EARTH BURNERS, INC.

P.O. Box 16083 Duluth, Minnesota 55816-6083 Terry Anderson 218/343-1162 (Mobile) 218/729-5229 (Home) 218/628-0454 (Office)

October 28, 1993

FILE CODY

Dale Schultz Route 3, Box 334 Dairyland, WI 54830

RE: Remedial Action Plan for the Former Underground Storage Tank at the Moose Junction Lounge in Dairyland, WI. WDNR Site # 0301

Dear Mr. Schultz,

Enclosed is a copy of the Remedial Action Plan (RAP) which was also sent to the Wisconsin Department of Natural Resources (WDNR). The report is intended to furnish data to you and the WDNR to gain approval for the RAP. If approved, ERS plans a third groundwater sampling event in November. If you have any questions concerning any aspect of this report, please call either of us at (218) 628-0248.

Sincerely,

EARTH REMEDIATION SERVICES

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Roger W. Biebl Project Hydrogeologist

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James R. Warren Staff Hydrologist

RWB:saa

Enclosure

Petroleum Contaminated Soil Specialists • We Burn The Soil Clean (Meets all Minnesota Regulations) • We Remove Petroleum Tanks

REMEDIAL ACTION PLAN

MOOSE JUNCTION LOUNGE

Prepared for:

DALE SCHULTZ ROUTE 3, PO BOX 334 DAIRYLAND, WI 54830

Prepared by:

EARTH REMEDIATION SERVICES P.O. BOX 16083 DULUTH, MN 55816 (218) 628-0248 Rect Nov1, 1993 NWD HQ

OCTOBER, 1993

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1.0 <u>INTRODUCTION</u>

Earth Remediation Services (ERS) provides this Remedial Action Plan as part of the Site Investigation Report for the Moose Junction Lounge. The present responsible party, Dale Schultz, contracted ERS to complete a Site Investigation and Remedial Our objective is to mitigate soil and Action Plan (RAP). contamination accordance with Wisconsin groundwater in quidance. ERS proposes the following RAP options as required by the WDNR to complete the Site Investigation. Design criteria and estimated costs reflect ERS's professional opinion; no warranty is expressed or implied. The site is located in the SE1/4 of the SE1/4 of the SE1/4 of section 18, Township 44N, Range 14W and is shown in Figure 1-1.

2.0 BACKGROUND INFORMATION

2.1 SITE CHRONOLOGY

The following is an abbreviated chronology of actions to date:

- O 1970 A 1,000 gallon gasoline UST is registered with the Department of Industry, Labor and Human Relations (DILHR).
- May 1980 Edward and Ceil Lyons sell the Moose Junction Site to Frank and Chris Day.
- Oct 1990 Aqua-Tech, Inc. conducted a Site Investigation for the Wisconsin Department of Transportation (WDOT).
- O Dec 1990 WDNR issues a Responsible Party Letter to Chris Day.
- Oct 1991 Dale L. Schultz begins operating business at the Moose Junction Site.
- o Feb/Sept 1992 WDNR determines that past or present possible Responsible Parties have not conducted a Site Investigation.
- o Sept 1992 WDNR issues a Notice of Violation to both Chris Day and Dale Schultz as Moose Junction is listed as the probable source of petroleum contamination.
- o Oct 1992 RMT, Inc. conducts an additional investigation for WDOT. Groundwater flow is estimated to be in a southerly direction with the highest concentration of contaminants near the Moose Junction Lounge property.



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- Oct 1992 WDNR samples a private well south of the site;
 possible hydrocarbon contamination.
- Oct 1992 Dale Schultz notifies DILHR that the Site UST has been taken out of service.
- o Nov 1992 WDNR/DILHR meet with Chris Day and Dale Schultz to inform them of an impending Administrative Order.
- o Dec 1992 Dale Schultz retains Earth Remediation Services (ERS) as an environmental consultant. Responsible Party is still in dispute.
- o Jan 1993 Terry Anderson, Manager of ERS, has teleconference with WDNR Project Manager.
- o Feb 1993 ERS complies with new PECFA regulations in receiving Consultant Certification Number 04939.
- Mar 1993 ERS drafts a workplan, visits the site, teleconferences with WDNR/DILHR/PECFA representatives, and sends out access agreements.
- April 1993 ERS revises the Site Investigation workplan to accommodate changes by the Wisconsin Department of Natural Resources (WDNR). Access Agreements to place soil boring on neighboring properties are received.
- May 1993 ERS installs soil borings and monitoring wells.
- o June 1993 Earth Burners, Inc. (EBI), a certified tank excavator/site assessor (#04174), removes a 1,000 gallon gasoline UST, pump island, associated supply pipes and grossly contaminated soils from the Moose Junction Lounge property as part of an interim action.
- July 1993 Analytical results indicate the soil is not hazardous waste allowing EBI to transport contaminated soils to their thermal treatment unit at Hallett Dock #7 in Duluth, Minnesota. 672 cubic yards of petroleum impacted soils are thermally treated.
- August 1993 ERS completes aquifer testing and a second groundwater sampling event.
- o September 1993 No contaminants are found in the potable wells at the Moose Junction Lounge and Dickman residence for both sampling events. Aquifer test data analyzed.
- o October 1993 ERS completes a Remedial Action Plan.

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2.2 Interim Excavation

On June 15, Earth Burners, Inc. excavated approximately 560 cubic yards of petroleum impacted soils and a 1,000 gallon gasoline UST, pump island, and associated supply pipes. While removing the piping, EBI found another set of supply pipes which used to service a previously removed UST. A second pump island was found approximately 10 feet north of the existing island. An additional 112 cubic yards of soil were removed as soil vapor evidence indicated the second pump island probably had a rather large petroleum release.

Contaminated soils were distinguished from clean soils using jar headspace analysis and an HNu DL-101-2 photoionization detector with a 10.2 electron volt lamp. At least one sample was analyzed for each 10 cubic yards of soil excavated. Soil vapor analysis logs are incorporated into the excavation report which can be viewed in Appendix A. ERS believes soil vapor concentrations did not match actual GRO concentrations as the lamp on the PID was constantly peaking out during testing. Soil vapors in the ambient air during part of the excavation were continuously greater than 5 ppm causing the use of respirators by field personnel. Contaminated soils were stockpiled with a sheet plastic base and cover 100 yards west of the site while waiting for analytical results. Because of the very high concentration levels of petroleum contaminants in the excavated soils, (one sample was totally saturated at 30% GRO) ERS decided thermal treatment was the only option which would economically remediate the soils. Earth Burners estimated 10,498.71 pounds of petroleum hydrocarbons were removed from the soils. The amount was calculated in accordance with Form 4400-149 'Application to Treat or Dispose of Petroleum Contaminated Soil' which is located at the end of the excavation report.

The UST was in good condition, however the supply pipes appeared to have been leaking. Pipes which led to a former tank basin and pump island also appeared to have leaked. The former tank basin on the northeast corner of the lounge had contaminated soils to 12 feet below grade which is very near the bedrock surface.

2.3 Wetlands Investigation

ERS hand augured and sampled shallow soil borings in the Highway 35 ditch and in Margaret Dickman's yard on August 26, 1993. Analytical results from the soil borings indicate no petroleum contamination is migrating to the wetlands area south of the site. Soil vapor results indicate some vapors migrating to the ground surface in the vicinity of HSB-4 as located on Figure 2-1. Soil vapor results from all soil borings can be viewed in Table 2-1. Soil borings were two to





five feet below the ground elevation of MW-2. Because the main contamination at MW-2 was between four and six feet below grade, ERS felt that shallow borings in the ditch would show if any contamination was migrating towards the wetlands area.

2.4 Hydrologic Characteristics

A Groundwater sampling event was accomplished on August 26, 1993. Groundwater quality was comparable to the first event except the significant increase in the benzene level in MW-4. This could reflect a continued migration of groundwater contaminants southward or a lowered water table caused groundwater to encounter increased concentrations of benzene. Contamination levels of GRO and benzene can be viewed in Figure 2-2. A third sampling is needed to accurately define a trend. Monitoring well construction details and groundwater analytical results can be viewed in Table 2-2 and Table 2-3, respectively. Groundwater stabilization forms are located in Appendix C with laboratory analysis in Appendix D.

Hydraulic gradient between MW-1 and MW-4 was 0.027 ft/ft on May 27, 1993 and August 26, 1993. Although previous reports indicated groundwater flow direction was southward, ERS believes the bedrock ridge striking southwest dominates the flow pattern. The bedrock ridge, probably formed by glacial scouring, may cause the decreasing hydraulic gradient between MW-1 and MW-4 as shown on a groundwater contour map which can be viewed on Figure 2-3. On August 26, 1993, ERS completed baildown test on all four monitoring wells. Data from the tests were computed utilizing AQTESOLV, a computer software for determining hydraulic properties. Aquifer testing graphs developed by the software are placed in Appendix E. Hydraulic conductivities ranged from 2.77 x 10-5 cm/sec to 4.36 x 10-5 cm/sec. These conductivities are in the range of silty soils or glacial tills. From multiplying the average hydraulic conductivity $(3.25 \times 10-5 \text{ cm/sec})$ by the hydraulic gradient and dividing by an assumed 25% porosity, an average linear groundwater velocity of 3.51 x 10-6 cm/sec is computed. At this velocity, contaminated groundwater in the MW-2 vicinity would take 14 years to reach the Margaret Dickman well area. It is possible that preferential pathways for the residual contaminants will short circuit the contaminants towards Mrs. Dickman's well. A groundwater hydrograph depicting water levels and quality can be seen on Figure 2-4.

TABLE 2-1

Moose Junction Lounge Soil Boring Vapor Results

Depth Below Grade (feet)	SB-7	SB-8	SB-9	SB-10	SB-11	SB-12	SB-13	MW-1	MW-2	MW-3	MW-4	HSB-1	HSB-2	HSB-3	HSB-4	
0 - 2	0.0	0.0	0.0	0.0	0.0	466	2.0	NS	31	0.0	4.0	0.0	0.0	0.0	0.5	
2 - 4	0.0	0.0	0.0	0.0	0.0	607	5.4	278	294	0.0	4.0	NR	0.4	0.0	10.1	
4 - 6	0.0	0.0	0.0	0.0	0.0	634	2.3	343	357	0.0	5.0		0.2		NR	
6 - 8	0.0	0.0		0.0	0.0	291	2.7	297	293	0.0	0.0			•		
8 - 10	0.0	NR		0.2		104	0.3	104	237	0.0	9.0					
10 - 12						34	0.0	BR	259	0.0	1.0					
12 - 14						41	0.0		178	0.0	8.0					
14 - 16						13	-		BR	0.0	4.0					

NR = No Recovery

NS = Not Screened

BR = Bedrock

	MW-1		MV	V-2	M	W-3	MW-4	
	05/93	08/93	05/93	08/93	05/93	08/93	05/93	08/93
Groundwater Elevation	1229.51	1228.16	1225.51	1224.17	1226.09	1225.07	1223.38	1221.99
Top of Riser Elevation	op of Riser Elevation 1233.23		1231.18		1228.93		1226.11	
Ground Surface Elevation	1231.2		1229.2		1226.9		1224.1	
Top of Well Screen Elevation	1228.5		1226.5		1224.1		1221.3	
Bottom of Well Elevation	Elevation 1220.7		1216.0		1213.6		1210.8	
Top of Filter Pack	1229.0		1227.0		1224.3		1221.9	
Top of Bentonite Seal 1231.0		1229.0		1226.3		1223.9		

Table 2-2Monitor well construction and water levels.

All elevations referenced to the National Geodetic Vertical Datum based on Wisconsin Department of Transportation Right of Way points 2025 and 2026 east of the Moose Junction Lounge.

	MW	-1	MW	-2	MW	-3	MW	-4	MD-	-MW	DS-	·WW
Elements	05/93	08/93	05/93	08/93	05/93	08/93	05/93	08/93	05/93	08/93	05/93	08/93
GRO	6160.0	3590.0	132000.0	3680.0	<100.0	<100.0	<100.0	<100.0	<100.0	<100.0	<100.0	<100.0
Benzene	41.0	228.0	19000.0	279.0	<1.0	<5.0	3.0	146.0	<1.0	<5.0	<1.0	<5.0
Toluene	210.0	54.0	29000.0	2770.0	<1.0	<5.0	<1.0	<5.0	NA	<5.0	<1.0	<5.0
Ethylbenzene	22.0	47.0	1600.0	551.0	<1.0	<5.0	<1.0	<5.0	NA	<5.0	<1.0	<5.0
Xylenes	820.0	53.0	1650.0	2650.0	<1.0	<5.0	<1.0	<5.0	NA	<5.0	<1.0	<5.0
Dibromochloro- methane	<1.0	NA	130.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0	NA
n-Propylbenzene	6.0	NA	1300.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0	NA
Isopropybenzene	3.0	NA	53.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0	NA
tert-Butylbenze	<1.0	NA	270.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0	NA
n-Butylbenzene	<1.0	NA	53.0	NA	<1.0	NA	<1.0	NA	NA	NA	<1.0	NA
p-lsopropytoluene	6.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA
1,2,4 Trimethyl- benzene	96.0	69.0	390.0	652.0	<1.0	<5.0	<1.0	<5.0	NA	<5.0	<1.0	<5.0
1,3,5 Trimethyl- benzene	190.0	45.0	470.0	259.0	<1.0	<5.0	<1.0	<5.0	NA	<5.0	<1.0	<5.0
Total Lead	406.0	<50.0	131.0	58.0	118	<50.0	18.0	<50.0	7.0	<50.0	2.0	<50.0

Table 2-3Analytical results from groundwater sampling at the Moose Junction Lounge during May and August 1993 (ppb).



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2.5 Contamination Pathway

Contaminated soils remain under the intersection of Wisconsin State Highway 35 and Douglas County Road M. Southerly groundwater flow should slowly transport the pollutants towards the wetlands south of the site. However, hand soil borings indicate the contamination is being diverted from the assumed path. ERS suspects the contamination is following the utility lines to the east. This preferential pathway may be the source for contaminants that may have migrated onto the Mary Mckelvey property, southeast of the UST site, as located on Figure 2-5. Note an abandoned well on the McKelvey property may be near the contamination boundary. This well has not been sealed and could be sampled. It will require proper abandonment in order to eliminate the possibility of the well becoming an additional pathway.

2.6 Extent of Contamination

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of the horizontal and vertical extent Estimates of contamination can be viewed on Figures 2-5 and 2 - 6Estimates are made from soil borings respectively. and groundwater samples from data collected by ERS, RMT and Aqua-Tech. End point for the vertical cross section are shown on Figure 2-7. Note the odd shape of the remaining contaminants. This could be from the preferential pathway of petroleum hydrocarbons along the utilities or it is possible a second source exists on the Mckelvey property. The absence of Methyl Tertiary Butyl Ether (MTBE) in soil boring sample SB-12(4) may indicate gasoline contamination may predate contamination from the Moose Junction Lounge. The presence of MTBE indicates gasoline contamination post dated 1979, the year it was commercially produced. ERS believes MW-4 is very close to the leading boundary of the contaminant plume. Very low concentrations of benzene but no other contaminants support

STASTED IND 1970 9 years Prior To MTBE

2.7 Summary of Investigation Results Make That beterno-Residual contaminants were characterized by bottom and Disign sidewall samples collected during the interim excavation. The for CFO analytics indicate that grossly contaminated soils were not excavated on the southeast end of the excavation as shown by sample 9308-B7(6) at 324,000 ppm GRO. The sample was collected from the WDOT/Schultz property boundaries of the excavation. This sample is representative of a one to two foot thick layer of medium to coarse sand which may be roadbase as the layer was found to be by the road only. This layer could also be acting as preferential path for the contaminants.







3.0 REMEDIAL ACTION PLAN

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3.1 Remedial Action Plan Alternatives

ERS considered three options in proposing this RAP. They are as follows:

• Air Sparging/Soil venting system. - This option would probably offer the most comprehensive soil and groundwater remediation system, it would also be the most expensive and labor intensive. In this scenario, many sparge/vent points would probably be needed for the residual contamination in the soils.

ERS estimates the system would need horizontal components to address the majority of the contaminated soils which are believed under the county and state roads. System maintenance and monitoring could be very costly with no guarantee that the system will be compatible with decontamination of the glacial till, even with enhanced bioremediation assisting the venting/sparging. Other possible problems with this alternative are: 1) the elimination of petroleum hydrocarbons from entering the atmosphere may require a separate air remedial system and 2) the actual remedial period is difficult to predict. Does this method offer an economical environmental gain?

Excavation of contaminated soils and remediation through bioremedial composting. This method quickly eliminates the remaining source of contaminants. This option does not directly address contaminated groundwater, although elimination of the source should induce less contaminated groundwater samples in the future. Composting of soils is an economical alternative to the higher cost of soil incineration. However, ERS believes the expense of excavating the road base, and the inconvenience to travelers using the throughway, makes this alternative economically unfeasible.

Passive bioremediation/Long-term groundwater monitoring. ERS favors this remedial alternative because this option is the most economical. Risk assessment previously published in the <u>Summary Report: Moose Junction Lounge</u> <u>Site Investigation</u> indicates a very low risk of receptors excluding the Margaret Dickman residence and the Moose Junction Lounge. The two water samples collected by ERS from the above sites have not detected any contaminants to date. The wells at these locations will be monitored quarterly for Gasoline Range Organics (GRO) and Petroleum Volatile Organic Compounds (PVOC) to ensure contaminant migration will not create adverse health effects. Although this RAP does not address the possibility of contaminants entering the wetlands area, the contaminants will require an estimated eight to ten years to migrate to this area south of MW-4. By that time, it is possible the contaminants will be under WDNR action limits as advection, dispersion, diffusion, biodegradation, and chemical adsorption will lower concentration levels. Present groundwater contaminant levels are low in MW-4.

3.2 REMEDIAL ACTION PLAN PROPOSAL

ERS proposes passive bioremediation because the majority of grossly contaminated soils were removed during the interim action in June, 1993. The RAP includes provisions for long term groundwater sampling of the monitoring and potable wells at both the Moose Junction Lounge and the Margaret Dickman residence. Groundwater samples will be analyzed for GRO, PVOC, and total lead. The monitoring and sampling will continue until two consecutive sampling events indicate groundwater analytics are under the following levels:

benzene 100 ppb toluene 3000 ppb lead 50 ppb

ethylbenzene 1360 ppb xylene 10000 ppb

Note that the following contaminant levels are based on the Wisconsin Department of Health and Social Services (DHSS) March, 1993 list of contaminant concentrations in drinking water for which the DHSS requires notification (see Appendix F). If the potable well samples at either the Moose Junction Lounge or the Margaret Dickman residence show any contaminants above the WDNR groundwater quality standards as listed in NR 140, the WDNR will be notified immediately. The enforcement standard concentrations are as follows:

benzene	5 ppb	ethylbenzene	1360	ppb
toluene	343 ppb	xylene	620	ppb
lead	50 ppb			

It is difficult to predict with any accuracy the time the concentrations will be under the DHSS notification levels. ERS could compute a solute transport model to predict the time when concentrations will be low enough to gain a site closure. However, ERS believes the heterogeneous hydrogeological conditions at the site would add a great amount of error to the model. The model would also be biased by the preferential pathways the contaminants may be following.

ERS proposes the following contingency:

If petroleum impacted groundwater either continually increases or does not decrease in the monitoring wells after one year of sampling, the RAP can be amended, with the WDNR's approval, to install an active remedial system. If contaminants are found in either potable well near the site, carbon filter absorbers can be installed on the receiving side of the water tank to Sampling would then be amended to protect water quality. include water samples from the influent and effluent sides of To KNOW inc inc inc mon inc inc mon inc inc mon inc inc inc inc the carbon filters. If benzene concentrations continue to increase in MW-4, ERS is amenable to installing a fifth monitoring well at the boundary of the wetlands.

SCHEDULE/PERMITS

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Groundwater will be sampled on quarterly basis until the aforementioned concentration levels are met or until the WDNR instructs ERS to cease the sampling events.

