumatic Tank			
NONE		Sewer	Sewage Sump	C.I. Other				Seepage Pit	Seepage Bed			
Private Pit		Pit: Nonconforming Existing	Subsurface Pumproom	Barn Gutter	Animal Barn Pen	Animal Yard	Silo With Pit	Glass Lined Storage Facility	Silo w/o Pit	Earthen Silage Storage Trench	Earthen Manure Basin	
Temporary Manure Stack or Platform		Watertight Liquid Manure Tank or Basin	Manure Pressure Pipe	Subsurface Gasoline or Oil Tank	Waste Pond or Land Disposal Unit (Specify Type)	Manure Storage Basin	Concrete Floor Only	Concrete Floor and Partial Concrete Walls	Other (Describe)			
5. Well is intended to supply water for: DEMINEALIZER FOR BOILER WATER						9. FORMATIONS						
6. DRILLHOLE						Kind						
Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)				From (ft.)	To (ft.)		
10	Surface	26	6	26	183	GRAVEL & FILL SAND			Surface	4		
						SAND			4	19		
						SOFT RED CLAY			18	94		
7. CASING, LINER, CURBING AND SCREEN						10. TYPE OF DRILLING MACHINE USED						
Dia. (in.)	Material, Weight, Specification		Mfg. & Method of Assembly		From (ft.)	To (ft.)						
6"	NEW 20 LBS FT BLACK STEEL CASING PIPE		A-120 T-6 USS		Surface	174	HARD PAN			94	139	
							WATER SAND WITH CLAY MIXED			138	150	
2" x 8'	88 SCREEN				174	183	HARD PAN			150	169	
							WATER SAND - CLEAN			163	183	
8. GROUT OR OTHER SEALING MATERIAL						<input checked="" type="checkbox"/> Cable Tool <input type="checkbox"/> Rotary-air w/drilling mud <input type="checkbox"/> Rotary-w/drilling mud <input type="checkbox"/> Rotary-hammer w/drilling mud & air <input type="checkbox"/> Rotary-hammer & air <input type="checkbox"/> Reverse Rotary <input type="checkbox"/> Jetting with <input type="checkbox"/> Air <input type="checkbox"/> Water						
Kind						From (ft.)	To (ft.)					
CLAY SLURRY						Surface	26					
11. MISCELLANEOUS DATA						Well construction completed on MARCH 7 1987						
Yield Test: 2 Hrs. at 25 GPM						Well is terminated 24 inches <input checked="" type="checkbox"/> above final grade <input type="checkbox"/> below						
Depth from surface to normal water level FLOWING @ 27 gpm						Well disinfected upon completion <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						
Depth of water level when pumping 4 Ft. Stabilized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						Well sealed watertight upon completion <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						
Water sample sent to ASHLAND WATER UTILITY laboratory on MARCH 16 1987												
Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to nearby wells, screens, seals, method of finishing the well, amount of cement used in grouting, blasting, etc., should be given on reverse side.												
Signature Robert T. Melius Registered Well Driller						Business Name and Complete Mailing Address 1318 MacArthur Ave, Ashland Wis 54806						

WELL LOG and REPORT

In this column indicate the kind of casing, liner, shoe and other accessories used.

WELL DIAGRAM
Use a red line to show casing or liner pipe. Use black for drill or borehole.

In this column state the kind of formations penetrated, their thickness in feet and if water bearing.

Record of
FINAL
Pumping test

Std. wt
wrot steel
Pipe 25#/ft.
National tube

8" drive shoe
Forged steel

8" Johnson
welded well
screen, brass.

8'-8" packer.
screen wedged

Note: When pump
installed, 16" concrete
base. Pump plate cement
grouted and bolted
into place.
Pomona turbine
pump installed
3" O.D. Droppipe.

= Screen - 8'-8"

= Mud Grout.

