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Superior Water Light & Power Superior, Wisconsin



Phase II, Part III Site Investigation Report Former Manufactured Gas Plant Superior, Wisconsin

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1.0 INTRODUCTION

This report presents the results of the Phase II, Part III Site investigation completed in October and November 2004 at the Superior Water Light & Power (SWL&P) Former Manufactured Gas Plant (MGP), located at the intersection of Winter Street and East 1st Street in Superior, Wisconsin (Site). The Site location is shown in Figure 1-1.

The Phase II, Part III investigation followed the scope of work outlined in the November 21, 2003 Recommendations for Further Investigation letter and the methodologies outlined in the Phase II Investigation, Part II Work Plan. The fieldwork for this investigation was completed on October 12 through October 15, 2004 and November 16 and 17, 2004.

1.1 **Purpose of Investigation**

ENSR conducted a Phase I environmental assessment at the Site for SWL&P in September/October of 2001. The Phase I report indicated that gas was manufactured at the Site for fifteen years, ending in 1904. Areas of the Site that had the potential to contain MGP-related chemicals and/or byproducts were identified as part of the Phase I assessment. ENSR performed a Phase II Site investigation from November 2001 through February 2002. Results of the Phase II indicated areas of the Site contained volatile organic compounds and polyaromatic hydrocarbons (PAH) compounds in the soil above Wisconsin Department of Natural Resources (WDNR) Residual Contaminant Levels (RCL). Groundwater samples contained benzene, toluene, ethylbenzene, and xylene (BTEX) and PAH compounds above the WDNR groundwater enforConcrete standards. South of the Site building, an area contained exclusively volatile organic compounds of unknown origin. Other Site areas contained both PAH and BTEX. The former gas holder tank bases were investigated with a backhoe. MGP wastes were not found in association with the tank bases, but tarry materials were that contained PAH were found in the soil north and west of the former Site building.

A Phase II, Part II Investigation was completed in September 2002 to further delineate the PAH and BTEX in the soil and groundwater. Fingerprinting analytical results indicated the volatile organic compounds found south of the Site building appeared to be a blended solvent or degreaser consisting of primarily benzene and toluene with lesser amounts of ethylbenzene and xylene. In addition, a test trench excavation north of the Site building encountered a clay tile pipe oriented toward the former Superior Bay shoreline that contained tarry material. The tarry material was analyzed using "fingerprinting" techniques and appeared to be carbureted water gas coal tar. The results of the Phase II, Part II investigation indicated additional BTEX and PAH impacts downgradient of the Site.

A sediment investigation was completed in the Superior Bay boat slip and nearby storm sewers in March and April 2003. The sediment results indicated concentrations of PAH similar to typical urban run-off in the storm sewer and boat slip. Thus, the investigation shifted back to soil and groundwater in



upland areas of the Site. The purpose of this Phase II, Part III investigation was to further delineate the off-Site soil and groundwater impacts.

1.2 Scope of Work

The scope of work for this Phase II Part III investigation was outlined in the November 21, 2003 Recommendation for Further Investigation letter, which served as the work plan for this investigation. The Phase II Part III scope of work is summarized below.

The scope consisted of first creating a project health and safely plan and clearing underground utilities at the Site. The field work consisted of installing eight soil borings using a Geoprobe[®] hydraulically powered percussion drilling method, installing five monitoring wells, and sampling the wells. One soil sample was collected from each soil boring for laboratory analysis. Groundwater samples were collected from temporary wells in the Geoprobe soil borings. After the new monitoring wells were developed, groundwater samples were collected from the five new monitoring wells and from three existing wells. Slug tests were performed on the five new monitoring wells to determine hydraulic conductivity of the formation. Figure 1-2 presents the locations of soil borings and monitoring wells completed for this investigation.

1.3 Site Location and Ownership

The former MGP Site is located northeast of the intersection of Winter Street and East 1st Street in Superior, Wisconsin. The Site occupies a portion of the northwest quarter of Section 13, Township 49 North and Range 14 West (NW ¼ of Sec. 13, T49N, R14W).

Portions of the former MGP property are now owned by SWL&P, the City of Superior, the U.S. Department of Transportation, and CLM, Inc..

The SWL&P owner contact is:

Bill Bombich Superior Water Light & Power Company 2915 Hill Avenue Superior, Wisconsin 54880 (715) 395-6288

1.4 Consultant and Contractor Identification

The Site investigation activities were conducted by ENSR Corporation. The contact for this investigation is:

ENSR

William M. Gregg ENSR International 4500 Park Glen Road, Suite 210 St. Louis Park, MN 55416 (952) 924-0117 - phone (952) 924-0317 - fax

Subcontractors that provided services for this investigation are identified below.

Laboratory Analytical Services

En Chem, Inc. Attn: Laurie Woelfel 1795 Industrial Drive Green Bay, WI 54302 (800) 736-2436 – phone (414) 469-8827 – fax (WDNR Certification 405132750)

Drilling Services

Matrix Environmental, LLC Attn: Jim Dzuby 8631 Jefferson Hwy Osseo, MN 55369 (763) 424-4803 - phone (763) 424-9452 - fax

<u>Surveying</u>

Salo Engineering Attn: Dale Berntsen 15 East First Street Duluth, MN 55802 (218) 727-8796 – phone (218) 727-0216 – fax



2.0 SITE BACKGROUND

2.1 Site Description

A 3,000-square foot brick building, that was an original MGP building reconstructed in 1929, is located on the northeast side of Water Street and East 1st Street, between Water Street and the railroad tracks that roughly parallel the shoreline of Superior Bay. Gravel parking areas surround the building. Several parcels of land adjacent to the building were part of the former MGP property including a vacant grass-covered field to the west of the building where two gas holders were once located. Another larger gas holder was located on the now-vacant property south of the building, immediately south of U.S. Highway 53. A city street and vacant, grass-covered lots are now located where the larger gas holder was situated.

The Site is irregularly shaped consisting of approximately five acres, and is situated approximately two miles from downtown Superior. The area surrounding the Site consists of industrial land along the Superior Bay shoreline and commercial/residential properties further inland. The property east of the Site is a fenced parcel used by Lakehead Concrete Company for storage and a ready mix plant. East of the Site is the City of Superior wastewater treatment plant. North of the Site is a former coal dock that is now owned and operated by CLM, Inc. for the production of lime. Adjacent to the CLM, Inc. dock are two large aboveground storage tanks that formerly contained fuel oil. Commercial and residential properties are located along Winter Street and other city streets south of the Site.

2.2 Site History

The gas plant was built in 1888 and began operations on November 1, 1889. The gas produced was a water gas made by the improved "Springer" process. Two gas holders were initially constructed on the Site: one single lift of 35,000 cubic feet capacity, built in October 1889, and one double lift holder of 250,000 cubic feet capacity, dimensions of 92 ft x 21 ft x 21 ft, completed in October 1891. In 1924, a third gas holder was constructed at the subject property. This 750,000-cubic foot gas holder was located southwest of the former MGP building. A spherical gas holder called the "Horton Sphere" was constructed in 1950.

Gas was produced at the Superior MGP from November 1889 to August 1904. After August 1904, all gas sold by SWL&P was purchased from the Zenith Furnace Company (later known as Interlake, Corporation). The gas purchased from Zenith/Interlake was purified in West Duluth before it was piped to SWL&P's plant in Superior. Therefore, no purifier wastes were generated at the Site after August 1904. The MGP at the Site produced a total of approximately 262,000 MCF (million cubic feet) of gas during its 15-year production history.

In 1929, the gas plant building was rebuilt to its present configuration. Gas purchased from Zenith/Interlake was stored in the gas holders, and pumped and metered from the reconstructed



building. Storage and metering of manufactured gas purchased from Zenith/Interlake continued until natural gas supplies became available in 1959. The 35,000-cubic foot gas holder was removed prior to 1938. The 250,000-cubic foot gas holder was removed between 1940 and 1961. The 750,000-cubic foot gas holder was removed between 1966, and the Horton Sphere was removed in 1985.

In 1978, SWL&P sold the former gas plant building and portions of the property to CLM, Inc. The building was gutted, concrete floors were poured over the existing sand floors, and the building has been used for storage since that time.

2.3 Source Areas

The previous investigations identified areas that had elevated levels of PAH and BTEX compounds. The results of the Phase II and Phase II Part II sampling indicated there are three general areas where RCLs/enforConcrete standards are exceeded, as illustrated on Figure 2-1. These areas have been generally defined based on the soil type, the types of compounds detected, and their concentrations. Below is a summary of the three areas:

- Area 1: Area 1 is located in a grassy field south of the Site building and south of East 1st Street. The soil encountered in Area 1 consisted of reddish-brown high plasticity clay. Analytical results indicate concentrations of benzene and toluene above the enforConcrete standards in the groundwater and benzene, ethylbenzene, and xylene above RCLs in the soil. Fingerprinting analysis indicated the chemicals were a blended solvent or degreaser consisting primarily of benzene and toluene.
- Area 2: Area 2 is located north and east of the Site building in the gravel parking lot. The soil encountered in Area 2 consisted of fill composed of lime-like material, cinders, bricks, and slag which contained groundwater at approximately five to nine feet below ground surface. Beneath the fill was reddish-brown high plasticity clay. The clay elevation sloped down towards the northeast. Analytical results indicated concentrations of BTEX and PAH in the soil and water above cleanup criteria. Fingerprinting results of tarry material in a clay pipe indicated the material is most likely carbureted water gas coal tar, with an unresolved petroleum constituent similar to #5 or #6 fuel oil. BTEX concentrations in Area 2, particularly in the vicinity of MW-7, indicate the custom solvent may also be present in Area 2.
- Area 3: Area 3 is located west of the Site building in a grassy field. The soil encountered in Area 3 consisted of reddish-brown high plasticity clay. Analytical results indicated concentrations of BTEX and PAH in the soil above cleanup criteria. Two former gas holders were located in Area 3, with PAH and BTEX impacts present only surrounding the eastern gas holder. Samples downgradient of Area 3, between Area 3 and Area 2, did not contain BTEX or PAH above cleanup criteria. Thus, the majority of impacts in Area 3 have been delineated.



The purpose of this Phase II Part III investigation was to further investigate the downgradient and cross gradient extent of Areas 1 and 2.

2.4 Geologic and Hydrogeologic Setting

The MGP Site is located at an elevation between 610 and 615 feet above mean sea level. The topography of the former MGP is relatively flat with little or no slope. To the northeast of the former MGP, the topography slopes down towards the railroad tracks. The land surface to the North of the railroad tracks is relatively flat with most elevations between 605 and 607 feet above mean sea level. The water elevation in Superior Bay is approximately 601 feet above mean sea level.

Aerial photographs and historic maps of the City of Superior, obtained during the Phase I, indicate the former Lake Superior shoreline was originally located approximately 50 to 75 feet northeast of the MGP building. Water was present between the former shoreline and the railroad track embankment in Superior Bay. By 1905 the area between the former shoreline and the railroad tracks had been filled, and no water was present. Various shoreline development and filling activities continued between 1905 and 1978. The 1978 aerial photo depicts the area north of the railroad tracks in it's current configuration.

The results of the subsurface investigations indicate that there are several soil types encountered in the area:

- Reddish-brown high-plasticity clay;
- Sand and silty sand;
- Fill material consisting primarily of light gray to dark gray lime-like material; and
- Miscellaneous fill, such as bricks, wood, slag, and cinders.

Sandstone bedrock (Keweenawan Formation) may be found beneath the unconsolidated soils. Depth to bedrock is estimated to be from 100 to 200 feet below the ground surface.

Groundwater was encountered in the lime-like material, miscellaneous fill, and sand, above the clay unit, 3 to 10-feet below the ground surface.



3.0 OVERVIEW OF PHASE II INVESTIGATION

3.1 Soil Borings Methodology

On October 12 through 15, 2004 eight Geoprobe borings, B-24 through B-31, and five monitoring well borings, MW-8 through MW-12, were advanced at the Site with a Geoprobe rig by ENSR's subcontractor Matrix Environmental. Borings were completed to a depth ranging from 15 to 20 feet below the ground surface. Soil samples were collected continuously using a 5-foot long, 2-inch diameter sampling spoon with new disposable plastic liners. The soil samples were field screened with a photo-ionization detector (PID), calibrated with 100 parts per million isobutylene, using a headspace screening technique. One soil sample from each boring was submitted to EnChem for BTEX and PAH analysis. The depth of the sample submitted for analysis was selected based on field observations (visible staining) and/or PID field screening results. Soil samples were immediately transferred from the sample sleeve to laboratory supplied containers and placed in an ice-filled cooler. Samples were shipped on ice, under chain-of-custody, to EnChem. Soil borings B-24 through B-31 were abandoned with granular bentonite. Soil boring logs and borehole abandonment forms are included in Appendix A.

3.2 Monitoring Well Construction

Soil borings for MW-8 through MW-12 were completed using the Geoprobe direct push methods outlined in Section 3.1. On October 13 through 15, 2004, after soil borings were complete, 8-inch outside diameter hollow-stem augers were used to over-drill the boring location and install monitoring wells. Monitoring wells were constructed with two-inch diameter 10-foot schedule 40 PVC 0.010" slot screen and solid PVC riser. Wells MW-8, MW-9, and MW-11 were completed above grade with locking steel pro-tops and bumper posts. Wells MW-10 and MW-12 were completed below grade with 12-inch diameter flush-mount steel manhole covers. Well construction details are illustrated on the soil boring logs in Appendix A.

3.3 Monitoring Well Development

On October 15, 2004, monitoring wells MW-8 through MW-12 were developed to ensure the proper hydraulic connectivity with the aquifer. Matrix Environmental staff used a bailer to surge and purge the wells, removing approximately ten well volumes from each well or until the water was clear. Water appeared clear in wells MW-10 through MW-12. Water from wells MW-8 and MW-9 contained silt and became clearer with development, however, the water continued to contain sediment after 10-well volumes were removed.



3.4 Water Level Gauging and Free Product Check

Groundwater level measurements were collected from monitoring wells MW-1 through MW-12 on November 16, 2004 and from temporary wells in borings B-24 through B-31 on October 13 and 14, 2004 with an interface probe. The depth to water was recorded and the wells were checked for light and dense non-aqueous phase liquids (free product). The measurements were made from a surveyed measuring point established on the top of the monitoring well PVC well casing. Groundwater elevations in the temporary wells were measured as depth below the surveyed ground surface.

3.5 Groundwater Sampling

Groundwater samples were collected from borings B-24 through B-31 on October 12 and 14, 2004 and from monitoring wells MW-5 through MW-12 on November 16 and 17, 2004.

3.5.1 Soil Boring Groundwater Sampling

Temporary one-inch PVC wells, with a ten-foot screen, were placed in the soil borings B-24 through B-31. After water levels had stabilized, groundwater samples were collected from the temporary wells using clean disposable tubing with a check valve at the bottom. Groundwater was removed from the temporary wells until it appeared clear. Groundwater was transferred directly into laboratory supplied containers and was placed in an ice-filled cooler. Samples were delivered to En Chem laboratory for BTEX and PAH analysis.

3.5.2 Monitoring Well Sample Collection and Handling

Groundwater samples were collected from wells MW-5 through MW-12. Monitoring wells were purged and sampled in general accordance with the WDNR "Groundwater Sampling Field Manual," September 1996. Purging was conducted using a peristaltic pump and dedicated polyethylene tubing utilizing a low-flow purging technique. Groundwater quality measurements were recorded during purging using a Quanta Hydrolab with a flow-through cell. Groundwater quality parameters included dissolved oxygen, specific conductivity, pH, temperature, and oxidation-reduction potential. Groundwater purging continued until water quality readings had stabilized.

Samples were collected directly from the tubing and placed into laboratory supplied containers. The samples were stored on ice in a cooler delivered under chain-of custody to En Chem. Groundwater samples were analyzed for PAH and BTEX. The groundwater collection logs are included as Appendix B.



3.6 Decontamination Procedures

Drilling and sampling equipment was decontaminated before and between sampling events to prevent potential cross contamination between soil boring locations, soil sampling intervals, and monitoring wells. Sampling equipment, including Geoprobe sampling spoons and interface probe, were decontaminated prior to each use with a detergent wash followed by a potable water rinse. Drilling equipment, such as hollow stem augers, were decontaminated with a steam cleaner and power washer.

3.7 Slug Test Methodology

On November 17, 2004, rising head slug tests were completed on wells MW-8 through MW-12. The slug test consisted of dropping a solid PVC cylinder (slug) beneath the water table and allowing the water levels to return to their pre-test level. The slug was then removed from the well and the changes in water levels were recorded using the MiniTroll transducer and In-situ data logging software. The test was allowed to run until the water levels had again returned to their static level. Water levels returned to static levels about five minutes or less. Data collected from the test was stored on a lap top computer.

Slug test data was analyzed using Aqtesolv 3.5 software and the Bouwer-Rice solution for unconfined aquifers. Slug test results are included as Appendix C. Variable input parameters into Aqtesolv included the saturated thickness of the aquifer, which was assumed to be the saturated fill layer, the total depth of well penetration and test well measurements. Fixed input parameters included casing radius, wellbore radius and screen length.

3.8 Elevation Survey

Upon completion of the field investigation, the elevation and location of soil borings and monitoring wells were surveyed by ENSR's subcontractor Salo Engineering. A copy of the survey is available upon request.



4.0 INVESTIGATION RESULTS

4.1 Results of Geologic/Hydrogeologic Site Investigation

Results Site investigations indicate there are three predominant soil types encountered in the Site vicinity: a red high-plasticity clay, silty sand and sand, and a fill material consisting primarily of white to dark gray lime-like material. There were also small amounts of miscellaneous fill, such as bricks, wood and slag, encountered in several locations.

During the Phase II Part III investigation, lime-like fill material was encountered in the majority of the borings as the uppermost soil type. The thickness of the lime-like material ranged from approximately five-feet thick south of the railroad tracks to one-foot thick or less north of the rail road tracks. Underlying the lime-like material was silty sand along with miscellaneous fill (slag, wood, brick, etc.) in some borings. Underlying the sand unit was reddish-brown high plasticity clay. The clay unit appears to slope northeast and east-northeasterly, towards Superior Bay. Figure 4-1 illustrates surface elevation contours of the clay unit. A detailed description of the soil is included on the boring logs in Appendix A.

Groundwater was encountered in the borings in the sand, silty sand, or fill material above the red clay. Groundwater was encountered approximately three to five-feet below the ground surface in the borings north of the railroad tracks and approximately eight to 11-feet below ground surface in the borings south of the railroad tracks. Depth to groundwater was gauged prior to collecting groundwater samples from the monitoring wells. The gauging data results are summarized in Table 4-1. Groundwater elevation contours are illustrated on Figure 4-2. The apparent groundwater flow direction at the Site appears to be northeast towards Lake Superior.

Results of the slug tests on the new monitoring wells indicate hydraulic conductivity of the aquifer ranged from 1.17×10^{-2} centimeters per second (cm/s) in MW-9 to 8.48×10^{-3} cm/s in MW-11. Hydraulic conductivity values are summarized on Table 4-1. This range of hydraulic conductivity values is consistent with values for sand and silty sand soil, which are the soil types identified in the wells screened interval.¹ The slug test data for wells MW-5 through MW-7, obtained during the November 2001 Phase II Investigation, were inputted into the updated Aqtesolve software. The hydraulic conductivities obtained by the updated software were slightly different than the values presented in the Phase II report due because of updated data matching capabilities. For example, the hydraulic conductivity of MW-5 changed from 9.9×10^{-5} cm/sec to 7.63×10^{-5} cm/sec. The updated hydraulic conductivities for wells MW-5 through MW-7 are included on Table 4-1.

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¹ Groundwater, R. A. Freeze and J. A. Cherry, 1979. Table 2.2, Range of Values of Hydraulic Conductivity and Permeability, lists clean sand as 5×10^{-4} to 1 cm/s and silty sand as 10^{-5} to 10^{-1} cm/s



Wells MW-1 through MW-7 are completed in clay or lime-like material and have lower hydraulic conductivities. As illustrated in Figure 4-2, the groundwater hydraulic gradient is steeper in the between these wells. Wells MW-8 through MW-12 are completed in sand or silty sand and have higher hydraulic conductivity and have a flatter hydraulic gradient. For example, south of the former shoreline the hydraulic gradient is approximately 0.04 feet per feet and north of the former shoreline the hydraulic gradient ranges from approximately 0.001 to 0.006 feet per feet.

4.2 Results of Soil Analyses

Laboratory results for BTEX and PAH analyses for soil are summarized in Tables 4-2. The complete En Chem soil analytical report is included as Appendix D. Figure 4-3 provides a summary of the soil analytical results on a Site map.

4.2.1 BTEX Soil Analytical Results

BTEX soil analytical results were compared to the WDNR residual contaminant levels (RCL) based on the protection of groundwater (NR 720, Table 1). These RCLs are based on generic site conditions and were used as a basic soil screening level. The majority of the soil samples were collected between five and eight-feet below the ground surface. Soil samples for analysis were selected based on visual impacts, high PID readings, or just above the inferred groundwater table if there were no indications of impacts. As shown Table 4-2, the chemical that exceeded the RCL most frequently was benzene, with an RCL of 0.0055 milligrams per kilogram (mg/kg). All of the soil samples analyzed as part of this investigation contained concentrations of benzene above the RCL. The concentrations of benzene ranged from 0.044 mg/kg in MW-11 at a depth of 6 to 7 feet to 13,000 mg/kg in B-31 at a depth of 14 to 15 feet. The soil benzene concentrations and the sum of BTEX concentrations are illustrated on Figure 4-3. Figure 4-4 illustrates isoconcentration contours for benzene in soil.

Samples from several borings also exceeded the RCL for ethyl benzene, toluene, and/or xylenes, with the highest concentrations found in boring B-31 on the Lakehead Concrete property and MW-9, which is downgradient of B-31.

4.2.2 PAH Soil Analytical Results

PAH soil analytical results were compared to the WDNR RCL based on the protection of groundwater and the WDNR RCL for the protection of human health from direct contact for industrial sites. The RCLs for PAH compounds are published in the Soil Cleanup Levels for PAHs Interim Guidance, Table 1. RCLs are based on generic site conditions and are considered cleanup guidance. The majority of the soil samples were collected between five and eight feet below the ground surface. As shown in the summary tables, nine of the twelve borings had PAH compounds that exceeded one or more RCL. The PAHs that most commonly exceeded the RCLs were benzo(a)pyrene, acenaphthylene, naphthalene, and phenanthrene. The sum of the PAH concentrations ranged from 0.76 mg/kg in MW-11 at a depth of 6 to 7 feet to 2,565 mg/kg in MW-10 at a depth of 5 to 6 feet. The benzo(a)pyrene, naphthalene, and



total PAH concentrations are illustrated on Figure 4-3. Figure 4-5 illustrates isoconcentration contours for total PAH in soil.

4.3 **Results of Groundwater Investigation**

Groundwater samples were collected from monitoring wells MW-5 through MW-12 and from borings B-24 through B-31. Groundwater samples were analyzed for PAH and BTEX. Monitoring well and Geoprobe boring groundwater analytical results are summarized in Table 4-3 and Table 4-4, respectively. The complete groundwater analytical report is included in Appendix D.

4.3.1 BTEX Groundwater Analytical Results

The groundwater results were compared to the WDNR groundwater enforConcrete standards (ES), which are based on the protection of public health for drinking water (NR 140, Table 1). The analytical results indicate the most common compound detected above the ES was benzene, with an ES of 5 micrograms per liter (ug/L). The benzene concentration was above the ES in all the groundwater samples except MW-5 and MW-11. The highest concentrations of benzene were detected east to southeast of the Site in B-31 (250,000 ug/L), MW-8 (74,000 ug/L), and MW-9 (54,000 ug/L). Benzene concentration and the sum of BTEX concentrations are illustrated on Figure 4-6. Benzene isoconcentration contours in groundwater are illustrated on Figure 4-7.

Ethylbenzene, toluene and/or xylene concentrations exceeded the ES in four of the eight monitoring wells and four of the eight Geoprobe boring groundwater samples. The samples with the greatest concentrations of BTEX are located east or southeast of the Site and include B-31, MW-8, and MW-9.

4.3.2 PAH Groundwater Analytical Results

PAH groundwater results were compared to the WDNR groundwater ES. The analytical results indicate the most common compounds detected above the ES were benzo(a)pyrene, chrysene, and naphthalene. Several other PAH also exceeded the ES in B-25, B-27, and MW-8. The highest total PAH concentrations occur northeast and east of the Site. The results for well MW-8 indicated concentrations of nine PAH chemicals up to over 300 times higher than their respective solubility limits. This indicates that tarry material was most likely present in the sample. Figure 4-6 illustrates the benzo(a) pyrene, naphthalene, and total PAH concentrations on a Site plan. Figure 4-8 illustrates total PAH isoconcentration contours in groundwater.

4.4 Quality Assurance and Quality Control Samples

Quality assurance and quality control (QA/QC) samples were collected to ensure that accurate and reliable data was obtained for this investigation. The laboratory conducted standard QA\QC procedures. Duplicates and trip blanks were collected and analyzed as discussed in the following sections.



4.4.1 Duplicates

One soil and one groundwater duplicate sample were collected for this investigation. The sample IDs followed by the suffix "dup" represent duplicate samples. The duplicate data was checked to assure that the relative percent difference (RPD) was within an acceptable range. The RPD was calculated using the following equation:

 $RPD = \{ (D_1 - D_2) / [(D_1 + D_2)/2] \} \times 100$

Where D_1 = First Sample Result D_2 = Second Sample Result (Duplicate)

Soil sample MW-11 6-7 feet was duplicated. The MW-11 RPD for naphthalene is 98%. The RPD for a BTEX compound was not calculated because the concentrations were below detection limits in one or both samples. Soil RPD can be highly variable for PAH chemicals at MGP sites.

Groundwater sample MW-8 was duplicated. The MW-8 RPD for naphthalene was 108% and the RPD for benzene was 2.7%. The high RPD is most-likely due to the fact that tarry material was present in well MW-8.

4.4.2 Trip blanks

A trip blank sample accompanied the water samples collected for this investigation. Two trip blanks was analyzed for BTEX as part of this investigation. No BTEX was detected in the trip blank samples.

4.5 Discussion of Results

Solvent Impacts

Previous investigations have found high concentrations of a solvent material consisting primarily of benzene and toluene in Area 1, southwest of the Site building. The source or origin of the solvent is unknown. The results of this investigation revealed high concentrations of benzene and toluene in soil and groundwater on Lakehead Concrete property in boring B-31, which may be related to the solvent identified in previous investigations. The solvent is commingled with PAH compounds on the Lakehead Concrete property. Soil and groundwater concentrations of BTEX and PAH extend downgradient towards the City of Superior waste water treatment plant. Data collected from Site investigations to date do not define the downgradient and cross-gradient (northeast and southeast) extent of solvent impacts.



Coal Tar Impacts

Previous fingerprinting analysis have found the PAH chemicals detected in Area 2 are most-likely carbureted water gas coal tar constituents. The purpose of this Phase II Part III investigation was to delineate the downgradient extent of PAH impacts. The investigation results indicate there is tarry material present in the vicinity monitoring well MW-8. Figure 4-9 shows the estimated extent of tarry materials. The figure illustrates that the majority of tarry material identified to date is present at the terminus of the clay pipe and to the southeast of the pipe towards well MW-8. Well MW-8 appears to be located near the historic Superior Bay shoreline. Thus, wastewater discharged from the clay pipe may have resulted in tarry materials accumulating in the area located between the former shoreline and the railroad track embankment. The railroad embankment appears to have acted as a barrier, because tar material was not found on the north side of the railroad tracks.

The extent of the tarry materials has not been fully delineated. There are data gaps northeast of the clay pipe terminus, and south of MW-8 and MW-9. Data collected during the Site investigations to date have not fully delineated the downgradient extent of PAH in the soil and groundwater in the vicinity of the waste water treatment plant.



5.0 SUMMARY

This report presents the results of the Phase II Part III subsurface investigation performed at the Site in October and November 2004. Eight soil borings, B-24 through B-31, and five monitoring wells, MW-8 through MW-12, were advanced at the Site with a Geoprobe rig. Soil samples were collected from the soil borings and monitoring well borings for BTEX and PAH laboratory analysis. Groundwater samples were collected from temporary wells installed in the soil borings and from monitoring wells MW-5 through MW-12. Slug tests were performed on wells MW-8 through MW-12.

Groundwater and the clay soil both slope towards the northeast / east northeasterly. The plume of dissolved BTEX and PAH in the groundwater follow the groundwater flow direction and are found northeast and east of the Site. The dissolved plume appears to be heading towards the City of Superior waste water treatment plant. Data obtained from this Phase II Part III investigation have not delineated the extent of soil and groundwater impacts to the southeast and east of the Site. Additional wells and borings would be needed to determine the extent of impacts.

Tarry materials were observed during the drilling of well MW-8. Chemical concentrations of individual PAH compounds, relative to their solubility limits in water, suggest that tarry materials are present in the vicinity of MW-8. No floating or sinking non-aqueous phase liquids were detected during the gauging event in any of the monitoring wells. The extent of tarry materials appears to be from the terminus of the clay pipe to the southeast towards MW-8, in the area between the former shoreline and the railroad embankment. However, the extent of tarry material is not fully delineated. Additional borings between the railroad tracks and the clay pipe, and on the Lakehead Concrete property, would be needed to determine the extent of tarry material.

In summary, the new data collected for this investigation provide a better description of the site hydrogeology and subsurface concentrations of BTEX and PAH. However, additional soil and groundwater sampling and analysis are needed to delineate the extent of tarry materials and dissolved chemical concentrations. ENSR is preparing a Work Plan for Phase II, Part IV, for submittal under separate cover, to provide the additional data.

5-1



TABLES

Superior Water Light and Power MGP Phase II, Part III Superior, Wisconsin March 2005

Table 4-1Groundwater Elevation Data and Hydraulic ConductivitySuperior MGP Phase II Part IIISuperior Wisconsin

Well ID	Ground Elevation ^a	Measuring Point Elevation ^b	Depth to Water [°]	Groundwater Elevation ^b	Hydraulic Conductivity ^d
MW-1	616.2	619.11	6.48	612.63	Clay ^e
MW-2	614.2	617.15	4.69	612.46	Clay
MW-3	613.9	617.07	5.67	611.40	Clay
MW-4	614.0	617.11	5.98	611.13	Clay
MW-5	610.1	612.40	7.06	605.34	7.63 x 10 ⁻⁵
MW-6	611.4	613.74	9.67	604.07	3.07 x 10 ⁻³
MW-7	612.3	614.91	11.16	603.75	7.79 x 10 ⁻³
MW-8	612	615.17	11.73	603.44	3.26 x 10 ⁻³
MW-9	608.7	611.38	8.39	602.99	1.17 x 10 ⁻²
MW-10	606.5	606.08	3.19	602.89	7.46 x 10 ⁻³
MW-11	607.0	609.89	7.43	602.46	8.48 x 10 ⁻³
MW-12	607.9	607.64	5.18	602.46	3.28 x 10 ⁻³

Groundwater elevations were measured on 11/16/04 with an interface probe.

- a. The ground surface and top of casings elevations were surveyed by Salo Engineering in November 2004. Elevation is given in feet above mean sea level.
- b. Elevation is given in feet above mean sea level.
- c. Depth to water in feet as measured below top of casing.
- d. Hydraulic conductivity (cm/sec) was determined in November 2001 and November 2004 by conducting slug tests.
- e. Wells screened in high plasticity clay. Estimated hydraulic conductivity is less than 10⁻⁶ cm/sec.