ERS does not foresee any special permits needed for the passive bioremediation. Access agreements between ERS, Mary McKelvey, and Margaret Dickman may have to be renewed for access to MW-2 and MW-4 which are located on their properties, respectively. Care will be taken to disallow contaminated purge waters from flowing into the drainage system and wetlands. Purge waters from MW-1, MW-2, and MW-4 will be collected and remediated in accordance with WDNR guidelines.

3.4 SITE ABANDONMENT

After groundwater monitoring indicates the contaminant levels are under the DHSS guidelines for two consecutive sampling events, as agreed upon by the WDNR, the site will be properly abandoned. Monitoring wells will be sealed according to NR 141, Groundwater Monitoring Well Requirements. The monitoring well casings will either be removed or cut two feet below grade and the boring sealed with neat cement grout. A report will be sent to the WDNR and, if all requirements are met, a site closure should be granted.

Soils from thermal treatment will probably be used as road base or as limited fill as post burn samples indicated the remediated soils than five ppm petroleum have less hydrocarbons remaining in the soils.

4.0 ESTIMATED COSTS

The following is an estimated cost for the groundwater sampling and reporting. ERS presents the estimate on a yearly basis because the exact costs for sampling events are not known at this time. ERS thinks it is important to give a cost range because of annual cost increases and any other unpredicted circumstances.

COSTS PER ANNUM	PRICE(\$)/UNIT	COST RANGE(\$)
Groundwater Sampling/Travel	55/Hr	1,760 - 2,200
Client\Regulator Correspondence	65/Hr	520 - 780
Quarterly Progress Reports	55/Hr	1,760 - 2,200
Diagnostic Equipment/Supplies	75/Day	300 - 300
Annual Report	65/Hr	780 - 1,040
Vehicle	50/Day	200 - 300
Analytical samples	NA	
PVOC & GRO	63/Sample	2,016 - 2,268
Total Lead	24/Sample	384 - 480
m. I		7 720 0 5 60
Total		1,120 - 9,568

5.0 RECOMMENDATIONS

ERS recommends a second vapor risk assessment be accomplished at the Moose Junction Lounge and the Dale Schultz residence because of the previous elevated vapor samples. This would ensure that contaminated soils not excavated from under the building(s) are not creating unhealthy conditions. The previous groundwater receptor survey indicates almost no chance of petroleum hydrocarbons entering other potable water wells. Because of the low risk associated with the remaining contaminated soils and groundwater, the most economic solution is continued passive bioremediation.

REFERENCES

American Petroleum Institute, August, 1989. <u>A Guide to the</u> <u>Assessment and Remediation of Underground Petroleum Releases.</u>

Aqua-Tech, November, 1990. <u>Environmental Assessment Report for the</u> <u>Moose Junction Lounge.</u>

Earth Remediation Services, July, 1993. <u>Summary Report: Moose</u> Junction Lounge Site Investigation.

Fetter, C. W., 1988. <u>Applied Hydrogeology</u>. Charles E. Merrill Publishing Company, Columbus, Ohio.

Garret, Peter & Marcel Moreau <u>MTBE as a Groundwater Contaminant.</u> Maine Department of Environmental Protection.

Geraghty & Miller, Inc. June, 1992. <u>AQTESOLV - Aquifer Test and</u> <u>Analysis Computer Software Manual.</u>

Kamnikar, Brian, "Bioremediation of Contaminated Soils" <u>Pollution</u> <u>Engineering</u> November, 1992.

RMT, Inc., October, 1992. <u>Moose Junction Lounge - WDOT Subsurface</u> <u>Investigation</u>.

Schultz, Dale, 1993. Personal communication

Wisconsin Department of Natural Resources, March 1992. <u>Guidance</u> for Conducting Environmental Response Actions.

Wisconsin Department of Natural Resources, October 1990. NR 140 Groundwater Quality.

Wisconsin Department of Natural Resources, June 1991. NR 141 Groundwater Monitoring Well Requirements.

1.0 INTRODUCTION

Earth Remediation Services (ERS) presents this summary to update involved parties of the site investigation at a former Underground Storage Tank (UST) site at the present Moose Junction Lounge in Dairyland, Wisconsin (Figure 1). Soil borings and monitoring wells were installed in an attempt to define the horizontal and vertical extent of petroleum fuel ERS through Earth Burners Inc. (EBI) was contamination. contracted by Dale Schultz to accomplish a Site Investigation on his property. Evidence that petroleum contamination had migrated off site prompted ERS to seek access agreements with four surrounding property owners to place environmental borings on their properties. Copies of the access agreements are located in Appendix G of this report. Installation of wells and borings occurred between May 17 and May 19, 1993. Groundwater sampling was performed on May 27, 1993. Groundwater elevations were surveyed and calculated on June 14, 1993. Groundwater flow direction may be influenced by a possible bedrock ridge which strikes southwest and is directly under the Moose Junction Lounge. General groundwater flow direction is towards the south. Petroleum contamination was found in the groundwater in three of the four monitoring wells, however monitoring well MW-4, which has low levels of petroleum groundwater contamination, may have a source other than the Moose Junction Lounge UST.

EBI conducted an interim action on June 15, 1993 by excavating the existing UST and grossly contaminated soils as specified in the workplan. Approximately 560 cubic yards of soils were excavated and stockpiled 100 yards north of the Lounge. Soil volume was larger than ERS had anticipated as evidence of another former UST and associated pump island were found during the excavation. On June 21, 1993 EBI contracted Dean's Trucking of Superior, a licensed solid waste transport company to move the petroleum contaminated soils to EBI's thermal treatment unit located on Hallet Dock #7 in Duluth, Minnesota. Soils were stockpiled awaiting treatment. Analysis results from the soil stockpile have not been received from the laboratory at this time.



2.0 BACKGROUND

2.1 Topography/Geology/Hydrology

The Moose Junction Lounge UST site is located in Douglas County as follows: SE ¼ of the SE ¼ of the SE ¼ of Section 18, Township 44N, Range 14W. The local topography is dominated by a hummocky ground moraine overlying igneous bedrock comprised of flood basalts and rhyolites. The glacial till is typically unstratified clay, with boulders, and is often interbedded with sand and gravel lenses or channels. This is indicative of a complex glacial history. According to Hydrologic Atlas HA-451, soil permeability is recorded as occurring between 0.8 to 2.5 inches per hour. Topography is influenced by the Superior glacial lobe which deposited linear glacial features striking northeast to southwest. Topographically the Moose Junction area is dominated by swampy lowland.

Depth to bedrock has been generalized for the area as being less than 100 feet below grade, however, bedrock was encountered approximately 10 to 12 feet below grade during the excavation and in soil borings by the lounge and on the Margaret Dickman residence (Figure 3-1). Soil borings to the east and west of the lounge were drilled to 16 feet without encountering bedrock. Well logs from the Wisconsin Geological And Natural Survey indicate the Moose Junction Lounge may enter bedrock 12 feet below grade. An unused well on the Mary McKelvey property is only 150 feet southeast of the tank basin and is 32 feet in depth below grade, but does not enter bedrock. The Margaret Dickman well log is not included in the well logs in Appendix F, but is reported to enter bedrock at 12 feet below grade.

Regional groundwater flow is in an easterly direction according to Hydrologic Atlas HA-451. Groundwater flow in the Moose Junction Lounge immediate vicinity is determined to be in a southerly direction.

Annual precipitation in the Moose Junction area is 30.5 inches with 65% of the rainfall expended by evapotranspiration and 35% towards surface runoff. Long term groundwater storage change is assumed to be near zero.

2.2 OTHER POSSIBLE SOURCES

Reports from local residents indicate the location of a former tavern/gas station on the present Mary McKelvey property. A gasoline UST was supposedly excavated in the near vicinity of SB-12 during 1985 or 1986. Data collected by ERS supports

this information by the high soil vapor readings and analytical results from SB-12. It is quite possible that a former UST leaked causing a second contaminant plume. MW-4 may be at the southern down gradient boundary of this plume as shown by the very low concentration of Benzene in the soil and groundwater there. The second source may explain the higher benzene concentration at the previous RMI soil boring B-4 which is higher than the concentration of AquaTec's boring MJ-2, even though MJ-2 is closer to the Moose Junction UST.

Another source that either contributed to or is responsible for the contamination is what appeared to be another UST basin on the northeast corner of the Moose Junction Lounge. During the interim action soil excavation, a former pump island was located directly in front of the Lounge. Supply pipes from the former pump island led to a contaminated soil area on the northeast corner of the lounge. Analytical soil sample 9308-B2(4) characterizes the sidewall of this area and B1(12) is indicative of the soils at the bottom of the excavation.

3.0 WORK SUMMARY

3.1 SOIL BORING/MONITORING WELL INSTALLATION

ERS and Stevens Well Drilling were scheduled to begin field work at Moose Junction Lounge on April 16, 1993; however road restrictions on Wisconsin highway 35 delayed the field work to May 17, 1993. Only SB-12 of the seven soil borings had any significant soil contamination. Monitoring wells MW-1, MW-2, MW-3, and MW-4 are water table observation wells. ERS and Stevens Well Drilling completed grouting the monitoring wells on May 19, 1993. Locations and corresponding elevations can be viewed in Figure 3-1. ERS field notes and pictures are available upon request. Soil boring and the appropriate abandonment logs are shown in Appendix A. Monitoring well logs are shown in Appendix B.

3.2 GROUNDWATER SAMPLING

Groundwater sampling was accomplished on May 27, 1993. Prior to sampling, well volumes and groundwater levels were determined. Groundwater elevations were calculated using WDOT ROW point 2025 near the highway 35/county M intersection. Elevations for the May 27, 1993 sampling event can be viewed in Figure 3-2. At least four well volumes were purged while testing for temperature, conductivity, and pH. After these field parameters stabilized, groundwater samples were collected with a dedicated bailer. No free product was seen in any of the wells, however, a noticeable petroleum odor emanated from MW-1 and MW-2. Groundwater sampling forms can be viewed in Appendix C.





3.3 VAPOR RISK ASSESSMENT

An initial phase of a vapor risk assessment was completed by ERS to assure potential explosive conditions did not exist. Because of the proximity of the Moose Junction Lounge foundation to the former UST(s), ERS tested the lounge area for petroleum vapors with an HNu DL101-2 photoionizer and a Gas Pro Plus explosimeter. The explosimeter gave no indication of an explosive atmosphere. Vapor readings indicated very low concentrations of vapors in both the lounge and the Schultz residence. Results can be viewed in Figure 3-3.

3.4 INTERIM ACTION EXCAVATION

Contaminated soils were separated from clean soils using jar headspace analysis and an HNu DL-101-2 photoionization detector with a 10.2 electron volt lamp. At least one sample was analyzed for each 10 cubic yards of soil excavated. Soil vapor analysis logs can be viewed in Appendix D. It should be noted that many PID soil vapor readings were lower than the probable actual value. Soils were very contaminated and affected the 10.2 eV lamp. There was no lamp cleaning compound available during the excavation which could be a cause for the low readings. ERS feels the PID values under 100 PPM are accurate based on visual and olfactory evidence.

The UST was in good condition, however the supply pipes ? appeared to have been leaking. Pipes which led to a former ? tank basin and pump island (shown on figure 3-4) also appeared How Was to have leaked. The former tank basin on the northeast corner This Which of the lounge had contaminated soils to 12 feet below grade This Which which is very near the bedrock surface.

4.0 ANALYTICAL SUMMARY

4.1 SOIL BORING ANALYSIS

Laboratory Analytics of Gasoline Range Organics (GRO's) for all environmental borings ranged from <10.0 to 4,220 PPM. Soil borings SB-12, and Monitoring Wells MW-1, and MW-2 were found to have olfactory and soil vapor evidence of petroleum contamination. Total lead values in the soil ranged from 3.38 to 12.90 PPM and are low enough to not be of a concern. Lead analytics show no spikes in concentrations as did a previous soil boring analytic which may have been either an anomaly or laboratory error. Low levels of Methyl Tertiary Butyl Ether (MTBE) were found in borings MW-1 and MW-2 indicating unleaded gasoline did have a part in the contamination. Soil boring analytics can be viewed in Table 4-1. Laboratory analysis by Twin Ports Testing (TPT) can be found in Appendix





E. Soil vapor headspace results from the soil borings are recorded on the Soil Boring Logs in Appendix A.

4.2 GROUNDWATER ANALYSIS

Groundwater samples were obtained from the four monitoring wells, the Margaret Dickman residence, and the Moose Junction Lounge. No chemical contaminants were found in the Moose Junction Lounge well indicating it is probably drawing water below the vertical extent of contamination. The Dickman well was sampled for only GRO. No contaminants were found in that range. Benzene and GRO concentrations for each groundwater sample are listed in Figure 4-1. Highest concentrations were found in MW-2 which is a water table observation well installed directly down gradient of the former UST basin. Total lead concentrations ranged from 0.002 to 0.406 PPM and should not be an environmental problem. Selected groundwater laboratory analytics can be viewed in Table 4-2. Complete analysis can be viewed in Appendix E.

4.3 EXCAVATION ANALYSIS

Eight sidewall and bottom samples were collected to characterize the remaining soils. Additionally, three grab samples were collected 18 inches into the contaminated stockpile shortly after the excavation was completed. Laboratory analytical samples were placed in an iced cooler to be preserved at four degrees centigrade before being transported to Lake Superior Labs. The excavation samples were analyzed for GRO, BTEX, and total lead. Soil vapor results from the UST excavation can be viewed in Appendix D. Bottom and sidewall analytics can be seen in Table 4-3 with the laboratory report in Appendix E.

5.0 CONCLUSIONS

ERS believes the high soil vapor readings and the analytical results from the SB-12 location are inconsistent with the concentration gradation from the Moose Junction Lounge. This fact, plus local population reports lead to a possible former UST in the SB-12 vicinity. It is improbable that the concentrations found at the Moose Junction Lounge could be the source of petroleum contamination found at the Mary Mckelvey property. Dispersion, diffusion, advection, and to some degree biodegradation would have reduced the concentrations of petroleum contaminants.

The contaminants found in MW-2 are impacted to the bedrock but do not seem to have migrated toward the nearby Dickman water

well as proven by SB-13 soil analytics. Coarser soils and possible utility lines may have created a preferential path for the impacted groundwater.

Although lab results indicate some very contaminated soils still remain on the south side of the excavation and under the Moose Junction Lounge, ERS believes the majority of the grossly contaminated soils were excavated. The excavation of soils may serve a double purpose:

- 1) Eliminate the source of the plume thereby stopping the contamination before it encounters Margaret Dickman's water well.
- 2) Lower the petroleum vapors which may be entering the Moose Junction Lounge and the Dale Schultz residence.

Groundwater flow may be affected by a probable bedrock ridge underlying the Moose Junction Lounge. Groundwater flow on the east side of the ridge is toward the south. The groundwater flow on the west side of the ridge is inconclusive, however, the flow may follow the glacial lineation to the southwest.




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Moose Junction Lounge Soil Analytics Table 4-1

Compounds in PPM						Sampl	e numb	ber							
					(Depth	l in f	eet bel	low gr	ade)						
	SB-7	SB-8	SB-9	SB-10	SB-11	SB-12	SB-12	SB-13	SB-13	MW-1	MW-2	MW-2	MW-3	MW-4	MW-4
	(8–10)	(6-8)	(4-6)	(8–10)	(6-8)	(4-6)	(14–16)	(2-4)	(12–14)	(4-6)	(4-6)	(12–13)	(14–16)	(8–10)	(14–16)
GRO	<10.0	<10.0	<10.0	<10.0	<10.0	308	<10.0	<10.0	<10.0	639	4220	51.5	<10.0	<10.0	<10.0
Benzene	<.200	<.200	<.200	<.200	<.200	0.28	<.200	<.200	<.200	10.1	73.6	5.9	<.200	<.200	0.57
Toluene	<.200	<.200	<.200	<.200	<.200	1.19	<.200	<.200	<.200	12.7	164	5.81	<.200	<.200	0.384
Ethylbenzene	<.200	<.200	<.200	<.200	<.200	2.51	<.200	<.200	<.200	8.77	30.7	0.846	<.200	<.200	<.200
Total Xylenes	<.200	<.200	<.200	<.200	<.200	8.25	<.200	<.200	<.200	39.7	358	3.78	<.200	<.200	0.64
						T									
MTBE	<.200	<.200	<.200	<.200	<.200	<.200	<.200	<.200	<.200	5.67	13.9	<.200	<.200	<.200	<.200
1 2 4-Trimethylbenzene	< 200	< 200	< 200	< 200	< 200	3 95	< 200	< 200	< 200	9 57	112	0 472	< 200	< 200	< 200
r, 2, 4-11 incenty idenizene	<u>.200</u>	.200	<u>\.200</u>	.200	×.200	5.25	.200	1.200	1.200	<u>.</u> .,	112	0.472	.200	.200	.200
1,3,5-Trimethylbenzene	<.200	<.200	<.200	<.200	<.200	9.73	<.200	<.200	<.200	23.7	192	1.39	<.200	<.200	0.247
Total Lead	12.8	8.64	10.3	7.18	9.48	12.9	11.1	12	6.81	9.99	3.38	5.72	6.31	5.95	5.93

Moose Junction Lounge Selected Groundwater Analytics Table 4-2

		Monitori	ng well			
Components in PPB	May 1993		1.57			~ ~ ~ ~ ~ ~
	MW-I	MW-Z	MW-3	MW-4	MD-WW	DS-WW
GRO	6160	132000	<100	<100	<100	<100
Benzene	41	19000	<1	3	<1	<1
Couluene	210	29000	<1	<1	N/A	<1
Sthylbenzene	22	1600	<1	<1	N/A	<1
and/or p-Xylene	290	12000	<1	<1	N/A	<1
D-Xylene	530	4500	<1	<1	N/A	<1
Dibromochloromethane	<1	130	<1	<1	N/A	<1
n-Propylbenzene	6	1300	<1	<1	N/A	<1
Isopropylbenzene	3	53	<1	<1	N/A	<1
ert-Butylbenzene	<1	270	<1	<1	N/A	<1
n-Butylbenzene	<1	53	<1	<1	N/A	<1
-Isopropytoluene	6	<1	<1	<1	<1	<1
,2,4-Trimethylbenzene	96	390	<1	<1	N/A	<1
,3,5-Trimethylbenzene	190	470	<1	<1	N/A	<1
Cotal Lead	406	131	118	18	7	2

Monitoring Well

Moose Junction Lounge Soil Excavation Analysis Table 4-3

			DOLLOIII	DOTT DO	mprc (1		LOW GIAC	<i>L</i> C)
Compounds in PPM	B1(12)	B2(4)	B3(7)	B4(9)	B5(8)	B6(9)	B7(6)	B8(7)
GRO	<10.000	769	<10.000	61.6	577	640	324000	12.1
Benzene	<.200	6.61	<.200	0.644	1.57	11.6	7240	1.39
Ethylbenzene	<.200	7.98	<.200	1.25	5.7	6.72	4200	<.200
			· · · · · · · · · · · · · · · · · · ·					
Toluene	<.200	12.4	<.200	2.25	5.72	19.8	10500	1.01
		(
Total Xylenes	<.200	9.56	<.200	5.82	24.9	30	18400	0.448
Lead	7.03	9.53	7.62	9.73	7.65	9.55	12.4	7.91

Bottom Soil Sample (feet below grade)