= Casing Pipe

	Inches	Diameter	Depth
	2 3 4 5 6 8 10 12 14 16 18		
			4'
			13
			50
			75
			87
			100
			143
			144
			150
			152
			159
			175
			180-2"
			185'
			200
			400
			800
			1200

Filling + Top Soil
4'

Red clay - 83'

Hard pan - 56'

Dirty Sand - 1'

Hard pan - 8'

Fine Sand - 7'

Hard pan - 16'

Sand water bearing 13'

Duration of test
Hours 18

Pumping rate
G.P.M. 40

Depth of pump in
well Ft. 106

Standing water-level
(from surface)
Ft. 18'

Water-level when
pumping Ft. 100'

Water. End of test.
Clear
Cloudy
Turbid

Was the well sterilized?
Yes No

To which laboratory wa
sample sent?
Superior.
Date April, May 2,

Was the well sealed o
completion?
Yes No

How high did you leave th
casing-pipe above grade?
2 ft.

Well was completed
Date May 8, 1937

Well Driller
Theodore Melis
Signature

Draw the diagram to show the
right half only

WELL CONSTRUCTION REPORT
WISCONSIN STATE BOARD OF HEALTH
WELL DRILLING DIVISION

2 ✓
 JUN 27 1939

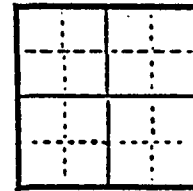
Note: Section 32 of the Wisconsin Well Drilling Sanitary Code, having the force and effect of law, provides that within thirty days after completion of every well the driller shall submit a report covering all essential details of construction to the State Board of Health on a form provided by the Board.

Owner Pioneer Creamery Co. Driller Melin Well Drilling Co.
 Street or RFD 909-7th St. West Post Office #1184 - Short St. W.
 Post Office Ashland, Wis. Date June 17-39 Permit No. 027

LOCATION OF PREMISES

Ashland Co. County Ashland Town Creamery in City of Ashland
 Describe further by subdivision, plat, district, lake, lot,
 block, nearest principal highway, etc., whichever apply.

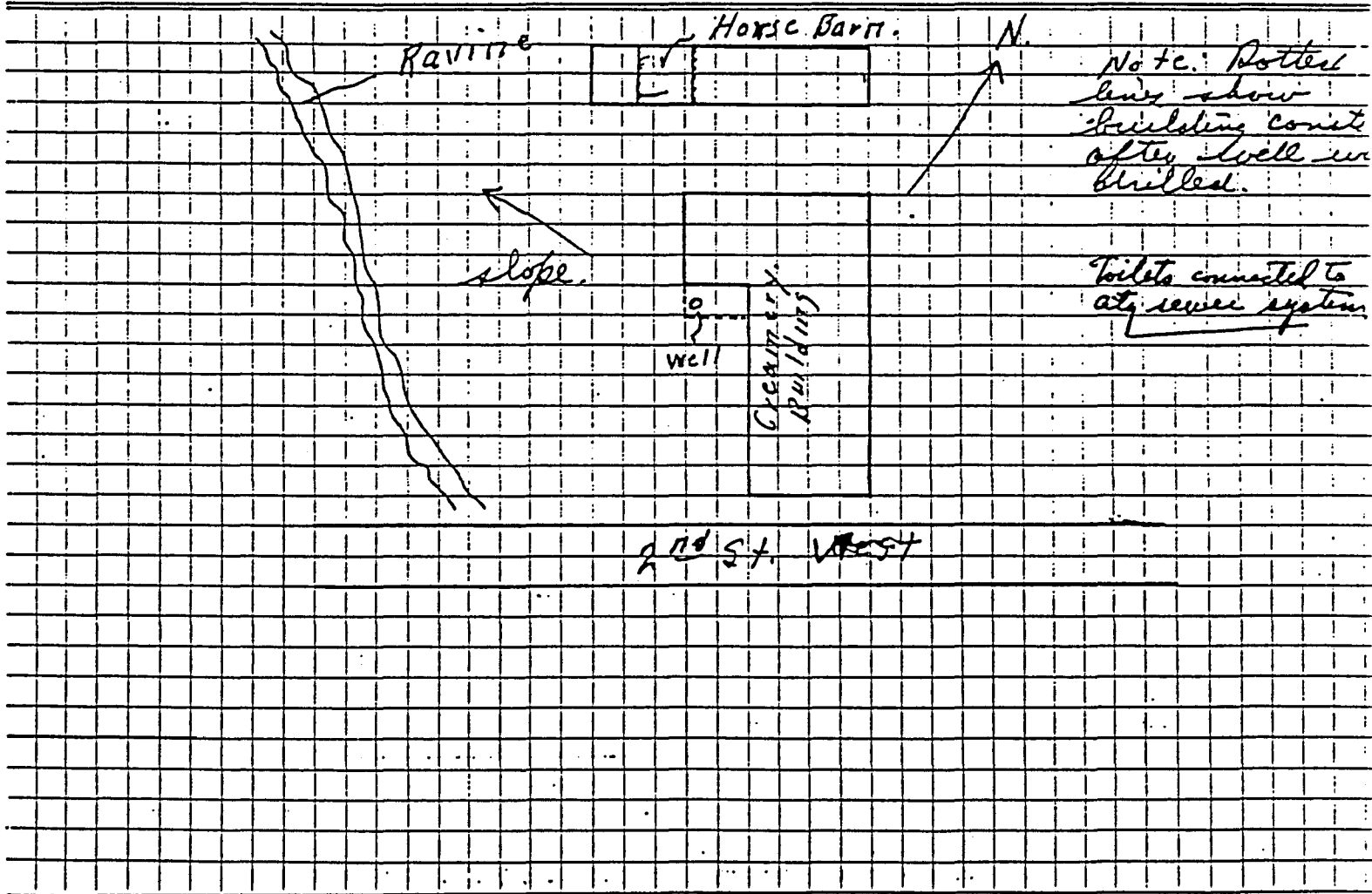
The square below represents a section of land divided into 40 acre tracts. Mark the position of the premises in the section.