Analyte	B-24 5-6 Ft	B-25 7-8 Ft	B- 2 6-7 F	MW-12 4-5 Ft	WDNR Soil Cleanup Standards	
РАН					RCL Groundwater ^a	RCL Direct Contact ^a
1-Methylnaphthalene	0.44	72	0.19	0.036	23	70,000
2-Methylnaphthalene	0.59	99	0.11	0.055	20	40,000
Acenaphthene	0.071	94	0.23	0.013	38	60,000
Acenaphthylene	0.019	5.2	<0.00	0.028	0.7	360
Anthracene	0.096	40	0.02	0.047	3,000	30,000
Benzo(a)anthracene	0.084	20	0.02	0.11	17	3.9
Benzo(a)pyrene	0.058	15	0.02	0.12	48	0.39
Benzo(b)fluoranthene	0.048	6.5	< 0.01	0.088	360	3.9
Benzo(ghi)perylene	0.025	7.5	0.01	0.069	6,800	39
Benzo(k)fluoranthene	0.044	8.9	<0.01	0.094	870	39
Chrysene	0.096	19	0.02	0.120	37	390
Dibenz(a,h)anthracene	<0.0084	1.7	<0.00	0.015	38	0.39
Fluoranthene	0.015	46	0.43	0.210	500	40,000
Fluorene	0.056	33	0.05	0.012	100	40,000
Indeno(1,2,3-cd)pyrene	0.019	5.2	0.01	0.059	680	3.9
Naphthalene	0.50	200	0.43	0.056	0.4	110
Phenanthrene	0.52	130	0.10	0.160	1.8	390
Pyrene	0.19	63	0.05	0.170	8,700	30,000
Sum of PAH	2.9	866	1.7	1.46	NE	NE ^b
					RCL	
voc					Groundwater ^c	Direct Contact ^d
Benzene	0.130	2.2	3.3	1.2	0.0055	1.1
Ethylbenzene	0.048	42	<0.02	<0.028	2.9	NE
Toluene	0.27	1.3	<0.02	0.42	1.5	NE
Xylene, -o	0.11	16	<0.02	0.038	4.1 ^e	NE
Xylenes, -m, -p	0.19	29	<0.05	0.07	4.1 ^e	NE

Results are reported in parts per million, or milligrams per kil **Bold** indicates results above WDNR soil cleanup standards

a. Residual Contaminant Level for PAH compounds in soil Groundy

b. NE means RCL is not established.

c. Residual Contaminant Level for protection of groundwater, Table

d. Protection of Human Health from Direct Contact with Contaminat

e. The RCL for xylene is 4,100 ug/kg for the sum of all xylenes.

Analyte	MW-5	MW-5	MW-5	MW-5	Enforcement
					Standard *
Sampling Date	11/20/2001	2/11/2002	9/18/2002	11/17/2004	
РАН					
1-Methylnaphthalene	0.058	<0.027	0.19	0.15	NA ^b
2-Methylnaphthalene	<0.028	<0.028	0.15	0.068	NA
Acenaphthene	3.8	0.11	0.43	0.44	NA
Acenaphthylene	0.16	<0.023	< 0.023	<0.039	NA
Anthracene	0.22	<0.020	0.059	0.046	3,000
Benzo(a)anthracene	0.053	<0.019	<0.019	<0.039	NA
Benzo(a)pyrene	0.023	<0.012	<0.012	<0.036	0.2
Benzo(b)fluoranthene	0.022	<0.014	<0.014	< 0.036	0.2
Benzo(g,h,i)perylene	0.017	<0.015	<0.015	<0.041	NA
Benzo(k)fluoranthene	0.014	<0.013	<0.013	< 0.039	NA
Chrysene	0.037	<0.018	<0.018	<0.033	0.2
Dibenzo(a,h)anthracene	<0.017	<0.017	<0.017	<0.044	NA
Fluoranthene	1.3	0.030	0.051	0.035	400
Fluorene	1.2	0.035	0.24	0.24	400
Indeno(1,2,3-cd)pyrene	< 0.014	<0.014	<0.014	<0.034	NA
Naphthalene	0.2	0.092	1.3	0.72	40
Phenanthrene	0.42	<0.19	0.22	0.16	NA
Pyrene	1.4	0.039	0.039	<0.033	250
Sum PAH	8.924	0.306	2.679	1.859	NA
VOC					
1,2,4-Trimethylbenzene	^c		<0.69		480 ^d
1,3,5-Trimethylbenzene			<0.64		480 ^d
Benzene	6.2	<0.45	0.99	1.2	5
Ethylbenzene	<0.82	<0.82	<0.53	<0.4	700
Toluene	2.1	<0.68	< 0.84	1.4	1,000
Xylene, -o	3.0	<1.7	<0.73	< 0.36	10,000 ^e
Xylenes, -m, -p	6.1	<0.77	<1.1	<0.74	10,000 ^e
Sum BTEX	17.4		0.99	2.6	NA

Analyte	MW-6	MW-6	MW-6	MW-6-dup	MW-6	Enforcement Standard
Sampling Date	11/20/2001	2/11/2002	9/18/2002	9/18/2002	11/17/2004	
PAH						
1-Methylnaphthalene	3.0	5.0	2.5	2.1	11.0	NA
2-Methylnaphthalene	2.3	3.7	1.6	1.3	8.0	NA
Acenaphthene	4.8	5.0	4.5	3.9	13.0	NA
Acenaphthylene	0.26	0.22	<0.92	<0.92	0.49	NA
Anthracene	0.96	<0.80	<0.8	<0.8	0.69	3,000
Benzo(a)anthracene	0.12	0.083	<0.76	<0.76	< 0.39	NA
Benzo(a)pyrene	0.026	<0.012	<0.48	<0.48	< 0.36	0.2
Benzo(b)fluoranthene	0.022	<0.014	<0.56	<0.56	<0.36	0.2
Benzo(g,h,i)perylene	0.016	<0.015	<0.6	<0.6	<0.41	NA
Benzo(k)fluoranthene	0.018	<0.013	<0.52	<0.52	<0.39	NA
Chrysene	0.095	0.081	<0.72	<0.72	< 0.33	0.2
Dibenzo(a,h)anthracene	<0.017	<0.017	<0.68	<0.68	<0.44	NA
Fluoranthene	1.1	<1.1	<1.1	<1.1	1.6	400
Fluorene	0.76	<0.84	<0.84	<0.84	1.6	400
Indeno(1,2,3-cd)pyrene	<0.014	<0.014	<0.56	<0.56	<0.34	NA
Naphthalene	9.8	34	12.0	10.0	91.0	40
Phenanthrene	3.1	2.1	3.4	3.8	3.8	NA
Pyrene	1.2	0.88	1.1	1.2	0.8	250
Sum PAH	27.577	51.1	25.1	22.3	131.9	NA
VOC						
1,2,4-Trimethylbenzene			0.8	0.81		480
1,3,5-Trimethylbenzene			<0.64	<0.64		480
Benzene	5.0	10	3.1	3.1	17	5
Ethylbenzene	1.5	5.8	1.1	1.2	21	700
Toluene	1.6	2.0	0.84	0.85	2.6	1,000
Xylene, -o	1.4	2.3	<0.73	< 0.73	7.6	10,000
Xylenes, -m, -p	2.2	2.6	<1.1	<1.1	4	10,000
Sum BTEX	11.7	22.7	5.04	5.15	52.2	NA

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Analyte	MW-7	MW-7	MW-7- dup	MW-7	MW-7	Enforcement Standard
Sampling Date	11/20/2001	2/11/2002	2/11/2002	9/18/2002	11/17/2004	
РАН						
1-Methylnaphthalene	4.7	4.1	3.8	10	<8.1	NE
2-Methylnaphthalene	6.3	5.6	5.2	13	<9.1	NE
Acenaphthene	1.9	2.4	2.0	5.4	<7.8	NE
Acenaphthylene	3.4	2.8	2.5	<4.6	<7.8	NE
Anthracene	0.75	<0.40	<0.40	<4	<7.1	3,000
Benzo(a)anthracene	<0.38	<0.38	<0.38	<3.8	<7.9	NE
Benzo(a)pyrene	<0.24	<0.24	<0.24	<2.4	<7.3	0.2
Benzo(b)fluoranthene	<0.28	<0.28	<0.28	<2.8	<7.2	0.2
Benzo(g,h,i)perylene	< 0.30	< 0.30	<0.30	<3	<8.3	NE
Benzo(k)fluoranthene	<0.26	<0.26	<0.26	<2.6	<7.8	NE
Chrysene	<0.36	< 0.36	<0.36	<3.6	<6.6	0.2
Dibenzo(a,h)anthracene	<0.34	< 0.34	<0.34	<3.4	<8.9	NE
Fluoranthene	<0.56	<0.56	<0.56	<5.6	<6.7	400
Fluorene	2.2	1.7	1.7	<4.2	<8.8	400
Indeno(1,2,3-cd)pyrene	<0.28	<0.28	<0.28	<2.8	<6.9	NE
Naphthalene	350	430	290	490	180	40
Phenanthrene	1.4	1.2	1.3	6.7	<8.2	NE
Pyrene	0.62	0.72	0.74	<4	<6.6	250
Sum PAH	371.27	448.52	307.24	525.1	180	NA
VOC						
1,2,4-Trimethylbenzene				770		480
1,3,5-Trimethylbenzene				<640		480
Benzene	230,000	190,000	200,000	110,000	46,000	5
Ethylbenzene	1,900	3,600	3,700	6,100	2,100	700
Toluene	130,000	120,000	120,000	64,000	15,000	1,000
Xylene, -o	11,000	17,000	17,000	4,800	1,600	10,000
Xylenes, -m, -p	14,000	9,500	10,000	18,000	5,400	10,000
Sum BTEX	386,900	340,100	350,700	202,900	70,100	NA

Results are reported in micrograms per liter or parts per billion.

Bold results indicate concentrations greater than the enforcement standards.

Analyte	MW-8	MW-8 DUP	MW-9	MW-10	MW-11	MW-12	Enforcement Standard	Solubility Limits
Sampling Date	11/16/2004	11/16/2004	11/16/2004	11/16/2004	11/16/2004	11/16/2004		
PAH								
1-Methylnaphthalene	690	3,300	100	84	10	53	NE	NA
2-Methylnaphthalene	830	3,900	110	5	1.3	12	NE	25,400
Acenaphthene	1,000	5,200	100	75	8.4	51	NE	7,400
Acenaphthylene	130	<770	<19	<1.9	< 0.39	<3.1	NE	NA
Anthracene	520	2,800	<18	4.1	<0.35	3.9	3,000	73
Benzo(a)anthracene	300	1,600	<20	<2.0	< 0.39	<3.1	NE	14
Benzo(a)pyrene	230	1,200	<18	<1.8	< 0.36	<2.9	0.2	3.8
Benzo(b)fluoranthene	<110	<720	<18	<1.8	< 0.36	<2.9	0.2	NA
Benzo(g,h,i)perylene	<130	<830	<21	<2.1	<0.41	<3.3	NE	NA
Benzo(k)fluoranthene	140	<770	<19	<1.9	<0.39	<3.1	NE	NA
Chrysene	290	1,600	<16	<1.6	<0.33	<2.6	0.2	22
Dibenzo(a,h)anthracene	<140	<880	<22	<2.2	<0.44	<3.5	NE	NA
Fluoranthene	790	4,400	<16	5.3	<0.33	3	400	275
Fluorene	410	2,100	31	18	1.2	11	400	1,980
Indeno(1,2,3-cd)pyrene	<110	<680	<17	<1.7	<0.34	<2.7	NE	NA
Naphthalene	1,400	4,700	310	36	19	13	40	3,170
Phenanthrene	1,900	10,000	78	31	1	18	NE	1,290
Pyrene	1,000	5,300	<16	6.1	<0.33	3.5	250	135
Sum PAH	9,630	46,100	729	264.5	40.9	168.4	NA	NA
Benzene	74,000	72,000	54,000	9,900	0.95	4,000	5	1,780,000
Ethylbenzene	980	880	870	340	0.56	<10	700	150,000
Toluene	51,000	48,000	13,000	34	<3.6	<8.9	1,000	500,000
Xylene, -o	6,500	5,600	780	100	3.90	<9	10,000	170,000
Xylenes, -m, -p	14,000	12,000	2,700	<37	1.70	<19	10,000	156,000
Sum BTEX	146,480	138,480	71,350	10,374	7	4,000	NA	

Results are reported in micrograms per liter or parts per billion.

Bold results indicate concentrations greater than the enforcement standards.

a. The Wisconsin Department of Natural Resources Groundwater Enforcement Standards

for the protection of public health (NR 140, Table 1).

b. No enforcement standard exists for this compound.

c. --- = Sample was not analyzed for this parameter.

d. The enforcement standard is 480 ug/L for the sum of 1,2,4-Trimethylbenzene and 1,3,5-Trimethylbenzene concentrations.

e. The enforcement standard is 10,000 ug/L for the sum of all xylene concentrations.

Table 4-4 Summary of Geoprobe Groundwater Analytical Results Superior MGP Phase II, Part III Superior, Wisconsin

Analyte	В-24	B-25	B-26	B-27	B-28	B-29	В-30	B-31	Enforcement Standard ^a
Sampling Date	10/12/2004	10/12/2004	10/12/2004	10/12/2004	10/12/2004	10/12/2004	10/12/2004	10/14/2004	
PAH									
1-Methylnaphthalene	9	380	5.1	340	55	17	190	13	NA ^b
2-Methylnaphthalene	4.1	510	1.1	170	23	7.7	150	21	NA
Acenaphthene	6.8	590	3.6	540	59	17	160	4.9	NA
Acenaphthylene	<0.44	<88	<0.41	88	3.5	<2.7	3.7	4.9	NA
Anthracene	<0.40	200	0.71	300	6.2	2.70	13	<96	3,000
Benzo(a)anthracene	<0.45	130	0.49	210	<3.2	<2.7	4	<84	NA
Benzo(a)pyrene	<0.41	96	<0.39	160	<3.0	<2.5	3.7	<58	0.2
Benzo(b)fluoranthene	<0.41	51	<0.38	74	<3.0	<2.5	<2.6	<48	0.2
Benzo(g,h,i)perylene	<0.47	<94	<0.44	83	<3.4	<2.9	<3.0	<25	NA
Benzo(k)fluoranthene	<0.44	<88	<0.41	94	<3.2	<2.7	<2.8	<44	NA
Chrysene	<0.37	140	0.56	210	2.8	2.7	5.2	1.9	0.2
Dibenzo(a,h)anthracene	<0.50	16	<0.47	23	<3.6	<3.1	<3.2	<8.4	NA
Fluoranthene	<0.38	320	1.5	460	6.7	5.6	11	3.7	400
Fluorene	1.5	200	0.8	220	17	4.9	29	2.6	400
Indeno(1,2,3-cd)pyrene	<0.39	44	<0.37	64	<2.8	<2.4	<2.4	<19	NA
Naphthalene	16	1,200	1.9	340	96	47	1,100	750	40
Phenanthrene	1.7	900	3.4	970	40	12	56	6.1	NA
Pyrene	<0.37	420	1.8	600	8	7.8	15	5	250
Sum of PAH	39	5,197	21	4,946	317	124	1,741	813	NA
BTEX									
Benzene	7.8	11,000	6,100	27,000	1,300	1,300	42,000	250,000	5
Ethylbenzene	2.2	280	<20	410	100	52	600	2,600	700
Toluene	0.83	<18	<18	3,500	340	720	540	130,000	1,000
Xylene, -o	5.5	88	<18	370	90	81	230	15,000	10,000 ^c
Xylenes, -m, -p	3.1	130	<37	480	220	210	<150	22,000	10,000 [°]
Sum of BTEX	19	11,498	6,100	31,760	2,050	2,363	43,370	419,600	NA

Results are reported in micrograms per liter or parts per billion.

 $\ensuremath{\textbf{Bold}}$ results indicate concentrations greater than the enforcement standards.

a. The Wisconsin Department of Natural Resources Groundwater Enforcement Standards

for the protection of public health (NR 140, Table 1).

b. No enforcement standard exists for this compound.

c. The enforcement standard is 10,000 ug/L for the sum of all xylene concentrations.



FIGURES

Superior Water Light and Power MGP Phase II, Part III Superior, Wisconsin March 2005





······································	SWL&P Property Boundary
• B-24	Phase II Part III Geoprobe Soil Boring Location (Oct 2004)
⊜ B-2	Previous Geoprobe Soil Boring Location (Nov 2001 and Sept 2002)
- 	Monitoring Well (Installed Oct 2004)
	Monitoring Well (Installed Nov 2001)
T1	Test Trench (Completed Nov 2001 and Sept 2002)
	Former Gas Holder

DRAWN:	AC/09480	DATE: Ja	anuary 2005	ENSR
FILE No.:	Fig 1-2.dwg	PROJECT:	09413-098	INTERNATIONAL



╊╄╊╊╋╋	Railroad Tracks
_ · · · ·	SWL&P Property Boundary
B-2	Previous Geoprobe Soil Boring Locatio (Nov 2001 and Sept 2002)
¥ MW-1	Monitoring Well Location
T10	Test Trench Location (Nov 2001 and Sept 2002)
	Former Gas Holder



• B-12	Geoprobe Soil Boring with Clay Elevation
🔶 MW-7	Monitoring Well with Clay Elevation
	Former Gas Holder
588	Estimated Clay Soil Elevation Contour

Notes:

Clay formation elevations are estimated based on soil encountered in borings and are in feet above mean sea level. Only borings that encountered clay have elevations listed by the boring.



Phase if Part in Investigation	
Superior Water Light & Power	
Former MGP	
Superior, Wisconsin	

DRAWN: AC/09480	DATE: January 2005	ENSR
FILE No.: Fig 4-2.dwg	PROJECT: 09413-098	INTERNATIONAL



• B-12	Geoprobe Soil Boring
🔶 MW-7	Monitoring Well with Groundwater Elevation
	Former Gas Holder
603	Estimated Groundwater Elevation Contour

Notes:

Groundwater elevations were measured on November 16, 2004 and are in feet above mean sea level.





• B-24	Geoprobe Soil Boring with Soil Analytical Data (Oct 2004)
⊕ B-2	Previous Geoprobe Soil Boring Location (Nov 2001 and Sept 2002)
- �- MW-8	Monitoring Well Location with Soil Analytical Data (Oct 2004)
-\$- MW-7	Monitoring Well Location (Nov 2001)

Notes:

Soil analytical results reported in ug/kg (parts per billion) with sampling depth in feet below the ground surface. B(a)P = benzo(a)pyrene Naph = naphthalene Total PAH = the sum of all PAH compounds detected in the sample Benz = benzene Total BTEX = the sum of benzene, toluene, ethylbenzene, and xylenes concentrations detected in the sample **Bold** result indicates the compound exceeds the corresponding residual contaminant level. Soil samples were collected in October 2004.





Т3

• B-12

🔶 MW-7

Monitoring Well Location

Geoprobe Soil Boring Location

Test Trench Location

Former Gas Holder

100

Estimated extent of benzene in soil with concentrations in micrograms per kilogram or parts per billion




Т3

• B-12

Geoprobe Soil Boring Location

- MW-7 Monitoring Well Location

Test Trench Location

Former Gas Holder

10,000

Estimated extent of total PAH (sum of all PAH concentrations in sample) in soil with concentrations in micrograms per kilogram or parts per billion



DRAWN:	AC/09480	DATE:	January 2005	ENSR
FILE No.:	Fig 4-4.dwg	PROJEC	Г: 09413-098	INTERNATIONAL



• B-24	Geoprobe Soil Boring with Groundwater Analytical Results
	Previous Geoprobe Soil Boring
- \$ - MW-7	Monitoring Well Location with Groundwater Analytical Results
	Former Gas Holder

Notes:

Groundwater analytical results reported in ug/L (parts per billion). Groundwater samples were collected in Nov 2004. B(a)P = benzo(a)pyrene Naph = naphthalene Total PAH = the sum of all PAH compounds detected in the sample Benz = benzene Total VBTEX = the sum of benzene, toluene, ethylbenzene, and xylenes detected in the sample **Bold** result indicates the compound exceeds the corresponding enforcement standard.





	Figure 4-6											
SUMMARY OF GROUNDWATER ANALYTICAL												
	RESULTS											
Phase II Part III Investigation												
Superior Water Light & Power												
	Former MGP											
	Superior, Wisconsin											
DRAWN: AC/09480	DATE: Januaury 2005	ENSR										
FILE No.: Fig 4-6.dwg	PROJECT: 09413-098	INTERNATIONAL										



• B-12 Geoprobe Soil Boring Location + MW-7 Monitoring Well Location Test Trench Location Т3 Former Gas Holder Estimated extent of benzene in 10,000

groundwater with concentrations in micrograms per liter or parts per billion





Т3

• B-12

Geoprobe Soil Boring Location

+ MW-7 Monitoring Well Location

Test Trench Location

Former Gas Holder

10,000

Estimated extent of total PAH (sum of all PAH chemicals in sample) in groundwater with concentrations in micrograms per liter or parts per billion





• B-12	Geoprobe Soil Boring
🔶 MW-7	Monitoring Well Location
Statement and the statement of	Estimated Extent of Tarry Materials in Soil





APPENDIX A

Boring Logs and Borehole Abandonment Forms

Superior Water Light and Power MGP Phase II, Part III Superior, Wisconsin March 2005 Route To:

Watershed/Wastewater	ן	Waste Managem	ent
Remediation/Redevelopm	ent 🗹	Other 🛛	

																		Page	1 of 1		
Fac	ility/	Project I	Name	SWL	&P Phase II Pa	rt III	Lic	ense/Permi	it/N	Monito	ring N	umber					Borin	g Num	ber B-	24	
Bor Guy	ing I Paq	Drilled B uette, M	iy: Na atrix E	me of nviror	f crew chief (fii nmental, LLC	rst, last) ai	nd Firm		D	Date Dr 10/12/0	rilling S U4	Started		Dat 10	te Dri 1/12/04	lling C 4	Compl	eted	ľ	rillin Geo Rig	g Method probe Track
WI	Jniq	ue Well	No.		DNR Well ID	No.	Common V	Vell Name	F	Final S 602.72	itatic V	Vater Le	evel	Sur 606	face E 5,52	Elevat	ion		Borel 2 ind	hole [ch	Diameter
Loc Stat	al Gi e Pla	rid Orgir ane	ם י	(esti	mated) 🗌 🕠	or Boring	Location 🛛			Lat Long	1				Local	l Grìd	Locat	ion N 🗌 S 🗌	7		е 🗆 W 🗆
Fac	ility	ID B			*	County D	ouglas		Co	ounty (Code		Civil	Towr	n/City	/or Vil	llage S	Superic	or		
	San	iphe															Soil	Prope	rties		
Number	Type	Length Att. Ro (ft)	Blow Counts	Depth In Feet		Soil/ R	ock Descriptio	on			U.S.C.S.	Graphic	Well		PID/FID	Compressive	Moisture	Liquid	Plasticity	P 200	RQD/
1	GP	2.5		1	Black sla loose, cri	ug-like m umbly, d	aterial wit	th fines, or.		F	Fill			3.	.3						
2	GP	2.1		5 6 7 7 8 9	3 inch la wet, petr Fine sand wet, petr	yer wood oleum-li 1 with fin roleum o	d chips and ke odor. nes,well so dor.	d slag, bla	wi	k, n,	42			4(0.4						5-6 Ft Soil Sample
3	GP	5.0		10 11 12 13 13 14										64	4						
				16-	END OF Note- Ho	BORIN	IG-15 FEE psed at 10	ET ft													
l he	rby c	ertify that	the in	Iformat	tion on this form	is true and	the correct to	the best of n	ny	knowle	edge										
Sig	natu	ire (Ú.	n l	bul l	ele		Firm		ENSF 4500	≺ Corp Park G	oration len Rd S	Ste 210 S	St. Lou	uis Pa	ark, Mi	N 5541	6			

Well / Drillhole / Borehole Abandonment

Form 3300-005 (R 10/03)

Page 1 of 2

Date \$igned

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between \$10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

Route to: Watershed/Wastewater Waste Management	Remediation/Redevelopment Other:
1. General Information	2. Facility / Owner Information
WI Unique Well No. DNR Well ID No. County	Facility Name
V. bugas	Duperior Water Light ? Voue
Common Well Name GP - 24 Gov't Lot # (if applicable)	Facility ID License/Permit/Monitoring NdCity, Village or Town
1/4/1/4 1/4 Section Township Range □ E N □ W	Street Address of Well Whiter Water Street
Grid Location Feet NFeet E Local Grid Origin	Present Well Owner Superior What Light : Power
s w (estimated) OR Well Location	Street Address or Route of Owner
DEG MIN SEC	City State ZIP Code
Reason For Abandonment WI Unique Well No. of Replacement W	e 4. Pump Liner Screen Casing & Sealing Material
empolary (Soring	
3. Well / Drillhole / Borehole Information	Pump and piping removed?
Monitoring Well	Screen removed?
Water Well	Casing left in place?
Borehole / Drillhole please attach.	Was casing cut off below surface?
Construction Type:	Did sealing material rise to surface?
Drilled Driven (Sandpoint) Dug	Did material settle after 24 hours?
Alther (specify):	If yes, was hole retopped?
Formation Type:	hydrated with water from a known safe source?
Unconsolidated Formation	Required Method of Placing Sealing Material Conductor Pipe-Gravity
Total Well Depth From Groundsurface (ft.) Casing Diameter (in.)	Bentonite Chips)
Lower Drillhole Diameter (in.) Casing Depth (ft.)	-Sealing Materials
NA NA	Reat Compart (Constraint) Craut Bentonite-Sand Slurry " "
Way and A A A A A A A A A A A A A A A A A A A	Concrete Bentonite Chips
	For Monitoring Wells and Monitoring Well Boreholes Only:
If yes, to what depth (feet)? Depth to Water (feet)	Bentonite Chips Bentonite - Cement Grout
NA =15	Bentonite Sand Slurry
5. Material Used To Fill Well / Drillhole	From (ft.) To (ft.) No. Yards, Sacks Sealant Mix Ratio or or Volume (circle one) Mud Weight /
Sentimite (grad	Surface 15-20' 1.5' tole = 0.991/4 25% Sulids
e Communia	
7. Supervision of Work	DNR Use Only
Name/of Person or Pirm Doing Sealing Work Date of Ab	avidonment Date Received Noted By
Il latrix Environmental, LLC 10/	14/64
Street or Route Telephone	Number Comments
Gity () State ZIP Code	Signature of Person Doing Work Date Signed

Signature of Person Dying Work

ZIP Code 55 36 S

State

m

Page 1 of 1

Route To:	Watershed/Wastewater		
	Remediation/Redevelopn	nent	V

Waste Management □ Other □

Fac	;ility/	Project	Name	SWL&	P Phase II Part III	License/Pern	nit/N	Monitori	ing N	umber				Borin	g Nun	nber B	-25	
Bo Gu	ring / Pac	Drilled E juette, M	By: Na atrix B	ame of e Environr	crew chief (first, last) a mental, LLC	and Firm	C	Date Dri 10/12/0-	illing 4	Started		Date Dr 10/12/0	illing (14	Compl	eted		Drillir Geo Rig	ng Method oprobe Track
w	Uniq	ue Well	No.		DNR Well ID No.	Common Well Name		Final St 602.57	tatic V	Vater Le	/el	Surface 606.17	Eleva	lion		Bore 2 in	hole ch	Diameter
Loc Sta	al G te Pl	rid Orgiı ane	ייייי ו	(estin	nated) 🔲 or Boring	Location 🖬		Lat Long				Loca	l Grid	Locat	tion N⊡ S⊡			E D W D
Fac	ility	ID			County	Douglas	Co	ounty C	ode		Civil	fown/City	//or Vi	llage	Superi	or		
	San	ıple									•			Soil	Prope	rties		
Number	Type	Length Att. & Recovered (ft)	Blow Counts	Depth In Feet	Soil/ F	Rock Description			U.S.C.S.	Graphic	Well	PID/FID	Compressive	Moisture	Liguid	Plasticity	P 200	RQD/
	GP	2.2		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Topsoil and gras Fill composed o material, fines a brown, moist, no	ss. f wood chips, slag- nd lime-like materi o odor.	liko al,	e Fi	ill			5.5						
2	GP	4.6		3 6 7 8 9 10 9	Fine sand with f brown, wet, tar 2 inch clay layer layer, sheen, stro Same as above	ines, well sorted, odor. r and 4 inch wood c ong odor at 8 feet. with sheen	hip	р				5.5 5.3						7-8 ft Soil Sample
3	GP	4.4		10 11 11 12 13 14 14 15				SI	P			56.3 224						
4	GP	4.6		16 16 17 18 19 19	Fine sand with f	ines,well sorted, br	ow	/n,	W			121 57						
				20	END OF BORI	NG-20 FEET		-1										
L I he	rby c	ertify that	the ir	nformatio	on on this form is true an	d the correct to the best of	my	knowled	lge	<u> </u> l		1	L	I	<u> </u>		<u> </u>	l
						1 Thursday		FLIDD	·									

Signature Chim Buch Cutton Firm ENSR Corporation 4500 Park Glen Rd Ste 210 St. Louis Park, MN 55416

Well / Drillhole / Borehole Abandonment

Form 3300-005 (R 10/03)

Page 1 of 2

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Noute to: Drinking Water Watershed/Wastewater Waste Management	Remediation/Redevelopment Other:
1. General Information	2. Facility / Owner Information
WI Unique Well No. DNR Well ID No. County	Facility Name
Common Well Name - Covit Lot # (if applicable)	Superior Watt Lynt Vove
GP-25	
1/4/1/4 1/4 Section Township Range E	Street Address of Well
N	Whiter/Water Street
Grid Location	Present Well Owner Species (Indef) Children (Criginal Well Owner
	Street Address or Route of Owner
	Water Stract
DEG MIN SEC	City State ZIP Code
Reason For Abandonment WI Unique Well No. of Replacement We	A During Lines Cooler & Cooler & Cooler
Temporary (Sorting	. Fump, Liner, Screen, Casing & Searing Material
3. Well / Drillhöle / Borehole Information	Pump and piping removed?
Monitoring Well Original Construction Date	
Water Well	
Borehole / Drillhole If a Well Construction Report is available, please attach.	
Construction Type:	Was casing cut off below surface?
	Did sealing material rise to surface?
	Did material settle after 24 hours?
	If bentonite chips were used, were they
Formation Type:	hydrated with water from a known safe source? Yes No KN/A
Unconsolidated Formation Bedrock	Required Method of Placing Sealing Material
Total Wall Depth From Groundsurface (#) Casing Diameter (in)	Screened & Poured
	(Bentonite Chips)
Lower Drillhole Diameter (in.) Casing Depth (fl.)	Sealing Materials
NA NA	Neat Cement Grout Bentonite-Sand Slurry "
T T R NA.	Sand-Cement (Concrete) Grout Bentonite Chips
Was well annular space grouted?	For Monitoring Wells and Monitoring Well Boreholes Only:
If yes, to what depth (feet)? Depth to Water (feet)	Bentonite Chips Bentonite - Cement Grout
NA =15	Granular Bentonite Bentonite - Sand Slurry
5. Material Used_To Fill Well / Drillhole	From (ft.) To (ft.) No. Yards, Sacks Sealant Mix Ratio or
Rook'h Coch	Surface 15-20' 15'z La = 0 9 sellet 25% Soliter
le elemente Orau	Surface (5 25 (1) a rot - C. (J. p) C to dorros
6. Comments	
	J
7 Supervision of Works	
Name/of Person or Prim Doing Sealing Work Date of Aba	plongrent Date Received Noted By
Nlabrix Envilonmenta. LLC 10/1	4/64
Street or Route Telephone I	Vumber Comments
Cosi Jeff (Son Highway (73) 4	24-480-J
State KIP Code Mail 55.34 S	Dignature of Person Doing vvork
	the states

Signature

Facility Boring Guy Pac WI Unic Local G State PI Facility Sar Jaquing V	/Project Drilled E quette, M jue Well irid Orgi ane	Nam By: N /atrix I No.	e SWL ame of Enviror	&P Phase II P f crew chief (f nmental, LLC	art III		License/Per														
Boring Guy Pao WI Unic Local G State Pl Facility Sar adk <u>r</u>	Drilled E quette, M que Well irid Orgi ane	By: N ⁄latrix I No.	ame of En∨iror	f crew chief (f nmental, LLC				mivivion	itoring N	umber				Borin	g Num	nber B					
WI Unic Local G State PI Facility Sar JAA	jue Well irid Orgi ane	No.	,		irst, last) a	nd Firm Date Drilling Started Date Drilling Completed 10/12/04 10/12/04			Firm Date Drilling Started Date Drilling Complete 10/12/04 10/12/04			Date Drilling Completed 10/12/04					Drilling Method Geoprobe Track Rig				
Local G State Pl Facility Sar Jaguny N	irid Orgi ane			DNR Well ID	No.	Comm	on Well Name	Fina 602	al Static V .78	Vater Le	vel	Surface 605.98	Eleva	tion		Bore 2 in	Borehole Diameter 2 inch				
Facility Sar Jagen Jabe	ID	in 🗋	(esti	imated) 🛛	or Boring	Locatio	י 🖬	La	_at ong			Loca	l Grid	Loca	lion N 🗆 S 🗖	n NO EO SO Wr					
Number Type					County D)ouglas		Count	ty Code		Civil	Town/City	/or Vi	ilage	Superie	or		·			
Number Type	nple				1						1		Soil Propertie				;]				
	Length Att. & Recovered (ft)	Blow Counts	Depth In Feet		Soil/ R	ock Desci	ription		U.S.C.S.	Graphic	Well	PID/FID	Compressive	Moisture	Liquid	Plasticity	P 200	RQD/			
1 GP	2.3		1 2 3 4	Topsoil Slag-lik crumbly Mixed F 2 inch th	and gras e materia r, moist, 1 fill consis nick laye:	s. I, blach no odo sting ò r wet s	k, loose, r. f: lag and woo	 od.	Fill			3.1									
2 GP	2.0		6 7 8 9	6 inch la 6 inch la 4 inch la 6 inch sa	ayer fine ayer silt. ayer woo and layer	sand. d. 7, no oc	lor, wet.					49.8						6-7 ft Soil Sample			
3 GP	3.5		10 11 12 13 14	Fine san slight oc Clay wi wet brow	id, well s lor. th sand a wn, no oc	orted, 1 nd woo lor.	orown, wet, od chip laye	, ers,	SP CH/SP			37.4									
4 GP	1.0		15 16 17 18 19 20	Clay, sti	ff, wet, t	prown,	no odor.		СН			3.1									
			I		DODD	$[C \ 10]$	TTTT		1	1 1				1		1					
l herby c			21-	END OI	F BORIN	[G-20]	FEET														