APPENDIX A

SOIL BORING LOGS/BOREHOLE ABANDONMENT LOGS

State of Wisconsin Route To: SOIL BORING LOG INFORMATION Department of Natural Resources Form 4400-122 Rev. 5-92 □ Solid Waste 🛛 Haz. Waste 🗖 Emergency Response 📋 Underground Tanks □ Wastewater □ Water Resources Page of Other . □ Superfund Boring Number Facility/Project Name License/Permit/Monitoring Number MUSE TWNCTION LOUNGE Boring Drilled By (Firm name and name of crew chief) hW Date Drilling Started Date Drilling Completed Drilling Method STEVENS WELL DRILLING/ RANDY JOHNSON 19 93 0 HOLLOW Ŧ MM MM Y Y $\overline{D} \overline{D}$ DD STEM AUGER Common Well Name Final Static Water Level MW-1 1229.5 Feet MSL DNR Facility Well No. WI Unique Well No. Surface Elevation Borehole Diameter 1231.2 Feet MSL 8.25 inches Boring Location State Plane Local Grid Location (If applicable) Lat 46017:20" E S/C/N XIN $\Box E$ E(W) Long 92 09'20 T44 19 SE _1/4 of <u>JE</u> N. R. 14 5.1 1/4 of Section Feet I S 183.6 Feet W DNR County Code Civil Town/City/ or Village County ONGLAS DAIRYLAND Sample Soil Properties ઝ Ð, Depth in Feet Soil/Rock Description Blow Counts Att. Recovered RQD/ Comments And Geologic Origin For Compressi Strength Plasticity Index SCS Number and Type Moisture Content Length PIDEIL Each Major Unit Graphic Log Diagram Liquid P 200 Well No Recovery Brown to grayish brown (2,5145) silty sand, loose, damp (Fill) strong petrolewin odop 278 22" SM 25 Same as above MW-1 (4-6) 343 24" SM 13 Mattled very dank gray and 24 " 297 brown (7.5484/2) Silty fine to course grained sand, losse to servi compact, petrolevin Sm 46 Oder 12" SM 104 Same as above 114 Refusal at 10.5 feet NOTE : below grade. Boring restarted twice with some refusal. Assible ×¥ bedrock at 10 feet below grade I hereby certify that the information on this form is true and correct to the best of my knowledge Signature Remediation runth ervices This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or

both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

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		RQD/ Comments

State of Wisconsin Route To: SOIL BORING LOG INFORMATION Department of Natural Resources Form 4400-122 Rev. 5-92 □ Solid Waste Haz. Waste 🗆 Emergency Response 🗖 Underground Tanks □ Wastewater □ Water Resources Page □ Superfund Other . License/Permit/Monitoring Number Facility/Project Name Boring Number MOUSE JUNCTION LOUNG Boring Drilled By (Firm name and name of crew chief) hW-LOUNDE Date Drilling Started $O \frac{5}{M} / \frac{1}{D} \frac{9}{D} / \frac{9}{Y}$ Drilling Method Date Drilling Completed $\frac{OS}{M} / \frac{J}{D} \frac{Q}{D} / \frac{Q}{Y} \frac{Q}{Y}$ STEVENS WELL DRILLING/ RANDY JOHNSON HULLOW STEM AUGER Borehole Diameter DNR Facility Well No. WI Unique Well No. Common Well Name Final Static Water Level Surface Elevation 1229.2 Feet MSL 1325.5 Feet MSL 8.25 inches NW-2 Boring Location State Plane Local Grid Location (If applicable) Lat 46° 17'20" E S/C/N $\Box E$ $\Box N$ $\frac{5E}{County}$ 1/4 of \underline{SE} 1/4 of Section E/W Long 92009 20" N, R_/4 64.8 Fect 13 5 177.1 Feet 18 W DNR County Code Civil Town/City/ of Village DOUGLAS DAIR' LAND Soil Properties Sample 8 Ē Feet Soil/Rock Description Blow Counts RQD/ Comments Length At Recovered And Geologic Origin For Compressi Strength Number and Type Depth in 5 Moisture Content Graphic Log Well Diagram Plasticit. Index Each Major Unit USC PIDEII P.200 Liquid Reddish brown (SYR 4/4) Silty Sand (m damp, loose (fil) 10" 21 Dark reddish gray (SYR 4/2) fine SP 3 to medium grained sand, moist to wet, losse, strong petroleum 4 odor 19" 294 15 Same as above, courser sand-Sp poorly graded 19" 357 -7 Silty gravely sond compact, wet, petroleum odor, sheen on water 293 13" 93 Some our above 12" 237 \square Same as above 10" 259 100 I hereby certify that the information on this form is true and correct to the best of my knowledge Signature Firm renvices Remediation Earth This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

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:	20" 20"	12	7	Dark brown (7.54R = to coarse grained interbedded silt lay	V2) f Sand ers,	ine with locse	SP			0.0						name and an other state and an other state of the state o
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-		19"	Fo		Dark Brown Silt With Some organ damp Brown (7.5)	(7:5 YR 3/2) a trace gr a debris, YR 4/4) silt,) San navel 1005- Sand	dy and e	ML 			0.0						
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		18"	68		Brown sond (Fill, Same	(7.54A Comp Closs abo	R44) sil aut dav 5 roadt Ve	ty gra ~? Suse)	velly	SM SM	A. A. A. A. O.		0.0 0,D						
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) /,-	-1) 8)	20''	30	1	Same	- aš (.	thore,	loose		SM	1.0.1.0.1		0.0						· ·
	1																		
	<u>l her</u> Signat	eby c ure	ertlify	that Zory	the inform \sim	ation on Bie	this form i H	s true a	and co Firm	E a	to th	<u>e bes</u> R	st of 1	ny kr	iowle tivr	dge. Se	rVi	ces	

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and a second s	Number and Type
	Length Att. & S Recovered (in)
	Blow Counts
	Depth in Feet
	Soil, And C E
	/Rock Jeolog ach M
	Descri ic Orig ajor U
	ption şin For nit
	USCS
	Graphic
	Log Well
	Diagram
	Compressive
	Strength
	Moisture Content
	Liquid Limit 00
	Plasticity Index
	P 200

State Dep	e of Wisc artment c	onsin f Natu	ral Reso	Route To:	□ Haz. Wi □ Undergr □ Water F	aste round Tar Resources	atter hks	S Startes F	OIL 1 orm 44	BORI 100-12	NG L 2	OG I	NFOR I	MAT Rev.	ION 5-92
Faci	lity/Proje	ect Nan	ne Tiv NI	UTIDN LOUALGE	Lice	ense/Pern	nit/Mor	itoring	g Numt	ber	Boring	Numb	er)	<u> </u>
Bori	ng Drille TEVEI	d By (I JS W	Firm na	DRILLING/RANDY JOHN	SON $\frac{O}{M}$	$\frac{D}{5} / \frac{1}{D}$	$\frac{Startec}{2}$	¥ 3 Y Y	$\frac{0}{M} \frac{1}{M}$	rilling $\frac{1}{1}$	Comp Z/ D	$\frac{90}{13}$	Drilling Som Pr	∑ z Meth ∽PLL •0 D.L	od
DN	R Facility	⁄ Well	No. W	I Unique Well No. Common Well	Name Fina	l Static V	Vater L Feet M	evel SL	Surface	e Eleva	tion Feet I	MSL .	Boreho Q.	le Diar d ir	neter ches
Bori State	ng Locat e Plane _	ion		N,1	E S/C/N	Lat 46	°17'	<u> 20"</u>	Local (Grid La	ocation	(If app N	licable))	ΠE
51	<u>5</u> 1/4 c	f <u>SE</u>	1/4 o	of Section <u>18</u> , T <u>44</u> N, R <u>1</u>	L EN L	ong <u>J</u>	° <u>09</u>	20"	<u>98</u>	.4 F	eet 🖬	s_	o 7,1	Feet	KA W
Cou		······	<u> </u>) ONGLAS		<u>6</u>		DA	IRYI	AN	<u>b</u>				
Sa	imple & ਜ਼	s	et .	Soil/Rock Description							Soll	Prop	erties		
Vumber J.T.	end type ength Att. Recovered (j	3low Count	Jepth in Fe	And Geologic Origin For Each Major Unit		USCS	Jraphic .og	Well Diagram	DFID	Compressiv	Moisture Content	Liquid Limit	Plasticity Index	200	2QD/ Comments
	·			Dark house (7508 3/2)	1 52 H. SA						20				<u> </u>
	18"	24		with a trace gravel, damp (Fill) petroleum	loose odor	SM	0,10		466		•.				
		-		mottled gray and very gravish Drown (10YR 3/3	' dark) clave	y M L			607						
B-1	12"	42		sandy silt, soft, wef	, petroiei	um			007		and a second in social memory of				
(H-6		149		JANLE (IS 4Dove		ML			634						
	11	1 - 1		same as above											
	13"	5			,	mr	- - - - - - - - - - - - - 	and the second	291						
		75		Dark Drown (7.5YR3)3 Sand with some grad Compact, petroleum) silty fin ie), sem odor	^{ve} SM	0. 0. 10. 60 0. 0. 10 0. 60 0. 10 0. 10		/04		a management of the second				
	51	151		Dark gray (7.5784/1) Course gravely sand Wet, slight petrole) finete , loose	° 3 SP	00		34	and a state of the					
		-	F:-12	the information on this form is	true and	CORRECT	Di i						<u> </u>		<u> </u>
Sig	nature) NJe	w Bill	Fin	m F Ch	rth	Re	men	liat	0m	Se	rrice	es.	
Thi tha bot	s form is n \$10 no h for eac	autho: r more h viola	rized by than \$: tion. E	y Chapters 144.147 and 162, Wis. Stats 5,000 for each violation. Fined not less Each day of continued violation is a sep	s. Completi than \$10 o. arate offens	ion of thi r more th e, pursua	s repor nan \$10 nt to ss	t is má 00 or ii 144.9	núator npriso 9 and 1	y. Pen ned no 62.06	alties: t less t Wis.	Forfe han 30 Stats.	t not lo days, c	SS ST	

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		58-12 (14-14)		Number and Type	San
			j 	Length Att. & Recovered (in	
		15 15		Blow Counts	_
				Depth in Feet	t
		Same	Same		
		ci î.	Q.J.	Soi And J	
· · · · · · · · · · · · · · · · · · ·		Abwe	Above	l/Rock Descr Geologic Ori 3ach Major U	
				nit	
		cl S	dSp	USCS	
· · ·		· · · · · · · · ·		Graphic Log	
· · ·				Well Diagram	
		- W	Ŧ	PIDFID	
	······································			Compressive Strength	
· · · · · · · · · · · · · · · · · · ·				Moisture Content	Soil
				Liquid Limit	Pror
· ·		·····		Plasticity Index	pertie.
				P 200	_s
				RQD/ Comments	

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				U Was	ewater rfund		ater Res	sources	IKS					Page	<u> </u>	_ of	2
Facilit	y/Proje	ct Narr	^{1e} JV	WCTION L	IVNGE		Licens	e/Perm	nit/Mor	itoring	g Numt	ber	Boring	Numb	 13	7	
Boring STE	Drilled VEN	I By (F ; V	^{irm na} VELL	me and name of crew DRILLING/R	chief) WDY JOHN	ison	Date D 0.5 M M	rilling / <u> </u> D	$\frac{\text{Startec}}{\text{D}} / \frac{\text{C}}{\text{V}}$	3 Y Y	Date D <u>0</u> 5 M M	rilling / [D	$\frac{9}{D} = \frac{1}{2}$	$\frac{2}{100}$	Drilling Sar Dr	g Meil nple	iod ¦·
DNR I	Pacility	Well	No. W	l Unique Well No.	Common Well	l Name	Final S	tatic V	√ater L Feet M	evel SL	Surface	e Eleva	ition _Feet M	MSL	Boreho 2	le Diai	neter iches
Boring State F	Locati lane	on		N,	···	E S/C/	N L	at <u>46</u>	017	20"	Local (Grid La	ocation	(If app N	olicable)	ΠE
SE	_ 1/4 of	<u>s S</u> E	_ 1/4 o	f Section <u>18</u> , T	<u>44</u> N, R <u>1</u>	H ER	Lon	<u>g 92</u>	0 <u>09</u>	<u>Jo"</u>	/8	$\frac{2}{10}$	eet 🗖	<u>S</u> _=	218.8	Feet	E W
coun.	y 		D	SUGLAS			L_{6}	·		Ľ	DAIR	Y LA	ND ND			· · · ·	,
Sam	iple ॐ (द्व	হা	tet	Soil/Ro	ck Description							ల	Soil	Prop	erties		
Number and Type	Length Att Recovered (Blow Coun	Depth in Fe	And Geo Each	logic Origin For Major Unit	•		uscs	Graphic Log	Well Diagram	PIDEID	Compressiv Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
		16		Brown (7.5) with little or damp	R 4/2) San nganic deb	dy si ris, J	1 1 sof)	ML			J.0						
<i>.</i>		27	3	Same as i	above			ML	-		5.4						
		56	L S	Mottled re brown (7.5 y Silt, semi-	ddish brov R 4/3) san compact,	on (n dy gr Mois	nich ravelhy 7	ML	0 0 0 0 0 0		2.3						
		53	7	Reddish brow Gravelly Sa	in SYR H, nd, loose,	14 5,1 , we	lty }	Sm			7,6						
		60		Dark reddis Silty fine semi compo	h brown (s grained t, wet	54R 3 Sand	/2)	SM		and a second	0.3			and a second and a s	a de la compañía de l		
		68		Same as a	50VC			Sm			0.0						
<u>I her</u> Signa	eby c lure	$\frac{\text{ertility}}{\sqrt{2}}$	that	Ine information o	n this form is	s_true_	Firm	orrect	to th		oduk	<u>ny kr</u>		oge. 	1.0.5		

Page 2 of 2 Sample Properties Soil Length Att. & T Recovered (in) Compressive Strength Blow Counts Depth in Feet Soil/Rock Description RQD/ Comments And Geologic Origin For Number and Type Well Diagram Plasticity Index Moisture Content USCS CILINAL DE LA CI Graphic Log Each Major Unit Liquid Limit P 200 SB-13 Same as above, coarser Is Same as above, coar SM (Ô. D (12-14) 12" Ē-14 SB-13A (12-14) 112 NOTE: Refusal at 14' below Grade (? bedrock?) 1

State of Wisconsin <u>Route to:</u> Solid Waste Haz. Waste Department of Natural Resources	Wastewater MONITORING WELL CONSTRUCTION Form 4400-113A Rev. 4-90
Facility/Project Name Local Grid Location of W	ell Well Name April 1
MODSE JUNCTION LOUNGE 5.1 A. AN.	193.6 ft. $\mathbf{W}_{\mathbf{W}}$
Facility License, Permit or Monitoring Number Grid Origin Location	G 2 [°] /G 2 2 4 Wis Unique Well Number DNR Well Number
Type of Well Water Table Observation Well 57 11 St. Diana	Long. $f(x) = f(x) = f(x)$ or $f(x) = f(x)$ Date Well Installed $f(x) = f(x)$
Piezometer	$\frac{10 \text{ N}}{\text{m} \text{ m}} = \frac{10 \text{ S}}{\text{d} \text{ d}} + \frac{17 \text{ g}}{\text{y} \text{ y}}$
Distance Well Is From Waste/Source Boundary $\underline{SE1/4}$ of $\underline{SE}1/4$ of Sec.	18, T. 44N, R. 14 E. Well Installed By: (Person's Name and Firm)
Is Well A Point of Enforcement Std. Application? Upgradient	to Waste/Source
Yes 🛛 No d 🖾 Downgradient	n DNot Known DTEVENS WELL DRILLING
A. Protective pipe, top elevation 1233.38 ft. MSL	1. Cap and lock? Xes I No
. B. Well casing, top elevation 1233 23 ft. MSL	a. Inside diameter: $4 \cdot 9$ in.
C. Land surface elevation $L231.2$ ft. MSL	b. Length: $_5.0$ ft.
D. Surface seal, bottom 1231. D ft. MSL or ft.	c. Material: Steel 🗹 04
12. USCS classification of soil near screen:	d. Additional protection?
	If yes, describe: <u>Bumper Posts</u>
Bedrock	3. Surface seal: Bentonite 30 Concrete 30
13. Sieve analysis attached? 🛛 Yes 🎾 No	Other 🖬 🛄
14. Drilling method used: Rotary 50	4. Material between well casing and protective pipe:
Other	Annular space seal
	Other 🗆
15. Drilling fluid used: Water □ 02 Air □ 01 Drilling Mud □ 03 None 🗖 99	5. Annular space seal: a. Granular Bentonite 8 33
	bLbs/gal mud weight Bentomite-sand shurry [] 3.1
16. Drilling additives used? 🗋 Yes 🗖 No	d% Bentonite Bentonite-cement grout [] 50
Describe	eFt volume added for any of the above
17. Source of water (attach analysis):	1 How installed: Tremie pumped $\Box = 02$
	Gravity 🕅 08
E Duration 1231 Of MSI or	6. Bentonite seal: a. Bentonite granules \mathbf{X} 3.3 () \mathbf{D} 1/4 in \mathbf{N} 3/8 in \mathbf{D} 1/2 in Pertonite pollute \mathbf{E} 2.0
E. Bentomite seal, top $$	b. Ц 1/4 п. разло п. Ц 1/2 п. Велюпие релев (1 32 с Other П
F. Fine sand, top	7. Fine sand material: Manufacturer, product name & mesh size
G. Filter pack, top 1229 D ft. MSL or ft.	a. b. Volume added \rightarrow ft ³
10395	8. Filter pack material: Manufacturer, product name and mesh size
H. Screen joint, top $I \stackrel{\frown}{\to} O \stackrel{\frown}{\to} J$ ft. MSL or II Fr	a American /hateriels Corp. 45/55 Ked Flint
I. Well bottom 1220 5 ft. MSL or ft.	9. Well casing: Flush threaded PVC schedule 40 🕱 23
I Filter pack bottom) 2207 ft MSL or	Flush threaded PVC schedule 80 🔲 24
	10. Screen material: <u>PVC</u>
K. Borehole, bottom $1 \ll d0$ ft. MSL or ft.	a. Screen type: Factory cut 🔯 11
L. Borehole, diameter 8 2 in.	
23/	b. Manufacturer <u>TIMLD</u>
M. U.D. well casing $\underline{-} \stackrel{\bullet}{\leftarrow} \stackrel{\bullet}{\underline{7}} \stackrel{\bullet}{\underline{b}}$ in.	$\begin{array}{c} c. & \text{Slot size.} \\ d. & \text{Slotted length:} \\ \end{array} \qquad \begin{array}{c} 0.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2 \\ 1.2$
N. I.D. well casing 200 in.	11. Backfill material (below filter pack): None 54 14
I hereby certify that the information on this form is true and co	prrect to the best of my knowledge.
Signature () Right Firm Firm	the Remedication Sources

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code: In accordance with ch. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis: Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

Env. Response & Reg	pair 🔲 Unde	rground Tanks 🔲 Othe	r 🔲 🖏 👘	
cility/Project Name	County Name	·······	Well Name	
MOOSE JUNCTION LOUNDE	Dow	GLAS	1 /nw-	-
cility License, Permit or Monitoring Number	County Code	Wis. Unique Well Nu	mber DNR We	il Number
Can this well be purged dry? Yes	□ No	11. Depth to Water	Before Development	After Development
Well development method		(from top of	$\underline{3}, \underline{72}_{ft.}$	12.40
surged with bailer and bailed \Box 41	L	well casing)		
surged with bailer and pumped \Box 61	Ł			
surged with block and bailed \Box 42	2	Date	05, 18, 93	05,18,9:
surged with block and pumped \Box 62	2		mm dd yy	mm dd y
surged with block, bailed and pumped \Box 7 ()		17 20 0 a.m.	
compressed air 2 ()	Time	c. <u>I I</u> : <u>J ∪</u> p.m.	$\underline{P} : \underline{V} \cup \underline{D} p$
bailed only)	12 Sediment in wall	0 1 7.00	0 0.,
pumped only	T T	bottom	\underline{v} . \underline{r} inches	$\underline{}$, $\underline{}$ mch
Other) \$	13 Water clarity		
	Š.	15. Water clarity	Turbid D 15	Turbid 120
Time spent developing well	Δ.		(Describe)	(Describe)
	\underline{V} min.		Brown	Brown
Depth of well (from top of well casisng) $1 \partial_{-}$. H ft.			<u></u>
			······································	
Inside diameter of well	<u>0</u> in.		· · · · · · · · · · · · · · · · · · ·	
Volume of water in filter pack and well	-		······	
casing b	gal.			ι μα
	\wedge	Fill in if drilling fluid	s were used and well is a	t solid waste facility:
Volume of water removed from well \underline{d}	. <u>U</u> gal.			
		14. Total suspended	mg/l	m
Volume of water added (if any)	gal.	solids		
Source of water added		15. ĆOD	mg/l	m
0. Analysis performed on water added? (If yes, attach results)	□ No			
6. Additional comments on development:			£13	
$V_{1} = (3.14) (0.17)^{2} ($	8.7)	÷	x+19=111 ×	7.48 = 6.1
1/ - 1301(2.00)/9		0.69'22 1	20127	
V 2 - (~ J V) (8	.7) [($\left(\frac{\partial}{\partial a}\right)^{2} - \left(\frac{\partial}{\partial a}\right)^{2}$		
ell developed by: Person's Name and Firm		I hereby certify that t of my knowledge.	he above information is t	rue and correct to the b
		Simature: Ro	Then 17 Bie	bel
Hame: Kandy Johnson				``````````````````````````````````````
im: Stevens Well Drilli	ng.	Print Initials: <u>K</u>	<u> </u>	1 ⁰⁰
	0		And O and the	1: (2011)