Sec. NW NE 5
 Twp. 47
 Range 40 E W

DIAGRAM OF PREMISES

See discussion and illustration in Part III Well Drilling Code. In making the diagram in the space below consider 10 ft. as the distance between lines. Be sure to indicate NORTH.



WELL CONSTRUCTION REPORT
WISCONSIN STATE BOARD OF HEALTH
WELL CONSTRUCTION DIVISION

APR 10 1942

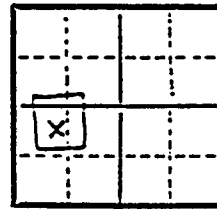
Note: Section 31 of the Wisconsin Well Construction Code, having the force and effect of law, provides that within thirty days after completion of every well the driller shall submit a report covering all essential details of construction to the State Board of Health on a form provided by the Board.

Owner St. Joseph Hospital Driller Mastrein Bros
 Street or RFD _____ Post Office Westbrook Wis.
 Post Office Ashland Wis. Date Oct Permit No. 232

Ashland

LOCATION OF PREMISES

The square below represents a section of land divided into 40 acre tracts. Mark the position of the premises in the section.



Sec. No. 33
 Twp. No. 48N
 Range 4 E W

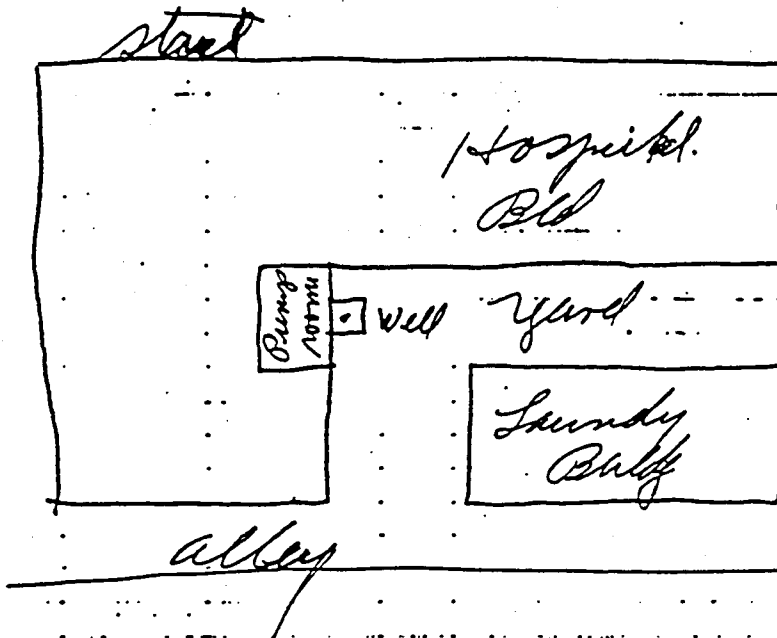
Describe further by subdivision, plat, district, lake, lot.