ENSR Corporation 4500 Park Glen Rd Ste 210 St. Louis Park, MN 55416 him Buch lec

Form 3300-005 (R 10/03)

Page 1 of 2

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Drinking Water Watershed/Wastewater Waste Management	Remediation/Redevelopment Other:
1. General Information	2. Facility / Owner Information
WI Unique Well No. DNR Well ID No. County Dugas	Facility Name Superior Water Lift & Pove
Common Well Name	Facility ID License/Permit/Monitoring NdCity, Village or Town
Y4/Y4 Y4 Section Township Range E N W	Street Address of Well Wher Water Street
Grid Location Feet Image: Constraint of the sector of th	Superior With Cight : Paver
Latitude: DEG_MIN_SEC Longitude: DEG_MIN_SEC	Weter Stract
Reason For Abandon gent WI Unique Well No. of Replacement W	Superior Diale Life Code
Temporary (Sorting	4. Pump, Liner, Screen, Casing & Sealing Material
3. Well / Drillhole / Borehole Information	Pump and piping removed?
Original Construction Date	Liner(s) removed?
$\frac{10}{12}$	Screen removed?
Borehole / Drillhole If a Well Construction Report is available, please attach.	Casing left in place? Yes No N/A Was casing cut off below surface? Yes No N/A
Construction Type:	Did sealing material rise to surface?
Drilled Driven (Sandpoint)	Did material settle after 24 hours?
Sother (specify): Direct Push	If yes, was hole retopped?
Formation Type:	If bentonite chips were used, were they hydrated with water from a known safe source?
Unconsolidated Formation	Required Method of Placing Sealing Material
Total Well Depth From Groundsurface (ft.) Casing Diameter (in.)	Screened & Poured (Bentonite Chips)
Lower Drillhole Diameter (in.) Casing Depth (ft.)	- Sealing Materials
NA NA	Bentonite-Sand Slurry "
Was well annular space grouted? Yes No Wunknown	Concrete Bentonite Chips
If yes, to what denth (feet)?	
NA =1.5	Denomine on ps Denomine - content croat Peránular Bentonite Bentonite - Sand Slurry
5. Material Used To Fill Well / Drillhole	From (ft.) To (ft.) No. Yards, Sacks Sealant Mix Ratio or or Volume (circle one) Mud Weight ,
Bentmite Grad	Surface 15-20' 1.5' the = 0.99 1/4+ 25% Solids
6. Comments	
7. Supervision of Work	DNR Use Only
Name of Person or Pirm Doing Sealing Work Date of Aba	pridonprient Date Received Noted By
Natrix Environmental, LC 10/	York Kimber Comments
He31 Journon Hichway (21) 4	124-4807
City State ZIP Code May 55 36 S	Signature of Person Doing Work Date Signed

				Route	To: Wa Rei	Watershed/Wastewater Waste Management Remediation/Redevelopment Variable Other									Page 1 of 1						
ac	ility/	Project	Name	e SWL	&P Phase II P	art III		License/Permi	it/Monite	oring N	umber				Borin	g Num	iber B	-27			
Bor Guy	ing I Paq	Drilled E uette, M	By: Na latrix	ame of Enviror	crew chief (f nmental, LLC	ïrst, last) a	nd Firm	1	Date Drilling StartedDate Drilling10/12/0410/12/04						Compl	eted		Drillir Geo Rig	illing Method Geoprobe Track Rig		
VIT	Jniq	ue Well	No.		DNR Well ID) No.	Comm	on Well Name	Final 602.8	Static V 3	Vater Lev	/el	Surface 605.73	Elevat	lon		Bore 2 in	iorehole Diameter 2 inch			
.oc tat	al Gi e Pla	id Orgi ine	n 🗆	(esti	mated) 🛛	or Boring	Location	n 67	La Lon	t g			Loca	l Grid	Locat	ion N 🗆 S 🗆		E			
ac	ility I	D				County [Douglas		County	Code		Civil 1	own/City	/or Vi	llage	Superio	or				
	San	ple	Ι			<u></u>	<u> </u>						-		Soil	Prope	rties				
Number	Type	Length Att. & Recovered (ff)	Blow Counts	Depth In Feet		Soil/ R	ock Descr	iption		U.S.C.S.	Graphic	Well	PID/FID	Compressive	Moisture	Liquid	Plasticity	P 200	RQD/		
1	GP	3.2		1 2 3 4	odor. Slag-like crumbly	e materia , no odo	il, black r, moist	x, loose, t.		Fill			3.6								
2	GP	2.8		6- 7- 8- 9-	Fine san brown, v	id odor. id with fi wet, odo	nes, we	ell sorted,					903						7-8 Ft Soil Sample		
3	GP	2.9		10 11 12 13 14	Same as odor.	above, l	out shee	en and strong	5	SP			1161								
4	GP	0.0		15 16 17 18 19	No reco	very.							NA								
				20-	END OI	F BORIN	IG-20 I	FEET			<u> 1997</u>										

I herby certify that the information on this form is true and the correct to the best of my knowledge

 Signature
 Cuin
 Firm
 ENSR Corporation 4500 Park Glen Rd Ste 210 St. Louis Park, MN 55416

|--|

Form 3300-005 (R 10/03)

Page 1 of 2

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Route to:	Remediation/Redevelopment Other
1. General Information	2 Eacility / Owner into motion
WI Unique Well No. DNR Well ID No. County	Facility Name
V. Sugas	Superior Water Lift ! hove
Common Well Name Gov't Lot # (if applicable)	Facility ID License/Permit/Monitoring NdCity, Village or Town
GT-17	Supertur
1/1/4 1/4 Section Township Range E	Street Address of Well
N W	Writer/Water Street
Feet NFeet E Local Grid Origin	Superior With Light Power
S (estimated) OR Well Location	Street Address or Route of Owner
Latitude: DEG MIN SEC Longitude: DEG MIN SEC	City State ZIP Code
NW	Superior Latter Lin Code
Reason For Abandonment WI Unique Well No. of Replacement We	4. Pump, Liner, Screen, Casing & Sealing Material
3. Well / Drillhole / Borehole Information	Pump and piping removed?
Original Construction Date	Liner(s) removed?
0/12/04	Screen removed?
If a Well Construction Report is available,	Casing left in place?
please allach.	Was casing cut off below surface?
	Did sealing material rise to surface?
Drilled Driven (Sandpoint) Dug	Did material settle after 24 hours?
Other (specify):	If yes, was hole retopped?
Formation Type:	If bentonite chips were used, were they hydrated with water from a known safe source? Yes No N/A
Unconsolidated Formation Bedrock	Conductor Pipe-Gravity
Total Well Depth From Groundsurface (ft.) Casing Diameter (in.)	Bentonite Chips)
Lower Drillhole Diameter (in.) Casing Depth (ft.)	Sealing Materials
NA NA	Send Coment (Concerts) Court
T T R NA.	Bentonite Chips
Was well annular space grouted? L_IYes L_INo [Z_N Inknown]	For Monitoring Wells and Monitoring Well Boreholes Only:
If yes, to what depth (feet)? Depth to Water (feet)	Bentonite Chips Bentonite - Cement Grout
NA	Heranular Bentonite Bentonite - Sand Slurry
5. Material Used_To Fill Well / Drillhole	From (ft.) To (ft.) No. Yards, Sacks Sealant Mix Ratio or Or Volume (circle one) Mud Weight
Sobrite /ocat-	Surface 15-20' 1.5' + have = 0.9911/4 25% Sulley
6. Comments	
7. Supervision of Work	DNR Use Only
Namept Person of Firm Doing Sealing Work Date of Aba	Monment Date Received Noted By
Street or Route Telephone Michael (22) 4	fumber Cömments 2 Y - Y fb]
City State ZIP Code	Signature of Person Dring Work Date Signed
U5360 Mg 55368	201 out 1/20/5

	R	oute ⁻	To: Watershed/W Remediation/I	astewate Redevelo	er 🗆 opment 🖵	Was Othe	te Mana ∋r □	gement					Page	1 of 1			
Facility/Project N	ame S	SWL&	P Phase II Part III		License/Perm	it/Moni	itoring N	lumber				Borin	g Num	ber B	-28		
Boring Drilled By Guy Paquette, Ma	/: Nam trix En	ne of a Ivironi	crew chief (first, last) a mental, LLC	nd Firm	<u>I</u>	Date Drilling Started Date Drilling Completed Drill 10/12/04 Date Drilling Completed G R							Grillir Geo Rig	g Method pprobe Track			
WI Unique Well N	lo.		DNR Well ID No.	Comm	on Well Name	Fina 602	I Static .84	Water Lev	vel Surface Elevation Bore 607.84 2 ir					Bore 2 in	hole Diameter ch		
Local Grid Orgin State Plane		(estin	nated) 🔲 or Boring	Locatio	ח 🖬	Lo Lo	.at ng			Loca	l Grid	Locat	tion N 🗆 S 🗔	<u> </u>		ED Wn	
Facility ID			County D	ouglas		Count	y Code		Civil	Town/City	/or V	llage	Superio	or			
Sample												Soil	Prope	rties			
Number Type Length Att. & Recovered (ft)	Blow Counts	Depth In Feet	Soil/ R	ock Desci	ription		U.S.C.S.	Graphic	Well	PID/FID	Compressive	Moisture	Liquid	Plasticity	P 200	RQD/	
1 GP 2.6		1 2 3 4 1	Lime-like materi moist, no odor. Fine sand, well s wet at 5 feet, slig	al, gray orted, l ht odo	y, crumbly, prown, mois r.	t to	Fill			3.0							
2 GP 2.0		5 6 7 8 9 1111 9								15.6						5-6 Ft Soil Sample	
3 GP 4.0		10 11 12 13 14 14 16					SP			29.4							
4 GP 4.8		13 16 17 17 18 19 19 1	Sand, poorly sort slight odor.	ted, bro	own/gray, wo	et,	SW			33.8							
<u>├</u> ─ 		20	Clay, moist, brow	vn, stif	f, no odor.		СН										
		21	END OF BORIN	[G-20]	FEET												
I herby certify that the	he info	rmatio	on on this form is true and	the corre	ect to the best of	my knov	vledge				•	•				L	

Signature Chin Buel Cecc Firm ENSR Corporation 4500 Park Glen Rd Ste 210 St. Louis Park, MN 55416

Nell / Drillhole /	Borehole	Abandonment	t
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Form 3300-005 (R 10/03)

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Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between \$10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

Route to:	Remediation/Redevelopment Other:
1. General Information	2. Facility / Owner Information
WI Unique Well No. DNR Well ID No. County	Facility Name Superior Water Lift ! Pove
Common Well Name $GP - 28$ Gov't Lot # (if applicable)	Facility ID License/Permit/Monitoring NdCity, Village or Town
メイソ メ Section Township Range E N ロッ	Street Address of Well Winter/Water Street
Grid Location Feet NFeet E Local Grid Origin	Present Well Owner Superior What Light & Paver Original Well Owner
Latitude: DEC NUM OF Longitude: DEC NUM OF LONGITUDE:	on Street Address or Route of Owner
Deg Min Sec Deg Min Sec	W Superior State ZIP Code
Temporary (Soring	Ve 4. Pump, Liner, Screen, Casing & Sealing Material
3. Well / Drillhole / Borehole Information	Pump and piping removed? Yes No XN/A Liner(s) removed? Yes No XN/A
Monitoring Well $ \phi/ 2/\phi4$	Screen removed?
Borehole / Drillhole If a Well Construction Report is available, please attach.	Casing left in place?
Construction Type:	Did sealing material rise to surface?
Driven (Sandpoint)	Did material settle after 24 hours?
Other (specify):	If bentonite chips were used, were they
Formation Type: Unconsolidated Formation Bedrock	Required Method of Placing Sealing Material
Total Well Depth From Groundsurface (ft.) Casing Diameter (in.)	Bentonite Chips)
Lower Drillhole Diameter (in.) Casing Depth (ft.)	Sealing Materials Neat Cement Grout Clay-Sand Slurry (11 lb./gal. wt
Was well annular space grouted? Yes No Kunknow	Concrete Grout Sand-Cement (Concrete) Grout Bentonite Chips For Monitoring Wells and Monitoring Well Boreholes Only:
If yes, to what depth (feet)? Depth to Water (feet)	Bentonite Chips Bentonite - Cement Grout
5. Material Used To Fill Well / Drillhole	From (ft.) To (ft.) No. Yards, Sacks Sealant Mix Ratio or Mud Weight
Sentinite Grad	Surface 15-20' 1.5' hole = 0.9 ge//4 25% Solids
6. Comments	
7. Supervision of Work	DNR Use Only
Matrix CANDAMENTA, LC 10	1/4/6 4 Comments
Cost Jeyrason Highway (73)	424-4803
State LIP Code May 55.76 S	Dignature of reison Doing work Date Signed

Signature

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						. –								Page	1 of 1		
Facility/Project Name SWL&P Phase II Part III License/Permit/Monitoring Number										iber B	er B-29						
Drilled I quette, M	3y: N a Iatrix I	ame of Environ	crew chief (fin mental, LLC	rst, last) a	nd Firm	<u> </u>	Date Drilling Started Date Drilling Completed Drilling Me 10/12/04 10/12/04 Geoprob						n g Method oprobe Trac I				
WI Unique Well No. DNR Well ID No. Common Well Nam							Final 603.7	Static V 73	Water Le	vel	Surface 609.23	Eleva	tion		Bore 2 in	hole hole	Diameter
Local Grid Orgin 🔲 (estimated) 🗋 or Boring Location 🖬 State Plane							La	at ng		-	Loca	l Grid	Locat	tion N⊡ S⊡			E
Facility ID County Douglas C							County	/ Code		Civil	Town/City	/or Vi	llage	Superi	or		
Sample								1		l.			Soil	Prope	rties		
Length Att. & Recovered (ft)	Blow Counts	Depth In Feet			U.S.C.S.	Graphic	Well	PID/FID	Compressive	Moisture	Liquid	Plasticity	P 200	RQD/			
4.7		1 1 2 3 4 4 5	Topsoil and grass Lime-like material, gray, moist, no odor.								3.2						
3.9		5 6 7 8 9	Slag-like 7 feet, sli Wood ch	Slag-like material, brown, loose, wet at 7 feet, slight odor. Wood chips, wet, slight odor.							3.9 47.7						6-7 Ft Soi Sample
3.2		10-11-11-11-11-11-11-11-11-11-11-11-11-1	Fine sand brown, w	rk	CD			77.4									
4.5		16 17 17 18 19	Same as above, but with brick pieces.								50.2 29.0						
	Project Drilled E juette, M ue Well rid Orgi ane ID nple 3: 11 Paramona 4.7 3.9 3.2	Project Name Drilled By: Na ue Well No. rid Orgin ane ID nple 3.9 3.2 4.5	Project Name SWL8 Drilled By: Name of nuette, Matrix Environ ue Well No. rid Orgin (estin ane ID nple (I) sumo Name B (I) A.7 A.7 A.7 A.7 A.7 A.7 A.7 A.	Project Name SWL&P Phase II Pa Drilled By: Name of crew chief (fin uette, Matrix Environmental, LLC ue Well No. DNR Well ID rid Orgin [] (estimated) [] ane ID nple ************************************	Project Name SWL&P Phase II Part III Drilled By: Name of crew chief (first, last) a puette, Matrix Environmental, LLC ue Well No. DNR Well ID No. rid Orgin [] (estimated) [] or Boring ane ID County D nple game Topsoil and grass J Jage Soil/ R 4.7 Soil/ R 4.7 Soil/ R 4.7 Soil/ R 4.7 Soil/ R 3.9 Sing-like materia A fight odo Silge-like materia Topsoil and grass Lime-like materia Silge-like materia Silge-like materia Topsoil and grass B Silge-like materia Topsoil and grass Silge-like materia Topsoil and grass Silge-like materia Topsoil and gras Silge-like mater	Project Name SWL&P Phase II Part III Drilled By: Name of crew chief (first, last) and Firm quette, Matrix Environmental, LLC ue Well No. DNR Well ID No. Comm rid Orgin [] (estimated) [] or Boring Location ane ID County Douglas nple gamma gamma <td>Project Name SWL&P Phase II Part III License/Perm Drilled By: Name of crew chief (first, last) and Firm puette, Matrix Environmental, LLC Common Well Name ue Well No. DNR Well ID No. Common Well Name rid Orgin [] (estimated) [] or Boring Location [] ane ID County Douglas nple Soil/ Rock Description I view of the state of</td> <td>Project Name SWL&P Phase II Part III License/Permit/Monif Drilled By: Name of crew chief (first, last) and Firm uette, Matrix Environmental, LLC Date 1 10/13 ue Well No. DNR Well ID No. Common Well Name Final 603. rid Orgin [] (estimated) [] or Boring Location [] License/Permit/Monif nple </td> <td>Project Name SWL&P Phase II Part III License/Permit/Monitoring N Drilled By: Name of crew chief (first, last) and Firm puetle, Matrix Environmental, LLC Date Drilling 10/12/04 ue Well No. Dome of crew chief (first, last) and Firm puetle, Matrix Environmental, LLC Date Drilling 10/12/04 ue Well No. Dome of crew chief (first, last) and Firm puetle, Matrix Environmental, LLC Date Drilling 10/12/04 ue Well No. Common Well Name Final Static L 603.73 Inder Colspan="2">County Code ane County Douglas County Code Inder County Douglas County Code Image: Soil/ Rock Description gig gig gig gig gig gig gig gig gig gig</td> <td>Project Name SWL&P Phase II Part III License/Permit/Monitoring Number Drilled By: Name of crew chilef (first, last) and Firm juetle, Matrix Environmental, LLC Date Drilling Started 10/12/04 ue Well No. DNR Well ID No. Common Well Name 603.73 rid Orgin (estimated) or Boring Location ane Lat Long (D) County Douglas County Code nple soil/ Rock Description g g g g g g g g Topsoil and grass g g g g 4.7 1 Topsoil and grass 4.7 3 Salge-like material, gray, moist, no odor. 3.9 Salge-like material, brown, loose, wet at 7 Fill 3.9 Wood chips, wet, slight odor. Fill 3.2 Image and with fines, well sorted, dark brown, wet, slight odor. Sp 4.5 Image and with fines, but with brick pieces. Sp</td> <td>Project Name SWL&P Phase II Part III License/Permit/Monitoring Number Drilled By: Name of crew chief (first, last) and Firm juette, Matrix Environmental, LLC Date Drilling Started 10/12/04 ue Well No. DNR Well ID No. Common Well Name 603.73 rid Orgin (estimated) or Boring Location G ane Lat Long ID County Douglas County Code Civil' nple using the started transformer t</td> <td>Project Name SWL&P Phase II Part III License/Permit/Monitoring Number Drilled By: Name of crew chief (first, last) and Firm uette, Matrix Environmental, LLC Date Drilling Started 10/12/04 Date Drilling Started 10/12/04</td> <td>Project Name SWL&P Phase II Part III License/Permit/Monitoring Number Drilled By: Name of crew chief (first, last) and Firm usels, Matrix Environmental, LLC Date Drilling Started 10/1204 Date Drilling Started 10/1204 ue Well No. DNR Well ID No. Common Well Name Final Static Water Level 603.73 Surface Eleva 609.23 rid Orgin () (estimated) () or Boring Location (2) Lat Long Local Grid Long ne County Douglas County Code Civil Town/City/or VI field By Soil/ Rock Description 1 apple soil/ Rock Description 9 9 9 9 4.7 1 Topsoil and grass 9 9 9 4.7 1 Time-like material, gray, moist, no odor. 5 3.2 3.9 7 7 feet, slight odor. 5 3.9 3.2 1 Same as above, but with brick pieces. SP 50.2 4.5 1 1 5 50.2 20.0</td> <td>Project Name SWL&P Phase II Part III License/Permit/Monitoring Number Date Drilling Started Date Drilling Started Date Drilling Complexity Drilled By: Name of crew chief (first, last) and Firm uselds, Matix Environmental, LLC Date Drilling Started Date Drilling Started Date Drilling Started Date Drilling Complexity ue Well No. DNR Well ID No. Common Well Name Final Static Water Level Surface Elevation 609.23 rid Orgin □ (estimated) □ or Boring Location (g) Lat Local Grid Local Local and grass nple soil/ Rock Description g</td> <td>Page Project Name SWL&P Phase II Part III License/Permit/Monitoring Number Date Drilling Completed Drilled By: Name of crew chief (first, last) and Firm puetie, Matrix Environmental, LLC Date Drilling Started 10/1204 Date Drilling Completed ue Well No. DNR Well ID No. Common Well Name (estimated) or Boring Location G ane I.Lat Long Surface Elevation 609.23 rid Orgin (estimated) or Boring Location G ane Lat Long Local Grid Location NC rid Soil/ Rock Description gi g</td> <td>Project Name SWL&P Phase II Part III Liconse/Permit/Monitoring Number Boring Number B Driftled By: Name of crew oblef (first, last) and Firm unlete, Matrix Environmental, LLC Date Driftling Started 10/12/04 Date Driftling Completed 10/12/04 ue Well No. DNR Well ID No. Common Well Name Final Static Water Level 000.7.3 Surface Elevation 000.2.3 Boring Number B rid Orgin □ (estimated) □ or Boring Location □ Lat Local Grid Location NO Surface Static Action NO Surface Static Action NO none County Douglas County Code Civil Town/City/or Village Superior N□ nple uig U</td> <td>Project Name SWL&P Phase II Part III License/Permit/Monitoring Number Boring Number 5-29 Drilled By: Name of crew chief (first, last) and Firm (uette, Matrix Environmental, LLC Date Drilling Started 10/1204 Date Driling Started 10/1204 Date Drilling Started 1</td>	Project Name SWL&P Phase II Part III License/Perm Drilled By: Name of crew chief (first, last) and Firm puette, Matrix Environmental, LLC Common Well Name ue Well No. DNR Well ID No. Common Well Name rid Orgin [] (estimated) [] or Boring Location [] ane ID County Douglas nple Soil/ Rock Description I view of the state of	Project Name SWL&P Phase II Part III License/Permit/Monif Drilled By: Name of crew chief (first, last) and Firm uette, Matrix Environmental, LLC Date 1 10/13 ue Well No. DNR Well ID No. Common Well Name Final 603. rid Orgin [] (estimated) [] or Boring Location [] License/Permit/Monif nple	Project Name SWL&P Phase II Part III License/Permit/Monitoring N Drilled By: Name of crew chief (first, last) and Firm puetle, Matrix Environmental, LLC Date Drilling 10/12/04 ue Well No. Dome of crew chief (first, last) and Firm puetle, Matrix Environmental, LLC Date Drilling 10/12/04 ue Well No. Dome of crew chief (first, last) and Firm puetle, Matrix Environmental, LLC Date Drilling 10/12/04 ue Well No. Common Well Name Final Static L 603.73 Inder Colspan="2">County Code ane County Douglas County Code Inder County Douglas County Code Image: Soil/ Rock Description gig	Project Name SWL&P Phase II Part III License/Permit/Monitoring Number Drilled By: Name of crew chilef (first, last) and Firm juetle, Matrix Environmental, LLC Date Drilling Started 10/12/04 ue Well No. DNR Well ID No. Common Well Name 603.73 rid Orgin (estimated) or Boring Location ane Lat Long (D) County Douglas County Code nple soil/ Rock Description g g g g g g g g Topsoil and grass g g g g 4.7 1 Topsoil and grass 4.7 3 Salge-like material, gray, moist, no odor. 3.9 Salge-like material, brown, loose, wet at 7 Fill 3.9 Wood chips, wet, slight odor. 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Bael Ger

ENSR Corporation 4500 Park Glen Rd Ste 210 St. Louis Park, MN 55416

Nell / Drillhole	/ Borehole	Abandonment
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Form 3300-005 (R 10/03)

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Route to:	Wastewater 🗌 Waste M	lan age ment	Remediat	lion/Redevo	elopment	Other:	
1. General Information	and an		2. Facility /	Owner Ir	nformation		
WI Unique Well No. DNR Well II	D No. County	<u>i interestadores de la constatores de la consta</u>	Facility Name	/		ata ta fa	\bigcirc
	V. bug	as		Supe	erior Wata	r Lift ?	Voue
Common Well Name	2 Gov't Lot # (if application	able)	Facility ID	Li	cense/Permit/N	Ionitoring NeCity	Village or Town
GF-2				,			Supertur
Val Va Va Section	Township Rang	e 🗌 e	Street Addres	of Well	st.		·
	N	W	Write(/	War.	er Sile	21	
Grid Location			Sand II		LiPaur	Jriginal Well Ow	ner
			Street Address	s or Route	e of Owner		
		j vveli Locatior	Water	Shark	-		
DEG MIN SEC	DEG MIN	SEC	City			State	ZIP Code
Reason For Abandonment			- Supe	2 M C		WF	
Ten Polari, Concina	ival Unique vaei No. 01 Rej	placement we	4. Pump, Li	ner, Scre	en, Casing &	Sealing Mater	ial
3 Well / Drillhole / Borehole Infe			Pump and	piping rem	oved?		Yes No N/A
Orice	inal Construction Date		Liner(s) ren	noved?			
Monitoring Well	10/12/04		Screen rem	noved?		X	
Water Well			Casing left	in place?		Π.	
Borehole / Drillhole	ase allach.	madie,					
Construction Type:	· · · · · · · · · · · · · · · · · · ·	······	vvas casing	j cut on be	low surface?		
			Did sealing	material n	ise to surface?		¥es ∐No ∐N/A
Driven (San			Did materia	al settle afte	er 24 hours?		
Other (specify):	A WSM	<u> </u>	If bentonite	chins wer	e used were th		
Formation Type:			hydrated wi	ith water fr	om a known sa	fe source?	Yes No KN/A
Linconsolidated Formation			Required Met	hod of Pla	cing Sealing Ma	aterial	
Conconsolidated Politikation				or Pipe-Gra	avity Cond	uctor Pipe-Pump	ed
Total Well Depth From Groundsurface	e (ft.) Casing Diameter (ir	n.)	Screene	d & Poured	I Other	r (Explain):	
20'	/*		Sealing Mater	rials			<u></u>
Lower Drillhole Diameter (in.)	Casing Depth (ft.)		Neat Cer	ment Grout	t	Clay-Sand	Slurry (11 lb./gal. wt.)
NA	NAT	- A	Sand-Ce	ement (Con	Icrete) Grout	Bentonite-	Sand Slurry " "
Man wall applies appendix and		X NA		a	,	Bentonite	Chips
was well annular space grouted?			For Monitorin	- g Wells an	d Monitoring W	ell Boreholes Or	nly:
If yes, to what depth (feet)?	Depth to Water (feet)		Bentonite	Chips	B	entonite - Cemer	nt Grout
NA	215'			Bentonite	В	entonite - Sand S	Slurry
5. Material Used To Fill Well / Drill	hole		From (ft.)	To (ft.)	No Yards, S	Sacks Sealant	Mix Ratio or Mud Weight
(Sabila Co	<u>c</u> t	<u> </u>	Surface	15-2-5'	15-1-		25% Sily
I CERTINGE	<u>au</u>		ournee	0 10			0 10 20110
						••••	
6. Comments							I
		. 142				· · · · · · · · · · · · · · · · · · ·	
			- 1.t				
7. Supervision of Work		D-44 A	and a second and a		Danskie	DNR Use Only	/
Name of Verson or Firm Doing Sealir		Date of Aba	nuonment	Date	Received	NOTED BY	
Street or Boute	fu	Telephone	Vumber	Comr	ments		
4631 Jourson Hich	wen	(2(2) 4	24-4803		\frown		
City ()	State , ZIP Co	de	Signature of F	erson De	ng Work	Dat	e \$igne¢
5310	Mr 5534	. ?		Doth	out	L	12 hs

		Route To: Watershed/Wastewater □ Remediation/Redevelopment I								ste Manaç er 🛛	gement		,			Page	1 of 1		
Fac	;ility/	Project	Nam	e SWL8	P Phase II Pa	art III		License/Perr	nit/Mon	nitoring N	umber	···			Borin	g Nun	ber B	-30	
Bo Gu	ring / Pac	Drilled E juette, M	By: N latrix	ame of Environ	crew chief (fi mental, LLC	irst, last) a	nd Firm	<u>I</u>	Date Drilling Started Date Drilling Completed Drill 10/12/04 G R						Geo Geo Rig	ig Method oprobe Track			
WI	Uniq	ue Well	No.		DNR Well ID	No.	Fina 602	al Static V 2.24	Vater Le	evel	Surface 605.94	Eleva	tion		Bore 2 in	 hole ch	Diameter		
Loc Sta	al G te Pla	rid Orgi ane	n 🗆	(estir	nated) 🛛	led) □ or Boring Location 🖬							Loca	l Grid	l Local	iion N⊡ S⊓	_ <u></u> _		E D W D
Fac	ility	ID				County Douglas						Civil	own/City	/or V	illage	Superi	or		
	San	ńple													Soil	Prope	rties		
Number	Type	Length Att. & Recovered (ft)	Blow Counts	Depth In Feet		Soil/ R	ock Desci	ription		U.S.C.S.	Graphic	Well	PID/FID	Compressive	Moisture	Liquid	Plasticity	P 200	RQD/
1	GP	2.5		1 2 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Topsoil a Slag-like no odor.	and gras e materia	s. hl, blaci	k, crumbly,	dry,	Fill) {		12.6						
2	GP	4.1		5 6 7 8 9 111 8 9 111	Fine san 2 inch w dark gra	d, well s rood chiq y, sheen	orted, l o and sl and od	brown, wet. lag layer, we lor.	et,	SP			659						8-9 Ft Soil Sample
3	GP	5.0		10 11 12 13 13 14	Fine to c	coarse sa	nd, poo	orly graded.					171		ere - re				
4	GP	5.0		15 16 17 18 19 19	Silty fine odor. Sand, po	Silty fine sand, well sorted, brown, v odor. Sand, poorly sorted, brown, wet. Clay, brown, stiff, wet.				SW SM SP CH			39.8						
				21	END OF	F BORIN	\G-20]	FEET											

I herby certify that the information on this form is true and the correct to the best of my knowledge

Signature Chin Buch Cuther Firm ENSR Corporation 4500 Park Glen Rd Ste 210 St. Louis Park, MN 55416

Well /	Drillhole	/ Borehole	Abandonment
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Form 3300-005 (R 10/03)