State of Wisconsin Department of Natural Resources	aste Wastewater MONITORING WELL CONSTRUCTION Form 4400-113A Rev. 4-90
Facility/Project Name Local Grid Location	1 of Well / Well Name
MOUSE JUNCTION LOUNCE 64.8 ft.	H_{S}^{N} <u>1/2,1 ft.</u> H_{W}^{E} $\gamma N V - 2$
Facility License, Permit or Monitoring Number Grid Origin Location Lat. 46° 17'	n 26"Long. 92 ⁶ (19 ⁻² 20" or Wis Unique Well Number DNR Well Number
Type of Well Water Table Observation Well 🖾 11 St. Plane	ft. N,ft. E. Date Well Installed 05/19/93
Distance Well Is From Waste/Source Boundary <i>NE</i> 1/4 of <i>NE</i> 1/4 of	Waste/Source $\underline{m} \underline{m} \underline{n} \underline{d} \underline{d} \underline{y} \underline{y}$ of Sec. $19 \underline{T} \underline{44} \underline{N} \underline{R} \underline{44} \underline{\Box} \underline{E}$ Well Installed By: (Person's Name and Firm)
80 ft. Location of Well Re	elative to Waste/Source RANDY JOHNSON
Is Well A Point of Enforcement Std. Application? u 🗆 Upgradient 🛛 Yes 🖾 No d 🖾 Downgradien	s \Box Sidegradient nt n \Box Not Known \Box $STEVENS WELL DRILLING$
A. Protective pipe, top elevation 1231.29 ft. MSL	1. Cap and lock? X Yes I No
B. Well casing, top elevation $L \partial 3 \int \frac{1}{2} ft$. MSL	a. Inside diameter: $4 \cdot \underline{\ell}$ in.
C. Land surface elevation $(\underline{1} \ \underline{2} \ \underline{2} \ \underline{4} \ \underline{2}$ ft. MSL	b. Length: $5 \cdot \frac{1}{2}$ ft.
D. Surface seal, bottom 1229. O ft. MSL or ft.	C. Material. Steel & 04
12. USCS classification of soil near screen:	d. Additional protection?
SM Z SC ML MH CL CH	$\begin{array}{c c} & & & \\ \hline \\ & & & \\ \hline & & \\ \hline & & & \\ \hline \\ \hline$
Bedrock □ 13. Sieve analysis attached? □ Yes ☑ No	Concrete 🖾 01
14. Drilling method used: Rotary 🗆 50	4. Material between well casing and protective pipe:
Hollow Stem Auger 🗔 41	Bentonite 🗖 30
Other	Annular space seal 🗷
15 Drilling fluid used: Water 0 0 2 Air 0 0 1	Other \Box
Drilling Mud 🔲 03 None 🖾 99	b. Lbs/gal mud weight Bentonite-sand slurry \square 35
16 Drilling additives used? \Box Yes \Box No.	cLbs/gal mud weight Bentonite slurry [] 31
	d% Bentonite Bentonite-cement grout \Box 50
Describe	e_{e} rt volume added for any of the above f How installed $Tremie \square 01$
17. Source of water (attach analysis):	Tremie pumped \square 02
	Gravity 🖄 08
E Bontonita coal ton 12239 Dfr MSL or	6. Bentonite seal: a. Bentonite granules \square 3.3 b. $\square 1/4$ in $\square 3/3$ in $\square 1/2$ in Bentonite pellets \square 3.2
E. Demonite seat, up 1 0001 O the most of	cOther □
F. Fine sand, top ft. MSL or ft.	7. Fine sand material: Manufacturer, product name & mesh size
G. Filter pack, top 1227 D ft. MSL or ft.	aft ³
H Screen joint ton 12265 ft MSL or ft	8. Filter pack material: Manufacturer, product name and mesh size
	b. Volume added $\underline{\underline{H}}$ t^3
I. Well bottom $1 \underline{\alpha} \cdot \underline{0} \cdot \underline{1}$ II. MSL or II.	9. Well casing: Flush threaded PVC schedule 40 M 25 Flush threaded PVC schedule 80 24
J. Filter pack, bottom 12160 ft. MSL or ft.	Other
K. Borehole, bottom 1216 D ft. MSL or ft.	a. Screen type: Factory cut [] 11
L Borehole diameter 82 in	Continuous slot [] 0 ;
$\gamma 3/\sigma$	b. Manufacturer $T M(\partial)$
M. U.D. well casing $\underline{\mathscr{Q}} \ \underline{?} \ \underline{\flat}$ in.	$\begin{array}{c} c. \text{Stor size:} \\ d. \text{Slotted length:} \\ \end{array} \begin{array}{c} 0. & 0. & 1 \\ \underline{0} & 0. \\ 0$
N. I.D. well casing $2 \underbrace{0} \underline{0}$ in.	11. Backfill material (below filter pack): None X 14 Other □
I hereby certify that the information on this form is true a	nd correct to the best of my knowledge.
Signature (1/ 100) Ridd Firm F.	with Demerliation Services

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

Route to: Solid Waste 🔲 Haz. Was	ste 🔲 Wastewater [2	· · · · · ·
Env. Response & Repair 🗖 Under	rground Tanks 🔲 🛛 O	ther 🔲	$\mathcal{T}_{i} = \{ i_{i}, \ldots, i_{i} \} \in \{ i_{i}, \ldots, i_{i} \}$
acility/Project Name County Name) all () AS	Well Name Ma	1-7
acility License, Permit or Monitoring Number County Code	Wis Unique Well	Number I DNR W	v CA /ell Number
<u> </u>			1
. Can this well be purged dry? 💋 Yes 🗖 No		Before Developmer	t After Development
	11. Depth to Wate	5 67.	9 /100
surged with hailer and hailed \square 4.1	well casing)	a. <u> </u>	-1.79
surged with bailer and pumped $\Box 61$			
surged with block and bailed \Box 42	Date	<u>ь.05,19,93</u>	03, 19, 93
surged with block and pumped \Box 6.2		mm.ddyy	mm dd yy
surged with block, bailed and pumped \Box 70	Time	。14.3 D日nn	$15.0D \exists rm$
bailed only	Thic		
pumped only 🖸 51	12. Sediment in we	II $(\underline{b}, \underline{b}, \underline{b})$ inche	s \underline{D} . \underline{D} inches
pumped slowly	bottom		
	13. Water clarity	Clear \square 10 Turbid \square 15	Clear [20] Turbid 54 25
. Time spent developing well 3° $\lambda_{\rm min}$		(Describe)	(Describe)
		Yellowish briv	n yellowish brown
. Depth of well (from top of well casisng) -10 . 1 ft.		, 	
Inside diameter of well 300 in			
			· · · · · · · · · · · · · · · · · · ·
5. Volume of water in filter pack and well $\nabla \nabla$			
casing $\underline{\qquad} \underline{\qquad} \underline{\qquad} \underline{\qquad} \underline{\qquad} \underline{\qquad} \underline{\qquad} gal.$	Rill in if drilling fly	ide wore word and well is	-
V. Volume of water removed from well 21.2 gal.	Fill II II di filmig II	nus were used and wen is	at solid waste facility.
	14. Total suspende	d mg	/l mg/l
3. Volume of water added (if any) gal.	solids		· ·
9. Source of water added	15. COD	ma	// mg/l
		.*	-
10 Analysis performed on water added?			1
(If yes, attach results)			
	יר	1 + 97 - 118	13 V7 40 001/ 570
$V_{1} = (3.14) \begin{pmatrix} 0.17 \\ -2 \end{pmatrix} (9.4)$	ر ما ا	1 1 1 - 110	X 1. 18 20/443 = X.8
$V_{3} = (.30)(7,14)(9,4)(0.4)$	£4 72 (3	$\frac{1}{20}$ (
	2 J (
Well developed by: Person's Name and Firm	I hereby certify th of my knowledge.	at the above information i	s true and correct to the best.
			2 1.1
Name: RANDY JOHNSON	Signature:	105gh W	Dreth
S + (2) (2) (1) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2	Print Initials:	$\underline{\langle \omega \rangle}$	
rum: JIGVEIN WOIL JINING	Eim F	At Dana	listion Source
	rum: K	april Reiner	MIWI INA JUNICE

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State of Wisconsin Route to: Solid Waste Haz. Waste I Department of Natural Resources East Resources &	□ Wastewater □ MONITORING WELL CONSTRUCTION Form 4400-113A Rev. 4-90
Facility/Project Name Local Grid Location of	Well Name Well Name
MOOSE JUNCTION LUNNGE 67.8 ft. 85	$\frac{1}{5}$ $\frac{1}{2}$ $\frac{1}{7}$ $\frac{1}$
	$\frac{9}{2000}$ Long. $92^{\circ}09'20''$ or $\frac{9}{200}$ or
Type of Well Water Table Observation Well X 11 St. Plane	_ ft. N, ft. E. Date Well Installed 05/19/93
Distance Well Is From Waste/Source Boundary	ste/Source $m m d d y y$ $1 \times \pi 44 \times \pi 14 \square E$, Well Installed By: (Person's Name and Firm)
$\frac{00}{\text{ft.}} \frac{90}{\text{ft.}} \frac{1}{1000} \frac{1}{10000} \frac{1}{10000} \frac{1}{10000} \frac{1}{10000} \frac{1}{10000} \frac{1}{100000} \frac{1}{1000000} \frac{1}{10000000000000000000000000000000000$	ve to Waste/Source RANDY JOHNSON
Is well A Point of Enforcement Std. Application? U ☑ Upgradient □ Yes ☑ No d □ Downgradient	n DNot Known STEVENS WELL ORILLING
A. Protective pipe, top elevation 1229.14 ft. MSL	1. Cap and lock? ☑ Yes □ No
B. Well casing, top elevation 1228.93 ft. MSL	a. Inside diameter: $-\frac{4}{9}$. $\underline{0}$ in.
C. Land surface elevation 13269 ft. MSL	b. Length: $5 \cdot 0$ ft.
D. Surface seal, bottom 1226.3 ft. MSL or ft.	C. Material: Steel 24 04
12. USCS classification of soil near screen:	d. Additional protection?
SM KA SC ML MH CL CH	If yes, describe: <u>Durper 10373</u> Bentonite 30
Bedrock □ 13 Sieve analysis attached? □ Yes 57 No.	3. Surface seal: Concrete 🖾 01
14. Drilling method used: Rotary \Box 50	4. Material between well casing and protective pipe:
Hollow Stem Auger 🖬 4.1	Bentonite 🔲 30
	Annular space seal 🔽
15. Drilling fluid used: Water □ 02 Air □ 01	5. Annular space seal: a. Granular Bentonite 🕱 33
	bLbs/gal mud weight Bentonite-sand slurry LJ 35
16. Drilling additives used? \Box Yes \Box No	d% Bentonite Bentonite-cement grout 🗆 50
Describe	eFt volume added for any of the above f How installed. Tremie [] 01
17. Source of water (attach analysis):	Tremie pumped \square 0.2
	6. Bentonite seal: a. Bentonite granules [56] 33
E. Bentonite seal, top $123b2$ ft. MSL or ft.	b. $\Box 1/4$ in. $\Box 3/2$ in. $\Box 1/2$ in. Bentonite pellets $\Box 3/2$
F. Fine sand, top ft. MSL or ft.	C Other []
	a
G. Filter pack, top $1 - 2 + 1$. Miss of $ + 1$	8. Filter pack material: Manufacturer, product name and mesh siz
H. Screen joint, top $1 \leq 1 \leq 1$ ft. MSL or ft.	a Amenican Anteriel Curp 45/55 Red Flint
I. Well bottom 1214 ft. MSL or ft.	9. Well casing: Flush threaded PVC schedule 40 23
J. Filter pack, bottom 1213 6 ft. MSL or	Flush threaded PVC schedule 80 🔲 24
12109 + 121	10. Screen material:PVC
K. Borehole, bottom	a. Screen type: Factory cut [] 11 Continuous slot [] 01
L. Borehole, diameter $\lambda = \frac{1}{2} \frac{1}{2}$ in.	b Manufacture IIm (D
M. O.D. well casing $2\frac{3}{2}$ in.	c. Slot size: 0.010 ir
N. I.D. well casing 200 in	d. Slotted length: 11. Backfill material (below filter pack): None \Box 14
	<u>Caved Native Soils</u> Other BI
I hereby certify that the information on this form is true and a Signature	correct to the best of my knowledge.
Coge W Dreby Car	The Kernediation Strong Strong and 14 147 and 160 Win States

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

State of Wisconsin	MONITORING WELL DEVELOPMENT
Department of Natural Resources	Form 4400-113B Rev. 4-90
Route to: Solid Waste 🗆 Haz, Waste 🗖 Wastewater 🗖	

Env Response & Repair T Underground Tanks T Other T

Facility/Project Name	County Name		Well Name MW	1-3
Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well N	umber DNR We	ll Number
1. Can this well be purged dry?	Yes 🛛 No	11 Depth to Water	Before Development	After Development
2. Well development method surged with bailer and bailed surged with bailer and pumped surged with block and bailed surged with block, bailed and pumped compressed air bailed only	4 1 6 1 4 2 6 2 7 0 2 0 1 0	(from top of well casing) Date Time	a. $\frac{2}{m} \cdot \frac{8}{m} \cdot \frac{1}{d} \cdot \frac{9}{y} \cdot \frac{7}{y}$ b. $\frac{0}{m} \cdot \frac{5}{m} \cdot \frac{1}{d} \cdot \frac{9}{d} \cdot \frac{7}{y} \cdot \frac{7}{y}$ c. $\frac{1}{7} \cdot \frac{0}{2} \cdot \frac{0}{2} \cdot \frac{1}{p} \cdot \frac{1}{m}$	$\frac{1}{2} \frac{2}{2} \frac{0}{2} \text{ ft.}$ $\frac{0}{2} \frac{5}{m} \frac{1}{d} \frac{9}{d} \frac{3}{y} \frac{3}{y}$ $\frac{1}{2} \frac{5}{2} \frac{0}{2} \frac{0}{2} \frac{1}{2} $
pumped only I pumped slowly I Other I	51 50	12. Sediment in well bottom13. Water clarity	$ \underbrace{I}_{\text{clear}} \underbrace{0}_{\text{inches}} $	$ \underbrace{O}_{\text{inches}} \underbrace{O}_{\text{inches}} $
 3. Time spent developing well 4. Depth of well (from top of well casisng) 	<u>60</u> min. 4.8 ft.		(Describe) NUMBISH Brown	(Describe) Readish Brown
5. Inside diameter of well	<u>200</u> in.			
 6. Volume of water in filter pack and well casing 7. Volume of water removed from well 8. Volume of water added (if any) 	<u> . A</u> gal. <u> D . D</u> gal. gal.	Fill in if drilling flui 14. Total suspended solids	ds were used and well is a	at solid waste facility:
 9. Source of water added 10. Analysis performed on water added? (If yes, attach results) 	Yes No	15. COD	mg/l	mg/l mg/l
16. Additional comments on development: $V_{1} = (3.14) \left(\frac{0.17}{2} \right)^{2} ($ $V_{2} = (.30) (3.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.14) (1.$	(2, p) $(0, 2)$	(<u>,</u>))- (<u>-</u> 2	1,23 <1.50 2-)37	ft ³ x 7.48541/fH=11.
Well developed by: Person's Name and Firm Name: <u>Randy Johns</u> Firm: <u>Stevens Well</u>	on <u>niling</u>	Firm:	the above information is Regn W B W B Oth Remediat	true and correct to the best ill Hon Jer Wices