on 1st st

block, nearest principal highway, etc., whichever apply.

DIAGRAM OF PREMISES

See Well Construction Report bulletin. In making the diagram in the space below consider 10 ft. as the distance between lines. Be sure to indicate NORTH.



building is
 torn down
 per City
 Clerk 3/20/42

mes

WELL LOG and REPORT

For method of making report, refer to bulletin entitled "Well Construction Report." 7-5-39.

In this column indicate the kind of casing, liner, shoe and other accessories used.

WELL DIAGRAM
Use a red line to show casing or liner pipe. Use black for drill or borehole.

In this column state the kind of formations penetrated, their thickness in feet and if water bearing.

Record of
FINAL
Pumping test

	Inches Diameter																Depth
	2	3	4	5	6	8	10	12	14	16	18						
<p>1 1/2" std Drill pipe Well pipe</p>																	25
																	50
																	75
																	96
<p>tell shoe and Parker</p>																	100
<p>10' Gardner Johnson screen</p>																	119
<p>Bals in Bottom</p>																	150
																	200
																	400
																	800
																	1200

sandy clay

some Boulder
Dry sand

Clear sand

Duration of test
Hours 10

Pumping rate
G.P.M. 90

Depth of pump in well. Ft. 60

Standing water-level (from surface)
Ft. 48

Water-level when pumping Ft. 25

Water. End of test.
Clear
Cloudy
Turbid

Was the well sterilized?
Yes No

To which laboratory was sample sent?
Ashlund
Date Nov 1 - 41

Was the well sealed on completion?
Yes No

How high did you leave the casing-pipe above grade?
0 ft

Well was completed
Date Oct 29 - 41

Draw the diagram to show the right half only

Well Constructor
Martin Masten
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 in an air matrix 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>	<u>Min. Equilibration Time</u>
< 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:

- 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

TABLE OF CONTENTS

I. GENERAL INFORMATION	F-1
II. SITE CHARACTERISTICS	F-1
III. WASTE CHARACTERISTICS	F-1
IV. HAZARD EVALUATION	F-1
V. PROCEDURES	F-3
VI. CONTINGENCY PLAN	F-5
VII. CERTIFICATION	F-7

I. GENERAL INFORMATION

CLIENT: Quearm Oil Company
PROJECT MANAGER: Tim Melka
SITE NAME: Quearm Oil Company LUST Site
PURPOSE OF FIELD VISIT(S): Soil and Groundwater Investigation
DATE OF VISIT(S): January 1995 through July 1996
OVERALL HAZARD SUMMARY: 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.

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

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

III. WASTE CHARACTERISTICS

WASTE TYPE(S): Gasoline impacted soil
CHARACTERISTICS(S): 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:

- Benzene 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.

- Ethylbenzene 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.
- Toluene 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.
- Xylene 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:

- Heat/Cold Stress 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.
- Slips, Trips and Falls are common problems around construction sites. Be alert for potential accidents. Keep the work site organized.

HAZARDS POSED BY SITE ACTIVITIES:

- Drilling 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.
- Excavations 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

LEVEL D: 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.

LEVEL C: 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.

AMBIENT AIR MONITORING: 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.

- OVA/OVM: 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

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

Samples: 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.

Sampling Equipment: 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)

John Laga 1/9/96

APPROVED BY: (signature and date)

Brian Hoge 1/9/96

(Attach local map showing route to hospital.)