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Conversition 2: Facility / Owiner Information W Unque Well No DNR Well ID No. Count Ougles Common Well Name Cuprice Wat Utt 1: Gaux Common Well Name Cuprice Wat Utt 1: Gaux X1 /k /k Section Township Feed Infection Street Address of Well Cuprice Control Well Address of Rother of Owner Mailude: Code Gorgin Street Address of Rother of Owner Code Gorgin Infection E Infection Street Address of Rother of Owner Influcte: Code Mix Store Street Address of Rother of Owner Influcte: Code Mix Store Street Address of Rother of Owner Influcte: Code Mix Store Street Address of Rother of Owner Influcte: Code Mix Store Street Address of Rother of Owner Influcte: Code Mix Store Street Address of Rother of Owner Influcte: Code Mix Street Address of Rother of Owner Influcte: Code Mix Street Address of Rother of Owner Influcte: Code Mix Puring, Influcter, Screen, Casing & Staffing Material	Route to:	Remediation/Redevelopment Other:
Mit Unique Weir No. DNR Weir ID No. South Joint & (f applicable) Facility Name Superior With Y is an analysis of the provided in theprovided in the provided in the provided in the	1. General Information	2 Facility / Owner Information
Cermon Well Name V. Jucks Superior Water 'i Gard V/ V K Section Township Parage E V/ V K Section Township Parage E Street Address of Viel Water 'i Gard V/ V K Section Township Parage E Street Address of Viel Digital Well Owner Grid Location Grid Location Grid Location Owner Water Viel Digital Well Owner Hild H W Gestimated) OR OR Well Careform Water Viel Digital Well Owner Multiple Section Section Section Section Section Section Digital Careford Multiple Section Section <t< td=""><td>WI Unique Well No. DNR Well ID No. County</td><td>Facility Name</td></t<>	WI Unique Well No. DNR Well ID No. County	Facility Name
Common Well Name Cover Lot # (if applicable) Facility ID LecrearPermitMonitoring McCity, Utilage or Town X1 // 4 // Section Township Pange E Grid Location Cover Lot # (if applicable) Cover Lot # (if	Lugas	Superior Water Lift Four
X1 /X Section Township Range E Stored Address of Weil Suppart Feet Implement Implement Implement Implement Store Store <td>Common Well Name Gov't Lot # (if applicable)</td> <td>Facility ID License/Permit/Monitoring NqCity, Village or Town</td>	Common Well Name Gov't Lot # (if applicable)	Facility ID License/Permit/Monitoring NqCity, Village or Town
V/ // V/ Section Township Range E Street Address of Veil View	67-34	Supertur
And Location N W With C.V. With Connert Diginal Well Conner Feet N Feet Local Grid Origin Present Well Conner Diginal Well Conner Latitude: Diag. MIN SEC Long MIN SEC Long MIN SEC State Address or Route of Owner Litter Conner Latitude: Diag. MIN SEC Long MIN SEC Link Screen, Casing & Stating Material Pump and piping removed? Yes No No 3. Well / Dytiltible / Borehole, throthriation Original Construction Report is available. Pump and piping removed? Yes No No No Water well If a Will Construction Report is available. Pump and piping removed? Yes No No No Water well If a Will Construction Report is available. Pump and piping removed? Yes No No No Construction Type: Original Construction Report is available. Pump and piping removed? Yes No No No Construction Type: Original Construction Report is available. Pump and piping removed? Yes No No Construction Type: Original Construction Report is available. Pump and piping removed? Yes	Val Va Section Township Range E	Street Address of Well
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Drilled Driven (Sandppint) Dug Did sealing material settle after 24 hours? Yes No Formation Type: Yes No NA Watcher (specify): Did sealing material settle after 24 hours? Yes No NA Wunconsolidated Formation Bedrock If bentonite chips were used, were they hydrated with water from a known safe source? Yes No NA Null Unconsolidated Formation Bedrock Conductor Pipe-Orany (Conductor Pipe-Pumped) Screened & Poured Other (Explain): Screened & Poured Other (Explain): Screened & Poured Screened & Poured Other (Explain): Screened & Poured Screened & Poured Other (Explain): Screened & Poured Screened & Pour	Construction Type:	
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Image: State Image: State <td< td=""><td></td><td>Neat Cement Grout Clay-Sand Slurry (11 lb./gal. wt.)</td></td<>		Neat Cement Grout Clay-Sand Slurry (11 lb./gal. wt.)
Was well annular space grouted? Yes No No No Concrete Bentonite Chips For Monitoring Wells and Monitoring Wells and Monitoring Well Boreholes Only: Bentonite Chips Bentonite - Cernent Grout If yes, to what depth (feet)? Depth to Water (feet) Bentonite Chips Bentonite - Cernent Grout Material Used To Fill Well / Drillhole Fiom (ft.) Fo (ft.) No. Yards, Sacks Sealant Mix Ratio or Material Used To Fill Well / Drillhole From (ft.) Fo (ft.) No. Yards, Sacks Sealant Mix Ratio or Material Used To Fill Well / Drillhole From (ft.) Fo (ft.) No. Yards, Sacks Sealant Mix Ratio or Material Used To Fill Well / Drillhole From (ft.) Fo (ft.) No. Yards, Sacks Sealant Mix Ratio or Material Used To Fill Well / Drillhole From (ft.) Fo (ft.) No. Yards, Sacks Sealant Mix Ratio or Material Used To Fill Well / Drillhole Surface IS - 2o' I.S' (ft.) No. Yards, Sacks Sealant Mix Ratio or Material Used To Fill Well / Drillhole Grad Surface IS - 2o' I.S' (ft.) So (ft.) Mix Ratio or Material Used To Fill Well / Drinlhole Grad Sur		Sand-Cement (Concrete) Grout Bentonite-Sand Slurry " "
For Monitoring Wells and Monitoring Well Boreholes Only: If yes, to what depth (feet)? Depth to Water (feet) NA 215 Bentonite Chips Bentonite - Cement Grout Bentonite Chips Bentonite - Cement Grout S. Material Used To Fill Well / Drillhole From (ft.) To (ft.) S. Material Used To Fill Well / Drillhole From (ft.) To (ft.) S. Material Used To Fill Well / Drillhole From (ft.) To (ft.) S. Material Used To Fill Well / Drillhole From (ft.) To (ft.) S. Material Used To Fill Well / Drillhole From (ft.) To (ft.) S. Material Used To Fill Well / Drillhole From (ft.) To (ft.) S. Material Used To Fill Well / Drillhole From (ft.) To (ft.) S. Material Used To Fill Well / Drillhole From (ft.) To (ft.) S. Material Used To Fill Well / Drillhole From (ft.) To (ft.) S. Material Used To Fill Well / Drillhole From (ft.) To (ft.) S. Material Used To Fill Well / Drillhole Surface IS (ft.) G. Comments IS (ft.) DNR Use Only DNR Use Only Name/of Person graphing Work Date of Abapidon ment <	Was well annular space grouted?	Concrete Bentonite Chips
If yes, to what depth (feet)? Depth to Water (feet) NA 25 Bentonite Chips Bentonite - Cement Grout Bentonite - Sand Slurry 5. Material Used To Fill Well / Drillhole From (ft.) To (ft.) No. Yards, Sack's Sealant Mix Ratio or Mud Weight, Surface 15-20' 1.5's hole = 0.9 11/4 25% Soliding 6. Comments 6. Comments 7. Supervision of Work Name/of Person gcPirm Doing Sealing Work Material Carlow Steet or Route Bentonite Chips Bentonite - Cement Grout Bentonite - Sand Slurry From (ft.) To (ft.) No. Yards, Sack's Sealant Mix Ratio or Mud Weight, Surface 15-20' 1.5's hole = 0.9 11/4 25% Soliding 6. Comments 7. Supervision of Work Name/of Person gcPirm Doing Sealing Work Materia Carlow Steet or Route Bentonite - Cement Grout DNR Use Only DNR Use Only Date of Abardonment Comments (23.1) Appr050n Highway City State ZIP Code Signature of Person Doing Work Date Signed State ZIP Code Signature of Person Doing Work Date Signed Signature of Person Doing Work Comments (23.1) Appr050n Highway City State ZIP Code Signature of Person Doing Work City State ZIP Code Signature of Person Doing Work Comments (24.3) Y2Y - 4BD Comments (25.36)		For Monitoring Wells and Monitoring Well Boreholes Only:
N/A $= 1.5$ Derinduar Bentonite Bentonite - Sand Slurry S. Material Used To Fill Well / Dirilihole From (ft.) To (ft.) No. Yards, Sack's Sealant or Volume (circle one) Mix Ratio or Mud Weight, or Volume (circle one) I. Sontmite Surface 15-20' 1.5's Hole = 0.9 ge//dt 25% Solidy 6. Comments DNR Use Only DNR Use Only Nameof Person or Pfim Doing Sealing Work Date of Abardonment 10/14/04 Date Received Noted By Stleet or Route Telephone Number Comments City State ZIP Code Signature of Person Doing Work Date Signed' City State ZIP Code Signature of Person Doing Work Date Signed'	If yes, to what depth (feet)? Depth to Water (feet)	Bentonite Chips Bentonite - Cement Grout
S. Material Used To Fill Well / Drillhole From (ft.) To (ft.) No. Yards, Sacks Sealant or Volume (circle one) Mix Ratio or Mud Weight, Surface 15 20' 1.5 's hole = 0.9 st/l/t 25% Solidy 6. Comments Surface 15 's hole = 0.9 st/l/t 25% Solidy 7. Supervision of Work DNR Use Only DNR Use Only Nameoff Person or Pfirm Doing Sealing Work Date of Abardonment / O/14/0 4 Date Received Stileet or Route Telephone Number Comments City State ZIP Code Signature of Person Doing Work Date signed City State ZIP Code Signature of Person Doing Work Date signed 1/20 State ZIP Code Signature of Person Doing Work Date signed	NA =15	Bentonite - Sand Slurry
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Name of Person or Firm Doing Sealing Work Date of Abardonment Street or Route Carrie Comments	7. Supervision of Work	DNR Use Only
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Street or Route Comments City State Stat	IV labrix Environmental, LLC 10/1	4/04
City State ZIP Code Signature of Person Doing Work Date Signed State 55.76 State 21P Code Signature of Person Doing Work Date Signed 1/20/55	Street or Route	Number Comments
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		the states

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Facili	ity/F	Project	Name	B SWL	&P Phase	II Part III		License/Pern	nit/Moni	toring N	umber					Borin		1ber B	-31	
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Sample							·		Γ		-				Soil	Prope	rties			
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2 G	3P	4.7		6 7 8 9	Same grave moist	e as above, t ely clay laye t, no odor.	h red-brown ches thick,	L	Fill			109	9							
3 GP 3.8 3 GP 3.8 13								vood, dark					278	36						14.15 Et Soil
brown, moist, strong odor. 15 Fine sand with fines/silty sand, of 16 17 17 17 17 17 17 17 17 17 17						lor. ty sand, darl , strong odo	c or.	PT SP/SM			184	49						Sample		
4 0	3P	4.7		18	Clay brow	with trace s n, moist, sti	and an ff, stro	d gravel, red ng odor.	d-	СН			73.	3						
				20	END	OF BORIN	IG-20	FEET			1 2000									
l herby	y ce	rtify that	the ir	formati	ion on this	form is true and	the corre	ect to the best of	my know	ledge	1	<u> </u>	<u>I</u>			1	L	l		L

Signature Curr Buch Carro Firm ENSR Corporation 4500 Park Glen Rd Ste 210 St. Louis Park, MN 55416

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Well /	Drillhole /	Borehole	Abandonmen
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Form 3300-005 (R 10/03) Page 1 of 2

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between \$10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

Drinking Water Watershed/Wastewater Waste Management	Remediation/Redevelopment Other:
1. General Information	2. Facility / Owner Information
WI Unique Well No. DNR Well ID No. County	Facility Name Superior Water Light & Pove
Common Well Name	Facility ID License/Permit/Monitoring NdCity, Village or Town
V/V/W Section Township Range E N W	Street Address of Well Wher Street
Grid Location Feet E Local Grid Origin	Street Address or Route of Owner
Latitude: DEG MIN SEC Longitude: DEG MIN SEC	Weter Stract
N N W	City State ZIP Code
Reason For Abandonment WI Unique Well No. of Replacement We	4: Pump, Liner, Screen, Casing & Sealing Material
3. Well / Drillhole / Borehole Information	Pump and piping removed?
Original Construction Date	Liner(s) removed?
$\frac{1}{10000000000000000000000000000000000$	Screen removed?
If a Well Construction Report is available, please attach,	Casing left in place?
Construction Type:	Was casing cut off below surface?
Drilled Driven (Sandpoint)	Did material settle after 24 hours?
Other (specify):	If yes, was hole retopped?
	If bentonite chips were used, were they
Formation Type:	nydrated with water from a known safe source? Yes No
Unconsolidated Formation Bedrock	Conductor Pipe-Gravity
Total Well Depth From Groundsurface (ft.) Casing Diameter (in.)	Bentonite Chips)
Lower Drillhole Diameter (in.) Casing Depth (ft.)	Sealing Materials
NA NA	Sand Compart (Concerto) Crout Bentonite-Sand Slurry " "
	Concrete Bentonite Chips
	For Monitoring Wells and Monitoring Well Boreholes Only:
If yes, to what depth (feet)? Depth to Water (feet)	Bentonite Chips Bentonite - Cement Grout
NA \$15	Granular Bentonite Bentonite - Sand Slurry
5. Material Used To Fill Well / Drillhole	From (ft.) To (ft.) Nov Yards, Sacks Sealant Mix Ratio or or Volume (circle one) Mud Weight,
Bentmite Grad	Surface 15-20' 1.5' tole = 0.99 / 14 25% Solids
6. Comments	
7. Supervision of Work	DNR Use Only
Name of Person or Pirm Doing Sealing Work Date of Aba	ndonment Date Received Noted By
Il labrix Environmental, LLC 10/1	4/64
Street or Route Telephone (72)	vumber $24 - 450$
City State ZIP Code	Signature of Person Doing Work Date Signed
(3540 M/ 5536)	Dot out 1/20/65

Stat Dep	e of artn	Wiscon ient of N	sin Vatur	al Res	sources						SOIL	BOR	lNG	LOG	INFO)RM	ATION
				Route	To: Watershed/Was Remediation/Re	tewater ⊡ development ☑	Waste Other	e Mana	gement					Page	1 of 1		
Fac	ility	Project	Name	SWL8	kP Phase II Part III	License/Pern	nit/Monite	oring N	umber l	MW-8			Borin	g Nun	nber M	W-8	
Bo Guy	ring y Pao	Drilled E quette, M	By: Na atrix I	ame of Environ	crew chief (first, last) and mental, LLC	l Firm	Date D 10/14	0rilling /04	Started		Date Dr 10/14/0	illing ()4	Compl	leted		Drillin HS,	ig Method A
WI JP7	Uniq 798	ue Well	No.		DNR Well ID No.	Common Well Name 1W-8	Final 603.4	Static V 4	Vater Le	vel	Surface 612.00	Elevat	ion		Bore 8 in	hole I ch	Diameter
Loc Sta	Local Grid Orgin [] (estimated) [] or Boring Location 🖬							t g			Loca	al Grid	Local	tion N⊡ S⊡			E [W[
Fac	ility	ID			County Do	uglas	County	Code	······	Civil	Town/City	y/or Vi	llage	Superi	or		
	San	nple V E	8	et									Soil	Prope	rties		
Number	Type	Length Att. Recovered (Blow Count	Depth In Fe	Soil/ Roc	k Description		U.S.C.S.	Graphic	Well	PID/FID	Compressiv	Moisture	Liquid	Plasticity	P 200	RQD/
	GP	4.0		-3 -2 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	Ground Surface Mixed fill, lime-lil gravel, coal and fir moist, no odor.	te material, sand nes, brown and g	, ray,				21.1						
				3 4 5 6				Fill									
2	GP	4.3		7 7 8 9 10	Wet at 8 feet.						7.0 A 7.5						7-8 ft Soil Sample
3	GP	4.0		10 11 12 13 14	Fine to coarse sand brown, wet, slight	l with fines, red- sheen, strong od	or.	SP			Lung 10 Sereen 						
4	GP	1.2		15	Same as above, bu odor, tarry materia Clay, red-brown, r odor.	t gray, very stron l, very wet and le noist, stiff, strong	ng oose. g	сн			2000						

20-20 END OF BORING-20 FEET I herby certify that the information on this form is true and the correct to the best of my knowledge ENSR Corporation 4500 Park Glen Rd Ste 210 St. Louis Park, MN 55416 Firm Signature 16 vel hi al

This form is authorized by Chapters 281,283,289,292,293,295, and 299, Wis. Stats. Completion of thes form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin Department of Natural Resources <u>Route to:</u> V	Watershed/Wastewater	Waste Management	MONITORING WELL CONSTI	RUCTION
F W IN IN I	lemediation/Redevelopment	Other	Form 4400-113A Rev. 7-98	\$
Pacifity/Project Name	Local Grid Location of Well	N OB	Well Name	
Superior Water Light Pouser	r d	<u>s:</u>	MW-8	
Facility License, Permit or Monitoring No.	Local Grid Origin 🔲 (estimat	ted: 🗋) or Well Location 🗍	Wis. Unique Well No. DNR Wel	ID No.
	Lat"L	ong or	JP798	
Facility ID	St. Planc D. N.	f E SICAL	Date Well Installed	
	Section Location of Waste/Sour		$-\frac{1}{2} - \frac{1}{2} - 1$	<u> </u>
Type of Well			Well installed By: Name (first las	t) and Firm
Well Code/	1/4 of 1/4 of Sec	,T N, R 🛛 W	- CauPault	ty and I man
Distance from Waste/ Enf. Stds.	Location of Well Kelative to W:	sideoradiant Gov. Lot Number	Cary aquese	
Source ft Apply ¬		Not Known	Motor Environ	month &
A. Protective pipe, top elevation	ft MSL	1. Cap and lock?	S Yes	
B Well casing top elevation	ft. MSL	2. Protective cover	pipe:	-
2 etsing, where services = = =		a. Inside diamete	τ:	in.
C. Land surface elevation	fLMSL	b. Length:	-	<u>7</u> . a.
D Surface real bottom 6 MG		c. Material:	Steel	Ø 04
		Steel	Other	
12. USCS classification of soil near screen	" (* * * * * * * * * * * * * * * * * * *	d. Additional pro	tection?	LI No
GP GM GM OC GW G S		If yes, describ	c;	
	тосној 💥		Bentamite	D 30
Bedrock		3. Surface scal:	ć Cometa	
13. Sieve analysis performed?	(es 🗆 No	B \ P. d hu	Concrete	
14. Drilling method used: Rot	ту П 50 🛛 👹		<u>CEMENY</u> Other	LTD
Hollow Stem Au			well casing and protective pipe:	1
		図 つけ	/ Bentonite	LI 30
		- Torten	<u>d</u> <u>centert</u> Other	
15 Drilling fluid used. Water TA 2		5. Annular space se	al: al: Granular/Chipped Bentonite	i 🗆 33
Drilling Muld Used; Wald [] 02		bLbs/gal n	nud weight Bentonite-sand slurry	y🛛 35
	ione LI 99	c. Lbs/gal n	and weight Bentonite slurry	0 31
16 Drilling addictors word?		d % Benton	ite Bentonite-cement grou	10 50
		FI	volume added for any of the above	
		f How installed	Tremie	
Desenbe			Tremic minned	
17. Source of water (attach analysis, if requi	ired):		Crevity	
		6 Bentesite seek	Bentumite tranules	
	🗱	C. Bentomite seil;		
E Personite and an 4 & MSI		600 b. ⊡1/4 m. b. 800 /	$3/8$ in. $\Box 1/2$ in. Bentonite chips	K 32
L. Bencome seat, up L $-L$ $ L$ $-$		C	Other	
E Dime and the		7. Fine sand materia	I Manufacturer product name & n	nesh size
r. rine sand, top				
• · · · · · · · · · · · · · · · · ·		None		
G. Filter pack, top $2 - 2 - 3 - 5$ ft. MSI	or ft.	b. Volume added	۱ n ³	
-		, 8. Filter pack mater	al: Manufacturer, product name &	mesh size
H. Screen joint, topft. MSI	_ or ft.	Red Fl	nt	
		b. Volume added	ft ³ 5 bea	
I. Well boutom 17. Z fL MSI	orft、	9. Well casing:	Flush threaded PVC schedule 40	E 23
		KI	Flush threaded PVC schedule 80	<u> </u>
I Filter neck bottom 17.2 ft MSI			These uncludes I ve periodale de	
			Ent Ha II OW	
K Bowhold Lower 17 2 10 MST	β. θ .	10. Screen material:	Figh Milleded Pol	
K. Borenoic, bottom i it Mist	- or 10	a. Screen type:	Factory cut	20 11
818		<u>a</u>	Continuous slot	0 01
L. Borehole, diameter $-Q - 2 \ge in$.		\	Olher	
		b. Manufacturer		
M. O.D. well casing in.		c. Slot size:	0.	. <u>010</u> in.
-		🔪 d. Slotted length	:	10_ft.
N. I.D. well casing 2 in		11. Backfill material	(below filter pack): None	Ľ 14
			Other	
I hereby certify that the information on this	form is true and correct to the be	st of my knowledge.		
Signature) / /	Firm . 1	· · · · · ·		
Satur in the	AA AA	K Englowed 1	lc	
		- Cwaphanit	<u> </u>	

Please complete bolk Forms 4400-113A and 4400-113B and return them to the appropriate DNR affice and bureau. Completion of these reports is required by chr. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be end.

Route To:	Watershed/Wastewater 🛛		Waste Management	
	Remediation/Redevelopment	7	Other 🛛	

							Page 1 of 1													
Fac	ility/	Project I	Name	SWL	&P Phase II Part III	L	icense/Perm	it/M	lonito	ring N	umber M	4W-9				Borin	g Nun	nber M	W-9	,, ,,,,,
Bo Guy	ing l Pac	Drilled B juette, M	ly: Na atrix E	ime of Enviror	f crew chief (first, last) a nmental, LLC	ind Firm		D 1	ate Di 10/12/	rilling 04	Started		C	Date Dri 10/12/0	lling (4	Compl	leted		Drillir HS	ng Method A
WI JP7	Uniq '99	ue Well	No.		DNR Well ID No.	Common MW-9	Well Name	F	inal S 602.99	Static V	Vater Le	vel	S 6	urface I 08.7	Elevat	ion		Bore 8 in	hole ch	Diameter
Loc Stat	al G e Pla	rid Orgin ane	ם ו	(esti	mated) ∏ or Boring	Location 5	2		Lat Long	; J				Loca	l Grid	Locat	tion N⊡ S⊡			E 🗆 W 🗆
Fac	ility	ID			County [Douglas		Co	unty (Code		Civil	То	wn/City	/or Vi	llage	Superi	or		
	San	nple														Soil	Prope	rties		
Number	Type	Length Att. & Recovered (ft)	Blow Counts	Depth In Feet	Soil/ R	ock Descript	tion			U.S.C.S.	Graphic	Vell		PID/FID	Compressive	Moisture	Liquid	Plasticity	P 200	RQD/
				-3 -2 -1 0	Ground Surface Topsoil and gras					~										
1	GP	4.2		1 2 3 4	Lime-like materi odor.	ial, gray, 1	moist, no			Fill				1.9						
2	GP	2.8		5 6 7 8 9	Sand with grave. sorted, brown to	l and fine gray, mo	s, poorly ist, odor.			sw				326						8-9 ft Soil Sample
3	GP	3.2		10 11 12 13 14	Fine sand with fi brown, strong of feet.	t, sheen, s ines, well lor, shee	sorted, n at 13-14	r.		Fill SP			2" Slot 10 Screen	554						
4	GP	4.4		15 16 17 18 19	Fine to coarse sa sheen and odor, Clay, stiff, brow	ind with t wet. n, wet.	race grave	l,		SW CH			T	549 420						
				21-	END OF BORIN	NG-20 FE	ET													
I he	rby ce	ertify that	the in	format	ion on this form is true and	the correct f	to the best of r	ny k	nowle	edge	oration									
Sig	natu	Bul Cale			4500	Park G	len Rd S	te 210 S	St. L	ouis Pa	ark, MI	N 5541	16							

State of Wisconsin Department of Natural Resources	Route to:	Watershed/Wastew Ramadiation/Rada		Waste Mar	nagement	MONITORING WE Form 4400-113A	LL CONSTRUC Rev. 7-98	TION
Facility/Project Name		Local Grid Locat	ion of Well	N.	CIE.	Well Name		
Superior Water L	i ht · Power		î 🗇	<u>s. </u>	^ ā w .	NW-	9	
Facility License, Permit or	Monitoring No.	Local Grid Origin	C (estimat	ted: 🛛) or ong.		Wis. Unique Well No. JP799	5. DNR Well ID	No.
Facility ID		St. Planc	î. N,		ft. E. S/C/N	Date Well Installed	21/4120	04
Type of Well		Section Location	of waste/Sout	rce	Πe	Wall Installed By: N	Jame (first last) or	<u>V V</u> vd Fiem
Well Code		1/4 of	1/4 of Sec Relative to W	T	Ov Lot Number	- Guy Paque	te	-
Distance from Waste/ Sourceft	Enf. Stds.	u 🗍 Upgradie	nt s 🖸 dient n 🗖	Sidegradien Not Known	u	Matrix E	nvironm	entrel
A. Protective pipe, top clev	ation	ft MSL			1. Cap and lock?		🛛 Yes 🗌	No
B. Well casing, top elevatio	a	ft. MSL	+F	A P	2. Protective cover a. Inside diamet	r pipe: er:	_6	_ in.
C. Land surface elevation		ft. MSL		-	b. Length:		_ 2 Steel 19	_ fi.
D. Surface real, bottom	ft. M	SLor fl				·····	Other 🗆	
12. USCS classification of	f soil near scree	n:	14.2 m	November	d. Additional pr	otoction?	_ E Yes □	No
GP GM GM GC	O OW D :	SW 🗆 SP 🗆			If yes, descri	be: Bumper	Youts (3)	
SM 🛛 SC 🗆 ML Bedrock 🗖		CL 🗖 CH 🗆			3. Surface scal:	1	Bentonite	30 01
13. Sieve analysis perform	ed? 🗖	Yes 21 No			Dath	ad come at	Other Pl	
14 Drilling method wede					A Material betwee	n well casing and prote	ctive nine:	9779-997 9779-977
14. Drining method used:	Nu Hollow Steen A					a well cashing and hove	Bentonite	30
		wher []			Purt	law comput	Other 🕅	
	`				6 Annulas annua	Granular/Chi	nned Bentonite	33
15. Drilling fluid used: W	/ater □ 0 2	Air 🖸 01			5. Annular space s	cali a cranala con	pper red churry	3.5
Drilling	Mud 🗆 03	None 12 99			bLos/gat	mud weight Domo		31
~	- 05				CLDS/gAl	mud weight Be		50
16. Drilling additives used		Yes 🛛 No			00 being	³ volume added for an	w of the showe	20
_					cr		Tremie	01
Describe					I. HOW MISCHIC	a: Ti	remic numped	0.2
17. Source of water (attack	n analysis, if req	uired):					Gravity	02
Sura' M	in the	to-			6 Bentonite seal:	a. Ben	tonite granules	33
Superior Muni	cipel va		1 🚟		b □1/4 in.	13/8 in. □1/2 in. I	Bentonite chips	32
E. Bentonite seal, top	_4fl.M	SL or f	۰ <u>ـ</u>		C		Other 🗆	
F. Fine sand, top	ft. M	SL or f			7. Fine sand mater	ial: Manufacturer, pro	duct name & mes	h size
G. Filter pack, top	5fi.M	\$Lorf			b. Volume add	cd	_ft ³	
H Screen joint ton	6 ft M	SLor 1			, 8. Filter pack man	erial: Manufacturer, pro	oduct name & me	sh size
The Serven Jound when a					b Volume add	ed	ft 3 4 Bags	
I. Well borrom	17_fl M	SLorí	1 🗸 🕌		9. Well casing:	Flush threaded PVC	schedule 40 🕅	23
J. Filter pack, bottom	<u>17fr.</u> M	SLorf	1				Other	
	7				10. Screen materia	1: Thish threaded		385
K. Borchole, bottom	// fL M	SL or 1	¹		a. Screen type	: C	Factory cut K continuous slot E	111 101
L. Borehole, diameter	<u>8.25</u> in.					· · · · · · · · · · · · · · · · · · ·	Oiher C	
					 b. Manufacture c. Slot size: 	ж <u> </u>	_{0.} ¢	210 in.
M. O.D. well casing	in.				d. Stotted leng	jth:	 	10 A.
N. I.D. well casing	in.				11. Backfull materi	al (below filter pack):	None B Other D	9 14]
Thereby certify that the in	formation on th	is form is true and	correct to the	best of my k	nowledge.			
Signature	TA		Firm	to Farth	manutal 11	C.	-	
	may					<u> </u>	·····	

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

Route To:	Watershed/Wastewater	Waste Management 🛛
	Remediation/Redevelopment 😡	Other 🗋

Page 1 of 1

Description of part with the original first last) and Firm Description (wr/c) Description (wr/c) Build Particle R. Math. Environmental, LLC Description (wr/c) Date Drilling Completed Clinitics Water Level Surface Elevation Borchale Disanster WI Unique Well No. DNR Well ID No. Common Well Name Final Stated Date Drilling Completed Clinitics Water Level Surface Elevation Borchale Disanster Local Grid Orgin [] (estimated) [] or Boring Location (g) Lat Local Grid Location EED State Flame County Ongles County Code Chill Town/Citylor Village Superior Soil Properties Sample gi	E-stills /Desired Name CV// #D Dhose II Dert III																		
Willingue Weil No. DNR Weil D No. Common Well Name MM-10 Final Static Water Level 602.85 Surface Elevation 600.5 Biorchold Diameter Binch Lacal Chd Orgin D (estimated) D or Boring Location GI Long Lat Long Local Grid Location SD Final Biorchold Diameter Bioch Facility ID County Douglas County Code Civil Town/Citylor Wilage Superior Sample Big	Bo	ring y Pac	Drilled E	By: Na latrix I	ame of Environ	crew chief (first, last) mental, LLC	and Firm	ense/rermi	Date [10/13	Drilling 3/04	Started	10100-10	Date Dr 10/13/0	illing (Compl	g Nun leted	nber №	Drillir HS.	ng Method
DP3P7 MW-10 00.2.89 00.65 8 inch Lead Grid Ducation Id Lat Local Grid Location N E Sample N </th <th>W</th> <th>Uniq</th> <th>ue Well</th> <th>No.</th> <th></th> <th>DNR Well ID No.</th> <th>Common W</th> <th>/ell Name</th> <th>Final</th> <th>Static</th> <th>Water Le</th> <th>evel</th> <th>Surface</th> <th>Eleva</th> <th>tion</th> <th></th> <th>Bore</th> <th>hole</th> <th>Diameter</th>	W	Uniq	ue Well	No.		DNR Well ID No.	Common W	/ell Name	Final	Static	Water Le	evel	Surface	Eleva	tion		Bore	hole	Diameter
Local Grid Urgin (estimated) of Boring Location IZ Lat Long NU Code Grid Location NU SU WU State Plane Long County Code Civit Towns (Fiver Village Suparior) Sample Superior NU Superior Village Suparior Sample Superior NU Superior Village Suparior Village Superior Vi	JP7	'97 					MW-10		602.8	39			606.5				8 in	ch 	
Facility ID County Douglas County Code Chill Town/Citylor Village Superior Sample gg of the second se	Sta	te Pl	rid Orgi ane	n 📋	(estin	nated) 📋 or Borin	g Location 😡		La	it Ig			Loca	al Grid	Locat	N□ S□			E 🗆 W 🗆
Sample Soil Properties under the second of the s	Facility ID County Douglas							1	County	Code		Civil 1	own/City	y/or Vi	or Village Superior				
Jamma A Sol/ Rack Description	Sample												Soil	Prope	rties	and a second sec			
Lime-like material, gray, moist, no odor. Lime-like material, gray, moist, no odor. Lime-like material, gray, moist, no odor. Lime-like material, gray, moist, no odor. Lime-like material, gray, moist, no odor. Fill Constraints and and gravel, black slag and coal, crumbly, moist, no odor. Fill Constraints and with silt, brown, wet, slight sheen and odor, woodchip layer at five feet with sheen. Constraints and with silt, brown, wet, slight sheen and odor, woodchip layer at five feet with sheen. Constraints and with silt, brown, wet, slight sheen and odor, woodchips, slight sheen and strong odor. Constraints and strong o	Numper Nu							n		U.S.C.S.	Graphic	Well	PID/FID	Compressive	Moisture	Liquid	Plasticity	P 200	RQD/
2 GP 2.1 3 Fine sand with silt, brown, wet, slight sheen and odor, woodchip layer at five feet with sheen. 11 12 128 3 GP 4.1 11 12 128 128 4 GP 3.2 15 15 15 14 10 10 11 13 Same as above, but no woodchips, slight sheen and strong odor. SP 435 435 4 GP 3.2 17 15 14 941 941 10 10 10 10 14 941 14 14 11 13 Same as above, but no woodchips, slight sheen and strong odor. SP 14 941 941 14 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 10 20 END OF BORING-20 FEET 941 941 16 16 16 16 16 16 16 16 17 16 16 17 <td< td=""><td>1</td><td>GP</td><td>2.0</td><td></td><td>1 2 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>Lime-like mater odor. Mixed sand and coal, crumbly, r</td><td>rial, gray, m gravel, blac noist, no od</td><td>oist, no ck slag ar or.</td><td>nd</td><td>Fill</td><td></td><td></td><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	1	GP	2.0		1 2 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Lime-like mater odor. Mixed sand and coal, crumbly, r	rial, gray, m gravel, blac noist, no od	oist, no ck slag ar or.	nd	Fill			6						
3 GP 4.1 10-1 11-1 12-1 Same as above, but no woodchips, slight sheen and strong odor. SP 435 435 4 GP 3.2 15-1 16-1 16-1 941 941 10-1 10-1 10-1 10-1 10-1 10-1 941 941 4 GP 3.2 18-1 10-1 10-1 941 941 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 4 GP 3.2 18-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 <t< td=""><td>2</td><td>GP</td><td>2.1</td><td></td><td>5 6 7 1111 7 1111 9 111 9</td><td>Fine sand with s sheen and odor, feet with sheen.</td><td colspan="4">Fine sand with silt, brown, wet, sligh sheen and odor, woodchip layer at fi feet with sheen.</td><td></td><td></td><td>2" Slot 10 Screen</td><td></td><td></td><td></td><td></td><td></td><td>5-6 ft Soil Sample</td></t<>	2	GP	2.1		5 6 7 1111 7 1111 9 111 9	Fine sand with s sheen and odor, feet with sheen.	Fine sand with silt, brown, wet, sligh sheen and odor, woodchip layer at fi feet with sheen.						2" Slot 10 Screen						5-6 ft Soil Sample
4 GP 3.2 13- 16- 17- 18- 19- 20- 21- 16- 18- 19- 20- 21- 941 941 19- 20- 21- END OF BORING-20 FEET 941 941 941 1 herby certify that the information on this form is true and the correct to the best of my knowledge ENSR Corporation 4500 Park Glen Rd Ste 210 St. Louis Park, MN 55416	3	GP	4.1		10 11 12 13 14 14	Same as above, slight sheen and	but no woo strong odo	dchips, r.		SP			435						
21 = 21 = I herby certify that the information on this form is true and the correct to the best of my knowledge Signature Firm ENSR Corporation 4500 Park Glen Rd Ste 210 St. Louis Park, MN 55416	4 GP 3.2 13 16- 17- 18- 19- 20- END OF BORING-20 FEET							T					941						
I herby certify that the information on this form is true and the correct to the best of my knowledge Signature Firm ENSR Corporation 4500 Park Glen Rd Ste 210 St. Louis Park, MN 55416					21 =														
	I herby certify that the information on this form is true and the correct to the best of m Signature							the best of m	ens ENS 4500	edge R Corp Park G	oration len Rd S	Ste 210 St	. Louis Pa	ark, MN	V 5541	6			