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

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$ \begin{array}{c} Letter prime the large of the larg$	State of Wisconsin <u>Route to:</u> Soli Department of Natural Resources Env. Response	d Waste 🛛 Haz. Waste 🛙 & Renair 🗖 – Undergrou	Wastewater □ md Tanks □ Other □	MONITORING WELL CONSTRUCTION Form 4400-113A Rev. 4-90
$\begin{array}{l c c c c c c c c c c c c c c c c c c c$	Facility/Project Name	Local Grid Location of V	Yell	Well Name
Citi Origi LeastoCiti Origi LeastoCiti Origi LeastoCiti Origi LeastoTop of Vell Well Fourier Colspan="2">Mell Fourier Colspan="2"Top of Well Well Fourier Colspan="2"Mell	MOOSE JUNCTION LOUNCE	173, 6 ft. HS	$\underline{-47.1}_{\text{ft.}} \mathbf{H}_{W}^{\text{ft.}}$	$\gamma \gamma \omega - 2$
Type of Well, Water Table Observation Well By its St. Plane. Provention 122 Section Location of Well Kauster Sources 150 Data Well Frank Wester Source Sources 150 Data Well Frank Wester Source Sources 150 Data Well Frank Wester Sources 151 Data Well Frank Wester Sources 151 Data Well Frank Wester Sources 152 Data Wester Sources 153 Data Well Frank Wester Sources 154 Data Wester Sources 155 Data Wester	Facility License, Permit of Monitoring Number	Grid Origin Location Lat. $H6^{\circ}$ 17' 20"	Long. 92 09-20"	Wis. Unique Well Number DNR Well Number
Datance Well is Free Watersbore boundary NMM at (MM 116 G.S. 20, 7, 44) N, 15, 15, 16 Well baseled Bays Name and firm 3 15 Well A bin of Enforcement SM. Application a Dispatcher a Bidegradient Starper SM. Application a Dispatcher <	Type of Well Water Table Observation Well 11 Piezometer 12	St. Plane Section Location of Was	ft. N,ft. E. te/Source	Date Well Installed $\frac{0}{m} \frac{5}{m} \frac{1}{y} \frac{1}{d} \frac{9}{d} \frac{3}{y}$
If Well A Foin of Endocement Still Application? If it is it it it is it	Distance Well Is From Waste/Source Boundary 50 ft.	<u>NW</u> 1/4 of <u>NW</u> 1/4 of Sec	с. <u>20, т.44</u> N, R. <u>14</u> ₿₩.	Well Installed By: (Person's Name and Firm)
A. Protective pips, top elevation 1226, 432 h. MSL 1. Cap and lock 1. Cap and lock B. Well casing, top elevation 1229, 12 h. MSL 2. Protective cover pipe: 4. Additional protection? B. Well casing, top elevation 1229, 11 h. MSL 5. Of the set o	Is Well A Point of Enforcement Std. Application?	u Dupgradient	s K Sidegradient	STEVENS WELL DRILLING
B. Weil easing, top elevation 1226.11 ft. MSL Protective cover pipe: 4.0 in C. Land carface elevation 1223.7 ft. MSL or ft. ft. D. Surface seal, bottom 223.7 ft. MSL or ft. ft. 12. USCS classification of onl near access: Other Gt. COL MIL Mill C. CL CH Start accessition Gt. Mill Mill C. CL CH 13. Surface seal; Concerce M. O Other Gt. 14. Dolling motion duscit Rotry 5.0 Hollow Stem Auge: Gt.11 Gt.11 Gt.12 15. Delling fluid treed, Wert [] 02 Air 0.1 Other Gt. 15. Delling fluid treed, Wert [] 02 Air 0.1 Other Gt. 15. Delling fluid treed, top ft. MSL or ft. There is purpoid Other Gt. 17. Source of water (strich analysis): There is purpoid Gt. Gt. MSL or ft. St.11 Raterial: Manufacture, product name & mechanize 18. Delling Mud [] 03 M. MSL or ft. ft. St.253/251 ft. St.253/251 ft. 19. Source of water (strich analysis): <	A. Protective pipe, top elevation 1226.25 f	t. MSL	1. Cap and lock	? X Yes [] No
C. Laed surface seak, boutom 1233 (2) ft. MSL or	B. Well casing, top elevation 1226.11 f	t. MSL	2. Protective co a. Inside diam	ver pipe: eter: 4 0 in
D. Surface seal. bottom 2.23 9 ft. MSL orf. 12. USCS classification of sell near screen: GP = GM = GC = GC = GY = SY = DA SM = SC = ML = MH = GL = CH Note Betrock = Betrock = 13. Sieve analyzis attached? Yes 14. Drilling method used: Retary = 50 15. Drilling fluid used: Water = 02 16. Drilling sublives used? Yes 17. Source of water (stack analysis): Termine = 0 17. Source of water (stack analysis): Termine = 0 17. Source of water (stack analysis): Termine = 0 17. Source of water (stack analysis): Termine = 0 18. Streen spint, top 12.3.1 m. MSL orft. 19. Fibre pack, top 12.3.1 m. MSL orft. 19. Source of water (stack analysis): Termine = 0 19. Fibre pack, top 12.3.1 m. MSL orft. 19. Source of water (stack analysis): Termine = 0 19. Fibre pack, top 12.3.1 m. MSL orft. 19. Source of water (stack analysis): Termine = 0 19. Fibre pack, top 12.3.1 m. MSL orft. 19. Fibre pack, top 12.3.1 m. MSL or	C. Land surface elevation 12241 f	t. MSL	b. Length:	$\overline{\underline{5}}$. $\overline{\underline{0}}$ ft.
12. USCS classification of soil near screen: fd Ys □ Ns 13. GP = GM = GC = GS ■ SS ■ SF = G M = GC = GC = GS ■ SS = SF = G 13. GP = GM = GS = GS ■ SS = SF = G Ns 13. Size analysis attached? Ys = DS 14. Drilling method used: Ratury = 50 15. Drilling method used: Ratury = 50 16. Drilling method used: Ratury = 50 17. Source of water (attach analysis): Ns 18. Bentonite seal, top 12. Source of water (attach analysis): 19. Describe Image: Source of water (attach analysis): 19. Bentonite seal, top 12. 31. 9 fn. MSL or	D. Surface seal, bottom 1223.9 ft. MSL or	<u> ft.</u>	c. Material:	Steel 🛛 04
Solid of the set of the line line of the line of the line of the line of the line o	12. USCS classification of soil near screen: GP GM GC GW SW GC SW GC GW GC GG GW GC GG GW GC GG GG GG GG GG GG GG GG GG	SP M	d. Additional If yes, desc	protection? Bumper Posts INO
13. Sieve analyzis attached? □ Yes □ No 14. Drilling method used: Rotary □ 50 15. Drilling fluid used: Nome [0 4.1] Color □ 01 15. Drilling fluid used: Water □ 02 16. Drilling fluid used: Water □ 02 17. Source of water (strach analysis): □ Yes □ No 17. Source of water (strach analysis): □ Ternis pumped □ 0 17. Source of water (strach analysis): □ 12 M. SL or □ 14 M. Miscalter: Ternis pumped □ 0 18. Bentonite seal, top 1 2 2 1 3 M. MSL or ft. M. Streen joint, top 1 2 3 1 3 M. MSL or ft. 19. Well bettern: 1 2 1 1 3 M. MSL or ft. ft. ft. 19. Fibre pack, bottom 1 2 0 8 .1 M. MSL or ft. ft. 19. Fibre pack, bottom 1 2 0 8 .1 M. MSL or ft. ft. 19. Fibre pack, bottom 1 2 0 8 .1 M. MSL or ft. ft. 19. Fibre pack, bottom 1 2 0 8 .1 M. MSL or ft. ft. 19. Fibre pack, bottom 1 2 0 8 .1 M. MSL or ft. ft. 19. Fibre pack, bottom	Bedrock		3. Surface seal:	Bentonite 🖸 30 Concrete 🕅 01
14. Drilling mothod used: Retary □ 50 Hollow Stem Auger ⊠ 41 Other □ 00her □ Bentonite 15. Drilling fluid used: Water □ 02 Air □ 01 Drilling fluid used: Water □ 02 16. Drilling fluid used: Water □ 02 Air □ 01 Drilling fluid used: Water □ 02 Air □ 01 Drilling fluid used: Water □ 02 Air □ 01 Drilling additives used? □ Yes D No Describe	13. Sieve analysis attached? 🖾 Yes 🖾 R	ło 🔛		Other 🖸
Follow Stem Auger 12 4 1 Other Bennonite Bennonite Annular space seal G 15. Drilling fluid usedt, Water 10 02 Air 10 01 Other Bennonite Bennonite<	14. Drilling method used: Rotary	50 X	4. Material betv	veen well casing and protective pipe:
Annual space sealAnnual space sealA	Hollow Stem Auger 🖾			Bentonite \Box 30
15. Drilling fluid used: Wate □ 02 Air □ 01 16. Drilling fluid used: Wate □ 02 Air □ 01 16. Drilling additives used? □ Yes ▷ None ⊠ 99 16. Drilling additives used? □ Yes ▷ None 17. Source of water (attach analysis): □ Termie □ 0 17. Source of water (attach analysis): □ Termie □ 0 18. Bentonite seal, top □ 2 2 3 9 ft. MSL or				Annular space seal ba
$\begin{bmatrix} Drailing Mud \\ 0 3 & None \\ \hline 0 9 9 \\ 16. Drilling additives used? \\ \Box Yes \\ \hline No \\ Describe \\ 17. Source of water (attach analysis): \\ \hline 18. Science joint, top \\ \hline 19. Science joint, t$	15. Drilling fluid used: Water 🖸 02 Air 🗖	01	5. Annular spac	e seal: a. Granular Bentonite 🗷 33
16. Drilling additives used? \Box Yes \Box No 16. Drilling additives used? \Box Yes \Box No 17. Source of water (attach analysis): \Box Mentonite carment grout S 17. Source of water (attach analysis): \Box Mentonite carment grout S 18. Bentonite seal, top \Box	Drilling Mud 🗖 03 None 🖾	99	bLbs/g	gal mud weight Bentonite-sand slurry 🔲 35
Describe 17. Source of water (attach analysis):d.% Bentonite Bentonite Bentonite Bentonite Bentonite	16. Drilling additives used? 🛛 Yes 🖂	vo l	cLbs/;	gal mud weight Bentonite slurry D 31
Describe a. To Volume added 101 ally 0: the added 17. Source of water (attach analysis): Tremie 0 17. Fine sand, top 1221 9 ft. MSL orft. 17. Fine sand material: Manufacturer, product name & mesh siz a. Continue added i			d% Be	intonite Bentonite-cement grout \Box_{1} 50
17. Source of water (attach analysis): Tremie pumped 0 18. Bentonite seal, top 12239 ft. MSL or	Describe	👹	f How insta	$\frac{11}{1000} \text{Tremie} \square 01$
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	17. Source of water (attach analysis):			Tremie pumped 🔲 02
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F. Fine sand, top ft. MSL or ft. ft. Screen joint, top 1221 3 ft. MSL or ft. ft. Screen joint, top 1231 3 ft. MSL or ft. ft. Well bottom 1210 8 ft. MSL or ft. ft. Screen joint, top 1231 6 ft. MSL or ft. ft. Screen joint, top 1231 7 Fine sand material: Manufacturer, product name and mesh st. a Arregricae Act Frid. Corp. 45/555 Red Fin. Screen joint, top 1231 7 Fine sand material: Manufacturer, product name and mesh st. Arregricae Act Frid. Corp. 45/555 Red Fin. Screen joint, top 1231 7 Fine sand material: Manufacturer, product name and mesh st. Screen joint, top 1231 7 Fine sand material: Manufacturer, product name and mesh st. Screen joint, top 1231 7 Fine sand material: Manufacturer, product name and mesh st. Screen joint, top 1231 7 Fine sand material: Manufacturer, product name and mesh st. Screen joint, top 12310 8 ft. MSL or ft. ft. Screen material: PVC schedule 40 ft 2 Flush threaded PVC schedule 40 ft 2 Flush threaded PVC schedule 40 ft 2 Flush threaded PVC schedule 80 2 Flush flush PVC schedule 80 2 Flush flush PVC schedule 80 2 Flush	E. Bentonite seal, top 12239 ft. MSL or	ft	6. Bentonite set b. $\Box 1/4$ in	al: a. Bentonite granules $X = 33$. $M = 3/8$ in. $\Box = 1/2$ in. Bentonite pellets $\Box = 32$
G. Filter pack, top 12219 ft. MSL or ft. H. Screen joint, top 12213 ft. MSL or ft. H. Well bottern 12193 ft. MSL or ft. I. Well bottern 12193 ft. MSL or ft. J. Filter pack, bottom 12198 ft. MSL or ft. H. Borehole, bottom 1208 ft. MSL or ft. H. Borehole, bottom 1208 ft. MSL or ft. H. Borehole, diameter 8.2 in. M. O.D. well casing $23/8$ in. M. O.D. well casing $23/8$ in. M. I.D. well casing $23/8$ in. H. I.D. well casing 202 m in. Hereby certify that the information on this form is true and correct to the best of my knowledge. Signature 1208 ft. MSL or first true and correct to the best of my knowledge. Signature 1208 ft. In scordance with ch. 144, Wis Stats, failure to file this form may result in a forfeiture of not more than \$10, nor more than \$20000 for each day of violation. In accordance with ch. 144, Wis Stats, failure to file this form may result in a forfeiture of not more than \$10, nor m	F. Fine sand, wp ft. MSL or	ft.	7. Fine sand ma	aterial: Manufacturer, product name & mesh size
H. Screen joint, top 1221.3 ft. MSL orft. 8. Filter pack material: Manufacturer, product name and mesh s I. Well bottom 1211.3 ft. MSL orft. 9. Well casing:	G. Filter pack, top 1221 9 ft. MSL or	ft.	a b. Volume a	dded ft ³
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J. Filter pack, bottom $1 \ge 10$ § ft. MSL or ft. Flush threaded PVC schedule 80 [] 2 K. Borehole, bottom $1 \ge 0$ § .1 ft. MSL or ft. 0 ther 0 L. Borehole, diameter § .2 in. 0 ther 1 M. O.D. well easing $-\frac{2}{3}$ 3/g in. 0 ther 0 M. O.D. well casing $-\frac{2}{3}$ 3/g in. 0 ther 0 N. I.D. well casing $-\frac{2}{3}$ 9 in. 0 ther 0 I hereby certify that the information on this form is true and correct to the best of my knowledge. Nore [] 1 Signature Nor_{LM} $Nether Area condance with ch. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10,00 for each day of violation. In accordance with ch. 144, Wis Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. In accordance with ch. 144, Wis Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. In accordance with ch. 144, Wis stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. In accordance with ch. 147, Wis Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. In accordance with ch. 147, Wis Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. In accordance with ch. 147, Wis Stats., failure to fi$	I. Well bottom	ft	b. Volume a 9. Well casing:	$\frac{1}{1000} = \frac{1}{1000} = 1$
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	K. Borehole, bottom 12081 ft. MSL or	ft.	10. Screen mater a. Screen ty	rial: <u><u><u>PV</u>C</u> pe: Factory cut <u>X</u> 11</u>
M. O.D. well casing	L. Borehole, diameter _ 2 A in.			Continuous slot 0 1
N. I.D. well casing 20_{D} in. 11. Backfill material (below filter pack): None 1 (aved Native Material (below filter pack): None 1 (aved Native Material (below filter pack): None 1 1 1. Backfill material (below filter pack): None 1 (aved Native Material (below filter pack): None 1 1 1. Backfill material (below filter pack): None 1 1 1 1. Backfill material (below filter pack): None 1 1 1 1 1 1 1 1 1 1 1 1 1 1	M. O.D. well casing $23/8$ in.		b. Manufactu c. Slot size: d. Slotted le	$\frac{11000}{0.010}$
I hereby certify that the information on this form is true and correct to the best of my knowledge. Signature Rock William Secondaria and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stat and ch. NR 141, Wis. Ad. Code: In accordance with ch. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be cert	N. I.D. well casing $\underline{\partial} \underline{\partial} \underline{D}$ in.		11. Backfill mate	erial (below filter pack): None 1 14
Signature Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stal and ch. NR 141, Wis. Ad. Code: In accordance with ch. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be card	I hereby certify that the information on this	s form is true and c	orrect to the best of my	knowledge.
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\$5000 for each day of violation.	In accordance with ch. 147,	Wis. Stats., failure to file this	s form may result in a forfeit.	re of not more than \$10,000 for each
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State of Wisconsin Department of Natural Resources	n an an Anna a Anna an Anna an Anna an Anna an	MONITORING WELL DEV Form 4400-113B	ELOPMENT Rev. 4-90

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State of Wisconsin Department of Natural Resources		an an an State an Anna an Anna An Anna an Anna Anna an Anna an	MONITORING WI	ELL DEVELOPMENT						
Route to: Solid Wast Env. Response & Rep	e □ Haz. Was air □ Under	ste 🔲 Wastewater 🗖 ground Tanks 🗖 Oth	er 🗌	Kev. 4-90						
Facility/Project Name MOOSE JUNCTION LOUNGE	ounty Name D0 WG1	LAS	Well Name $MW - 4$							
Facility License, Permit or Monitoring Number	County Code	Wis Unique Wall Ni	imber DNR We	ell Number						
1. Can this well be purged dry? 2. Well development method surged with bailer and bailed \Box 41 surged with block and bailed \Box 42 surged with block and bailed \Box 42 surged with block and pumped \Box 62 surged with block, bailed and pumped \Box 70 compressed air \mathbf{x} 20 bailed only \Box 10 pumped only \Box 51 pumped slowiy \Box 50 Other \Box 3. Time spent developing well $\underline{2}$ ($\underline{14}$, 4. Depth of well (from top of well casisng) $\underline{-14}$, 5. Inside diameter of well $\underline{-2}$ ($\underline{0}$ 6. Volume of water in filter pack and well casing $\underline{-11}$ 7. Volume of water removed from well $\underline{37}$. 8. Volume of water added (if any) 9. Source of water added $\underline{-11}$ 10. Analysis performed on water added? \Box Yes (If yes, attach results) 16. Additional comments on development: $V_{1} \equiv (3, 14) (\underline{-17})^{2}$ (16 $V_{2} \equiv (-37)$) $(3, 14)$ (12) Well developed by Person's Name and Firm	$\square No$ $\frac{\square No}{2} min.$ $\frac{B}{ft.}$ $\frac{O}{gal.}$ $gal.$ $\square No$ $\frac{O}{2}.$	11. Depth to Water (from top of well casing) Date Time 12. Sediment in well bottom 13. Water clarity Fill in if drilling fluid 14. Total suspended solids 15. COD $a \gtrsim 7 + \frac{69}{2} - \left(\frac{2}{2}\right)^{2}$	Before Development a	After Development -1.4.70ft. $m m d d y y$ $1.6.00 m m.$ $-0.0 m m.$ -0.0						
Name: <u>Randy</u> Johnson Firm: <u>Stevens Well</u> Drillin		I hereby certify that of my knowledge. Signature: Print Initials: Firm: Eur	the above intermation is $\frac{94}{28}$ $\frac{3}{16}$ $\frac{16}{16}$ Remedia	tion Service						

only. See instructions for more information including a list of county codes.

State of Wisconsin Department of Natural Resources

GROUNDWATER MONITORING WELL INFORMATION FORM Chapter 144, Wis. Stats. Form 4400-89 Rev. 1-90

Facility Name MOOSE	JWN	CTION LO	UN	GE	Fac	ility ID Number	Date	6/3	30/93	Completed B	y (Nar GEA	ne and i W	Firm) BIEBL	. E+	AR	TH	, B	EWEDIA	PION	SERV	ILES
	DNR		Π				Well (Casing	Eleva	lions	Refe	rence	Screen	Wall				Type of Well	(√)		Gradient
Well Name	Well ID Number	Well Location	N	SE	w	Date Established	Diam.	Турс	Top of Well Casing	Ground Surface	MSL (√)	Site Daturn (V)	Length	Depth	PIEZ	₹	PW	Other	Aban- doned	Enf. Stds Apply	U, S, D or N
MW-1		5,1'	X	-	X	5/18/93	2.0	PVC	1233,23	1231.2	\checkmark		8.0	10.5		\checkmark	· • •				D
WM-J		64.8		×	X	5/19/93	2.0"	ργί	1231,18	1229,2	\checkmark		10,0	13.D		V					D
WM-3		67.8	X		X	5/19/93	2.0	PVC	1228.33	1226.9	V		(0.0)	13,0		٧					N
MW-4		173.6		X	X	5/18/93	2.0'	PVC	1226.11	1224.1			10.D	13.0		V			-		S
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Location Coordi	nates Are: d System ared)	State Plane State Plane Hord F. Ceph	Coor hem rel	Tinato	e.	Remarks:			······································								PSS Fil Ot	Use: e Maint. Comp her:	leted:		
INSTRUCTIONS FOR GROUNDWATER MONITORING WELL INFORMATION - FORM 4400-89

This form, when completed provides a record of information for each well that is part of a facility's groundwate monitoring program. It provides the facility or consultant with a means of presenting in a consistent format the well data which the department requires during a site review process. It should be updated as new wells are added to the monitoring program.

Each element of the form is described below. Complete the form with the necessary information, using the description of the elements as a guide.

<u>Facility ID Number</u>: The license number or identification number of the facility, asssigned by the Department. <u>Date</u>: The date on which the form is filled out.

Completed By: The name and firm of person completing the form.

Facility Name: The name of the site or landfill.

<u>Well Name:</u> The name given to the well by the facility or consultant; e.g. MW-2, OW-5. <u>DNR Number</u>: The number assigned to the well by the Department, for use by the Department.

<u>Well Location</u>: The location of the well, measured in feet, in relation to a grid system origin established for the site or state plane coordinate system. (A local grid system is preferred.)

Date Established: The installation date of the well.

Well Casing Diam .: The inside diameter of the pipe used in the well construction, in inches.

Well Casing Type: The type of pipe used: plastic (P), steel (S), or other (O).

Elevations:

<u>Top of Well Casing:</u> The measurement, in feet, of the top of the well casing (not top of protective casing), in feet.

Ground Surface; The measurement, in feet, of the ground surface adjacant to the well.

<u>Reference:</u> Are elevations in reference to Mean Sea Level (MSL) or to a particular site datum established consultant or facility? Check one or the other.

Screen Length: The length of the screen measured in feet.

Well Depth: The depth of the well from the top of well casing, measured in feet.

Type of Well:

PIEZ:	piezometer (sealed below water table)	Abandonød:	Check this box if the well has
OW:	water table observation well		been abandoned.
PVT	private well	Enf. Stds. Apply:	Check this box if enforcement
LYS:	lysimeter		standards apply (well is outsic
OTHER:	not any of the above. e.g. head well.		DMZ or property line).

adjent: The location of the well in the groundwater flow system relative to the disposal site, spill, etc. Use one of the four letters designated below:

IJ =	up gradient	D = down gradient
S =	side gradient	N = not known

Location Coordinates Are:

cocal grid system, established by consultant and submitted to the Department; or State Plane Coordinate System, an established location system for Wisconsin.

CINCISNIS,

Add any comments to help clarify items listed above; e.g. MW-17 was abandoned on 1/24/90 and replaced by MW-17R; LHW-1 and LHW-2 are leachate head wells.