State of Wisconsin Department of Network Resources	Route to: W	atershed/Wastewa	ater	Waste Mans	igement	MONITORING WEI Form 4400-113A	LL CONSTRUC Rev. 7-98	OTION
Facility/Project Name		ocal Grid Locati	on of Well			Well Name		
Sugariar Mater L.	inhel + Poured		r H	N. S		MW-10	2	
Facility License, Permit or M	fonitoring No. I	Local Grid Origin	(estimat	ed:) or	Well Location	Wis. Unique Well No	DNR Well ID	No.
Facility ID		St. Plane	î. n.			Date Well Installed	1/3/20	<u> </u>
Turne of Well	 \$	Section Location	of Waste/Sour	œ	ΠE	Well Installed By: N	d d Y Y	v v nd Firm
Well Code	, -	1/4 of	_ 1/4 of Sec	,T	N, R 🗖 Ŵ			
Distance from Weste/	Enf Stde	ocation of Well	Relative to Wa	ste/Source	Gov. Lot Number	- contract		- , ,
Sourceft.	Apply	d Downgrad	ient n 🗌	Not Known		Matrix En	vironmer	ztal
A. Protective pipe, top eleval	lion	fl MSL		╗╱╎	. Cap and lock?	Flush mo	out I Yes I	No
B. Well casing, top elevation		ft. MSL -		<u>ן</u> י∕יי∦י	a. Inside diameter	r. prbe:	4	2 in.
		6 MSI		IF	b. Length:		7	Ξ <u>α</u> .
C. Land surface elevation		IL MISE		- Constant	c. Material:		Steel	04
D. Surface seal, bostom	ft. MSI	Lor fL	9.33 I		Steel		Other 🛛	
12. USCS classification of	soil near screen:		200	Washing	d, Additional pro	stoction?	🛛 Yes 🛛	No
OP D GM DO OC D	OWD SV	w 🗆 SP 🗆 🛛		$ \mathbf{R} \setminus$	If yes, describ	c:		
SM BQ SC 🗖 ML							Bentonite	30
Bedrock 🗖			100		S. Surface scal:	Δ.	Concrete 02	01
13. Sieve analysis performe	d? 🗆 Y	es 🖸 No			Portla	nd cement	Other 🛛	
14. Drilling method used:	Rota	my 🗆 50			. Material between	well casing and protect	stive pipe:	
H	ollow Stem Au	ker 12 41		8	~ // /	с ,	Bentonite 🗆	30
	Od	her 🗆 🚛 🛛		8	Partland	cement	Other 🖬	1
				88	5. Annular space se	al: L Granular/Chip	oped Bentonite 🛙	33
15. Drilling fluid used: Wa	ater 🔲 0 2	Air 🛛 01			hLbs/gal r	nud weight , Benton	ite-sand slurry 🛛	35
Drilling M	Aud 🗆 03 N	one 02/99			cLbs/gal r	nud weight Be	ntonite slurry 🛛	31
	_ v				d % Bentor	njte Bentonite	:-cement grout 🗆	1 50
16. Drilling additives used?		es 🗵 No			cFt	³ volume added for an	y of the above	
					f. How installed	l:	Tremie 🛛	01
Describe						Tr	emic pumped 🛛	02
17. Source of water (attach	analysis, if requi	(red):				_	Gravity D	08
Superior Munic	ipal H20	/			6. Bentonite seal:	a. Bent	unite granules	33
	15			× ,	b. D1/4 in. 25	13/8 in. □1/2 in. E	lentonite chips be	1 32
E. Bentonite seal, top	<u>- 2</u> _ft, MSI	L or 11.			C	al: Manufacturer, pro	duct name & me	sh size
F. Fine sand, top	ft. MS1	Lorft.			· None	p		
G. Filter pack, top	2.5 fl. MSI	Lor1			b. Volume adde	d	. ft ³	
	7				8. Filter pack mater	rial: Manufacturer, pro	jouct name & me	Sen size
H. Screen joint, top	ے ft. MSI	$L \text{ or } _ _ _ _ _ \square$			a. Ked	Flint	B3 2 bans	
	1	A. A			9 Well caring:	Fluch threaded PVC	schedule 40	23
I. Well bouom	$\mathcal{O}_{}$ ic ms	Lor1		30 A	y. wencising.	Flush threaded PVC	schedule 80	
L Filterneck bottom	13 fr. MS	Lorf					Other C	ב ב
				ا ^ن 📓	0. Screen material:	: Elushe thread	ed rvc	
K. Borchole, bottom	<u>17 </u>	Lorf			 Screen type: 		Factory cut	
L Borebole diameter	8.25 in					C	Ontinuous slot L Other C	
					b. Manufacture	r		
M. O.D. well casing	in.				c. Slot size:		0. <u>c</u>	10 n.
				\ \	d. Slotted lengt	in:		11 1 A
N. I.D. well casing	<u> </u>				1. Backfill materia	d (below filter pack):	Other	
Thereby couldry that the Chr.	ormation on this	form is true and	correct to the	best of my kn	owledge.			
Signature	1	1	Firm, 1		4 1			
tot ag	with		Matri	x EnVIT	montal, L			
					•			

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiure of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

Route To:

Watershed/Wastewater] Waste Management	
----------------------	--------------------	--

Remediation/Redevelopment 🖬 🚽 Other 🗖

D----

																	Page	1 of 1		
Fac	ility/	Project I	Name	∍ SWL	&P Phase II Pa	art III	-	License/Pern	nit/Mo	onitoring	Number	MW-11				Borin	ng Nun	nber N	1 W-11	
Bo Guy	ring / Pac	Drilled B Juette, M	iy: Na atrix I	ame of Enviror	f crew chief (fi nmental, LLC	irst, last) a	nd Firm		Da 1(ite Drilling 0/13/04	started		Date 10/	e Dri 13/0	lling (4	Comp	leted		Drilli HS	ng Method A
WI JP7	Uniq '96	ue Well	No.		DNR Well ID	No.	Comm MW-11	on Well Name	Fi 6(nal Static 02.46	Water Lo	evel	Surf a 608.9	ace I 9	Eleva	lion		Bore 8 ir	hole ich	Diameter
Loc Sta	al G te Pia	rid Orgir ane		(esti	mated) 🔲	or Boring	Locatio	n 🖸		Lat Long			L	.oca	l Grid	Loca	tion N⊡ S⊡			ED
Fac	ility	ID				County [Douglas		Cou	inty Code		Civil	Town/	/City	/or Vi	llage	Superi	or		
	San	ıple														Soil	Prope	erties	1	
Number	Type	Length Att. & Recovered (ft)	Blow Counts	Depth In Feet		Soil/ R	ock Desc	ription		U.S.C.S.	Graphic	Well		PID/FID	Compressive	Moisture	Liquid	Plasticity	P 200	RQD/
				-3 -2 -1	Ground S	urface														
1	GP	3.2		1 1 2 3	Lime-lik odor. Black co crumbly Fine san layers 1	al and s al and s , slightly d with fi to 3 incl	al, gray lag-liko v moist nes and nes thic	y, moist, no e material, , no odor. d organic sil ek, well sorte	t ed,	Fill			2,1	1						
2	GP	4.1		5 6 7 8 9	wet, no o	odor, bro	own.			SP-SN	4		t 10 Screen	6						6-7 ft Soil Sample
3	GP	3,8		10 11 12 13 14	Same as	above, l	out no s	silt layers		SP			0 S	.1						
4	GP	5,0		15 16 17 18 19	Fine to c brown, v	coarse sa wet, no c	nd, poo odor.	orly sorted,		SW			8.8	В						
				20-	END OF	BORIN	NG-20	FEET												
l he	rby ce	ertify that	the ir	format	ion on this form	n is true and	I the corre	ect to the best of	my kr	nowledge	·	•	d		•••••		···· ·- ·	•	• • •	
Sin	nafu	ro		11.	1/ 1	1		Firm	E	ENSR Cor	poration	• • • • • • •								

Signature Unit Will Cuther Firm ENSR Corporation 4500 Park Glen Rd Ste 210 St. Louis Park, MN 55416

State of Wisconsin Department of Natural Resources ROUT	<u>e to:</u> Watershed/Wastewat	ter Waste Mai	ngement	MONITORING WELL CONSTRUCTION Form 4400-113A Ray, 7-98
Facility/Project Name	Local Grid Location	a of Well		Well Name
Superior Water light	Power	<u>∿ ⊟S:</u>	^ Ľ Ū Ŵ.	MW-11
Facility License, Permit or Monitori	ng No. Local Grid Origin	(estimated:) o	r Well Location	Wis. Unique Well No. DNR Well ID No.
Facility ID	Lat	Long	or	Date Well Installed
	St. Plane	fL N,	ft. ES/C/N	$\frac{70}{14}$
Type of Well		1/4 of See T		Well Installed By: Name (first, last) and Firm
Well Code/	Location of Well R	clative to Waste/Source	Gov. Lot Number	(my requette
Distance from Waste/ Enf. Sourceft. Apply	d Downgradient	s 🖪 Sidegradier ent n 🗌 Not Known	nt	Matrix Environmental LLC
A. Protective pipe, top elevation	fl MSL ·		1. Cap and lock?	Yes 🗋 No
R Well casing ton elevation	ft. MSL 🦟		2. Protective cover	pipe:
b. wen casing, up elevation			a. Inside diamete	r:
C. Land surface elevation	ILMOL	Contract I Contract	c. Material:	Steel 22 04
D. Surface seal, bottom	. ft. MSL or ft.			Other 🛛 🌉
12. USCS classification of soil near	r screen:	Lever Kar	d. Additional pro	otection? 🖸 Yes 🖪 No
			If yes, describ	e:
Bedrock			3, Surface scal:	
13. Sieve analysis performed?	□ Yes 🖾 No		Portland	cement Other B
14. Drilling method used:	Rotary 50		4. Material between	well casing and protective pipe:
Hollow S	Stem Auger 🛛 🚛		` > I.	0 Bentonite 🗆 30
	Other 🗆 🏨		rovitla	net cement Other E
15 Delline finid used. Water			5. Annular space se	al; a. Granular/Chipped Bentonite 80 53
Drilling Mud	0.3 None 12 99		bLbs/gal f	nud weight Bentonite-said slury [] 3
			d% Benior	nite Bentonite-cement grout D 50
16. Drilling additives used?	Yes 🖪 No		eFi	³ volume added for any of the above 1/4 bag
Describe			f. How installed	
17 Source of water (attach analysi	s if required);			Tremie pumped D 02
			6 Bentonite teal	\mathbf{B} . Rentonite granules $\square 33$
Superior MUNICIPA	<u>/ //20</u>		b. 01/4 in.	13/8 in. 11/2 in. Bentonite chips 23 3 2
E. Bentonite seal, top	_ ft. MSL or ft.		c	Other 🛙 🎆
F. Fine sand, top	_ ft. MSL or ft. \		7. Fine sand moteri	al: Manufacturer, product name & mesh size
G. Filter pack, top 35	_ ft. MSL or ft.		b. Volume adde	dfi ³ Reasons
3.5	ft MSL or ft		8. Filler pack made	Tial: Manufacturer, product name ac mean size
H. Screen joint, top $2^{-9} = 2^{-1}$			h Voluma adde	the ft 3 3 bags
I. Well bottom 13.5	fL MSL or fL		9. Well casing:	Flush threaded PVC schedule 40 2 23
				Flush threaded PVC schedule 80 24
J. Filter pack, bottom -13.5	_ fr. MSL or ft.		10 Screen material	Flush threaded PVC
K. Borehole, bottom 13.5	_ fL MSL or fL		a. Screen type:	Factory cut 😰 11
L Borchole diameter	25 in			Other 🗆 💥
	- m.		b. Manufactures	
M. O.D. well casing $-\frac{Z}{2}$	$\frac{2}{2}$ in.	\backslash	c. Slot size: d. Slotted lengt	h: $\underline{10}$ ft.
N. I.D. well casing $-\frac{2}{2}$	in.		11. Backfill materia	L (below filter pack): None 1 4 Other 1 4
I hereby certify that the informatio	n on this form is true and c	orrect to the best of my k	nowledge.	
Signature	· ────────────────────────────────────	mal 1	1110	
Sty Option		MANY ENVIRON	neway, LUL	

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent. Route To:

Watershed/Wastewater	Waste Management	
Remediation/Redevelopment	Other 🛛	

																Page	1 of 1		
Fac	ility/	Project	Name	SWL	&P Phase II Pa	rt III		License/Perm	it/Monif	oring N	lumber	MW-12			Borin	g Nun	iber M	W-12	
Bo Guy	ring / Pac	Drilled E quette, M	By: Na atrix B	ame of Enviror	crew chief (fi n nmental, LLC	rst, last) a	nd Firm		Date Drilling Started Date Drilling 10/15/04 10/15/04				illing ()4	Compl	eted		Drillir HS	ng Method A	
WI JP8	Uniq 00	ue Well	No.		DNR Well ID	No.	Comm MW-12	on Well Name	Final 602.4	Static 46	Water Le	evel	Surface 607.9	Elevat	tion		Bore 8 in	hole I ch	Diameter
Loc Sta	al G te Pla	rid Orgiı ane	n 🗆	(esti	mated) 🗋	or Boring	Location	ו ש ו	La	at ng			Loca	al Grid	Loca	tion N⊡ S⊡	_		E 🗆 W 🗆
Fac	ility	ID				County I	Douglas		County	/ Code		Civil	Town/Cit	y/or Vi	llage	Superi	or		
	San	nple				•								-	Soil	Prope	rties		
Number	Type	Length Att. & Recovered (ft)	Blow Counts	Depth In Feet		Soil/ R	ock Desci	ription		U.S.C.S.	Graphic	Well	PID/FID	Compressive	Moisture	Liquid	Plasticity	P 200	RQD/
1	GP	4.2		1 2 3	Mixed sa no odor. Silty fine sorted, n	nd and sand, b o odor.	gravel, prown, 1	moist, brow	/n,	SW			4.6						4-5 ft Soil Sample
2	GP	2.2		5- 6- 7- 8- 9-	Same as	above, l	out wet	at 6 feet.		SM			4.3						
3	GP	2.6		10- 11- 12- 13- 14-									6.4						
4	GP	1.5		15 16 17 18 19									3.4						
				21-	END OF	BORIN	IG-20 I	FEET											
I he	rby c	ertify that	the in	format	ion on this form	is true and	I the corre	ect to the best of	my know	ledge	oration		•						
Sig	natu	ire	Ú	m	level	14		Lun Lun	4500) Park C	Slen Rd S	Ste 210 S	t. Louis P	ark, Ml	N 5541	6			

State of Wisconsin Department of Natural Resources Route to: 1	Watershed/Wastewater	Weste Manag	······	MONITORING WI	ELL CONSTRU	CTION
	Remediation/Redevelopment			Form 4400-113A	Rov. 7-98	011011
Facility/Project Name	[Local Grid Location of Wel]			Wall Name		
Superior Water Litter 1 Power	n			Mu	1-17	
Facility License, Permit or Monitoring No.	Local Grid Origin 🔲 (estin	unted: 🔲) or W	cll Location	Wis Unique Well N	O IDNR Wall TO	No
	Lat,	Long	1 U	19800		, 110.
Facility ID	St Diene			Date Well Installed	•	
	Section Location of Wester/Se	N ,	_ n. e. s/c/n		2115120	04
Type of Well	Securi Locaton of Waster So	urve		Well Installed By	<u>n d d y y</u> Name (first last) a	<u>v v</u> nd Eim
Well Code/	1/4 of 1/4 of Sec	T N	<u>, R</u> W	Guileau		
Distance from Waste/ Enf. Stds.	Location of Well Relative to V	Waste/Source G	iov. Lot Number	- Oudiate	anc	-
Sourceft. Apply	d Downgradient n [Not Known		Metrix E	nvironmer	ntal
A. Protective pipe, top elevation	fLMSL	1.0	Cap and lock?		, 🗆 Yes 🗹	No
B. Well casing, top elevation	ft. MSL		rotective cover p	ipe: Flush mo	wnt	
			. Inside diameter	:		in.
C. Land surface elevation	fL MSL	b	. Longth:			_ ft.
D. Surface seal, bottom ft. MS	Lor fL		. Material:		Steel	04
12. USCS classification of soil near some		小 秋天 经经			Other 🗆	<u> </u>
			1. Additional prot	ection?	🖸 Yes 🖬	No
			lf yes, describe			
Bedrock		3.5	urface scal:		Bentomite 🗇	30
13. Sieve analysis performed?			511 ()	Concrete	01
		- E -	tortland	cement	Other E	
14. Drilling method used: Rot	ary U SU	4. N	Asterial between	well casing and prote	ctive pipe:	
Hollow Stem Au	Igor 25 4 1		DI	0 .	Bentonite 🗆	30
U		- 📓 –	For Fla	nd cement	Other 🛙	
15. Drilling fluid used: Water 11.0.2		5. A	Innular space sea]; I. Granular/Chij	pped Bentonite 🛛	33
		Ь	Lbs/gal m	ud weight Benton	uite-sand slurry	35
		с	Lbs/gal m	ud weight Be	ntonite slurry	31
16. Drilling additives used?	(es 🖸 No 🛛 🗱	d	% Bentoni	te Bentoniu	s-cement grout	50
		с. –	Fi *	volume added for an	y of the above	
Describe		f .	How installed:		Tremie	01
17. Source of water (attach analysis, if requ	ired):			Tr	emic pumped	02
Sumaine M. Sind I	alitar 1			. D	Gravity	08
Lopertor retonicipo		о. р		a. Deni		33
E. Bentonite seal ton 1.5 ft. MSI	Lor fl.		. 1/4 in. 233	$/0$ in. $\Box 1/2$ in. E	ientonite chips El	32
					Other D	9 0.00
F. Fine sand, top ft. MS	Lor ft	7.F	ine sand material	: Manufacturer, pro	duct name & mesh	h size
G. Filter pack, top 7.5 ft, MS	Lor ft.		Volume added		63	100 (042)
		8.F	ilter pack materia	I: Manufacturer, mo	duct name & mes	h size
H. Screen joint, topft. MS	Lorft.		Red Flin			
• • • • • • • • • • • •		e h	Volums added		fr3 4 backs	20.00
I. Well boxom/4/fL MS	Lorft 🔪 🕅	9 W	Vell casing:	Flush threaded PVC	schedule 40 🖾	23
			-	Flush threaded PVC	schedule 80 🔲	24
J. Filter pack, bottom ft. MS	Lorft			A	, Other	
6/		10. S	creen material:	Flush threader	1 PUC	80
K. Borchole, bottomft. MS	Lorft.	1	Screen type:		Factory cut 2	11
0 - 5				Co	mtinuous slot 🔲	01
L. Borehole, diameter B_22 in.					Other 🛛	3 33
		🔪 ь.	Manufacturer			
M. O.D. well casing in.		\ c.	Slot size:		0. 20	in.
~		λ d.	Slotted length:			<u>0</u> ft.
N. I.D. well casing in.		11.B	lackfill material (below filter pack):	None 🗹	14
				·	Other 🛛	
I hereby config that the information on this	form is true and correct to the	best of my knowle	dge.	_		
Signature	Firm M L	6 11	1 110			
	INAMA	Envior marta	<u>, uc</u>			

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and buresu. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.



APPENDIX B

Groundwater Collection Logs

Superior Water Light and Power MGP Phase II, Part III Superior, Wisconsin March 2005

STABILIZATION TEST

SiteSWLPM(rP	_ Date	11/17/04	Well	No. <u>MW-5</u>
Pumping Rate (gallons/min	uto)/	min			· · · · · · · · · · · · · · · · · · ·
Type of Pump Per	istaltic		7.06	Lijoll	
Water Level Before Pum	ping (nearest 0.01 ft. below	top of casing) _	20.34	Depth	20.34
Approximate Well Location	on North of Me	op building			-
Calculated Volume of Wa	ater in Casing 13.	28 Ft X	0.163 = 0	1.16 gallons	
Meather Conditions	overcast 50°				

Time	pH (units)	Temperature- Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
1650	9,42	0.786	10.31	4.93 141	OL
57-1701	7.54	1.320	10.11	1:37 130	4,5
1704	7.31	1.371	10.11	3.8 42133	7,2
1710	1.33	1,412	10.13	0.74 121	12.6
1714	7.35	1.426	10.711	0.27 113	16.2

Comments:

Analyzed for PAH + BTEX

Well diameter

Gallons per foot of casing

1 1/4" 0.0625 2" 0.163 4" 6" 0.653 1.47 2.61 5.87 8" 12"

Min Boel Cal 1117164 Date

STABILIZATION TEST

SiteSWL	P MGR	Date	11/17/04	W	ell NoMW-6
Pumping Rate	(gallons/minute)	.9 L/min		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Type of Pump .	Peristaltic				
Water Level Be	fore Pumping (neare	st 0.01 ft. below top of casing) _	9.67	Well Depth	20.34
Approximate W	ell Location No	th of MEP bui	Iding	•	-
Calculated Volu	ime of Water in Cas	ing 10.67 × 0.16	3 = 1.74		
Weather Condi	lione	·			

Time	pH (units)	Temperature- Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
1630	12.19	7.19	10.27	301 139	0L
1634	12.17	770	10.49	0.65 131	3.66
1637	12.15	8.11	10.42	0.39 128	6.36
1640	12.15	8.31	10.40	0.27 124	9 L
					· · · · · · · · · · · · · · · · · ·

Comments:

Analyzed for BTEX + PAH

Well diameter

Gallons per foot of casing

1 1/4" 0.0625 2" 4" 0.163 0.653 6* 1.47 8* 2.61 12" 5.87

Chin Buch Cale Signature

11/17/04 Date

**990450

STABILIZATION TEST

Site SWLP MGP	Date	11/17/04	We	11 NoMW -7
Pumping Rate (gallons/minute)9 (-Imin			
Type of Pump Peristaltic				
Water Level Before Pumping (nearest 0.01	ft. below top of casing) _	11.16	Depth	20.30
Approximate Well Location North	east of ME	of building		-
Calculated Volume of Water in Casing	9.14 × 0.11	63 = 1.49	·······	
Weather Conditions	· .			

Time	pH (units)	Temperature- Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
1600	6.74	1.74	9.28	281 226	0
1604	8.66	1.70	10.04	0.520 177	3.UL
1007	8.99	1.93	10.05	0.25 151	4.36
1612	8.97	1.991	10.03	0.19 137	10.8L
1614	8.93	1.87	10.04	0.17 125	14.4 L
					· · · · · · · · · · · · · · · · · · ·

omments: Analyzed for BTEX + PAH It. Vellowish color Comments:

Well diameter

Gallons per foot of casing

1 1/4" 2" 4" 6" 8" 0.0625 0.163 0.653 1.47 2.61 12 5.87

Chin Boel Cal

11/17/04 Date

Signature
Site SWLP MGP	_Date1//6/04	Well No. MW-8
911	· •	· · · · · · · · · · · · · · · · · · ·
Pumping Rate (gallons/minute)		
Type of Pump Peristaltic		
Water Level Before Pumping (nearest 0.01 ft. below	w top of casing) 11.73	Depth 18.34
Approximate Well Location North of	Latehead Concre	fe -
Coloulated Volume of Water in Casing lab	1 × 0.163 = 1.08	al
Calculated Volume of Water in Casing		
Weather Conditions overcast , 50	U	······································

Time	pH (units)	Temperature- Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
10207	12.54	6.71	9.07	1,10 -30	01
1630	12.47	6.15	9.80	0,26 -39	2.7L
1434	12.48	6.57	9.87	0.09 -46	4.3L
1637	12.51	7.1315	9.88	0.05 -50	92
1640	12,52	7.46	9.89	0.057 -55	11.76
1642	12.54	7.60	9.89	0.04 -57	13.5L
					×
					4

Comments:

Analyzed for BTEX + PAH

minor sheen, dk brown, slight oder

Well diameter

Gallons per foot of casing

1 1/4" 0.0625 2" 0.163 0.653 4" 6" 1.47 8* 2.61 5.87 12*

Chin Boch Cube 11/16/04 Signature Date

SiteSWLP	MGP	Date/	16/04		ell NoMW-9_
Pumping Rate (gallons/	minute)9 (······································			
Type of Pump	rstaltic				
Water Level Before Pu	100 (nearest 0.0	1 ft. below top of casing)	8.39	Depth	20.00
Approximate Well Loc	ation North	of Lakel	read	·	_
Calculated Volume of	Water in Casing_	11.61 × 0.16	03 = 1.89	gal	
Weather Conditions	overcast	50°			
		r			

Time	pH (units)	Temperature- Corrected Conductance (umhos/cm)	Temperature	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
1541	10.26	1.72	10.24	0,16 -164	OL
1545	11.91	2.32	11.05	0.02 -213	3.66
1549	11.86	a.70	11.08	0.02 -191	7.26
1552	11.85	2.19	11.07	0.07 -187	9.96
		, N			

		·			,

Comments:

Analyzed PAH + BTEX

Sheen dank brown, slight oder

Well diameter

Gallons per foot of casing

1 1/4" 2" 4" 0.0625 0.163 0.653 1.47 2.61

5.87

Chin boch lake

Signature

11/16/04 Date

MA90450

6" 8"

12"

Site SWLP	MOP	Date	11/16/04	Wel	1 No MW-10
Pumping Rate (gallons	s/minute) - 9	L/min			
Type of Pump	Peristaltic				
Water Level Before F	Pumping (nearest 0.0	I ft. below top of casi	no) <u>3.19</u>	Depth	11.57
Approximate Well Lo	cation_South	of WWTP	screen built	vej	
Calculated Volume o	f Water in Casing_	500T 8.	38 x 0.163	= 1.37	gal.
Weather Conditions _	over cas	+ 150°			

Time	pH (units)	Temperature- Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
1517	7.84	1.097	9.52	0.40 120	OL
1520	7.03	1.042	9.85	6.07 78	2.76
1574	6.90	1.041	9.92	0.04 22	4.36
1527	(0.89	1.039	9.93	0.05 -9	9.04
	•				
					· · · · · · · · · · · · · · · · · · ·

Comments:

Avalyzed for PAH + BTEX slight sheen and odor.

Well diameter

Gallons per foot of casing

1 1/4" 0.0625 0.163 0.653 1.47 2.61 12" 5.87

Chin boek Cak Signature

11/16/04 Date

2" 4" 6" 8"

Site <u>SVILP</u>	MGP	Date	11/16/04	We	11 No MW -11
Pumping Rate (gallo	ns/minute)91 m				
Type of Pump	Perstaltic				
Water Level Before	Pumping (nearest 0.01 ft. be	low top of casing)	7,43	Well Depth	14.38
Approximate Well Le	ocation Supervor B	my Boat	- slip		-
Calculated Volume	of Water in Casing6	.95 × 0	.163 = 1.13	<u>99</u>	
Weather Conditions	overcast, 5	0*			

Time	pH (units)	Temperature- Corrected Conductance (umhos/cm)	Temperature	Water Level (nearest 0.01 ft.)	Cumulative Volume of Water Removed From Well (measured in gallons)
1449	7.46	1.48	10.17	1.53 140	0
1452	6.77	1.453	16.31	0.13 145	a.T.L
1454	6.45	1.442	10.29	0.08 155	6.3L
1459	6.40	1.447	10.30	0.08 157	91
1601	6.39	1.440	10.30	0.08 1578	9.20k 10.8L

Comments: Analyzed for PAH + BTEX

Well diameter

Gallons per foot of casing

1 1/4" 0.0625 0.163 0.653 1.47 2.61 5.87

Chir bul Cab

11/16/04 Date

Signature

2" 4"

6" 8"

12"

SiteSWLP	MGP	Date	11/16/04	We	11 No MW-12
Pumping Rate (gallons)	minute)9 L/_				
Type of Pump	eristaltic				
			5.18	Well	12.78
Water Level Belore P	UMPING (nearest 0.01 ft. be	low top of casing).	· · · · · · · · · · · · · · · · · · ·	Depin	
Approximate Well Loc	ation Near WW	P lagoon			-
Calculated Volume of	Water in Casing	7.60 +0.	163 = 1.24		
Weather Conditions	overcast	500			

Time	pH (units)	Temperature- Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (nearest 0.01.1t.)	Cumulative Volume of Water Removed From Well (measured in gallons)
1418	6.21	1.52	10,57	311 226	OL
1423	6.44	1.54	10.67	0.32 201	4.5L
1427	6.48	1.54	10.46	0.18 187	8.1L
1431	6.49	1.52	10.65	0.15 177	1176
				•	
			· · · · · · · · · · · · · · · · · · ·		
				, <u></u>	

Comments:

Avalyzed for BTEX + PAH

Well diameter

Gallons per foot of casing

1 1/4* 0.0625 0.163 0.653 1.47 2.61 12" 5.87

Chin Breh Gele-11/16/04

Signature

Date

2" 4" 6"

8*



APPENDIX C

Slug Test Results

Superior Water Light and Power MGP Phase II, Part III Superior, Wisconsin March 2005



Data Set: J:\Projects\09413 Misc Projects\09413-098 Superior MGP\Slug Tests\MW-5.aqt Date: 12/22/04 Time: 14:17:51

PROJECT INFORMATION

Company: ENSR Client: SWL&P Project: 09413-098 Location: Superior, WI Test Date: 11/20/01 Test Well: MW-5

AQUIFER DATA

Saturated Thickness: 322. cm Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: : MW-5

X Location: 0. cm Y Location: 0. cm

Initial Displacement: 57.4 cm Static Water Column Height: 322. cm Casing Radius: 2.62 cm Wellbore Radius: 2.62 cm Well Skin Radius: 2.62 cm Screen Length: 305. cm Total Well Penetration Depth: 533. cm

No. of Observations: 149

	Observatio	n Data	
Time (sec)	Displacement (cm)	Time (sec)	Displacement (cm)
6.	57.4	231.	15.9
9.	53.7	234.	15.8
12.	50.2	237.	15.7
15.	47.	240.	1.57
18.	44.2	243.	15.6
21.	41.6	246.	15.5
24.	39.2	249.	15.5
27.	37.1	252.	15.4
30.	35.2	255.	15.3
33.	33.7	258.	15.
36.	32.2	261.	15.2
39.	30.9	264.	15.1
42.	29.8	267.	15.
45.	28.8	270.	14.9
48.	27.9	273.	14.8
51.	27.2	276.	14.8
54.	26.6	279.	14.7
57.	26.	282.	14.6
60.	25.4	285.	14.5
63.	24.9	288.	14.5
66.	24.4	291.	14.4
69.	24.	294.	14.4
12.	23.6	297.	14.3
/5. 70	23.2	300.	14.2
/ð.	22.9	303.	14.1
81. 04	22.0	306.	14.1
84.	22.3	309.	13.9

<u>Time (sec)</u>	Displacement (cm)	<u>Time (sec)</u>	Displacement (cm)
87.	22.	312.	13.8
90.	21.7	315.	13.7
93.	21.5	318.	13.7
96.	21.2	321.	13.6
99.	21.	324.	13.6
102.	20.8	327.	13.5
105	20.6	330	13.4
108.	20.4	333.	13.3
111.	20.2	336.	13.2
114.	20.1	339.	13.2
117.	19.8	342.	13.1
120.	19.7	345.	13.
123.	19.6	348.	13.
126.	19.4	351.	12.9
129.	19.2	354.	12.9
132.	19.1	357.	12.8
135.	18.9	360.	12.7
138	18.9	363	12.7
141. 144. 147	18.7 18.6 18.5	366. 369.	12.6 12.5
147.	18.5	372.	12.5
150.	18.3	375.	12.4
153.	18.2	378.	12.3
156.	18.1	381.	12.3
159.	18.	384.	12.2
162.	17.9	387.	12.2
165 <i>.</i>	17.8	390.	12.1
168.	17.7	393.	12.
171.	17.6	396.	12.
174.	17.5	399.	12.
177.	17.4	402.	11.8
180	17.3	405	11.8
183. 186. 189	17.2 17.1 17.1	408. 411.	11.7 11.6 11.6
192.	16.9	417.	11.6
195.	16.9	420.	11.5
201. 204.	16.7 16.6	423. 426. 429.	11.4 11.4 11.3
207.	16.6	432.	11.3
210.	16.5	435.	11.3
213.	16.4	438.	11.2
216.	16.3	441.	11.1
219.	16.2	444.	11.1
222.	16.1	447.	11.1
225. 228.	16. 16.	450.	11.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice Shape Factor: 4.025

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	7.625E-5	cm/sec
y0	23.64	cm



Data Set: J:\Projects\09413 Misc Projects\09413-098 Superior MGP\Slug Tests\MW-6.aqt Title: Superior Slug MW-6 Date: 12/22/04 Time: 13:02:35

PROJECT INFORMATION

Company: ENSR Client: Superior MGP Project: 9413-098-200 Location: Superior, WI Test Date: 11/20/01 Test Well: MW-6

AQUIFER DATA

Saturated Thickness: 262. cm Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: : MW-6

X Location: 0. cm Y Location: 0. cm

Initial Displacement: 65.4 cm Static Water Column Height: 262. cm Casing Radius: 2.62 cm Wellbore Radius: 2.62 cm Well Skin Radius: 2.62 cm Screen Length: 305. cm Total Well Penetration Depth: 533. cm Corrected Casing Radius (Bouwer-Rice Method): 2.62 cm Gravel Pack Porosity: 0.35

No. of Observations: 71

Observation Data				
Displacement (cm)	Time (sec)	Displacement (cm)		
65.4	114.	1.6		
55.3	117.	1.5		
46.5	120.	1.5		
38.7	123.	1.3		
31.8	126.	1.3		
25.9	129.	1.2		
20.9	132.	1.1		
16.9	135.	1.1		
13.7	138.	1.		
11.3	141	0 9		
95	144	0.9		
8.2	147	0.9		
7.2	150	0.8		
65	153	0.0		
5.8	156	0.0		
5.0	150.	0.0		
4.0	162	0.7		
4.5	165	0.0		
4.0	169	0.0		
4.2	100.	0.0		
3.9	1/1.	0.5		
3.7	174.	0.5		
3.5	177.	0.4		
3.3	180.	0.4		
3.1	183.	0.4		
	<u>Observatio</u> <u>Displacement (cm)</u> 65.4 55.3 46.5 38.7 31.8 25.9 20.9 16.9 13.7 11.3 9.5 8.2 7.2 6.5 5.8 5.3 4.9 4.5 4.2 3.9 3.7 3.5 3.3 3.1	$\begin{array}{c c c} \hline Observation Data \\ \hline Displacement (cm) & Time (sec) \\ \hline 65.4 & 114. \\ 55.3 & 117. \\ 46.5 & 120. \\ 38.7 & 123. \\ 31.8 & 126. \\ 25.9 & 129. \\ 20.9 & 132. \\ 16.9 & 135. \\ 13.7 & 138. \\ 11.3 & 141. \\ 9.5 & 144. \\ 8.2 & 147. \\ 7.2 & 150. \\ 6.5 & 153. \\ 5.8 & 156. \\ 5.3 & 159. \\ 4.9 & 162. \\ 4.5 & 165. \\ 4.2 & 168. \\ 3.9 & 171. \\ 3.7 & 174. \\ 3.5 & 177. \\ 3.3 & 180. \\ 3.1 & 183. \\ \end{array}$		

AQTESOLV for Windows

Time (sec)	Displacement (cm)	Time (sec)	Displacement (cm)
78.	2.9	186.	0.4
81.	2.7	189.	0.4
84.	2.7	192.	0.3
87.	2.5	195.	0.2
90.	2.4	198.	0.2
93.	2.3	201.	0.2
96.	2.2	204.	0.2
99.	2.	207.	0.2
102.	2.	210.	0.2
105.	1.8	213.	0.1
108.	1.8	216.	0.1
111.	1.7		

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice Shape Factor: 4.025

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.003071	cm/sec
y0	110.1	cm

12/22/04



K = 0.007789 cm/sec

y0 = 72.49 cm

Data Set: J:\Projects\09413 Misc Projects\09413-098 Superior MGP\Phase II Documents\Superior Slug MW-7.a Title: Superior Slug MW-7 Date: 12/22/04 Time: 14:25:39

PROJECT INFORMATION

Company: ENSR Client: Superior MGP Project: 9413-098-200 Location: Superior, WI Test Date: 11/20/01 Test Well: MW-7

AQUIFER DATA

Saturated Thickness: 210. cm Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: : MW-7

X Location: 0. cm Y Location: 0. cm

Initial Displacement: 46.9 cm Static Water Column Height: 210. cm Casing Radius: 2.62 cm Wellbore Radius: 2.62 cm Well Skin Radius: 2.62 cm Screen Length: 305. cm Total Well Penetration Depth: 518. cm

No. of Observations: 37

Observation Data				
Time (sec)	Displacement (cm)	Time (sec)	Displacement (cm)	
3.	46.9	60.	0.3	
6.	28.6	63.	0.3	
9.	15.9	66.	0.3	
12.	8.5	69.	0.3	
15.	4.5	72.	0.3	
18.	2.6	75.	0.3	
21.	1.7	78.	0.3	
24.	1.2	81.	0.3	
27.	0.9	84.	0.3	
30.	0.8	87.	0.3	
33.	0.6	90.	0.3	
36.	0.5	93.	0.3	
39.	0.5	96.	0.3	
42.	0.4	99.	0.3	
45.	0.3	102.	0.3	
48.	0.3	105.	0.3	
51.	0.3	108.	0.3	
54.	0.3	111.	0.2	
57.	0.3			

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice Shape Factor: 4.007

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.007789	cm/sec
y0	72.49	cm



Data Set: J:\Projects\09413 Misc Projects\09413-098 Superior MGP\Slug Tests\Data\MW-8.aqt Date: 12/22/04 Time: 14:28:37

PROJECT INFORMATION

Company: ENSR Client: SWL&P Project: 09413-098-600 Location: Superior, WI Test Date: 11/17/04 Test Well: MW-8

AQUIFER DATA

Saturated Thickness: 6.56 ft Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: : MW-8

X Location: 0. ft Y Location: 0. ft

Initial Displacement: -1.591 ft Static Water Column Height: 8.52 ft Casing Radius: 0.086 ft Wellbore Radius: 0.086 ft Well Skin Radius: 0.086 ft Screen Length: 10. ft Total Well Penetration Depth: 6.56 ft Corrected Casing Radius (Bouwer-Rice Method): 0.086 ft Gravel Pack Porosity: 0.35

No. of Observations: 71

	Observation	on Data	
Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.7	-1.591	25.2	-0.204
3.	-1.531	26.7	-0.182
3.3	-1.482	28.2	-0.163
3.6	-1.439	29.8	-0.146
3.9	-1.397	31.5	-0.131
4.2	-1.359	33.3	-0.118
4.5	-1.32	35.2	-0.109
4.8	-1.286	37.3	-0.098
5.1	-1.251	39.5	-0.09
5.4	-1.214	41.8	-0.083
5.7	-1.18	44.3	-0.077
6.	-1.148	46.9	-0.071
6.4	-1.116	49.7	-0.064
6.7	-1.073	52.6	-0.06
7.1	-1.036	55.7	-0.056
7.5	-0.999	59.	-0.053
8.	-0.956	62.5	-0.049
8.4	-0.916	66.2	-0.045
8.9	-0.873	70.1	-0.043
9.5	-0.832	74.3	-0.039
10.	-0.797	78.7	-0.038
10.6	-0.757	83.4	-0.036
11.3	-0.716	88.4	-0.032
11.9	-0.677	93.7	-0.032
12.6	-0.636	99.3	-0.03

AQTESOLV for Windows

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)	
14.2	-0.556	111 5	-0.020	
15.	-0.516	118.1	-0.022	
15.9	-0.479	125.1	-0.022	
16.8	-0.44	132.6	-0.021	
17.8	-0.402	140.5	-0.019	
18.9	-0.365	148.9	-0.017	
20.	-0.327	157.8	-0.015	
21.2	-0.292	167.2	-0.015	
22.4	-0.26	177.2	-0.013	
23.8	-0.23			

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice Shape Factor: 3.387

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.003264	cm/sec
y0	-1.854	ft

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In-Situ I	nc.	MiniTroll Pr	co	
Report ge Report fr Win-Situ	nerated: om file: Version	11/24/04 \SN09993 4.50	14:55:00 2004-11-17 14160	09 MW-8.bin
Serial nu Firmware Unit name	mber: Version :	00009993 3.09 MiniTROLL		
Test name	:		MW-8	
Test defi Test star Test stop Test extr	ned on: ted on: ped on: acted on:	11/17/04 11/17/04 N/A N/A	14:15:44 14:16:09 N/A N/A	
Data gath Maximu Number	ered using m time bet of data s	Logarithmic ween data poi amples:	testing ints: 600. 80	0 Seconds.
TOTAL DAT	A SAMPLES	80		
Channel n Measure Channel Sensor Specifi Mode: User-de	umber [2] ment type: name: Range: c gravity: Surface fined rafe	Pressure Pressure 30 PSIG. 1.000	0,000	Foot H20
Referen	ced on:	test start	5 929	Foot H20
Date	Time	ET (sec)	Chan[2] Pressure Feet H2O	
11/17/04 11/17/	14:16:09 14:16:09 14:16:10 14:16:10 14:16:10 14:16:11 14:16:11 14:16:11 14:16:12 14:16:12 14:16:12 14:16:12 14:16:13 14:16:13 14:16:13 14:16:13 14:16:14 14:16:15 14:16:15 14:16:15 14:16:16 14:16:16 14:16:17 14:16:18 14:16:18	0.0 0.3 0.6 0.9 1.2 1.5 1.6 2.1 2.4 2.7 3.0 3.9 4.2 4.5 4.6 5.1 5.4 5.7 6.0 6.4 6.7 7.1 7.5 8.0 8.4 9.5	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
11/17/04 11/17/04 11/17/04 11/17/04	14:16:18 14:16:19 14:16:20 14:16:20	9.5 10.0 10.0 11.3	5 -0.832 0 -0.797 6 -0.757 3 -0.716	

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11/17/04	14:16:21	11.9	-0.677
11/17/04	14:16:22	12.6	-0.636
11/17/04	14:16:22	13.4	-0.597
11/17/04	14:16:23	14.2	-0.556
11/17/04	14:16:24	15.0	-0.516
11/17/04	14:16:25	15.9	-0.479
11/17/04	14.16.26	16 8	-0.440
11/17/04	$14 \cdot 16 \cdot 27$	17 8	-0 402
$\frac{11}{17}$	14.16.28	18 9	-0.365
11/17/04	14.16.29	20.0	-0.327
11/17/04	14.16.30	20.0	-0.292
11/17/04	14.16.21	21.2	-0.292
11/17/04	14.16.31	22.4	-0.230
11/17/04	14.16.24	25.0	-0.230
11/17/04	14:10:34	20.2	-0.204
11/17/04	14:10:30	20.7	-0.162
11/17/04	14:10:37	20,2	-0.163
11/17/04	14:16:39	29.8	-0.146
11/17/04	14:16:40	31.5	-0.131
11/1//04	14:16:42	33.3	-0.118
11/1/04	14:16:44	35.2	-0.109
11/1//04	14:16:46	37.3	-0.098
11/1//04	14:16:48	39.5	-0.090
11/17/04	14:16:51	41.8	-0.083
11/17/04	14:16:53	44.3	-0.077
11/17/04	14:16:56	46.9	-0.071
11/17/04	14:16:59	49.7	-0.064
11/1//04	14:17:02	52.6	-0.060
11/17/04	14:17:05	55.7	-0.056
11/17/04	14:17:08	59.0	-0.053
11/17/04	14:17:11	62.5	-0.049
11/17/04	14:17:15	66.2	-0.045
11/1//04	14:17:19	70.1	-0.043
11/17/04	14:17:23	74.3	-0.039
11/1//04	14:17:28	78.7	-0.038
11/1//04	14:17:32	83.4	-0.036
11/17/04	14:17:37	88.4	-0.032
11/17/04	14:17:43	93.7	-0.032
11/17/04	14:17:48	99.3	-0.030
11/17/04	14:17:54	105.2	-0.026
11/17/04	14:18:00	111.5	-0.025
11/17/04	14:18:07	118.1	-0,022
11/17/04	14:18:14	125.1	-0.022
11/17/04	14:18:22	132.6	-0.021
11/17/04	14:18:29	140.5	-0.019
11/17/04	14:18:38	148.9	-0.017
11/17/04	14:18:47	157.8	-0.015
11/17/04	14:18:56	167.2	-0.015
11/17/04	14:19:06	177.2	-0.013

Professional Statistics of the

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Data Set: J:\Projects\09413 Misc Projects\09413-098 Superior MGP\Slug Tests\Data\MW-9.aqt Date: 12/22/04 Time: 14:29:54

PROJECT INFORMATION

Company: ENSR Client: SWL&P Project: 09413-098 Location: Superior, WI Test Date: 11/17/04 Test Well: MW-9

AQUIFER DATA

Saturated Thickness: 11.85 ft Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: : MW-9

X Location: 0. ft Y Location: 0. ft

Initial Displacement: -1.497 ft Static Water Column Height: 11.85 ft Casing Radius: 0.086 ft Wellbore Radius: 0.086 ft Well Skin Radius: 0.086 ft Screen Length: 10. ft Total Well Penetration Depth: 17.3 ft

No. of Observations: 69

	Observatio	on Data	
Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
2.7	-1.497	23.8	-0.049
3.	-1.241	25.2	-0.045
3.3	-1.069	26.7	-0.04
3.6	-0.944	28.2	-0.036
3.9	-0.832	29.8	-0.034
4.2	-0.739	31.5	-0.03
4.5	-0.662	33.3	-0.03
4.8	-0.597	35.2	-0.027
5.1	-0.541	37.3	-0.023
5.4	-0.496	39.5	-0.021
5.7	-0.451	41.8	-0.019
6.	-0.414	44.3	-0.017
6.4	-0.375	46.9	-0.015
6.7	-0.341	49.7	-0.013
<u>7.1</u>	-0.309	52.6	-0.011
7.5	-0.281	55.7	-0.009
8.	-0.255	59.	-0.009
8.4	-0.231	62.5	-0.007
8.9	-0.208	66.2	-0.007
9.5	-0.19	70.1	-0.006
10.	-0.176	74.3	-0.004
10.6	-0.162	/8./	-0.004
11.3	-0.148	83.4	-0.002
11.9	-0.135	88.4	-0.002
12.6	-0.126	93.7	-0.002
13.4	-0.115	99.3	υ.
14.2	-0.105	105.2	0.

AQTESOLV for Windows

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)	
15.	-0.096	111.5	0.002	
15.9	-0.088	118.1	0.002	
16.8	-0.081	125.1	0.004	
17.8	-0.075	132.6	0.004	
18.9	-0.07	140.5	0.004	
20.	-0.062	148.9	0.004	
21.2	-0.059	157.8	0.006	
22.4	-0.053			

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice Shape Factor: 4.018

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.01172	cm/sec
у0	-1.99	ft

In-Situ Inc.	MiniTroll Pro	0		
Report generated: Report from file: Win-Situ Version	11/24/04 \SN09993 2 4.50	15:15:18 2004-11-17	140250	MW-9.bin
Serial number: Firmware Version Unit name:	00009993 3.09 MiniTROLL			
Test name:		MM-9		
Test defined on: Test started on: Test stopped on: Test extracted on:	11/17/04 11/17/04 N/A N/A	13:59:22 14:02:50 N/A N/A		
Data gathered using Maximum time betw Number of data sa	Logarithmic (ween data poir amples:	testing nts: 78	600.0	Seconds.
TOTAL DATA SAMPLES	78			
Channel number [2] Measurement type: Channel name: Sensor Range: Specific gravity: Mode: Surface	Pressure Pressure 30 PSIG. 1.000			
User-defined refe: Referenced on:	rence: test start	0.000		Feet H2O
Pressure head at :	reference:	7.970		Feet H2O
		Chan [2]		

procession decension of the

.8

Date	Time	ET	(sec)	Pressure Feet H2O	
11/17/04	14:02:50		0.0	0.000	
11/17/04	14:02:50		0.3	0.007	
11/17/04	14:02:50		0.6	-0.165	
11/17/04	14:02:51		0.9	-0.518	
11/17/04	14:02:51		1.2	-0.591	
11/17/04	14:02:51		1.5	-0.574	
11/17/04	14:02:51		1.8	-1.116	
11/17/04	14:02:52		2.1	-1.109	
11/17/04	14:02:52		2.4	-1.391	
11/17/04	14:02:52		2.7	-1.497	
11/17/04	14:02:53		3.0	-1.241	
11/17/04	14:02:53		3.3	-1.069	
11/17/04	14:02:53		3.6	-0.944	
11/17/04	14:02:54		3.9	-0.832	
11/17/04	14:02:54		4.2	-0.739	
11/17/04	14:02:54		4.5	-0.662	
11/17/04	14:02:54		4.8	-0.597	
11/17/04	14:02:55		5.1	-0.541	
11/17/04	14:02:55		5.4	-0.496	
11/17/04	14:02:55		5.7	-0.451	
11/17/04	14:02:56		6.0	-0.414	
11/17/04	14:02:56		6.4	-0.375	
11/17/04	14:02:56		6.7	-0.341	
11/17/04	14:02:57		7.1	-0.309	
11/1//04	14:02:57		7.5	-0.281	
11/1//04	14:02:58		8.0	-0.255	
11/17/04	14:02:58		8.4	-0.231	
11/17/04	14:02:59		8.9	-0.208	
$\pm \pm / \pm / / 04$	14:02:59		9.5	-0.190	
$\pm \pm / \pm / / 04$	14:03:00		10.0	-0.1/0	
11/17/04	14.03.00		11.0	-0,102	
エエ/エ // 04	TH:00:01		11.3	-0.140	

`æ			
11/17/04	14:03:02	11.9	-0.135
11/17/04	14:03:02	12.6	-0.126
11/17/04	14:03:03	13.4	-0,115
11/17/04	14:03:04	14.2	-0.105
11/17/04	14:03:05	15.0	-0.096
11/17/04	14:03:06	15.9	-0.088
11/17/04	14:03:06	16.8	-0.081
11/17/04	14:03:07	17.8	-0.075
11/17/04	14:03:09	18.9	-0.070
11/17/04	14:03:10	20.0	-0.062
11/17/04	14:03:11	21.2	-0.059
11/17/04	14:03:12	22.4	-0.053
11/17/04	14:03:13	23.8	-0.049
11/17/04	14:03:15	25.2	-0.045
11/17/04	14:03:16	26.7	-0.040
11/17/04	14:03:18	28.2	-0.036
11/1//04	14:03:19	29.8	-0.034
11/17/04	14:03:21	31.5	-0.030
11/17/04	14:03:23	33.3	-0.030
11/1//04	14:03:25	35.2	-0.027
11/17/04	14:03:27	37.3	-0.023
11/17/04	14:03:29	39.5	-0.021
11/17/04	14:03:31	41.0	-0.019
$\frac{11}{17}$	14:03:34	44.5	-0.017
11/1/04 11/17/04	14:03:37	40.9	-0.013
11/17/04	14.03.39	49.7 52.6	-0.013
11/17/04	14.03.42	55 7	-0.009
11/17/04	14.03.49	59.0	-0.009
11/17/04	14:03:52	62.5	-0.007
11/17/04	14:03:56	66.2	-0.007
11/17/04	14:04:00	70.1	-0.006
11/17/04	14:04:04	74.3	-0.004
11/17/04	14:04:08	78.7	-0.004
11/17/04	14:04:13	83.4	-0.002
11/17/04	14:04:18	88.4	-0.002
11/17/04	14:04:23	93.7	-0.002
11/17/04	14:04:29	99.3	0.000
11/17/04	14:04:35	105.2	0.000
11/17/04	14:04:41	111.5	0.002
11/17/04	14:04:48	118.1	0.002
11/17/04	14:04:55	125.1	0.004
11/17/04	14:05:02	132.6	0.004
11/17/04	14:05:10	140.5	0.004
11/17/04	14:05:19	148.9	0.004
11/1//04	14:05:27	T21.8	0.006



Data Set: J:\Projects\09413 Misc Projects\09413-098 Superior MGP\Slug Tests\Data\MW-10.aqt Date: 12/22/04 Time: 14:30:48

PROJECT INFORMATION

Company: ENSR Client: SWL&P Project: 09413-098 Location: Superior Test Date: 11/17/04 Test Well: MW-10

AQUIFER DATA

Saturated Thickness: 9.92 ft Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: : MW-10

X Location: 0. ft Y Location: 0. ft

Initial Displacement: -1.774 ft Static Water Column Height: 9.92 ft Casing Radius: 0.086 ft Wellbore Radius: 0.086 ft Well Skin Radius: 0.086 ft Screen Length: 10. ft Total Well Penetration Depth: 13.5 ft

No. of Observations: 72

Observation Data					
<u> Time (sec)</u>	Displacement (ft)	Time (sec)	Displacement (ft)		
2.4	-1.774	23.8	-0.073		
2.7	-1.679	25.2	-0.066		
3.	-1.537	26.7	-0.06		
3.3	-1.419	28.2	-0.053		
3.6	-1.312	29.8	-0.047		
3.9	-1.213	31.5	-0.041		
4.2	-1.127	33.3	-0.038		
4.5	-1.047	35.2	-0.034		
4.8	-0.972	37.3	-0.03		
5.1	-0.911	39.5	-0.028		
5.4	-0.853	41.8	-0.025		
5.7	-0.802	44.3	-0.023		
6.	-0.756	46.9	-0.023		
6.4	-0.707	49.7	-0.019		
6.7	-0.657	52.6	-0.019		
7.1	-0.61	55.7	-0.017		
7.5	-0.563	59.	-0.017		
8.	-0.522	62.5	-0.015		
8.4	-0.477	66.2	-0.013		
8.9	-0.438	70.1	-0.013		
9.5	-0.399	74.3	-0.013		
10.	-0.367	78.7	-0.011		
10.6	-0.333	83.4	-0.011		
11.3	-0.301	88.4	-0.011		
11.9	-0.273	93.7	-0.009		
12.6	-0.244	99.3	-0.009		
13.4	-0.221	105.2	-0.009		

AQTESOLV for Windows

Time (sec)	Displacement (ft)	<u>Time (sec)</u>	Displacement (ft)	
14.2	-0.197	111.5	-0.009	
15.	-0.178	118.1	-0.007	
15.9	-0.159	125.1	-0.007	
16.8	-0.142	132.6	-0.007	
17.8	-0.127	140.5	-0.005	
18.9	-0.114	148.9	-0.005	
20.	-0.103	157.8	-0.005	
21.2	-0.092	167.2	-0.005	
22.4	-0.083	177.2	-0.005	

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice Shape Factor: 3.86

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.007463	cm/sec
у0	-2.149	ft

In-Situ Inc.	MiniTroll Pr	0	
Report generated: Report from file: Win-Situ Version	11/24/04 \SN09993 4.50	15:16:33 2004-11-17 115	759 MW-10 Test #1.bi
Serial number: Firmware Version Unit name:	00009993 3.09 MiniTROLL		
Test name:		MW-10 Test #	1
Test defined on: Test started on: Test stopped on: Test extracted on:	11/17/04 11/17/04 N/A N/A	11:57:24 11:57:59 N/A N/A	
Data gathered usin Maximum time be Number of data	g Logarithmic tween data poi samples:	testing .nts: 60 80	0.0 Seconds.
TOTAL DATA SAMPLES	80		
Channel number [2] Measurement type Channel name: Sensor Range: Specific gravity Mode: Surface	: Pressure Pressure 30 PSIG. : 1.000		
User-defined ref	erence:	0.000	Feet H2O
Pressure head at	reference:	6.902	Feet H2O
		Chan[2] Pressure	

Date	Time	ΕT	(sec)	Feet H2O
11/17/04	11:57:59		0.0	0.000
11/17/04	11:58:00		0.3	0.007
11/17/04	11:58:00		0.6	0.011
11/17/04	11:58:00		0.9	0.011
11/17/04	11:58:01		1.2	-0.602
11/17/04	11:58:01		1.5	-1.041
11/17/04	11:58:01		1.8	-0.340
11/17/04	11:58:02		2.1	-1.249
11/17/04	11:58:02		2.4	-1.774
11/17/04	11:58:02		2.7	-1.679
11/17/04	11:58:02		3.0	-1.537
11/17/04	11:58:03		3.3	-1,419
11/17/04	11:58:03		3.6	-1.312
11/17/04	11:58:03		3.9	-1.213
11/17/04	11:58:04		4.2	-1.127
11/17/04	11:58:04		4.5	-1.047
11/17/04	11:58:04		4.8	-0.972
11/17/04	11:58:05		5.1	-0.911
11/17/04	11:58:05		5.4	-0.853
11/17/04	11:58:05		5.7	-0.802
11/17/04	11:58:05		6.0	-0.756
11/17/04	11:58:06		6.4	-0.707
11/17/04	11:58:06		6.7	-0.657
11/17/04	11:58:07		7.1	-0.610
11/17/04	11:58:07		7.5	-0.563
11/17/04	11:58:07		8.0	-0.522
11/17/04	11:58:08		8.4	-0.477
11/17/04	11:58:08		8.9	-0,438
11/17/04	11:58:09		9.5	-0.399
11/17/04	11:58:09		10.0	-0.367
11/17/04	11:58:10		10.6	-0.333
11/17/04	11:58:11		11.3	-0.301

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	11/17/04	11.58.11	11 9	-0 273
	11/17/04	11.58.12	12 6	-0.244
	11/17/04	11,50,12	13 4	-0 221
	11/17/04	11.50.14	14 0	-0.221
	11/17/04	11:58:14	14.2	-0,197
	11/1//04	11:58:14	15.0	-0.178
	11/1//04	11:58:15	15.9	-0.159
	11/17/04	11:58:16	16.8	-0.142
	11/17/04	11:58:17	17.8	-0.127
	11/17/04	11:58:18	18.9	-0.114
	11/17/04	11:58:19	20.0	-0.103
	11/17/04	11:58:21	21.2	-0.092
	11/17/04	11:58:22	22.4	-0.083
	11/17/04	11:58:23	23.8	-0.073
	11/17/04	11:58:25	25.2	-0.066
	11/17/04	11:58:26	26.7	~0.060
	11/17/04	11:58:28	28.2	-0.053
	11/17/04	11:58:29	29.8	-0.047
	11/17/04	11.58.31	31.5	-0.041
	11/17/04	11.58.33	33 3	-0.038
	11/17/04	11.58.35	35.2	-0.034
	11/17/04	11.50.33	37.3	-0.030
	11/17/04	11.50.37	J/.J 20 E	-0.030
	11/17/04	11:58:39	39.5	~0.028
	11/17/04	11:58:41	41.8	-0.025
	11/17/04	11:58:44	44.3	-0.023
	11/17/04	11:58:46	46.9	-0.023
	11/17/04	11:58:49	49.7	-0.019
	11/17/04	11:58:52	52.6	-0.019
	11/17/04	11:58:55	55.7	-0.017
	11/17/04	11:58:58	59.0	-0.017
	11/17/04	11:59:02	62.5	-0.015
	11/17/04	11:59:06	66.2	-0.013
	11/17/04	11:59:09	70.1	-0.013
	11/17/04	11:59:14	74.3	-0.013
	11/17/04	11:59:18	78.7	-0.011
	11/17/04	11:59:23	83.4	-0.011
	11/17/04	11:59:28	88.4	-0.011
	11/17/04	11:59:33	93.7	-0.009
	11/17/04	11:59:39	99.3	-0.009
	11/17/04	11.59.45	105 2	-0.009
	11/17/04	11.59.51	111 5	-0.009
	11/17/01	11.59.57	118 1	-0.007
	11/17/04	12.00.04	105 1	-0.007
	11/17/04	12.00.04	132 6	-0.007
	11/17/04	12.00:12	132.0 140 E	
	11/17/04	12:00:20	140.5	-0.005
	$\perp \perp / \perp / / 04$	12:00:28	148.9	-0.005
	11/17/04	12:00:37	157.8	-0.005
	11/17/04	12:00:47	167.2	-0.005
	11/17/04	12:00:57	177.2	-0.005



Data Set: J:\Projects\09413 Misc Projects\09413-098 Superior MGP\Slug Tests\Data\MW-11.aqt Date: 12/22/04 Time: 14:33:40

PROJECT INFORMATION

Company: ENSR Client: SWL&P Project: 09413-098 Location: Superior, WI Test Date: 11/17/04 Test Well: MW-11

AQUIFER DATA

Saturated Thickness: 10.07 ft Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: : MW-11

X Location: 0. ft Y Location: 0. ft

Initial Displacement: -1.546 ft Static Water Column Height: 10.07 ft Casing Radius: 0.086 ft Wellbore Radius: 0.086 ft Well Skin Radius: 0.086 ft Screen Length: 10. ft Total Well Penetration Depth: 14.5 ft

No. of Observations: 41

Observation Data					
Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)		
2.1	-1.546	9.5	-0.455		
2.4	-1.406	10.	-0.418		
2.7	-1.307	10.6	-0.376		
3.	-1.228	11.3	-0.335		
3.3	-1.159	11.9	-0.294		
3.6	-1.098	12.6	-0.258		
3.9	-1.049	13.4	-0.221		
4.2	-1.006	14.2	-0.189		
4.5	-0.969	15.	-0.161		
4.8	-0.926	15.9	-0.135		
5.1	-0.888	16.8	-0.113		
5.4	-0.855	17.8	-0.094		
5.7	-0.819	18.9	-0.077		
6.	-0.787	20.	-0.062		
6.4	-0.748	21.2	-0.047		
6.7	-0.711	22,4	-0.034		
7.1	-0.67	23.8	-0.025		
7.5	-0.627	25.2	-0.015		
8.	-0.586	26.7	-0.008		
8.4	-0.541	28.2	-0.004		
8.9	-0.5				

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice Shape Factor: 3.906 AQTESOLV for Windows

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.008477	cm/sec
v0	-2.958	ft

12/22/04

In-Situ Inc.	MiniTroll Pro	0	
Report generated: Report from file: Win-Situ Version	11/24/04 \SN09993 2 4.50	15:15:54 2004-11-17 134307	MW-11.bin
Serial number: Firmware Version Unit name:	00009993 3.09 MiniTROLL		
Test name:		MW-11	
Test defined on: Test started on: Test stopped on: Test extracted on:	11/17/04 11/17/04 N/A N/A	13:42:48 13:43:07 N/A N/A	
Data gathered using Maximum time betw Number of data sa	Logarithmic t ween data poir amples:	testing hts: 600.0 84	Seconds.
TOTAL DATA SAMPLES	84		
Channel number [2] Measurement type: Channel name: Sensor Range: Specific gravity: Mode: Surface User-defined rafe:	Pressure Pressure 30 PSIG. 1.000	0,000	Feet H20
Referenced on: Pressure head at a	test start	7 149	Feet H20
riessure neau at i	lererence.	1.135	reet nzo
Date Time	ET (sec)	Chan[2] Pressure Feet H2O	
11/17/04 $13:43:07$ $11/17/04$ $13:43:07$ $11/17/04$ $13:43:07$ $11/17/04$ $13:43:08$ $11/17/04$ $13:43:08$ $11/17/04$ $13:43:08$ $11/17/04$ $13:43:09$ $11/17/04$ $13:43:09$ $11/17/04$ $13:43:09$ $11/17/04$ $13:43:09$ $11/17/04$ $13:43:09$ $11/17/04$ $13:43:09$ $11/17/04$ $13:43:10$ $11/17/04$ $13:43:10$ $11/17/04$ $13:43:10$ $11/17/04$ $13:43:11$ $11/17/04$ $13:43:11$ $11/17/04$ $13:43:11$ $11/17/04$ $13:43:12$ $11/17/04$ $13:43:12$ $11/17/04$ $13:43:12$ $11/17/04$ $13:43:12$ $11/17/04$ $13:43:13$ $11/17/04$ $13:43:13$ $11/17/04$ $13:43:13$ $11/17/04$ $13:43:14$ $11/17/04$ $13:43:15$ $11/17/04$ $13:43:16$ $11/17/04$ $13:43:17$ $11/17/04$ $13:43:17$ $11/17/04$ $13:43:17$ $11/17/04$ $13:43:17$ $11/17/04$ $13:43:17$ $11/17/04$ $13:43:17$ $11/17/04$ $13:43:17$ $11/17/04$ $13:43:17$ $11/17/04$ $13:43:17$ $11/17/04$ $13:43:17$ $11/17/04$ $13:43:17$ $11/17/04$ $13:43:17$	$\begin{array}{c} 0.0\\ 0.3\\ 0.6\\ 0.9\\ 1.2\\ 1.5\\ 1.8\\ 2.1\\ 2.4\\ 2.7\\ 3.0\\ 3.3\\ 3.6\\ 3.9\\ 4.2\\ 4.5\\ 4.8\\ 5.1\\ 5.4\\ 5.1\\ 5.4\\ 5.7\\ 6.0\\ 6.4\\ 6.7\\ 7.1\\ 7.5\\ 8.0\\ 8.4\\ 8.9\\ 9.5\\ 10.0\\ 10.6\\ 11.3\\ \end{array}$	$\begin{array}{c} 0.000\\ 0.005\\ -0.056\\ -1.067\\ -0.324\\ -1.045\\ -1.153\\ -1.546\\ -1.406\\ -1.307\\ -1.228\\ -1.159\\ -1.098\\ -1.049\\ -1.006\\ -0.969\\ -0.926\\ -0.888\\ -0.855\\ -0.819\\ -0.787\\ -0.787\\ -0.787\\ -0.748\\ -0.711\\ -0.670\\ -0.586\\ -0.586\\ -0.541\\ -0.500\\ -0.418\\ -0.376\\ -0.335\end{array}$	