Appendix A Excavation Report

EXCAVATION REPORT WORKSHEET FOR PETROLEUM RELEASE SITE: MOOSE JUNCTION LOUNGE

I. BACKGROUND

Α.	Site:	Moose Junction Lounge
	Location/Address:	Route 3 Box 334
		Dairyland, WI 54830
	County:	Douglas
	WDNR LUST #	301
	Project Manager:	John Prohaska
	_	
в.	Tank Owner/Operator:	Dale Schultz
	Mailing Address:	Route 3 Box 334
		Dairyland, WI 54830
	Telephone:	(715) 224-3362
С.	Excavating Contractor:	Earth Burners, Inc.
	Contact:	Terry Anderson
	Telephone:	(218) 628-0454
	Tank Contractor Certifica	ation Number: <u>0227</u>
D.	Consultant	Earth Remediation Services
C. D.	Excavating Contractor: Contact: Telephone: Tank Contractor Certifica Consultant	Earth Burners, Inc. Terry Anderson (218) 628-0454 ation Number: 0227 Earth Remediation Serve

- D.ConsultantEarth Remediation ServicesContact:Roger W BieblAddress:PO Box 16083Duluth, MN 55816-6083Telephone:(218) 628-0248
- E. Others on-site during site work (e.g., fire marshal, local officials, etc.): John Prohaska

II. DATES

- A. Date release reported to WDNR: October, 1990
- B. Dates site work performed:

Work PerformedDateExisting 1000 gallon UST removed and approximately 672 cyJune 15, 1993of contaminated soils were excavated.Output

Contaminated soils were transported to Duluth for treatment June 21, 1993 at Earth Burners, Inc. facility on Hallett Dock #7.

III. RELEASE INFORMATION

- A. Provide the following information for all removed tanks.
 - Tank 1: Capacity 1000 gallon Type Steel Age 23 years

Condition: Fair Product history: Gasoline

Approximate quantity of petroleum released, if known: Unknown

Cause of release: Possible leaky lines and dispensers, overfills, remaining piping from an earlier excavation.

Tank 2: Capacity Unknown Type Unknown Age Unknown

B. Provide the following information for all existing tanks.

Tank No.	Capacity	Contents	Туре	Age
NA				

- C. If the release was associated with the lines or dispensers, briefly describe the problem: Piping that connected previously removed pump island and UST remained in the ground until this excavation. It is unknown whether the piping was properly drained during the earlier excavation.
- D. If the release was a surface spill, briefly describe the problem: NA

IV. EXCAVATION

- A. Dimensions of excavation: 61' X 30' X 10' on average
- B. Original tank backfill material (sand, gravel, etc.): Sand
- C. Native soil type (clay, sand, etc.): Unstratified clay
- D. Quantity of contaminated soil removed (cubic yards): 672 cy
- E. Was groundwater encountered or was there evidence of a seasonally high groundwater table? At what depth? Groundwater may have been encountered at a depth of five feet.
- H. If ground water was encountered or if a soil boring was conducted, was there evidence of ground water contamination? Product sheen was observed on the groundwater in the bottom of the excavation.
- I. Was bedrock encountered in the excavation? At what depth? Bedrock was encountered at depths between 10 and 12 feet.

J. Were there other unique conditions associated with this site? If so, explain. NA

V. SAMPLING

- A. Briefly describe the field screening methods used to distinguish contaminated from uncontaminated soil: Contaminated soils were distinguished from clean soils using an HNu DL 101-2 photoionization detector with a 10.2 electron volt lamp. At least one sample was analyzed for each 8.5 cubic yards excavated. Soil vapor samples were allowed to develop at least 10 minutes before PID readings were recorded.
- B. List soil vapor headspace analysis results. Indicate sampling locations using sample codes (with sampling depths in parentheses), e.g. R-1 (2 feet), R-2 (10 feet), etc. "R" stands for "removed". Samples collected at different depths at the same location should be labeled R-1A (2 feet), R-1B (4 feet), R-1C (6 feet), etc. If the sample was collected from the sidewall or bottom after excavation was complete, label it S-1 (for "sidewall") or B-1 (for "bottom"). Be sure the sample codes correspond with the site map required in Part VI, below.

Sample Code	Date/ Time	Soil Type	PID Reading	Comments
R1-1	12:00 6/14	Fill	100	
R2-1	12:00	11	200	
R3-1	12:00	11	200	
R4-2	12:00	11	>400	
R5-1	12:00	11	220	
R6-1	13:30	11	57.2	
R7-1	13:50	11	482	
R8-2.5	14:01	11	44.3	
R9-2.5	14:13	Ħ	446	-
R10-2.5	14:16	11	17.2	
R11-3	14:25	Ħ	344	
R12-8	14:28	Silt	385	
R13-2.5	14:28	Fill/sand	>240	
R14-11	14:38	Silt	284	

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Sample Code	Date/ Time	Soil Type	PID Reading	Comments
R15-2	15:10	11	427	
R16-5	15:12	11	>500	
R17-4	10:25 6/15	11	565	
R18-5	10:30	18	588	
R19-8	10:45	11	55	Former tank basin
R20-2	10:50	Gravel	5.0	
R21-4	10:55	Clay	9.0	
R22-3	11:00	11	518	Sidewall of building
R23-4	11:00	11	570	н
R24-3	11:05	Sand	391	Under pipe joint
R25-8	11:30	11	278	
R26-9	11:40	18	141	Center of tank basin
R27-4	11:42	silt	13	
R28-12	11:45	Sand	145	Center of tank basin
R29-5	11:55	11	250	
R30-5	12:00	11	290	
R31-6	12:10	11	158	
R32-5	12:20	Sand	31	·
R33-4	12:25	Silt	303	
R34-4	12:35	Sand	48	
R35-5	12:45	11	474	
R36-2	12:50	17	572	
R37-7	12:55	11	201	
R38-6	13:00	11	385	
R39-7	13:05	11	532	
R40-9	13:10	11	490	Bedrock encountered
R41-6	13:20	11	27	
R42-6	13:25		278	

Sample Code	Date/ Time	Soil Type	PID Reading	Comments
R43-6	13:30	Sand	92	
R44-4	14:00	11	428	
R45-4	14:00	11	238	Under pump island
R46-3	14:05	н	410	Under concrete pad
R47-4	14:10	11	543	
R48-3	14:15	11	529	
R49-7	14:20	11	300	
R50-3	14:25	11	249	
R51-9	14:35	37	579	Pump dispenser sample B4
R52-3	14:40	11	253	
R53-4	14:45	31	424	
R54-5	14:55	11	289	Sand layer with groundwater
R55-5	15:00	11	285	
R56-7	15:10	11	298	
R57-6	15:15	11	319	
R58-4	15:20	11	258	
R59-6	15:25	11	472	
R60-8	15:35	11	485	Pump dispenser sample B5
R61-5	15:45	Sand	540	
R62-6	15:50	11	309	
R63-6	15:55	11	489	
R64-4	16:00	11	460	
R65-5	16:00	18	370	
R66-6	16:10	11	362	
R67-7	16:20	11	378	
R68-4	16:25	11	288	
R69-8	16:30	TT	656	
R70-3	16:45	17	263	
R71-6	17:00	Sand	321	Bottom sidewall sample B7

11 - 14 M

Sample Code	Date/ Time	Soil Type	PID Reading	Comments
R72-5	6/15 17 : 10	Sand	287	
R73-9	17:25	н	486	UST bottom sample B6
R74-8	17:35	11	297	
R75-6	17:45	11	521	
R76-6	17:55	11	411	
R77-6	18:05	¥T.	15	
R78-6	18:10	17	278	
R79-7	18:15	Sand	51	Bottom sidewall sample B8

- C. Briefly describe the soil analytical sampling and handling procedures used: Eight analytical soil samples were collected. Laboratory soil samples were immediately placed in an iced cooler to be preserved at 4 degrees centigrade. Laboratory samples were collected with a separate clean trowel and disposable gloves. BTEX and GRO analytical samples were preserved with methanol in tared 60 ml bottles from the analytical lab. Approximately 25 grams of soil were collected for GRO and BTEX.
- D. List below the soil sample analytical results from bottom and sidewall samples. Note: samples B2-4, B3-7, B7-6 and B8-7 characterize the sidewalls of the excavation.

Sample Code	GRO	Benzene	Ethyl- benzene	Toluene	Xylene	Lead
	ppm	ppm	ppm	ppm	ppm	ppm
в1–12	<10.0	<0.20	<0.20	<0.20	<0.20	7.03
B2-4	769.0	6.61	7.98	12.40	9.56	9.53
B3-7	<10.0	<0.20	<0.20	<0.20	<0.20	7.62
B4-9	61.6	0.644	1.25	2.25	5.82	9.73
в5-8	577.0	1.57	5.70	5.72	24.90	7.65
в6-9	640.0	11.60	6.72	19.80	30.00	9.55
в7-6	324000	7240.00	4200.0	10500.0	18400.0	12.40
B8-7	12.1	1.39	<0.20	1.01	0.448	7.91
FB	<10.0	NA	NA	NA	NA	NA

6

VI.FIGURES

Attach the following figures to this report:

Site location map.
 Site map(s) drawn to scale illustrating the following:

 a.Location (or former location) of all present and former tanks, lines, and dispensers;
 b.location of other structures (buildings, canopies, etc.);
 c.Adjacent city, township, or county roadways;
 d.Final extent and depth of excavation;
 e.Location of soil screening samples (e.g. R-1), soil analytical samples (e.g., S-1 or B-1), and soil borings (e.g. SB-1). Also, attach all boring logs.
 f.North arrow, bar scale and map legend.

VII.SUMMARY

Briefly summarize evidence indicating whether additional investigation is necessary at the site.

Contaminated soils remain at depth and in the sidewall in all but the north portion of the excavation (Samples B3(7) and B1 (12). Grossly contaminated soil remains in the SW west corner of the excavation (Sample B7 (6)). Only 10 out of 79 soil vapor samples had readings below 100 ppm. The amount of contamination observed may be, in part, due to a previously excavated UST and pump island. The associated supply pipes were left in the ground, revealing the former location of the UST. It is not known whether the former UST was properly removed. Since the site vertical and horizontal extent of contamination have been defined, further investigation is not warranted.

VIII.SOIL TREATMENT INFORMATION

A.Soil treatment method used (thermal, land application, other). If you choose "other" specify treatment method: Thermal

B.Location of treatment site/facility: Earth Burners Inc.

C.Date of soil treatment: July 1 - 6, 1993

D.Identify the location of any stockpiled contaminated soil: Treated soils are stockpiled at Hallett Dock #7 awaiting reuse.

IX. CONSULTANT (OR OTHER) PREPARING THIS REPORT

Company Name: Street/Box: City, Zip: Telephone: Contact: Earth Remediation Services PO Box 16083 Duluth, MN 55816-0083 (218) 628-0248 Roger W Biebl

(Logen W Dield Date: 10/28/93

Signature:

7





Laboratory Analytical Results

IOR LABORA		728 GAR MN (218) A DIVIS	FIELD AVENI 722-1911 • F SION OF T	JE • DULUT AX (218) 72: WIN POR T	H, MINNESO 2-3295 TS TESTIN	TA 55802 I G, INC.	N		10574 Atory Ri DF Custo	EQUEST
Project Name/No. MOOSE	JUNCTION]	JJ UNNO	9308-0	30) p.O.	#					.*
Client Earth Burber	<u>s, Inc</u> , Report T	Roye	r Bieb)	Rema	rks				
Address PO. Box 161	083				-	Ana)yz-	e Fil	JJ B	Jank 4	on GRI
Duluth MN, 5	5816 Bill To_	EBI			-	only.	-	\wedge	19211	_921
Phone (218) 828-C	1454	·			-				1134	「うし
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Sampler (Print) Roye	r w Bieb									
	Ma	trix Numbe	* atlv		In Ser					
Sample No./Location	Date Time 북	ຍ ຊີ່ ຊີ່ ເກີ່ອີ່ ເກີ່ອີ່ ເກີ່ອີ່ ເກີ່ອີ່ ອີ່ງ ອີ່ງ ອີ່ງ ອີ່ງ ອີ່ງ ອີ່ງ ອີ່ງ	Prese	$\overline{S}/\overline{\overline{e}}$						LSL
9308-BI(12)	95/3 11:45	VQ	mebh)]]						192
9308-82 (4)	1 12:00	VI))						192
.9308-B3L7)	14:00	V))						192
9308-B4(9)	14:30	1)]]						1929
9308-B5(8)	15:30	ν))						1430
9308-B6(9)	17:30	V)						1931
9308-B7(6)	16:30	\sim								1932
9308-B8(7)	15:00	\mathbf{v})))						1933
9308-P1	14:30									
9301- P2	16:45									
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SIS REPORT ABOR 728 GARFIELD AVENUE

MN (218) 722-1911 FAX (218) 722-3295

A DIVISION OF TWIN PORTS TESTING, INC.

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32 J

SPERIOR LABORATORIES Duluth, MN 55816

Project Moose Junction Lounge Project No. 9308-0301

Collected By Roger Biebl Delivered By Roger Biebl

Chem. Lab ID	1926-93LS	1927-93LS	1928-93LS	1929-93LS	
Sample Type	Soil	Soil	Soil	Soil	
Collected Received Analyzed Reported	06/15/93 06/16/93 06/28/93 07/01/93	06/15/93 06/16/93 06/28/93 07/01/93	06/15/93 06/16/93 06/28/93 07/01/93	06/15/93 06/16/93 06/28/93 07/01/93	
Sample Description	9308-B1 (12)	9308-B2 (4)	9308-B3 (7)	9308-B4 (9)	
Gasoline Range Organics Moisture Benzene Ethylbenzene Lead Toluene Total Xylenes	<10.000 mg/kg 18.0% <0.200 mg/kg <0.200 mg/kg <0.200 mg/kg <0.200 mg/kg	769 mg/kg 11.7% 6.61 mg/kg 7.98 mg/kg 9.53 mg/kg 12.4 mg/kg 9.56 mg/kg	<10.000 mg/kg 11.4% <0.200 mg/kg <0.200 mg/kg <0.200 mg/kg <0.200 mg/kg	61.6 mg/kg 10.5% 0.644 mg/kg 1.25 mg/kg 9.73 mg/kg 2.25 mg/kg 5.82 mg/kg	

Remarks

hur Analyzed By

Date

Petusin utta

7/1/93 Date

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Reviewed By

Wisconsin DNR Certification Number 816057440

LABOHATORY ANALYSIS REPORT

728 GARFIELD AVENUE E DULUTH, MINNESOTA 55802 MN (218) 722-1911 # FAX (218) 722-3295

A DIVISION OF TWIN PORTS TESTING, INC.

Page

SPERIOR LABORATORIES Duluth, MN 55816

Project Moose Junction Lounge Project No. 9308-0301

Collected By Roger Biebl Delivered By Roger Biebl

Chem. Lab ID	1930-93LS	1931-93LS	1932-93LS	1933-93LS	
Sample Type	Soil	Soil	Soil	Soil	
Collected Received Analyzed Reported	06/15/93 06/16/93 06/28/93 07/01/93	06/15/93 06/16/93 06/28/93 07/01/93	06/15/93 06/16/93 06/28/93 07/01/93	06/15/93 06/16/93 06/28/93 07/01/93	
Sample Description	9308-B5 (8)	9308-B6 (9)	9308-B7 (6)	9308-B8 (7)	
Analysis					
Gasoline Range Organics Moisture Benzene Ethylbenzene Lead Toluene Total Xylenes	577 mg/kg 10.8% 1.57 mg/kg 5.70 mg/kg 7.65 mg/kg 5.72 mg/kg 24.9 mg/kg	640 mg/kg 9.81% 11.6 mg/kg 6.72 mg/kg 9.55 mg/kg 19.8 mg/kg 30.0 mg/kg	324000 mg/kg 12.5% 7240 mg/kg 4200 mg/kg 12.4 mg/kg 10500 mg/kg 18400 mg/kg	12.1 mg/kg 12.0% 1.39 mg/kg <0.200 mg/kg 7.91 mg/kg 1.01 mg/kg 0.448 mg/kg	

Remarks

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Analyzed By

Date

eteran 7/1/93 Date **Réviewed By**

Wisconsin DNR Certification Number 816057440

SPERIOR LABORATORIES



A DIVISION OF TWIN PORTS TESTING, INC.

Page

PO Box 16083 Duluth, MN 55816

Project Moose Junction Lounge Project No. 9308-0301

Collected By Roger Biebl Delivered By Roger Biebl

Chem. Lab ID	1934-93LS		
Sample Type	Soil		
Collected Received Analyzed Reported	06/15/93 06/16/93 06/28/93 07/01/93		
Sample Description	FB		 4
Analysis			
Gasoline Range Organics Moisture	<10.000 mg/kg		 4
Benzene Ethylhenzono	-		
Lead	-		
Total Xylenes	-		
	-		

Remarks

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- Not tested for.

Analyzed By

Date

litu<u>ar</u> **Reviewed By**

193 Date

Wisconsin DNR Certification Number 816057440

		MN (2	$\frac{1}{218} 722 - 1911 \cdot FA$	(218) 722-3295	STING INC	, L	ABORATOR	Y REQUES
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Project Name/No. <u>Moos</u>	e Junction	1 7305	-	_ P.O. #				
Client Macse Tenc	<u>rt:0/</u> R	eport To	Th Barn	ets Dre	Remarks			
Address		~ 0	·					
	Bi	II To <u>12</u> 6						
Phone	A 11 P							
Sampler Signature _/ Ker	in Lund		Ana	iyses /				[, ,
Sampler (Print) Keula	J. Lund		ative	1.0/4/	W D			
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728 GARFIELD AVENUE
DULUTH; MINNESOTA 55802
MN (218):722-1911* FAX (218):722-3295

A DIVISION OF TWIN PORTS TESTING, INC.

Page 1

SPERIOR LABORATORIES SO UNDER Client Earth Burn 500 Duluth, MN 55816

Project Moose Junction Lounge Project No. 9308-0301

Collected By Kevin J. Lund Delivered By Kevin J. Lund

Chem. Lab ID	2188-93LS		
Sample Type	Soil		 -
Collected Received Analyzed Reported	07/13/93 07/13/93 07/27/93 08/02/93		
Sample Description	9308-PB1	Post Burn Sample	
Gasoline Range Organics Moisture Benzene Ethylbenzene Lead Toluene Total Xylenes	<5.000 mg/kg 3.22% <0.200 mg/kg <0.200 mg/kg 28.0 mg/kg <0.200 mg/kg <0.200 mg/kg		· .

Remarks

Mth111 8-2-93

Analyzed By

Date

8/2/93 terson

Reviewed By

Date

Wisconsin DNR Certification Number 816057440

Application to Treat Contaminated Soil

3 NA	APPLICATION TO TREAT PETROLEUM CONTAMINATED SOIL
N DX	MINNESOTA POLLUTION CONTROL AGENCY APPLICATION TO THERMALLY TREAT PETROLEUM CONTAMINATED SOIL May 1992
. I.	Minnesota Pollution-Control Agency (MPCA) Site ID Number: LEAK#
II.	MPCA Project Manager: WDNR John Prehaska
III.	Source of Soil:
	Facility Name:Moose Junction LoungeStreet Address:Route 3 Box 334City, State, Zip:DairYland, WI 54830
	Contact Name: <u>Dwle Shultz</u> Telephone: <u>715-224-3362</u>
IV.	Contamination Details:
	Weight of Soil (tons): (One cubic yard of soil is approximately equivalent to 1.4 tons.) <u>940.8</u>
	Type Petroleum Contamination: Gasoline, diesel fuel, No. 1 fuel oil,

No. 2 fuel oil, kerosene, used oil, (hydraulic fluid, cutting oil, motor oil, quench oil).