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11/17/04	13:43:19	11.9	-0.294
11/17/04	13:43:19	12.6	-0.258
11/17/04	13:43:20	13.4	-0.221
11/17/04	13:43:21	14.2	-0.189
11/17/04	13.43.22	15 0	-0.161
11/17/04	13.13.22	15 0	-0 135
11/17/04	12.42.23	16 0	-0.133
11/17/04	13:43:24	10.8	-0.113
11/1//04	13:43:25	17.8	-0.094
11/17/04	13:43:26	18.9	-0.077
11/17/04	13:43:27	20.0	-0.062
11/17/04	13:43:28	21.2	-0.047
11/17/04	13:43:29	22.4	-0.034
11/17/04	13:43:30	23.8	-0.025
11/17/04	13:43:32	25.2	-0.015
11/17/04	13:43.33	26.7	-0.008
11/17/04	13.43.35	28.2	-0.004
11/17/04	13.13.36	20.2	0.004
11/17/04	13.43.30	23.0	0.001
11/17/04	13:43:38	31.3	0.005
11/1//04	13:43:40	33.3	0.007
11/17/04	13:43:42	35.2	0.007
11/17/04	13:43:44	37.3	0.009
11/17/04	13:43:46	39.5	0.009
11/17/04	13:43:48	41.8	0.009
11/17/04	13:43:51	44.3	0.007
11/17/04	13:43:54	46.9	0.007
11/17/04	13:43:56	49.7	0.007
11/17/04	13:43:59	52.6	0.005
11/17/04	13:44:02	55.7	0.005
11/17/04	13:44:06	59.0	0 004
11/17/04	13.44.00	62 5	0.004
11/17/04	13.44.05	66 2	-0.002
11/17/04	10.44.17	70 1	-0.000
11/17/04	10:44:1/	70.1	-0.000
11/1//04	13:44:21	/4.3	-0.002
11/17/04	13:44:25	/8./	-0.002
11/17/04	13:44:30	83.4	-0.004
11/17/04	13:44:35	88.4	-0.006
11/17/04	13:44:40	93.7	-0.009
11/17/04	13:44:46	99.3	-0.011
11/17/04	13:44:52	105.2	-0.011
11/17/04	13:44:58	111.5	-0.013
11/17/04	13:45:05	118.1	-0.015
11/17/04	$13 \cdot 45 \cdot 12$	125 1	-0.017
11/17/04	13.45.19	132 6	-0.018
11/17/04	13.45.07	1/0 5	-0.020
11/17/04	10.40.27	140.0	-0.020
11/17/04	TO:40:30	167 0	-0.022
$\pm \pm / \pm / / 04$	13:45:44	157.8	-0.024
11/17/04	13:45:54	167.2	-0.026
11/17/04	13:46:04	177.2	-0.026
11/17/04	13:46:14	187.8	-0.028
11/17/04	13:46:26	199.0	-0.030
11/17/04	13:46:38	210.9	-0.032
11/17/04	13:46:50	223.5	-0.031

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Data Set: J:\Projects\09413 Misc Projects\09413-098 Superior MGP\Slug Tests\Data\MW-12.aqt Date: 12/22/04 Time: 14:34:53

PROJECT INFORMATION

Company: ENSR Client: SWL&P Project: 09413-098 Location: Superior, WI Test Date: 11/17/04 Test Well: MW-12

AQUIFER DATA

Saturated Thickness: 8.8 ft Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: : MW-12

X Location: 0. ft Y Location: 0. ft

Initial Displacement: -1.811 ft Static Water Column Height: 8.8 ft Casing Radius: 0.086 ft Wellbore Radius: 0.086 ft Well Skin Radius: 0.086 ft Screen Length: 10. ft Total Well Penetration Depth: 14.3 ft

No. of Observations: 77

	Observatio	on Data	
Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
5.4	-1.811	49.7	-0.118
5.7	-1.666	52.6	-0.107
6.	-1.496	55.7	-0.098
6.4	-1.378	59.	-0.088
6.7	-1.271	62.5	-0.081
7.1	-1.185	66.2	-0.073
7.5	-1.103	70.1	-0.07
8.	-1.032	74.3	-0.064
8.4	-0.967	78.7	-0.059
8.9	-0.903	83.4	-0.055
9.5	-0.847	88.4	-0.051
10.	-0.793	93.7	-0.047
10.6	-0.739	99.3	-0.045
11.3	-0.687	105.2	-0.042
11.9	-0.636	111.5	-0.04
12.6	-0.587	118.1	-0.038
13.4	-0.542	125.1	-0.036
14.2	-0.501	132.6	-0.034
15.	-0.46	140.5	-0.032
15.9	-0.427	148.9	-0.03
16.8	-0.395	157.8	-0.029
17.8	-0.365	167.2	-0.029
18.9	-0.341	177.2	-0.027
20.	-0.316	187.8	-0.027
21.2	-0.294	199.	-0.027
22.4	-0.275	210.9	-0.025
23.8	-0.256	223.5	-0.025

AQTESOLV for Windows

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)	
25.2	-0.24	236.8	-0.025	
26.7	-0.227	250.9	-0.023	
28.2	-0.212	265.8	-0.025	
29.8	-0.198	281.6	-0.023	
31.5	-0.187	298.4	-0.023	
33.3	-0.176	316.2	-0.021	
35.2	-0.165	335.	-0.023	
37.3	-0.157	354.9	-0.021	
39.5	-0.15	376.	-0.021	
41.8	-0.144	398.4	-0.019	
44.3	-0.135	422.1	-0.017	
46.9	-0.127			

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice Shape Factor: 3.897

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.003275	cm/sec
у0	-1.463	ft

In-Situ Inc.	MiniTroll Pro	C	
Report generated: Report from file: Win-Situ Version	11/24/04 \SN09993 2 4.50	15:16:14 2004-11-17 122021	MW-12.bin
Serial number: Firmware Version Unit name:	00009993 3.09 MiniTROLL		
Test name:		MW-12	
Test defined on: Test started on: Test stopped on: Test extracted on:	11/17/04 11/17/04 N/A N/A	12:19:31 12:20:21 N/A N/A	
Data gathered using Maximum time be Number of data :	y Logarithmic t cween data poir samples:	cesting hts: 600.0 95	Seconds.
TOTAL DATA SAMPLES	95		
Channel number [2] Measurement type Channel name: Sensor Range: Specific gravity Mode: Surface	Pressure Pressure 30 PSIG. 1.000		
User-defined refe	erence:	0.000	Feet H2O
Pressure head at	reference:	7.234	Feet H2O
Data "ima		Chan[2] Pressure	
	E1 (Sec)	Feet H20	
11/17/04 12:20:21 11/17/04 12:20:22 11/17/04 12:20:22 11/17/04 12:20:22 11/17/04 12:20:22 11/17/04 12:20:22 11/17/04 12:20:23	0.0 0.3 0.6 0.9 1.2	0.000 0.007 0.009 0.013 0.012	
11/17/04 12:20:23 11/17/04 12:20:23	1.5 1.8	0.012 0.014	
11/17/04 12:20:24 11/17/04 12:20:24	2.1 2.4	$0.012 \\ 0.014$	
11/17/04 12:20:24 11/17/04 12:20:24	2.7 3.0	0.014 0.014	
11/17/04 12:20:25 11/17/04 12:20:25	3.3 3.6	0.014	
11/17/04 12:20:25 11/17/04 12:20:26	3.9	0.001	
11/17/04 12:20:26 11/17/04 12:20:26	4.5	-1.410	
11/17/04 $12:20:2711/17/04$ $12:20:27$	5.1	-1.060	
11/17/04 $12:20:2711/17/04$ $12:20:2711/17/04$ $12:20:27$	5.7	-1.811	
11/17/04 12:20:27 11/17/04 12:20:28	6.U 6.4	-1.496 -1.378	
11/17/04 12:20:28 11/17/04 12:20:29	6.7 7.1	-1.271 -1.185	
11/17/04 12:20:29 11/17/04 12:20:29	7.5 8.0	-1.103 -1.032	
11/17/04 12:20:30 11/17/04 12:20:30	8.4 8.9	-0.967 -0.903	
11/17/04 12:20:31 11/17/04 12:20:31	9.5 10.0	-0.847 -0.793	
11/17/04 12:20:32 11/17/04 12:20:33	10.6 11.3	-0.739 -0.687	

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11/17/04	12:20:33	11.9	-0.636
11/17/04	12:20:34	12.6	-0.587
11/17/04	12:20:35	13.4	-0.542
11/17/04	12:20:36	14.2	-0.501
11/17/04	12:20:36	15.0	-0.460
11/17/04	12:20:37	15.9	-0.427
11/17/04	12:20:38	16.8	-0.395
11/17/04	12:20:39	17.8	-0.365
11/17/04	12:20:40	18.9	-0.341
11/17/04	$12 \cdot 20 \cdot 41$	20.0	-0.316
11/17/04	12.20.43	21.2	-0.294
11/17/04	12.20.44	22 4	-0 275
11/17/04	12.20.45	23.8	-0.256
11/17/04	$12 \cdot 20 \cdot 47$	25.2	-0.240
11/17/04	12.20.48	26.7	-0.227
11/17/04	12.20.10	28.2	-0.212
11/17/04	12:20:50	29.2	-0 198
11/17/04	12.20.51	20.0	-0.187
11/17/04	12.20.55	34.3	-0.176
11/17/04	12.20.55	35.2	-0.165
11/17/04	12.20.59	37.3	-0.157
11/17/04	12.20.35	39.5	-0.150
11/17/04	12.21.01	41 8	-0.144
11/17/04	12.21.05	41,0	-0.135
11/17/04	12.21.00	44.5	-0.127
11/17/04	12.21.00	40.9	-0.127
11/17/04	12,21,11	49.7 50 G	-0.110
11/17/04	12:21:14 12:21:17	52.0	-0.107
11/17/04	12.21.17	50.0	-0.098
11/17/04	12:21:20	53.0	-0.088
11/17/04	12.21.24	66 2	-0.073
11/17/04	12.21.20	70 1	-0.073
11/17/04	12.21.32	70.1	-0.070
11/17/04	12.21.30	74.3	-0.059
11/17/04	12.21.40	/0./ 03 A	-0.055
11/17/04	12.21.40	00,4	-0.055
11/17/04	12.21.30	00.4	-0.031
11/17/04	12.21.00	93.7	-0.047
11/17/04	12.22.01	105 2	-0.043
11/17/04	12.22.07	111 5	-0.042
11/17/04	12.22.13	118 1	-0.038
11/17/04	12.22.20	125 1	-0.036
11/17/04	12.22.27	132 6	-0.034
11/17/04	12.22.34	140 5	-0.032
11/17/04	12.22.50	148 9	-0.030
11/17/04	12.22.50	157 8	-0.029
11/17/04	12.23.09	167 2	-0.029
11/17/04	12.23.19	177 2	-0.027
11/17/04	12.23.29	187 8	-0.027
11/17/04	12.23.20	199 0	-0.027
11/17/04	12.23.52	210 9	-0.025
11/17/04	12:24:05	223.5	-0.025
11/17/04	12:24:18	236.8	-0.025
11/17/04	12:24:32	250.9	-0.023
11/17/04	12:24:47	265.8	-0.025
11/17/04	12:25:03	281.6	-0.023
11/17/04	12:25:20	298.4	-0.023
11/17/04	12:25:38	316.2	-0.021
11/17/04	12:25:56	335.0	-0.023
11/17/04	12:26:16	354.9	-0.021
11/17/04	12:26:37	376.0	-0.021
11/17/04	12:27:00	398.4	-0.019
11/17/04	12:27:24	422.1	-0.017

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APPENDIX D

Soil and Groundwater Laboratory Analytical Report

Superior Water Light and Power MGP Phase II, Part III Superior, Wisconsin March 2005



A Division of Pace Analytical Services, Inc.

1241 Bellevue Street, Suite 9 Green Bay, WI 54302 920-469-2436, Fax: 920-469-8827

Lab Contact: Laurie Woelfel

Analytical Report Number: 853671

Client: ENSR-MN

Project Name: SWL & P

Project Number: 09413-098

Lab Sample Number	Field ID	Matrix	Collection Date
853671-001	MVV-5	WATER	11/17/04
853671-002	MW-6	WATER	11/17/04
853671-003	MW-7	WATER	11/17/04
853671-004	MVV-8	WATER	11/16/04
853671-005	MW-8 DUP	WATER	11/16/04
853671-006	MVV-9	WATER	11/16/04
853671-007	MW-10	WATER	11/16/04
853671-008	MW-11	WATER	11/16/04
853671-009	MW-12	WATER	11/16/04
853671-010	TRIP BLANK	WATER	11/16/04

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and Laboratory Standard Operating Procedure. Exceptions, if any, are discussed in the accompanying sample comments. Release of this final report is authorized by Laboratory management, as is verified by the following signature. Reported results shall not be reproduced, except in full, without the written approval of the lab. The sample results relate only to the analytes of interest tested.

danne aver

12/104

Date

Approval Signature

Analytical Report Number: 853671

1241 Bellevue Street Green Bay, WI 54302 920-469-2436

A Division of Pace Ana	alytical Servic	es, Inc.								920-469-2	2436
Client :	ENSR-MN								Mat	rix Type: WATE	R
Project Name :	SWL & P								Collecti	on Date : 11/17/	04
Project Number :	09413-098								Rep	ort Date : 12/01/	04
Field ID :	MW-6							La	ab Sample I	Number: 85367	1-002
BTEX										Prep Da	te: 11/22/04
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Ani Method
Benzene		17	0.14	0.46		1	ug/L	·	11/22/04	SW846 5030B	SW846 M8021
Ethylbenzene		21	0.40	1.3		1	ug/L		11/22/04	SW846 5030B	SW846 M8021
Toluene		2.6	0.36	1.2		1	ug/L		11/22/04	SW846 5030B	SW846 M8021
Xylene, o		7.6	0.36	1.2		1	ug/L		11/22/04	SW846 5030B	SW846 M8021
Xylenes, m + p		4.0	0.74	2.5		1	ug/L		11/22/04	SW846 5030B	SW846 M8021
a,a,a-Trifluorotoluene		100				1	%Recov		11/22/04	SW846 5030B	SW846 M8021
BTEX BLANK										Prep Da	te: 11/22/04
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Ani Date	Prep Method	Anl Method
BTEX Blank ID	<u></u>	1536-65				1	,				
PAH/ PNA	<u> </u>									Prep Da	te: 11/23/04
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Ani Method
1-Methylnaphthalene		11	4.0	13		200	ug/L	QD	11/30/04	SW846 3510C	8270C-SIM
2-Methylnaphthalene		8.0	0.45	1.5		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
Acenaphthene		13	3.9	13		200	ug/L	D	11/30/04	SW846 3510C	8270C-SIM
Acenaphthylene		0.49	0.39	1.3		20	ug/L	Q	11/24/04	SW846 3510C	8270C-SIM
Anthracene		0.69	0.35	1.2		20	ug/L	Q	11/24/04	SW846 3510C	8270C-SIM
Benzo(a)anthracene	<	0.39	0.39	1.3		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	0.36	0.36	1.2		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	0.36	0.36	1.2		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
Benzo(ahi)pervlene	<	0.41	0.41	1.4		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	0.39	0.39	1.3		20	ua/L		11/24/04	SW846 3510C	8270C-SIM
Chrysene	<	0.33	0.33	1.1		20	ua/L		11/24/04	SW846 3510C	8270C-SIM
Dibenz(a h)anthracene	• <	0.44	0.44	1.5		20	ua/L		11/24/04	SW846 3510C	8270C-SIM
Eluoranthene		0.77	0.33	1.0		20	ug/L	0	11/24/04	SW846 3510C	8270C-SIM
Fluorene		16	0.00	1.5		20	ug/L	ά.	11/24/04	SW846 3510C	8270C-SIM
Indeno(1.2.3-cd)pyren	<u>م</u>	0.34	0.44	1.0		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
Nephthelene	e ``	0.34	4.5	1.1		200	ug/L	n	11/24/04	SW040 3510C	8270C SIM
Dhononthrono		20	4.J	1.4		200	ug/L	D	11/24/04	SW846 35100	8270C SIM
Prienantiniene		0.76	0.41	1.4		20	ug/L	0	11/24/04	SW040 3510C	8270C-SIM
Pyrene		0.76	0.33	1.1		20	ug/L 0/Decev	Q D	11/24/04	SVV646 3510C	8270C-SIW
Nitropenzene-as		0				20	%Recov	D	11/24/04	SVV846 3510C	8270C-SIIV
2-Fluoropipnenyi		0				20	%Recov	D	11/24/04	SVV846 3510C	8270C-SIM
lerphenyl-d14		0		· · · · · · ·	<u> </u>	20	%Recov	D	11/24/04	SVV846 3510C	8270C-SIM
PAH/PNA BLANK										Prep Da	te: 11/23/04
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
PAH Blank ID		1550-29				1					

Analytical Report Number: 853671

1241 Bellevue Street Green Bay, WI 54302 920-469-2436

A Division of Pace Analy	tical Service	es, Inc.								920-469-2	2436
Client : El	NSR-MN								Mati	rix Type: WATE	R
Project Name : S	NL & P								Collecti	on Date : 11/16/	04
Project Number: 09	413-098								Rep	ort Date : 12/01/	04
Field ID : M	W-8							La	b Sample	Number: 85367	1-004
BTEX							·			Prep Dat	te: 11/22/04
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
Benzene		74000	34	110		250	ug/L		11/22/04	SW846 5030B	SW846 M8021
Ethylbenzene		980	100	330		250	ug/L		11/22/04	SW846 5030B	SW846 M8021
Toluene		51000	89	300		250	ug/L		11/22/04	SW846 5030B	SW846 M8021
Xylene, o		6500	90	300		250	ug/L		11/22/04	SW846 5030B	SW846 M8021
Xylenes, m + p		14000	190	620		250	ug/L		11/22/04	SW846 5030B	SW846 M8021
a,a,a-Trifluorotoluene		96				1	%Recov		11/22/04	SW846 5030B	SW846 M8021
BTEX BLANK										Prep Da	te: 11/22/04
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
BTEX Blank ID		1536-65				1					
PAH/ PNA										Prep Da	te: 11/23/04
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene		690	130	430		800	ug/L		11/30/04	SW846 3510C	8270C-SIM
2-Methylnaphthalene		830	140	480		800	ug/L		11/30/04	SW846 3510C	8270C-SIM
Acenaphthene		1000	120	410		800	ug/L		11/30/04	SW846 3510C	8270C-SIM
Acenaphthylene		130	120	410		800	ug/L	Q	11/30/04	SW846 3510C	8270C-SIM
Anthracene		520	110	380		800	ug/L		11/30/04	SW846 3510C	8270C-SIM
Benzo(a)anthracene		300	130	420		800	ug/L	Q	11/30/04	SW846 3510C	8270C-SIM
Benzo(a)pyrene		230	120	390		800	ug/L	Q	11/30/04	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	110	110	380		800	ug/L		11/30/04	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	130	130	440		800	ug/L		11/30/04	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene		140	120	410		800	ug/L	Q	11/30/04	SW846 3510C	8270C-SIM
Chrysene		290	100	350		800	ug/L	Q	11/30/04	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	140	140	470		800	ug/L		11/30/04	SW846 3510C	8270C-SIM
Fluoranthene		790	110	350		800	ug/L		11/30/04	SW846 3510C	8270C-SIM
Fluorene		410	140	460		800	ug/L	Q	11/30/04	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene	<	110	110	360		800	ug/L		11/30/04	SW846 3510C	8270C-SIM
Naphthalene		1400	140	480		800	ug/L		11/30/04	SW846 3510C	8270C-SIM
Phenanthrene		1900	130	430		800	ug/L		11/30/04	SW846 3510C	8270C-SIM
Pyrene		1000	100	350		800	ug/L		11/30/04	SW846 3510C	8270C-SIM
Nitrobenzene-d5		0				800	%Recov	D	11/30/04	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		0				800	%Recov	D	11/30/04	SW846 3510C	8270C-SIM
Terphenyl-d14		0				800	%Recov	D	11/30/04	SW846 3510C	8270C-SIM
PAH/PNA BLANK										Prep Da	te: 11/23/04
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Ani Date	Prep Method	Anl Method
PAH Blank ID		1550-29				1					

Analytical Report Number: 853671

1241 Bellevue Street Green Bay, WI 54302

A Division of Pace Analy	tical Service	es, Inc.								920-469-2	436		
Client: E	NSR-MN							Matrix Type: WATER					
Project Name : S	WL & P								Collecti	on Date : 11/16/	04		
Project Number: 0	9413-098								Rep	ort Date: 12/01/	04		
Field ID : M	W-9							La	b Sample I	Number: 85367	1-006		
BTEX							· · · · ·	<u></u>		Prep Dat	te: 11/22/04		
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method		
Benzene		54000	34	110		250	ug/L		11/22/04	SW846 5030B	SW846 M8021		
Ethylbenzene		870	100	330		250	ug/L		11/22/04	SW846 5030B	SW846 M8021		
Toluene		13000	89	300		250	ug/L		11/22/04	SW846 5030B	SW846 M8021		
Xylene, o		780	90	300		250	ug/L		11/22/04	SW846 5030B	SW846 M8021		
Xylenes, m + p		2700	190	620		250	ug/L		11/22/04	SW846 5030B	SW846 M8021		
a,a,a-Trifluorotoluene		98				1	%Recov		11/22/04	SW846 5030B	SW846 M8021		
BTEX BLANK										Prep Dat	te: 11/22/04		
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method		
BTEX Blank ID		1536-65				1				· · · · · · · · · · · · · · · · · · ·			
PAH/ PNA										Prep Dat	te: 11/23/04		
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Ani Method		
1-Methylnaphthalene		100	20	66		1000	ug/L	**	11/30/04	SW846 3510C	8270C-SIM		
2-Methylnaphthalene		110	23	76		1000	ug/L		11/30/04	SW846 3510C	8270C-SIM		
Acenaphthene		100	19	65		1000	ug/L		11/30/04	SW846 3510C	8270C-SIM		
Acenaphthylene	<	19	19	64		1000	ug/L		11/30/04	SW846 3510C	8270C-SIM		
Anthracene	<	18	18	59		1000	ug/L		11/30/04	SW846 3510C	8270C-SIM		
Benzo(a)anthracene	<	20	20	65		1000	ug/L		11/30/04	SW846 3510C	8270C-SIM		
Benzo(a)pyrene	<	18	18	60		1000	ug/L		11/30/04	SW846 3510C	8270C-SIM		
Benzo(b)fluoranthene	<	18	18	60		1000	ug/L		11/30/04	SW846 3510C	8270C-SIM		
Benzo(ghi)perylene	<	21	21	69		1000	ug/L		11/30/04	SW846 3510C	8270C-SIM		
Benzo(k)fluoranthene	<	19	19	64		1000	ug/L		11/30/04	SW846 3510C	8270C-SIM		
Chrysene	<	16	16	55		1000	ug/L		11/30/04	SW846 3510C	8270C-SIM		
Dibenz(a,h)anthracene	<	22	22	73		1000	ug/L		11/30/04	SW846 3510C	8270C-SIM		
Fluoranthene	<	16	16	55		1000	ug/L		11/30/04	SW846 3510C	8270C-SIM		
Fluorene		31	22	73		1000	ug/L	Q	11/30/04	SW846 3510C	8270C-SIM		
Indeno(1,2,3-cd)pyrene	<	17	17	57		1000	ug/L		11/30/04	SW846 3510C	8270C-SIM		
Naphthalene		310	22	75		1000	ug/L		11/30/04	SW846 3510C	8270C-SIM		
Phenanthrene		78	20	68		1000	ug/L		11/30/04	SW846 3510C	8270C-SIM		
Pvrene	<	16	16	54		1000	ug/L		11/30/04	SW846 3510C	8270C-SIM		
Nitrobenzene-d5		0				1000	%Recov	D	11/30/04	SW846 3510C	8270C-SIM		
2-Eluorobiphenvl		0				1000	%Recov	D	11/30/04	SW846 3510C	8270C-SIM		
Terphenyl-d14		0				1000	%Recov	D	11/30/04	SW846 3510C	8270C-SIM		
PAH/PNA BLANK										Prep Dat	te: 11/23/04		
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method		
PAH Blank ID		1550-29				1							

Analytical Report Number: 853671

1241 Bellevue Street Green Bay, WI 54302 920-469-2436

PAH Blank ID		1550-29				1					
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Ani Date	Prep Method	Anl Method
PAH/PNA BLANK										Prep Dat	te: 11/23/04
Terphenyl-d14		0				20	%Recov	D	11/24/04	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		0				20	%Recov	D	11/24/04	SW846 3510C	8270C-SIM
Nitrobenzene-d5		0				20	%Recov	D	11/24/04	SW846 3510C	8270C-SIM
Pyrene	<	0.33	0.33	1.1		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
Phenanthrene		1.0	0.41	1.4		20	ug/L	Q	11/24/04	SW846 3510C	8270C-SIM
Naphthalene		19	1.1	3.7		50	ug/L	D	11/30/04	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrene	<	0.34	0.34	1.1		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
Fluorene		1.2	0.44	1.5		20	ug/L	Q	11/24/04	SW846 3510C	8270C-SIM
Fluoranthene	<	0.33	0.33	1.1		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracene	<	0.44	0.44	1.5		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
Chrysene	<	0.33	0.33	1.1		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene	<	0.39	0.39	1.3		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	<	0.41	0.41	1.4		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	<	0.36	0.36	1.2		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
Benzo(a)pyrene	<	0.36	0.36	1.2		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
Benzo(a)anthracene	<	0.39	0.39	1.3		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
Anthracene	<	0.35	0.35	1.2		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
Acenaphthylene	<	0.39	0.39	1.3		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
Acenaphthene		8.4	0.39	1.3		20	ug/L		11/24/04	SW846 3510C	8270C-SIM
2-Methylnaphthalene		1.3	0.45	1.5		20	ug/L	Q	11/24/04	SW846 3510C	8270C-SIM
1-Methyinaphthalene		10	1.0	3.3		50	ug/L	D	11/30/04	SW846 3510C	8270C-SIM
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
PAH/ PNA								. .		Prep Dat	te: 11/23/04
BIEX Blank ID		1535-65				1					
		Result				ווט	UnitS	Lode	Ani Date	Prep Method	Ani Method
		Decult		1.00	ECI	יים	11	0		Prep Dat	
								<u> </u>			
a,a,a-Trifluorotoluene		101		-		1	%Recov		11/23/04	SW846 5030B	SW846 M8021
Xylenes, m + p		1.7	0.74	2.5		1	ug/L	Q	11/23/04	SW846 5030B	SW846 M8021
Xylene, o		3.9	0.36	1.2		1	ug/L		11/23/04	SW846 5030B	SW846 M8021
Toluene	<	0.36	0.36	1.2		1	ug/L		11/23/04	SW846 5030B	SW846 M8021
Ethylbenzene		0.56	0.40	1.3		1	ug/L	Q	11/23/04	SW846 5030B	SW846 M8021
Benzene		0.95	0.14	0.46		1	ug/L		11/23/04	SW846 5030B	SW846 M8021
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
DTEV										Bron Dol	to: 11/23/04
Project Number:0 Field ID:1	9413-098 AW-11							La	Repo b Sample I	ort Date: 12/01/ Number: 85367	04 1-008
Project Name : S	5VVL & P								Collecti	on Date: 11/16/	04
Client : E									Wati Callasti	nx lype: VVAIE	
Client - E									88-4	NATE	ъ
A Division of Pace Anal	ytical Service	es, Inc.								920-469-2	2436

Analytical Report Number: 853671

1241 Bellevue Street Green Bay, WI 54302 920-469-2436

А	Division	of Pace	Analytical	Services,	Inc.
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Client :	ENSR-MN							Matrix Type: WATER				
Project Name :	SWL & P								Collecti	on Date: 11/16/	04	
Project Number :	09413-098								Rep	ort Date: 12/01/	04	
Field ID :	TRIP BLANK							Lab Sample Number: 853671-010				
BTEX										Prep Dat	te: 11/23/04	
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Ani Method	
Benzene	<	0.14	0.14	0.46	·	1	ug/L		11/23/04	SW846 5030B	SW846 M8021	
Ethylbenzene	<	0.40	0.40	1.3		1	ug/L		11/23/04	SW846 5030B	SW846 M8021	
Toluene	<	0.36	0.36	1.2		1	ug/L		11/23/04	SW846 5030B	SW846 M8021	
Xylene, o	<	0.36	0.36	1.2		1	ug/L		11/23/04	SW846 5030B	SW846 M8021	
Xylenes, m + p	<	0.74	0.74	2.5		1	ug/L		11/23/04	SW846 5030B	SW846 M8021	
a,a,a-Trifluorotoluene		101				1	%Recov		11/23/04	SW846 5030B	SW846 M8021	
BTEX BLANK										Prep Da	te: 11/22/04	
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Ani Date	Prep Method	Anl Method	
BTEX Blank ID		1536-65	,			1						

Qualifier Codes

Flag	Applies To	Explanation
A	Inorganic	Analyte is detected in the method blank. Method blank criteria is evaluated to the laboratory method detection limit. Additionally, method blank acceptance may be based on project specific criteria or determined from analyte concentrations in the sample and are evaluated on a sample by sample basis.
в	Inorganic	The analyte has been detected between the method detection limit and the reporting limit.
В	Organic	Analyte is present in the method blank. Method blank criteria is evaluated to the laboratory method detection limit. Additionally, method blank acceptance may be based on project specific criteria or determined from analyte concentrations in the sample and are evaluated on a sample by sample basis.
С	All	Elevated detection limit.
D	All	Analyte value from diluted analysis or surrogate result not applicable due to sample dilution.
E	Inorganic	Estimated concentration due to matrix interferences. During the metals analysis the serial dilution failed to meet the established control limits of 0-10%. The sample concentration is greater than 50 times the IDL for analysis done on the ICP or 100 times the IDL for analysis done on the ICP-MS. The result was flagged with the E qualifier to indicate that a physical interference was observed.
Е	Organic	Analyte concentration exceeds calibration range.
F	Inorganic	Due to potential interferences for this analysis by Inductively Coupled Plasma techniques (SW-846 Method 6010), this analyte has been confirmed by and reported from an alternate method.
F	Organic	Surrogate results outside control criteria.
Н	All	Preservation, extraction or analysis performed past holding time.
HF	Inorganic	This test is considered a field parameter, and the recommended holding time is 15 minutes from collection. The analysis was performed in the laboratory beyond the recommended holding time.
J	Inorganic	The analyte has been detected between the method detection limit and the reporting limit.
J	Organic	Concentration detected is greater than the method detection limit but less than the reporting limit.
К	Inorganic	Sample received unpreserved. Sample was either preserved at the time of receipt or at the time of sample preparation.
K	Organic	Detection limit may be elevated due to the presence of an unrequested analyte.
L	All	Elevated detection limit due to low sample volume.
М	Organic	Sample pH was greater than 2
N	All	Spiked sample recovery not within control limits.
О	Organic	Sample received overweight.
P	Organic	The relative percent difference between the two columns for detected concentrations was greater than 40%.
Q	All	The analyte has been detected between the limit of detection (LOD) and limit of quantitation (LOQ). The results are qualified due to the uncertainty of analyte concentrations within this range.
S	Organic	The relative percent difference between quantitation and confirmation columns exceeds internal quality control criteria. Because the result is unconfirmed, it has been reported as a non-detect with an elevated detection limit.
U	All	The analyte was not detected at or above the reporting limit.
V	Ali	Sample received with headspace.
W	All	A second aliquot of sample was analyzed from a container with headspace.
Х	All	See Sample Narrative.
&	All	Laboratory Control Spike recovery not within control limits.
*	All	Precision not within control limits.
<	All	The analyte was not detected at or above the reporting limit.
1	Inorganic	Dissolved analyte or filtered analyte greater than total analyte; analyses passed QC based on precision criteria.
2	Inorganic	Dissolved analyte or filtered analyte greater than total analyte; analyses failed QC based on precision criteria.
3	Inorganic	BOD result is estimated due to the BOD blank exceeding the allowable oxygen depletion.
4	Inorganic	BOD duplicate precision not within control limits. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
5	Inorganic	BOD result is estimated due to insufficient oxygen depletion. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
6	Inorganic	BOD laboratory control sample not within control limits. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
7	Inorganic	BOD result is estimated due to complete oxygen depletion. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.