Contaminant Concentration (parts per million)*

(circle one)

Benzene	160	540	10.1		
Toluene	720	1600	12.7		
Ethyl Benzene	200	370 :		`\	
Xylene	1220	2150	39.7		
Total Lead	21.0	<u><0.9</u>	9.99		
Total Hydrocart	ons				
as Fuel Oil or			. 70		
Gasoline	5100	11000	6 57		
		1	~ \ \ / ~		
Soil Type (sand, si	It, clay, ϵ	etc.) Brow	n siltr (-10,1	

*Note: See Tanks and Spills Section document "Soil and Ground Water Analysis at Petroleum Release Sites" (Guidance Document 11) for additional analysis that may be necessary.

Application to Treat Petroleum Contaminated Soil Page 2 an an an an Araba. An an Araba an Araba an Araba an Araba 1194 - 11 May 1992 Thermal Treatment Unit ν. Earth Burners Inc. Name: Address: <u>Soo Leisure St</u> (if portable, where will plant be located) City, State, Zip: Duluth, MN 55816 Plant Number or Model: <u>RS-15</u> (If portable, separation distance in feet from nearest residence(s): $2,\infty$.) Contact Name: <u>Terry Anderson</u> Title: <u>Vice President</u> Telephone: (218) <u>726-1537</u> Site Telephone: (218) <u>628-0454</u> Air Quality Permit Number: <u>2439-91-07-1</u> Signature of Authorized Thermal Treatment 6/15/93 Unit Representative Accepting Soil Date treatment will be completed: 7/18/9 3 VI. VII. Individual Submitting Request: Dale Schultz Company Name: Route 3 Box 334 Address: City, State, Zip: DairYland, WI 54830 Dale Schultz Contact Name: (715) Telephone: Signature: 6-18-93

This application, if complete and confirmed by information submitted in the monthly log by the thermal treatment facility, constitutes an acceptable form of a soil corrective action plan. The signatures of the individual submitting the request and the authorized thermal treatment unit representative constitute certification that the concentration and the type of contamination in the contaminated soil falls within the criteria established by the MPCA's guidance document. "Thermal Treatment of Petroleum Contaminated Soil" (Guidance Document 21) and that the thermal treatment facility is operating in compliance with its Air Quality emission permit.

Mail to: Project Manager Minnesota Pollution Control Agency Hazardous Waste Division Tanks and Spills Section 520 Lafayette Road St. Paul, Minnesota 55155-4194 Fax No.: 612/297-8676

Date:

ATTACH EMISSIC	DNS CALCULATIONS
$(a/1,000,000) \times (2,800 \text{ lbs/yd}^3) \times b = benzene emission in lbs., when weight basis, and b = amount of contaminated soil in yds3. NOTI substituting TPH concentration (ppm or mg/kg) for "a". It may all$	re a = benzene concentration of soil sample in ppm or mg/kg dry E: This calculation can also be used to estimate TPH emissions by so be used to calculate VOCs.
Part II: Propose	ed Treatment Facility
Name of Plant Earth Burner's Inc	Plant number and Model
Contact Terry Anderson	DNR Facility I.D. No. 998020100
Address Hallett Dock #7 Duluth, MN (or location of portable plant)	Distance to Nearest Residence/Business 2000 feet
LEAVE BLANK - DEPARTMENT C	OF NATURAL RESOURCES USE ONLY
Application Concurrence:	
Air Management	Date
Project Manager	Date
Comments:	
THIS SECTION TO BE COMPLETED BY THE ASPHALT	THERMAL UNIT PROCESSING THE CONTAMINATED SOIL
THIS SECTION TO BE COMPLETED BY THE ASPHALT <i>AFTER PROCESS</i> P	(THERMAL UNIT PROCESSING THE CONTAMINATED SOIL SING IS COMPLETED Part III
THIS SECTION TO BE COMPLETED BY THE ASPHALT <i>AFTER PROCESS</i> P WDNR Air Pollution Control Permit Number 92-0CF -051 Date of transport to plant June 21 1993	YTHERMAL UNIT PROCESSING THE CONTAMINATED SOIL SING IS COMPLETED Part III Part III Actual Volume of Soil Treated (tons/cubic yards) 6.7.2 Date of treatment July July Date of treatment
THIS SECTION TO BE COMPLETED BY THE ASPHALT <i>AFTER PROCESS</i> P WDNR Air Pollution Control Permit Number 92-0CF -051 Date of transport to plant June 21, 1993 Transporter Name Denas Truck Log of Supering	7THERMAL UNIT PROCESSING THE CONTAMINATED SOIL SING IS COMPLETED Part III Actual Volume of Soil Treated (tons/cubic yards) 6.7.2 Date of treatment. July 1 - 6, 1993 Transporter License Number
THIS SECTION TO BE COMPLETED BY THE ASPHALT AFTER PROCESS F WDNR Air Pollution Control Permit Number 92-0CF -051 Date of transport to plant June 21, 1993 Transporter Name Dean's Trucking of Superior Circle One: Roasted and Incorporated Roas	/THERMAL UNIT PROCESSING THE CONTAMINATED SOIL SING IS COMPLETED Part III Actual Volume of Soil Treated (tons/cubic yards) 6.7.2 Date of treatment July Transporter License Number
THIS SECTION TO BE COMPLETED BY THE ASPHALT AFTER PROCESS	YTHERMAL UNIT PROCESSING THE CONTAMINATED SOIL SING IS COMPLETED Part III Actual Volume of Soil Treated (tons/cubic yards) Date of treatment July Transporter License Number sted Only truction factor if no after burner is used).
THIS SECTION TO BE COMPLETED BY THE ASPHALT AFTER PROCESS WDNR Air Pollution Control Permit Number 92-00F -051 Date of transport to plant June 21, 1993 Transporter Name Dean's Trucking of Superior Circle One: Roasted and Incorporated Roas Total Benzene emissions in pounds for this batch (apply 50% designed Benzene emissions to date for this plant (including this batch) for	YTHERMAL UNIT PROCESSING THE CONTAMINATED SOIL SING IS COMPLETED Part III Actual Volume of Soil Treated (tons/cubic yards) Date of treatment July Transporter License Number sted Only truction factor if no after burner is used)
THIS SECTION TO BE COMPLETED BY THE ASPHALT AFTER PROCESS WDNR Air Pollution Control Permit Number 92-00F -051 Date of transport to plant June 21, 1993 Transporter Name Dean's Trucking of Superior Circle One: Roasted and Incorporated Roas Total Benzene emissions in pounds for this batch (apply 50% desi Benzene emissions to date for this plant (including this batch) for Signature of Treatment plant representative	ZTHERMAL UNIT PROCESSING THE CONTAMINATED SOIL SING IS COMPLETED Part III Actual Volume of Soil Treated (tons/cubic yards) Date of treatment July Date of treatment July Transporter License Number sted Only truction factor if no after burner is used) this calendar year Telephone Number at Plant
THIS SECTION TO BE COMPLETED BY THE ASPHALT AFTER PROCESS P WDNR Air Pollution Control Permit Number 92-0CF -051 Date of transport to plant June 21, 1993 Transporter Name Dean's Trucking of Supercorr Circle One: Roasted and Incorporated Roast Total Benzene emissions in pounds for this batch (apply 50% dest Benzene emissions to date for this plant (including this batch) for Signature of Treatment plant representative POST BURN SAMPLE RESULTS:	7/THERMAL UNIT PROCESSING THE CONTAMINATED SOIL SING IS COMPLETED Part III Actual Volume of Soil Treated (tons/cubic yards) 6.7.2 Date of treatment. July 1 - 6, 1993 Transporter License Number sted Only truction factor if no after burner is used). this calendar year. Telephone Number at Plant. (218). 628-0.248 FOR SOILS NOT INCORPORATED!
THIS SECTION TO BE COMPLETED BY THE ASPHALT AFTER PROCESS F WDNR Air Pollution Control Permit Number 92-0CF -051 Date of transport to plant June 21, 1993 Transporter Name Deans Total Benzene emissions in pounds for this batch (apply 50% dest Benzene emissions to date for this plant (including this batch) for Signature of Treatment plant representative POST BURN SAMPLE RESULTS: COMPLETE ONLY (One representative sample for each 100 cubic yards-not composite	YTHERMAL UNIT PROCESSING THE CONTAMINATED SOIL SING IS COMPLETED Part III Actual Volume of Soil Treated (tons/cubic yards) Date of treatment July Transporter License Number Sted Only truction factor if no after burner is used) this calendar year Telephone Number at Plant YEOR SOILS NOT INCORPORATED! tes)
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THIS SECTION TO BE COMPLETED BY THE ASPHALT AFTER PROCES: F WDNR Air Pollution Control Permit Number. $92 \cdot 0.cF \cdot 0.51$ Date of transport to plant. Junce 21 , 1993 Transporter Name Dean's Trucking of Supercier Circle One: Roasted and Incorporated Roast Total Benzene emissions in pounds for this batch (apply 50% dest Benzene emissions to date for this plant (including this batch) for Signature of Treatment plant representative POST BURN SAMPLE RESULTS: COMPLETE ONLY (One representative sample for each 100 cubic yards-not composit Sample Number $928 \cdot P31$ TPH 45.00	YTHERMAL UNIT PROCESSING THE CONTAMINATED SOIL SING IS COMPLETED Part III Actual Volume of Soil Treated (tons/cubic yards) 6.7.2 Date of treatment July Transporter License Number sted Only truction factor if no after burner is used) this calendar year Telephone Number at Plant TOR SOILS NOT INCORPORATED! tes)
THIS SECTION TO BE COMPLETED BY THE ASPHALT AFTER PROCESS P WDNR Air Pollution Control Permit Number $92 \cdot 0.6F \cdot 0.51$ Date of transport to plant June 21, 1993 Transporter Name Deans Trucking of Supercore Circle One: Roasted and Incorporated Roast Roasted and Incorporated Total Benzene emissions in pounds for this batch (apply 50% designature of Treatment plant representative POST BURN SAMPLE RESULTS: COMPLETE ONLY (One representative sample for each 100 cubic yards-not composite Sample Number $9308 \cdot P31$ TPH 45.00 DNR APPROVAL IS REQUIRED BEFORE USING AS COM	YTHERMAL UNIT PROCESSING THE CONTAMINATED SOIL SING IS COMPLETED Part III Actual Volume of Soil Treated (tons/cubic yards) Date of treatment July Image: Date of treatment Image: Date of treatment July Image: Date of treatment <

APPLICATION TO TREAT OR DISPOSE OF PETROLEUM CONTAMINATED SOIL ASPHALT PLANT OR OTHER TYPE OF THERMAL TREATMENT UNIT

Form 4400-149

This form is required by the Department of Natural Resources for leaking underground storage tank sites to ensure that petroleum contaminated soil is treated or disposed o; f in compliance with NR 500-540, NR 158, and NR 419, Wis. Adm. Code. Failure to comply with applicable statutes and administrative rules may lead to violations of subchapters III and IV of ch. 144 Wis. Stats. and may result in forfeitures of not less than \$10 or more than \$25,000 for each violation, pursuant to ss. 144.426(1), 144.74 (1), and 144.99, Wis. Stats., or fines of not less than \$100 or more than \$150,000 or imprisonment for not more than 10 years, or both, pursuant to s. 144.74 (2), Wis. Stats. Each day of a continuing violation constitutes a separate violation. Department approval of this form is required <u>prior</u> to site remediation, except for soils to be buried in landfills.

DIRECTIONS: 1) Complete parts I and II. 2) Submit the application to the DNR project manager for approval. 3) Have the treatment facility complete part III of the approved form after the soil has been treated. 4) Return the ORIGINAL form to the DNR project manager. 5) Keep a copy for your files.

ALL SITES MUST CO Part I. Source	MPLETE PART L of Soil
Moose Junction Lounge -	Site I.D. # (for DNR use only)
Site Address Route 3 Box 334	Contact Name Dale Schultz
City, State, Zip Code Dairy land, WI 54830	1/4, 1/4, Section, Township, and Range SE 1/4, SE 1/4 Section 18 T44N R14W
The information on this form is accurate to the best of my knowledge. Signature of Soil Generator	Telephone Number (include area code)
Consulting Firm Contact	Telephone Number
Earth Burners, Inc. Terry Anderson	(218) 628-0454
Estimated Volume Contaminated Soil	Soil Type (USCS)
672 Tons/cubic yards (circle one)	
Type of Petroleum Contamination (Circle):	$\underline{\times}$ clay (Cl, CH, OH)
Gasoline Diesel Fuel/#2 Fuel Oil	peat (PT)
Other	Distance to Nearest Residence/Business_O
Contaminant concentration:	

One screened sample for each 15 yds³ and one laboratory analysis for each 300 yds³ of contaminated soil when the field instrument *registers contamination* OR one laboratory analysis for each 100 yds³ when the field instrument *does not register contamination* on soil shown to be contaminated during the site investigation/excavation or stockpiling. PLEASE ATTACH A TABLE LISTING RESULTS OF BOTH FIELD SCREENING AND LAB ANALYSES, AND INCLUDE SUPPORTING LAB REPORTS, IN ADDITION TO THE TPH AND BENZENE INFORMATION REQUESTED BELOW. NOTE: DILHR requires a minimum of 3 laboratory samples on excavated soil for PECFA claims.

Total Benzene in soil to be remediated (attach calculations)

445.37 lbs

Total Petroleum Hydrocarbons(TPH) in soil to be remediated (attach calculations) 10,498,71 lbs

Total TPH as Gasoline Range Organics

Appendix B Hand Soil Boring Logs

site N	loose	Junctio	on Lou	inge	DRILLER	AUGERID	1.8 inch		
DATE/LOC	DATE/LOCATION 08/26/93				COMPANY	AUGER OD	2.0 inch		
BORING # HSB-1					TYPE RIG	TYPE BIT	Hand Auger		
PROJECT	* 93	08-030	D1		METHOD Hand Auger	LOGGED BY	JRW		
SAMPLE NUMBER	TIME	BLOW COUNT	RECOV. (FEET)	DEPTH RANGE	SOL DESCRIPTION WITH MUNSELL COLOR CC	ODE		USCS	PID (PPM)
	14:30			- 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 19 - 14 - 15 - 16 - 17 - 18 - 19	Sand with little gravel, damp, red mottled (2.5YR 3/3) Could not extend hole past 2.5 f	ddish brov ^r eet due to	vn, o rocks	SM	0.0
			No	ot enco	puntered TOTAL DEPTH 2.		bw grade		
NULES:	in c	ditch o	r in the	e wetla	nd area.	ΠΠατιοΠ			

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SITE N	loose	Junctio	on Lou	unge	DRILLER		AUG	BERID	1.8 inch		
DATE/LOC	ATION	08/	/26/93		COMPANY		AUG	EROD	2.0 inch		
BORING #	۶ H	ISB-2			TYPE RIG		TYP	E BIT	Hand Auger		
PROJECT	# 93	108-030	D1		METHOD	Hand Auger	LOG	GED BY	JRW		
SAMPLE NUMBER	TIME	BLOW COUNT	RECOV. (FEET)	DEPTH RANGE	SOLDESCRIP	PTION WITH MUNSELL O	OLOR CODE			USCS	PID (PPM)
9308 HSB-2 (4')	15:00			- 1 - 2 - 3 - 4 - 5	Silty sand, to bluish gr Same as al Same as al	few peblles; mot ay clay (5YR 3/3 bove bove, little less si	itled appe 3 and 10F ilt, wet	earanc 3 3/1))	e - rust	SM SM SM	0.0 0.4 0.2
				- 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 - 19							
GROUNE	WATER (L DEPTH	3.8	⊥ 5 feet k	elow grade	TOTAL DEPTH	4 feet	t belov	v grade		I
NOTES:											<u></u>

SITE Moose Junction Lounge	DRILLER	AUGERID 1.8 Inch	
DATE/LOCATION 08/26/93	COMPANY	AUGER OD 2.0 Inch	
BORING # HSB-3	TYPE RIG	TYPE BIT Hand Auger	
PROJECT # 9308-0301	METHOD Hand Auger	LOGGED BY JRW	
SAMPLE BLOW RECOV. DEP NUMBER TIME COUNT (FEET) RANG	H SOLDESCRIPTION WITH MUNSELL COLOR CO	DDE	USCS (PID
9308 HSB-3 (4') 15:35 	Silty sand with little gravel, dull ru to brown (5YR 5/3), moist, loose Same as above, more gray and n to 5YR 5/3), wet, loose Could not extend hole past 4.0 fe	nottled (2.5YR 5/1 net due to rocks	SM 0.0 SM 0.0
GROUNDWATER DEPTH 3 feet	Delow grade TOTAL DEPTH 4	0 feet below grade	
NOTES:			

DATE/LOCATION 08/26/93 COMPANY AUGER OD 2.0 inch BORING # HSB-4 TYPE RIG TYPE BIT Hand Auger PROJECT # 9308-0301 METHOD Hand Auger LOGGED BY JRW SAMPLE NUMBER TIME BLOW COUNT RECOV. (FEET) DEPTH RANGE SOIL DESCRIPTION WITH MUNSELL COLOR CODE USCS 9308 Interview In	^{РІД} (РРМ) 0.5
BORING # HSB-4 TYPE RIG TYPE BIT Hand Auger PROJECT # 9308-0301 METHOD Hand Auger LoggED BY JRW SAMPLE NUMBER TIME BLOW COUNT RECOV. (FEET) DEPTH RANGE SOL DESCRIPTION WITH MUNSELL COLOR CODE USCS 9308	^{РІД} (РРМ) 0.5
PROJECT # 9308-0301 METHOD Hand Auger LOGGED BY JRW SAMPLE NUMBER TIME BLOW COUNT RECOV. (FEET) DEPTH RANGE SOL DESCRIPTION WITH MUNSELL COLOR CODE USCS 9308 HSB-4 (4') Image: Count (FEET) Image: Count (FEET) Image: Count (FEET) Dark reddish brown gravel (5YR 3/3) dry, loose (fill) GM 9308 HSB-4 (4') Image: Count (FEET) Image: Count (FEET)	^{РІД} (РРМ) 0.5
SAMPLE NUMBER TIME BLOW COUNT RECOV. (FEET) DEPTH RANGE SOIL DESCRIPTION WITH MUNSELL COLOR CODE USCS 9308 HSB-4 (4') GM 9308 HSB-4 (4') GM Dark reddish brown gravel (5YR 3/3) dry, loose (fill) GM	^{РІД} (РРМ) 0.5
9308 1 Dark reddish brown gravel (5YR 3/3) dry, loose (fill) GM 2	0.5
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	
GROUNDWATER DEPTH Not encountered TOTAL DEPTH 4.0 feet below arade	<u>.</u>
NOTES:	

Appendix C Groundwater Stabilization Logs

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a division of Earth Burners, Inc. 500 Leisure St PO Box 16083 Duluth, MN 55816-0083

Office: (218) 628-0248 Fax: (218) 628-0455

GROUND WATER SAMPLING FORM

SITE:	Moose Junction Lounge	WELL CONDITION: Capped & Locked
DATE:	08/26/93	WEATHER CONDITIONS: Sunny
WELL #:	MW - 1	80°
PROJECT	#: 9308-0301	SAMPLED BY: <u>RWB/JRW</u>

WATER LEVEL MEASUREMENT AND WELL PURGING

Location of measuring point:Top of CasingHeight of measuring point above ground surface:feetTotal depth of well below measuring point:12.15Depth of water table from measuring point:5.07Length of water column:7.08Purge method:Dedicated BailerRequired purge volume:1.15gallons

Volume Removed Gallons	рH	Cond. (um/cm)	Temp (F)	Color
1.2	6.8	870	61.3°	Yellowish brown
2.4	6.7	950	61.0°	п
3.6	7.0	970	61.0	u
4.8	6.9	960	60.7	U U

SAMPLE COLLECTION

Collection method: <u>Dedicated Bailer</u>	Time: <u>14:00</u>	
--------------------------------------------	--------------------	--

Analysis	Containers	Sample Prep/ Preservation
GRO/VOC's (465D)	3-40 ml each	HC I
Total Pb	1-250 ml plastic	*

Chain of Custody form: [] No [X] Yes Chain of Custody Tape: [X] No [] Yes

Shipping Container: Iced Cooler

NOTES: <u>* Unpreserved - will be preserved with HNO₁ after filtering</u> by the analytical laboratory. Petroleum odor.

a division of Earth Burners, Inc. 500 Leisure St PO Box 16083 Duluth, MN 55816-0083

Office: (218) 628-0248 Fax: (218) 628-0455

GROUND WATER SAMPLING FORM

SITE:	Moose Junction Lounge	WELL CONDITION: <u>Capped & Locked</u>
DATE:	08/26/93	WEATHER CONDITIONS: Sunny
WELL #:	MW-1A	<u>80°</u>
PROJECT	#: 9308-0301	SAMPLED BY: <u>RWB/JRW</u>

 WATER LEVEL MEASUREMENT AND WELL PURGING

 Location of measuring point:
 Top of Casing

 Height of measuring point above ground surface:
 feet

 Total depth of well below measuring point:
 feet

 Depth of water table from measuring point:
 feet

 Length of water column:
 feet

 Purge method:
 Dedicated Bailer

 Required purge volume:
 gallons

Volume Removed Gallons	рН	Cond. (um/cm)	Temp (F)	Color
			-	

SAMPLE COLLECTION

Collection method: <u>Dedicated Bailer</u> Time: <u>14:00</u>

Analysis	Containers	Sample Prep/ Preservation
GRO/PVOC/MTBE	3-40 ml each	HC I

Chain of Custody form: [] No [X] Yes Chain of Custody Tape: [X] No [] Yes

Shipping Container: Iced Cooler

NOTES: Duplicate of MW-1

a division of Earth Burners, Inc. 500 Leisure St PO Box 16083 Duluth, MN 55816-0083

Office: (218) 628-0248 Fax: (218) 628-0455

GROUND WATER SAMPLING FORM

SITE:	Moose Junction Lounge	WELL CONDITION: <u>Capped & Locked</u>
DATE:	08/26/93	WEATHER CONDITIONS: Sunny
WELL #:	<u>MW-2</u>	80 °
PROJECT #	:9308-0301	SAMPLED BY: RWB/JRW

 WATER LEVEL MEASUREMENT AND WELL PURGING

 Location of measuring point:
 Top of Casing

 Height of measuring point above ground surface:
 feet

 Total depth of well below measuring point:
 15.41
 feet

 Depth of water table from measuring point:
 7.01
 feet

 Length of water column:
 8.40
 feet

 Purge method:
 Dedicated Bailer
 1.37
 gallons

Volume Removed Gallons	рН	Cond. (um/cm)	Temp (F)	Color
1.4	6.3	2300	56.3°	Tan
2.8	6.13	2150	56.6°	Dark tan
4.2	5.76	2160	54.0°	Brownish tan
5.6	5.88	1960	61.0°	Brown

SAMPLE COLLECTION

Collection method: <u>Dedicated Bailer</u> Time: <u>13:00</u>

Analysis	Containers	Sample Prep/ Preservation
GRO/VOC's (465D)	3-40 ml each	HC I
Total Pb	1-250 ml plastic	*

Chain of Custody form: [] No [X] Yes Chain of Custody Tape: [X] No [] Yes

Shipping Container: Iced Cooler

NOTES: <u>* Unpreserved - will be preserved with HNO, after filtering</u> by the analytical laboratory. Heavy petroleum odor with sheen.

a division of Earth Burners, Inc. 500 Leisure St PO Box 16083 Duluth, MN 55816-0083

Office: (218) 628-0248 Fax: (218) 628-0455

GROUND WATER SAMPLING FORM

SITE:	Moose Junction Lnge	WELL CONDITION: <u>Capped & Locked</u>
DATE:	08/26/93	WEATHER CONDITIONS: <u>Sunny</u>
WELL #:	MW - 3	85 <u>°</u>
PROJECT #:	9308-0301	SAMPLED BY: <u>RWB/JRW</u>

WATER LEVEL MEASUREMENT AND WELL PURGINGLocation of measuring point:Top of CasingHeight of measuring point above ground surface:feetTotal depth of well below measuring point:15.41Depth of water table from measuring point:3.86Length of water column:11.55Purge method:Dedicated BailerRequired purge volume:1.88

Volume Removed Gallons	Нq	Cond. (um/cm)	Temp (F) *	Color
1.9	6.2	680	60.9°	Medium brown
3.8	6.4	650	57.8°	Medium brown
5.7	6.5	640	56.5°	Medium reddish brown
7.6	6.7	670	55.3°	Dark red brown

SAMPLE COLLECTION

Collection method: <u>Dedicated Bailer</u> Time: <u>10:30</u>

Analysis	Containers	Sample Prep/ Preservation
GRO/PVOC/MTBE	3-40 ml each	HC1
Total Pb	1-250 ml plastic	* *

Chain of Custody form: [] No [X] Yes Chain of Custody Tape: [X] No [] Yes

Shipping Container: Iced Cooler

NOTES: <u>* Temperatures are skewed due to high air temperature</u>. <u>** Unpreserved - will be preserved with HNO</u> after filtering by the analytical laboratory.

a division of Earth Burners, Inc. 500 Leisure St PO Box 16083 Duluth, MN 55816-0083

Office: (218) 628-0248 Fax: (218) 628-0455

GROUND WATER SAMPLING FORM

SITE:	Moose Junction Lnge	WELL CONDITION: Capped & Locked
DATE:	08/26/93	WEATHER CONDITIONS: <u>Sunny</u>
WELL #:	MW-4	<u>80°</u>
PROJECT	#: 9308-0301	SAMPLED BY: <u>RWB/JRW</u>

WATER LEVEL MEASUREMENT AND WELL PURGING

Location of measuring point:Top of CasingHeight of measuring point above ground surface:feetTotal depth of well below measuring point:14.38Depth of water table from measuring point:4.12Length of water column:10.26Purge method:Dedicated BailerRequired purge volume:1.73gallons

Volume Removed Gallons	На	Cond. (um/cm)	Temp (F)	Color
1.7	6.7	950	60.8°	Yellowish brown
3.4	6.7	970	60.5°	"
5.1	6.7	950	59.6°	11
6.8	6.7	950	59.7°	17

SAMPLE COLLECTION

Collection method: <u>Dedicated Bailer</u> Time: <u>12:00</u>

Analysis	Containers	Sample Prep/ Preservation					
GRO/VOC's (465D)	3-40 ml each	HC I					
Total Pb	1-250 ml plastic	*					

Chain of Custody form: [] No [X] Yes Chain of Custody Tape: [X] No [] Yes

Shipping Container: Iced Cooler

NOTES: <u>* Unpreserved - will be preserved with HNO, after filtering</u> by the analytical laboratory. Appendix D Groundwater and Hand Soil Boring Laboratory Analysis

			K	1																	
< D		ATO	Ź		72 M	28 GARF IN (218) 7	IELD AVE 22-1911	ENUE • • FAX	DULI (218)	JTH, MI 722-329 PTS T	NNESC	DTA 558	302		N	I □ LABC	1 DRA	107 TORY	78 (RE	QUEST AND	
PEH		А	DIVISI		1 44 11	N PU	RIS I	E911	NG, IN	ю.			CHAI	N Oł	- CUS	510	DA KECOKD				
л S	Project Name/No. 🥂 005E	JUNC	TIDN LI) ~~~6	€ 	9308	- 030	1	P.	D. #											
Ш	Client Earth Remediation	, Koger Bieb) Re							Remarks												
Ā	Address <u>R.O. B.o.x</u>		* NOTE							The lead mater samples a											
ᆋ	Dulwth MN, 55816 Bill TO EBI										not	D	rese	ived	as they need to be						
	Phone 628-02				f.)-	tere	·L _														
	Sampler Signature Porgen W Bield							Analy	/ses		/*/	~~~		7	7		/	/	/		
	Sampler (Print) Roga			ative					("), ("),												
	Sample No./Location	Date	Time	Matr Air Liauld	Solid R	Number Of Containers	Preserva			(2/a)	micra									LSL No.	
	MW - 3	8/26/93	10:30	Ý		4	王 王 王 王 王 王	3)											2504	
	MW-4		12:00	V		4	HU	3)											2505	
	MW-2		13:00	V		Ч	HU	3)											2506	
	MW-1		14:00	\checkmark		4	140)	3	•)								-			2507	
	MW-1A		14:00	V		3	1401	3												2508	
	¥ 9308-HSB-2(4)		15:00		\checkmark	2	/ne0H	1		1			-							2509	
	9308-HSB-3(4)		15:35		\checkmark	Ç	mebty	1)										2510	
	(1708 - HSB - 4(4))	Y	16:3D		\bigvee	2	MODA	l		1										251)	
	DS-WW		1):00	V		14	19CI	3]						,					2512	
	MD-WW	\bigvee	11:15	V		4	HA	3)											2513	
	Rolinquished By Rogen w Richel	Date/	1111111111111111111111111111111111111	S Rece	ived B	Y ===				Relinquis	hed By				Date/Time			Received By			
	Relinquished By	Date/1	Time	Rece	ived B	y	(Relinquis	hed By				Date/Tim	e	Rec	eived By			
				J						*****				l,							

Turnaround Time: 24 Hour Rush

2-5 Day _____

2 Week _____

SERIAL NUMBER
LABORATORY ANALYSIS REPORT

728 GARFIELD AVENUE ■ DULUTH, MINNESOTA 55802 MN (218) 722-1911 ■ FAX (218) 722-3295

A DIVISION OF TWIN PORTS TESTING, INC.

Page 1

Earth Remediation Services 500 Leisure Street Duluth, MN 55816 (218) 628-0248

ABORAT

Project Moose Junction, WI Project No. 9308-0301

Collected By Roger W. Biebl Delivered By Roger W. Biebl

Chem. Lab ID	2504-93LS	2505-93LS	2506-93LS	2507-93LS
Sample Type	Water	Water	Water	Water
Collected Received Analyzed Reported	08/26/93 08/27/93 09/01/93 09/10/93	08/26/93 08/27/93 09/01/93 09/10/93	08/26/93 08/27/93 09/01/93 09/10/93	08/26/93 08/27/93 09/01/93 09/10/93
Sample Description	MW-3	MW-4	MW-2	MW-1
Analysis				
Gasoline Range Organics Methyl Tertiary Butyl Ether Moisture	<0.100 mg/L <0.005 mg/L	<0.100 mg/L <0.005 mg/L	36.8 mg/L <0.005 mg/L	3.59 mg/L 0.099 mg/L
1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Benzene Ethylbenzene Lead Toluene Total Xylenes	<0.005 mg/L <0.005 mg/L <0.005 mg/L <0.005 mg/L <0.050 mg/L <0.005 mg/L <0.005 mg/L	<0.005 mg/L <0.005 mg/L 0.146 mg/L <0.005 mg/L <0.050 mg/L <0.005 mg/L <0.005 mg/L	0.652 mg/L 0.259 mg/L 2.79 mg/L 0.551 mg/L 0.058 mg/L 2.77 mg/L 2.65 mg/L	0.069 mg/L 0.045 mg/L 0.228 mg/L 0.047 mg/L <0.050 mg/L 0.054 mg/L 0.053 mg/L

ORIES

N. Song Street

Remarks Not tested for. TADIN 110/93 Analyzed By Date

9/15/93 **Reviewed** By Date

4.1 P 1.1

Wisconsin DNR Certification Number 816057440

(1976 s)

LABORATORY ANALYSIS REPORT

728 GARFIELD AVENUE ■ DULUTH, MINNESOTA 55802 MN (218) 722-1911 ■ FAX (218) 722-3295

A DIVISION OF TWIN PORTS TESTING, INC.

Client Earth Remer⁴ 500 1 (218) 628-0248

Project Moose Junction, WI Project No. 9308-0301

Collected By Roger W. Biebl Delivered By Roger W. Biebl ing."

Page 2

2508-93LS	2509-93LS	2510-93LS	2511-93LS
Water	Soil	Soil	Soil
08/26/93 08/27/93 09/01/93 09/10/93	08/26/93 08/27/93 09/01/93 09/10/93	08/26/93 08/27/93 09/01/93 09/10/93	08/26/93 08/27/93 09/01/93 09/10/93
MW-1A	9308-HSB-2(4)	9308-HSB-3(4)	9308-HSB-4(4)
13.4 mg/L 0.621 mg/L 0.417 mg/L 0.369 mg/L 1.12 mg/L 0.455 mg/L 0.368 mg/L 0.871 mg/L	<5.000 mg/kg <0.200 mg/kg <0.200 mg/kg <0.200 mg/kg <0.200 mg/kg <0.200 mg/kg 9.08 mg/kg <0.200 mg/kg <0.200 mg/kg	<5.000 mg/kg <0.200 mg/kg <0.200 mg/kg <0.200 mg/kg <0.200 mg/kg <0.200 mg/kg 11.3 mg/kg <0.200 mg/kg <0.200 mg/kg <0.200 mg/kg	<5.000 mg/kg <0.200 mg/kg 23.8% <0.200 mg/kg <0.200 mg/kg <0.200 mg/kg 9.87 mg/kg <0.200 mg/kg <0.200 mg/kg
	2508-93LS Water 08/26/93 09/01/93 09/10/93 MW-1A 13.4 mg/L 0.621 mg/L 0.369 mg/L 1.12 mg/L 0.455 mg/L 0.368 mg/L 0.368 mg/L 0.871 mg/L	2508-93LS 2509-93LS Water Soil 08/26/93 08/26/93 08/27/93 08/27/93 09/01/93 09/01/93 09/10/93 09/10/93 09/10/93 09/10/93 MW-1A 9308-HSB-2(4) 13.4 mg/L <5.000 mg/kg 0.621 mg/L <0.200 mg/kg 16.6% <0.200 mg/kg 0.369 mg/L <0.200 mg/kg 1.12 mg/L <0.200 mg/kg 0.368 mg/L <0.200 mg/kg 0.3671 mg/L <0.200 mg/kg	2508-93LS 2509-93LS 2510-93LS Water Soil Soil 08/26/93 08/26/93 08/26/93 08/27/93 08/27/93 08/27/93 09/01/93 09/01/93 09/01/93 09/10/93 09/10/93 09/10/93 09/10/93 09/10/93 09/10/93 MW-1A 9308-HSB-2(4) 9308-HSB-3(4) 13.4 mg/L <5.000 mg/kg <0.200 mg/kg - 16.6% 18.0% - 16.6% 18.0% 0.417 mg/L <0.200 mg/kg <0.200 mg/kg 0.369 mg/L <0.200 mg/kg <0.200 mg/kg - 0.200 mg/kg <0.200 mg/kg - 0.200 mg/kg <0.200 mg/kg - 9.08 mg/kg 11.3 mg/kg 0.368 mg/L <0.200 mg/kg <0.200 mg/kg - 9.08 mg/kg 11.3 mg/kg 0.368 mg/L <0.200 mg/kg <0.200 mg/kg 0.368 mg/L <0.200 mg/kg <0.200 mg/kg 0.368 mg/L <0.200 mg/kg <td< th=""></td<>

49 Remarks Not tested for. Intersor Analyzed By Date , e/10/93 **Reviewed** By Date Wisconsin DNR Certification Number 816057440

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LABORATORY ANALYSIS REPORT

Page 3

728 GARFIELD AVENUE ■ DULUTH, MINNESOTA 55802 MN (218) 722-1911 ■ FAX (218) 722-3295

E	RIOR LABORATO	DRIES	A DIVISION OF T	WIN PORTS TESTING, IN	JC.
S					ŗ
LAKE	Client Earth Remediation Services 500 Leisure Street Duluth, MN 55816 (218) 628-0248		Project Project No Collected B Delivered B	t Moose Junction, WI 9308-0301 y Roger W- Biebl y Roger W. Biebl	
	Chem. Lab ID	2512-93LS	2513-93LS		
1				*	

Chem. Lab ID	2512-93LS	2513-93LS	
Sample Type	Water	Water	 :
Collected Received Analyzed Reported	08/26/93 08/27/93 09/01/93 09/10/93	08/26/93 08/27/93 09/01/93 09/10/93	Y
Sample Description	DS-WW	MD-WW	
Analysis			
Gasoline Range Organics	<0.100 mg/L	<0.100 mg/L	
Moisturo	<0.005 mg/L	<0.005 mg/L	
1 2 4-Trimethylbonzono	- - 0.005 mg/l	- -0.005 mg/l	
1.3.5-Trimethylbenzene	<0.005 mg/L	<0.005 mg/L	
Benzene	<0.005 mg/L	<0.005 mg/L	
Ethylbenzene	<0.005 mg/L	<0.005 mg/L	
Lead	<0.050 mg/L	<0.050 mg/L	
Toluene	<0.005 mg/L	<0.005 mg/L	
Total Xylenes	<0.005 mg/L	<0.005 mg/L	

Remarks

- Not tested for.

Piterson He Analyzed By

Reviewed By

ŝ,

Wisconsin DNR Certification Number 816057440

9/10/0

Date

LAKE SUPERIOR LABORATORIES 7

SAMPLE CONDITION UPON RECEIPT CHECKLIST

Client: Farth Remediation Services Project: Moose Junction Longe # 9308-0301 Date Received: 8/27/93 coc # 10778 Samples Received By: 1 - Harold (Signature)

- 1. Is there a chain of custody (COC) or letter stating information contained on a COC?
- 2. Is the date and time relinquished in agreement with that written on the letter or COC?
- 3. Do the samples received agree with the COC or accompanying paperwork (i.e. number of samples, matrices, sample tags, sample containers, analyses, etc.)?
- 4. Are all the samples within the holding times for requested analyses? Communicate any lapse of greater than 4 days beyond date of collection for VOA analysis.
- 5. Are all the sample containers intact (i.e., not broken, leaking, etc.)?
- 6. Did the samples arrive on ice?a) Are the samples at the proper temperature?
- 7. Is there enough sample to do all the analyses?
- 8. Are the samples preserved correctly?
- 9. Are the VOA vials head-space free?

'NO' Items Explained:

One of The Vials for Saple #2512-4365 (DS-WW) had Anair bubble

Yes No

NA = Not Applicable.

Appendix E Aquifer Testing Graphs









Appendix F Wisconsin Department of Health and Social Services Concentrations at Which DHSS Requests Notification

CONCENTRATIONS AT WHICH DHSS REQUESTS NOTIFICATION March 1992 (LEVELS ARE FOR CONTAMINATED DRINKING WATER)

<u>Chemical</u>	oncentration (ug/l)	<u>Chemical</u> <u>Cor</u>	<u>icentration</u> (ug/1)
Alachlor	40	Aldicarh	10
Arsenic	50	Atrazine	50
Barium	5000	Benzene	100
Bromodichloromethane	179	Butylate	350
Cadmium	20	Carbaryl	1000
Carbofuran	50	Carbon Tetrachloride	30
Chloramben	200	Chromium	200
Cvanazine	20	Cvanide	200
Dibromochloropropane	3	Dibromochloromethane	215
Dicamba	300	o,m-Dichlorobenzene	9000
p-Dichlorobenzene	750	1.1-Dichloroethane	1700
1,2-Dichloroethane	40	1,1-Dichloroethylene	7
1,2-Dichloroethylene	200	Dichloromethane	500
2,4-D	100	Dimethoate	7
Dinoseb	13	Dioxins	.00002
Endrin	3	EPTC	. 500
Ethylenedibromide	.04	Ethylbenzene	1360
Fluoride	10000	Fluorotrichloromethane	3490
Lead	50	Lindane	0.2
Mercury	10	Methoxychlor	500
Metolachlor	100	Metribuzin	300
Nitrogen(Nitrate+Nitrite)	20000	Pentachlorophenol	. 300
Selenium	50	Silver	200
Simazine	50	Tetrachoroethylene	70
Tetrahydrofuran	500	Toluene	3000
Toxaphene	3	1,1,1-Trichloroethane	1000
1,1,2-Trichloroethane	60	Trichloroethylene	300
2,4,5-Trichlorophenoxy-propionic	c acid 800	Trifluralin	30
Vinyl Chloride	1.5	Xylene	10000

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