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En Chem, Inc. Cooler Receipt Log

Project Name or ID No. of Coolers:	
A. Receipt Phase: Date cooler was opened: 11/19/04 By: 2. W	Deling.
1: Were samples received on ice? (Must be $\leq 6 \text{ C}$)	NO ² NA
2. Was there a Temperature Blank?YES	NO
3: Were custody seals present and intact on cooler? (Record on COC)YES	- ON
4: Are COC documents present?	NO ²
5: Does this Project require quick turn around analysis?YES	NQ
6: Is there any sub-work?YES	\odot
7: Are there any short hold time tests?	NO
8: Are any samples nearing expiration of hold-time? (Within 2 days)	NO Contacted by/Who
9: Do any samples need to be Filtered or Preserved in the lab?	NO Contacted by/Who
B. Check-in Phase: Date samples were Checked-in: <u>11/19/04</u> By:	hullin
1: Were all sample containers listed on the COC received and intact?	NO ² NA
2: Sign the COC as received by En Chem. Completed	NO
3: Do sample labels match the COC?	NO ²
4: Completed pH check on preserved samples	NO NA
(This statement does not apply to water. VOC, OxC, TOC, DRO, Total Rec. Filencies) 5: Do samples have correct chemical preservation?	NO ² NA
6: Are dissolved parameters field filtered?	NO ² (NA ⁷
7: Are sample volumes adequate for tests requested?	NO ²
8: Are VOC samples free of bubbles >6mm	NO ² NA
9: Enter samples into logbook. Completed	NO
10: Place laboratory sample number on all containers and COC. Completed	NO
11: Complete Laboratory Tracking Sheet (LTS). CompletedYES	NO MA
12: Start Nonconformance formYES	NO NA
13: Initiate Subcontracting procedure. CompletedYES	NO NA
14: Check laboratory sample number on all containers and COC	NO NA

Short Hold-time tests:

24 Hours or less	48 Hours	7 days	Footnotes
Coliform	BOD	Ash	1 Notify proper lab group
Corrosivity = pH	Color	Aqueous Extractable Organics- ALL	immediately.
Dissolved Oxygen	Nitrite or Nitrate	Flashpoint	2 Complete nonconformance
Hexavalent Chromium	Ortho Phosphorus	Free Liquids	memo.
HPC	Surfactants	Sulfide	
Ferrous Iron	Turbidity	TDS	
Eh	En Core Preservation	TSS	
Odor	Power stop preservation	Total Solids	
Residual Chlorine		TVS	
Sulfite		TVSS	
		Unpreserved VOC's	

Rev. 2/05/04, Attachment to 1-REC-5. Subject to QA Audit.

p:/everyone/forms/samplereceiving/crl.doc



1241 Bellevue Street, Suite 9 Green Bay, WI 54302 920-469-2436, Fax: 920-469-8827

Lab Contact: Laurie Woelfel

A Division of Pace Analytical Services, Inc.

Analytical Report Number: 852367

Client: ENSR-MN

Project Name: SWL&P MGP

Project Number: 09413-098

Lab Sample Number	Field ID	Matrix	Collection Date
852367-001	MW-11-6-7	SOIL	10/13/04
852367-002	MW-11-6-7-DUP	SOIL	10/13/04
852367-003	MW-10-5-6	SOIL	10/13/04
852367-004	GP23-14-15	SOIL	10/14/04
852367-005	GP2331	WATER	10/14/04
852367-006	MW-8-7-8	SOIL	10/14/04
852367-007	MW-12-4-5	SOIL	10/15/04

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and Laboratory Standard Operating Procedure. Exceptions, if any, are discussed in the accompanying sample comments. Release of this final report is authorized by Laboratory management, as is verified by the following signature. Reported results shall not be reproduced, except in full, without the written approval of the lab. The sample results relate only to the analytes of interest tested.

Lance Wolf

10/2 Ploy

Approval Signature

Date

Analytical Report Number: 852367

1241 Bellevue Street Green Bay, WI 54302 920-469-2436

A Division of Pace Analytical Services, Inc.

Client :	ENSR-MN
Project Name :	SWL&P MGP
Project Number :	09413-098

Field ID : MW-11-6-7-DUP

Matrix Type : SOIL Collection Date : 10/13/04 Report Date : 10/26/04 Lab Sample Number : 852367-002

INORGANICS

Test		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
Percent Solids		74.7				1	%		10/20/04	SM 2540G M	SM 2540G M
BTEX										Prep Da	ite: 10/21/04
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
Benzene	<	33	33	80		50	ug/kg		10/22/04	5035/5030B	SW846 M8021
Ethylbenzene	<	33	33	80		50	ug/kg		10/22/04	5035/5030B	SW846 M8021
Toluene		120	33	80		50	ug/kg		10/22/04	5035/5030B	SW846 M8021
Xylene, o	<	33	33	80		50	ug/kg		10/22/04	5035/5030B	SW846 M8021
Xylenes, m + p	<	33	33	80		50	ug/kg		10/22/04	5035/5030B	SW846 M8021
a,a,a-Trifluorotoluene		101				1	%Recov		10/22/04	5035/5030B	SW846 M8021
BTEX BLANK										Prep Da	ite: 10/21/04
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Ani Date	Prep Method	Anl Method
BTEX Blank ID		1530-72				1					
PAH/PNA										Prep Da	ite: 10/20/04
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene		4.6	3.1	10		1	ug/Kg	Q	10/20/04	SW846 3545	8270C-SIM
2-Methylnaphthalene		4.8	4.3	14		1	ug/Kg	Q	10/20/04	SW846 3545	8270C-SIM
Acenaphthene		27	2.1	7.1		1	ug/Kg		10/20/04	SW846 3545	8270C-SIM
Acenaphthylene	<	7.5	7.5	25		1	ug/Kg		10/20/04	SW846 3545	8270C-SIM
Anthracene		8.5	2,9	9.6		1	ug/Kg	Q	10/20/04	SW846 3545	8270C-SIM
Benzo(a)anthracene		19	17	56		1	ug/Kg	Q	10/20/04	SW846 3545	8270C-SIM
Benzo(a)pyrene		19	13	45		1	ug/Kg	Q	10/20/04	SW846 3545	8270C-SIM
Benzo(b)fluoranthene	<	11	11	37		1	ug/Kg		10/20/04	SW846 3545	8270C-SIM
Benzo(ghi)perylene		10	7.4	25		1	ug/Kg	Q	10/20/04	SW846 3545	8270C-SIM
Benzo(k)fluoranthene	<	15	15	49		1	ug/Kg		10/20/04	SW846 3545	8270C-SIM
Chrysene		18	15	51		1	ug/Kg	Q	10/20/04	SW846 3545	8270C-SIM
Dibenz(a,h)anthracene	<	4.4	4.4	15		1	ug/Kg		10/20/04	SW846 3545	8270C-SIM
Fluoranthene		39	13	42		1	ug/Kg	Q	10/20/04	SW846 3545	8270C-SIM
Fluorene		4.0	1.8	5.9		1	ug/Kg	Q	10/20/04	SW846 3545	8270C-SIM
Indeno(1,2,3-cd)pyrene		7.8	7.1	24		1	ug/Kg	Q	10/20/04	SW846 3545	8270C-SIM
Naphthalene		13	3.3	11		1	ug/Kg		10/20/04	SW846 3545	8270C-SIM
Phenanthrene		8.3	7.5	25		1	ug/Kg	Q	10/20/04	SW846 3545	8270C-SIM
Pyrene		51	17	56		1	ug/Kg	Q	10/20/04	SW846 3545	8270C-SIM
Nitrobenzene-d5		54				1	%Recov		10/20/04	SW846 3545	8270C-SIM
2-Fluorobiphenyl		61				1	%Recov		10/20/04	SW846 3545	8270C-SIM
Terphenyl-d14		77				1	%Recov		10/20/04	SW846 3545	8270C-SIM
PAH/PNA BLANK										Prep Da	ite: 10/20/04
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Ani Date	Prep Method	Anl Method
PAH Blank ID		1454-24	•			1			10/20/04		

Analytical Report Number: 852367

1241 Bellevue Street Green Bay, WI 54302 920-469-2436

Matrix Type : SOIL Collection Date : 10/14/04 Report Date : 10/26/04 Lab Sample Number : 852367-004

A Division of Pace Analytical Services, Inc.

En Chem, Inc.

Client :	ENSR-MN
Project Name :	SWL&P MGP
Project Number :	09413-098
Field ID :	GP23-14-15

INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
Percent Solids	46.9				1	%		10/20/04	SM 2540G M	SM 2540G M
BTEX									Prep Da	te: 10/21/04
Analyte	Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
Benzene	1.3E+7	27000	64000	*****	25000	ug/kg		10/22/04	SW846 5030B	SW846 M8021
Ethylbenzene	170000	27000	64000		25000	ug/kg		10/22/04	SW846 5030B	SW846 M8021
Toluene	1.1E+7	27000	64000		25000	ug/kg		10/22/04	SW846 5030B	SW846 M8021
Xylene, o	2.1E+6	27000	64000		25000	ug/kg		10/22/04	SW846 5030B	SW846 M8021
Xylenes, m + p	2.9E+6	53000	130000		25000	ug/kg		10/22/04	SW846 5030B	SW846 M8021
a,a,a-Trifluorotoluene	94				1	%Recov		10/22/04	SW846 5030B	SW846 M8021
BTEX BLANK									Prep Da	te: 10/21/04
Analyte	Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
BTEX Blank ID	1530-72				1					
PAH/PNA									Prep Da	te: 10/20/04
Analyte	Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	6100	780	2600		80	ug/Kg		10/21/04	SW846 3545	8270C-SIM
2-Methylnaphthalene	11000	1100	3700		80	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Acenaphthene	3400	540	1800		80	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Acenaphthylene	15000	1900	6300		80	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Anthracene	9500	730	2400		80	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Benzo(a)anthracene	9600	4200	14000		80	ug/Kg	Q	10/21/04	SW846 3545	8270C-SIM
Benzo(a)pyrene	13000	3400	11000		80	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Benzo(b)fluoranthene	8900	2800	9300		80	ug/Kg	Q	10/21/04	SW846 3545	8270C-SIM
Benzo(ghi)perylene	14000	1900	6300		80	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Benzo(k)fluoranthene	8900	3800	13000		80	ug/Kg	Q	10/21/04	SW846 3545	8270C-SIM
Chrysene	13000	3900	13000		80	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Dibenz(a,h)anthracene	2000	1100	3800		80	ug/Kg	Q	10/21/04	SW846 3545	8270C-SIM
Fluoranthene	17000	3200	11000		80	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Fluorene	2300	450	1500		80	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Indeno(1,2,3-cd)pyrene	9100	1800	6000		80	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Naphthalene	190000	840	2800		80	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Phenanthrene	15000	1900	6400		80	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Pyrene	29000	4200	14000		80	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Nitrobenzene-d5	0				80	%Recov	D	10/21/04	SW846 3545	8270C-SIM
2-Fluorobiphenvl	0				80	%Recov	D	10/21/04	SW846 3545	8270C-SIM
Terphenyl-d14	0				80	%Recov	D	10/21/04	SW846 3545	8270C-SIM
PAH/PNA BLANK									Prep Da	te: 10/20/04
Analyte	Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
PAH Blank ID	1454-24			<u> </u>	1	1744 Hara 81		10/20/04	· ·	

Analytical Report Number: 852367

1241 Bellevue Street Green Bay, WI 54302 920-469-2436

A Division of Pace Analytical Services, Inc.

En Chem, Inc.

INORGANICS	
Field ID: MW-8-7-8	Lab Sample Number : 852367-006
Project Number: 09413-098	Report Date : 10/26/04
Project Name : SWL&P MGP	Collection Date: 10/14/04
Client : ENSR-MN	Matrix Type : SOIL

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Ani Date	Prep Method	Anl Method
Percent Solids	59.9				1	%		10/20/04	SM 2540G M	SM 2540G M
BTEX									Prep Da	te: 10/21/04
Analyte	Result	LOD	LOQ	EQL	Dii.	Units	Code	Anl Date	Prep Method	Ani Method
Benzene	5900	42	100		50	ug/kg		10/22/04	5035/5030B	SW846 M8021
Ethylbenzene	730	42	100		50	ug/kg		10/22/04	5035/5030B	SW846 M8021
Toluene	3200	42	100		50	ug/kg		10/22/04	5035/5030B	SW846 M8021
Xylene, o	620	42	100		50	ug/kg		10/22/04	5035/5030B	SW846 M8021
Xylenes, m + p	1100	42	100		50	ug/kg		10/22/04	5035/5030B	SW846 M8021
a,a,a-Trifluorotoluene	97				1	%Recov		10/22/04	5035/5030B	SW846 M8021
BTEX BLANK							_		Prep Da	te: 10/21/04
Analyte	Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Ani Method
BTEX Blank ID	1530-72				1					
PAH/PNA									Prep Da	te: 10/20/04
Analyte	Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	9000	150	510		20	ug/Kg		10/21/04	SW846 3545	8270C-SIM
2-Methylnaphthalene	12000	220	720		20	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Acenaphthene	13000	110	350		20	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Acenaphthylene	9900	370	1200		20	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Anthracene	10000	140	480		20	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Benzo(a)anthracene	13000	830	2800		20	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Benzo(a)pyrene	30000	670	2200		20	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Benzo(b)fluoranthene	15000	550	1800		20	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Benzo(ghi)perylene	13000	370	1200		20	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Benzo(k)fluoranthene	15000	740	2500		20	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Chrysene	17000	760	2500		20	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Dibenz(a,h)anthracene	3300	220	740		20	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Fluoranthene	18000	630	2100		20	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Fluorene	4000	89	300		20	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Indeno(1,2,3-cd)pyrene	10000	350	1200		20	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Naphthalene	22000	160	550		20	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Phenanthrene	22000	380	1300		20	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Pvrene	28000	830	2800		20	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Nitrobenzene-d5	0				20	%Recov	D	10/21/04	SW846 3545	8270C-SIM
2-Fluorobiphenvl	0				20	%Recov	D	10/21/04	SW846 3545	8270C-SIM
Terphenyl-d14	0				20	%Recov	D	10/21/04	SW846 3545	8270C-SIM
PAH/PNA BLANK									Prep Da	ite: 10/20/04
Analyte	Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
PAH Blank ID	1454-24	ļ	<u></u>		1			10/20/04	····	

Qualifier Codes

Flag	Applies To	Explanation
A	Inorganic	Analyte is detected in the method blank. Method blank criteria is evaluated to the laboratory method detection limit. Additionally, method blank acceptance may be based on project specific criteria or determined from analyte concentrations in the sample and are evaluated on a sample by sample basis.
В	Inorganic	The analyte has been detected between the method detection limit and the reporting limit.
B	Organic	Analyte is present in the method blank. Method blank criteria is evaluated to the laboratory method detection limit. Additionally, method blank acceptance may be based on project specific criteria or determined from analyte concentrations in the sample and are evaluated on a sample by sample basis.
C	All	Elevated detection limit.
D	All	Analyte value from diluted analysis or surrogate result not applicable due to sample dilution.
E	Inorganic	Estimated concentration due to matrix interferences. During the metals analysis the serial dilution failed to meet the established control limits of 0-10%. The sample concentration is greater than 50 times the IDL for analysis done on the ICP or 100 times the IDL for analysis done on the ICP-MS. The result was flagged with the E qualifier to indicate that a physical interference was observed.
Е	Organic	Analyte concentration exceeds calibration range.
F	Inorganic	Due to potential interferences for this analysis by Inductively Coupled Plasma techniques (SW-846 Method 6010), this analyte has been confirmed by and reported from an alternate method.
F	Organic	Surrogate results outside control criteria.
Н	All	Preservation, extraction or analysis performed past holding time.
HF	Inorganic	This test is considered a field parameter, and the recommended holding time is 15 minutes from collection. The analysis was performed in the laboratory beyond the recommended holding time.
J	Inorganic	The analyte has been detected between the method detection limit and the reporting limit.
J	Organic	[©] Concentration detected is greater than the method detection limit but less than the reporting limit.
К	Inorganic	Sample received unpreserved. Sample was either preserved at the time of receipt or at the time of sample preparation.
к	Organic	Detection limit may be elevated due to the presence of an unrequested analyte.
L	All	Elevated detection limit due to low sample volume.
М	Organic	Sample pH was greater than 2
Ν	All	Spiked sample recovery not within control limits.
0	Organic	Sample received overweight.
Р	Organic	The relative percent difference between the two columns for detected concentrations was greater than 40%.
Q	Ali	The analyte has been detected between the limit of detection (LOD) and limit of quantitation (LOQ). The results are qualified due to the uncertainty of analyte concentrations within this range.
S	Organic	The relative percent difference between quantitation and confirmation columns exceeds internal quality control criteria. Because the result is unconfirmed, it has been reported as a non-detect with an elevated detection limit.
U	All .	The analyte was not detected at or above the reporting limit.
V	All	Sample received with headspace.
W	All	A second aliquot of sample was analyzed from a container with headspace.
х	All	See Sample Narrative.
&	All	Laboratory Control Spike recovery not within control limits.
*	All	Precision not within control limits.
<	All	The analyte was not detected at or above the reporting limit.
1	Inorganic	Dissolved analyte or filtered analyte greater than total analyte; analyses passed QC based on precision criteria.
2	Inorganic	Dissolved analyte or filtered analyte greater than total analyte; analyses failed QC based on precision criteria.
3	Inorganic	BOD result is estimated due to the BOD blank exceeding the allowable oxygen depletion.
4	Inorganic	BOD duplicate precision not within control limits. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
5	Inorganic	BOD result is estimated due to insufficient oxygen depletion. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
6	Inorganic	BOD laboratory control sample not within control limits. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.
7	Inorganic	BOD result is estimated due to complete oxygen depletion. Due to the 48 hour holding time for this test, it is not practical to reanalyze and try to correct the deficiency.

CLIENT SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET BLKV 1530-72 Lab Name: ENCHEM INC.-GREEN BAY Contract: Lab Code: ENCHEMGB Case No.: SAS No.: SDG No.: GR07-102104 Matrix: (soil/water) SOIL Lab Sample ID: BLKV 1530-72 Sample wt/vol: 10.0 (g/mL) G Lab File ID: 007F0201 Date Received: Level: (low/med) MED % Moisture: not dec. Date Analyzed: 10/21/04 GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 50.0 Soil Extract Volume: 10(mL) Soil Aliquot Volume: 1000 (uL) CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG Q 1634-04-4-----Methyl tert-butyl ether 25.00 U 71-43-2----Benzene 25.00 U 108-88-3----Toluene 25.00 U 100-41-4----Ethylbenzene 25.00 U 108-38-3----m/p-Xylene 50.00 U 95-47-6----o-Xylene 25.00 U 108-67-8-----1,3,5-Trimethylbenzene_____95-63-6-----1,2,4-Trimethylbenzene_____ 25.00 U 25.00 U 91-20-3-----Naphthalene 30.98 -----Total Xylenes 75.00 U

FORM 1

VOLATILE	FORM 1 ORGANICS ANALYSIS	DATA SHEET	CLIENT S	SAMPLE .	NO.
Lab Name: EN CHEM IN	C GREEN BAY Co	ontract:	BLI	KK 1548	-79
Lab Code: ENCHEMGB	Case No.:	SAS No.:	SDG No.	: GRO2-	102104
Matrix: (soil/water)	WATER	Lab Samp	ple ID: BLKK	1548-7	9
Sample wt/vol:	5.000 (g/mL) ML	Lab File	e ID: 007F0	0101	
Level: (low/med)	LOW	Date Rec	ceived:		
% Moisture: not dec.	·	Date Ana	alyzed: 10/21	1/04	
GC Column: DB-624	ID: 0.32 (mm)	Dilution	n Factor: 1.0)	
Soil Extract Volume:	(uL)	Soil Ali	iquot Volume:	:	(uL)
CAS NO.	COMPOUND	CONCENTRATION (ug/L or ug/Kg	UNITS: g) UG/L	Q	
$ \begin{array}{r} 1634-04-4\\ 71-43-2\\ 108-88-3\\ 100-41-4\\ 108-38-3\\ 95-47-6\\ 108-67-8\\ 95-63-6\\ 91-20-3\\ \end{array} $	Methyl tert-buty Benzene Toluene Ethylbenzene m/p-Xylene 0-Xylene 1,3,5-Trimethylb 1,2,4-Trimethylb Naphthalene Total Xylenes	rl ether	$\begin{array}{c} 1.000\\ 1.000\\ 1.000\\ 2.000\\ 1.000\\ 1.000\\ 1.000\\ 1.000\\ 1.000\\ 1.000\\ 3.000\end{array}$	บ บ บ บ บ บ บ บ บ บ บ บ	

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PAH Sand Blank Anal by: aro Anal date-10/20/2004 Blank #1454-24

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			REFURIED					
	LOD	LOQ	RESULT	UNITS	QUALIFIER	INIT RES	WEIGHT	CALC RES
Acenaphthene	1.59	25	ND	ug/kg		0	0.02	0
Acenaphthylene	5.58	25	ND	ug/kg		0	0.02	0
Anthracene	2.15	25	ND	ug/kg		0	0.02	0
Benzo(a)anthracene	12.44	25	ND	ug/kg		0	0.02	0
Benzo(a)pyrene	10.08	25	ND	ug/kg		0	0.02	0
Benzo(b)fluoranthene	8.20	25	ND	ug/kg		0	0.02	0
Benzo(g,h,i)perylene	5.56	25	ND	ug/kg		0	0.02	0
Benzo(k)fluoranthene	11.02	25	ND	ug/kg		0	0.02	0
Chrysene	11.44	25	ND	ug/kg		0	0.02	0
Dibenzo(a,h)anthracene	3.32	25	ND	ug/kg		0	0.02	0
Fluoranthene	9.50	25	ND	ug/kg		0	0.02	0
Fluorene	1.33	25	ND	ug/kg		0	0.02	0
Indeno(1,2,3-c,d)pyrene	5.30	25	ND	ug/kg		0	0.02	0
1-Methylnaphthalene	2.29	25	ND	ug/kg		0	0.02	0
2-Methylnaphthalene	3.24	25	ND	ug/kg		0	0.02	0
Naphthalene	2.45	25	ND	ug/kg		0	0.02	0
Phenanthrene	5.64	25	ND	ug/kg		0	0.02	0
Pyrene	12.44	25	ND	ug/kg		0	0.02	0
Nitobenzene-d5			74.1	% recov			1	74.1
2-Fluorobiphenyl	1		71.5	% recov			1	71.47
Terphenyl-d14			76.2	% recov			1	76.15

REPORTED

Analytical Report Number: 852196

1241 Bellevue Street Green Bay, WI 54302 920-469-2436

A Division of Pace Analytical Services, Inc.

Matrix Type: SOIL
Collection Date: 10/12/04
Report Date: 10/26/04
Lab Sample Number: 852196-002

INORGANICS

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Test			Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
Percent Solids			76.4				1	%		10/15/04	SM 2540G M	SM 2540G M
BTEX											Prep Da	te: 10/21/04
Analyte			Result	LÒD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
Benzene			14000	260	630		400	ug/kg		10/21/04	SW846 5030B	SW846 M8021
Ethylbenzene			16000	260	630		400	ug/kg		10/21/04	SW846 5030B	SW846 M8021
Toluene		<	200	200	480		400	ug/kg		10/21/04	SW846 5030B	SW846 M8021
Xylene, o			5900	260	630		400	ug/kg		10/21/04	SW846 5030B	SW846 M8021
Xylenes, m + p			1500	520	1300		400	ug/kg		10/21/04	SW846 5030B	SW846 M8021
a,a,a-Trifluorotoluene	1 (s)		92				1	%Recov	<u> </u>	10/21/04	SW846 5030B	SW846 M8021
PAH/PNA			-								Prep Da	te: 10/19/04
Analyte	$\{ j_{i}, j_{i+1}\}_{i=1}^{N}$		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	a la portante la forma de la forma		2200	30	100		10	ug/Kg		10/25/04	SW846 3545	8270C-SIM
2-Methylnaphthalene			2800	42	140		10	ug/Kg		10/25/04	SW846 3545	8270C-SIM
Acenaphthene			3500	21	69		10	ug/Kg		10/25/04	SW846 3545	8270C-SIM
Acenaphthylene			200	73	240		10	ug/Kg	Q	10/25/04	SW846 3545	8270C-SIM
Anthracene			1800	28	94		10	ug/Kg		10/25/04	SW846 3545	8270C-SIM
Benzo(a)anthracene			790	160	540		10	ug/Kg		10/25/04	SW846 3545	8270C-SIM
Benzo(a)pyrene			580	130	440		10	ug/Kg		10/25/04	SW846 3545	8270C-SIM
Benzo(b)fluoranthene			230	110	360		10	ug/Kg	Q	10/25/04	SW846 3545	8270C-SIM
Benzo(ghi)perylene			240	73	240		10	ug/Kg		10/25/04	SW846 3545	8270C-SIM
Benzo(k)fluoranthene			360	140	480		10	ug/Kg	Q	10/25/04	SW846 3545	8270C-SIM
Chrysene			760	150	500		10	ug/Kg		10/25/04	SW846 3545	8270C-SIM
Dibenz(a,h)anthracene			61	43	140		10	ug/Kg	Q	10/25/04	SW846 3545	8270C-SIM
Fluoranthene			1900	120	410		10	ug/Kg		10/25/04	SW846 3545	8270C-SIM
Fluorene			1200	17	58		10	ug/Kg		10/25/04	SW846 3545	8270C-SIM
Indeno(1,2,3-cd)pyrene			180	69	230		10	ug/Kg	Q	10/25/04	SW846 3545	8270C-SIM
Naphthalene			4500	32	110		10	ug/Kg		10/25/04	SW846 3545	8270C-SIM
Phenanthrene			5200	74	250		10	ug/Kg		10/25/04	SW846 3545	8270C-SIM
Pvrene			2400	160	540		10	ug/Kg		10/25/04	SW846 3545	8270C-SIM
Nitrobenzene-d5			38				10	%Recov		10/25/04	SW846 3545	8270C-SIM
2-Fluorobiphenvl			42				10	%Recov		10/25/04	SW846 3545	8270C-SIM
Terphenyl-d14			52				10	%Recov		10/25/04	SW846 3545	8270C-SIM

Terphenyl-d14

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Analytical Report Number: 852196

1241 Bellevue Street Green Bay, WI 54302 920-469-2436

A Division of Pace Analytical Services, Inc.

Lab Sample Number · 852196-004
Report Date: 10/26/04
Collection Date: 10/12/04
Matrix Type: SOIL

Test		Result	LOD	LOQ	EQL	Dil.	Units	Code	Ani Date	Prep Method	Anl Method
Percent Solids		57.6				1	%		10/15/04	SM 2540G M	SM 2540G M
BTEX										Prep Da	te: 10/21/04
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
Benzene		3300	43	100		50	ug/kg		10/21/04	SW846 5030B	SW846 M8021
Ethylbenzene	<	25	25	60		50	ug/kg		10/21/04	SW846 5030B	SW846 M8021
Toluene	<	25	25	60		50	ug/kg		10/21/04	SW846 5030B	SW846 M8021
Xylene, o	<	25	25	60		50	ug/kg		10/21/04	SW846 5030B	SW846 M8021
Xylenes, m + p	<	50	50	120		50	ug/kg		10/21/04	SW846 5030B	SW846 M8021
a,a,a-Trifluorotoluene		95				1	%Recov		10/21/04	SW846 5030B	SW846 M8021
PAH/PNA										Prep Da	te: 10/19/04
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	-	190	4.0	13		1	ug/Kg		10/19/04	SW846 3545	8270C-SIM
2-Methylnaphthalene		110	5.6	19		1	ug/Kg		10/19/04	SW846 3545	8270C-SIM
Acenaphthene		230	2.8	9.2		1	ug/Kg		10/19/04	SW846 3545	8270C-SIM
Acenaphthylene	· <	9.7	9.7	32		1	ug/Kg		10/19/04	SW846 3545	8270C-SIM
Anthracene		24	3.7	12		1	ug/Kg		10/19/04	SW846 3545	8270C-SIM
Benzo(a)anthracene		22	22	72		1	ug/Kg	Q	10/19/04	SW846 3545	8270C-SIM
Benzo(a)pyrene		27	17	58		1	ug/Kg	Q	10/19/04	SW846 3545	8270C-SIM
Benzo(b)fluoranthene	<	14	14	47		1	ug/Kg		10/19/04	SW846 3545	8270C-SIM
Benzo(ghi)perylene		15	9.6	32		1	ug/Kg	Q	10/19/04	SW846 3545	8270C-SIM
Benzo(k)fluoranthene	<	19	19	64		1	ug/Kg		10/19/04	SW846 3545	8270C-SIM
Chrysene		24	20	66		1	ug/Kg	Q	10/19/04	SW846 3545	8270C-SIM
Dibenz(a,h)anthracene	<	5.8	5.8	19		1	ug/Kg		10/19/04	SW846 3545	8270C-SIM
Fluoranthene		43	16	55		1	ug/Kg	Q	10/19/04	SW846 3545	8270C-SIM
Fluorene		54	2.3	7.7		1	ug/Kg		10/19/04	SW846 3545	8270C-SIM
Indeno(1,2,3-cd)pyrene		12	9.2	31		1	ug/Kg	Q	10/19/04	SW846 3545	8270C-SIM
Naphthalene		430	4.3	14		1	ug/Kg		10/19/04	SW846 3545	8270C-SIM
Phenanthrene		100	9.8	33		1	ug/Kg		10/19/04	SW846 3545	8270C-SIM
Pyrene		53	22	72		1	ug/Kg	Q	10/19/04	SW846 3545	8270C-SIM
Nitrobenzene-d5		52				1	%Recov		10/19/04	SW846 3545	8270C-SIM
2-Fluorobiphenyl		44				1	%Recov		10/19/04	SW846 3545	8270C-SIM

1

%Recov

10/19/04 SW846 3545

8270C-SIM

Analytical Report Number: 852196

1241 Bellevue Street Green Bay, WI 54302 920-469-2436

A Division of Pace Analytical Services, Inc.

Client : ENSR-MN	Matrix Type : SOIL
Project Name : SWL&P	Collection Date: 10/12/04
Project Number: 09413-098	Report Date: 10/26/04
Field ID: MW-9-8-9	Lab Sample Number: 852196-006

INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
Percent Solids	76.8				1	%		10/15/04	SM 2540G M	SM 2540G M
BTEX									Prep Da	te: 10/21/04
Analyte	Result	LOD	LOQ	EQL	Dil.	Units	Code	Ani Date	Prep Method	Anl Method
Benzene	34000	130	310		200	ug/kg		10/21/04	SW846 5030B	SW846 M8021
Ethylbenzene	31000	130	310		200	ug/kg		10/21/04	SW846 5030B	SW846 M8021
Toluene	1000	130	310		200	ug/kg		10/21/04	SW846 5030B	SW846 M8021
Xylene, o	24000	130	310		200	ug/kg		10/21/04	SW846 5030B	SW846 M8021
Xylenes, m + p	85000	260	620		200	ug/kg		10/21/04	SW846 5030B	SW846 M8021
a,a,a-Trifluorotoluene	92				1	%Recov		10/21/04	SW846 5030B	SW846 M8021
PAH/PNA									Prep Da	te: 10/19/04
Analyte	Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	1400	15	50		5	ug/Kg		10/21/04	SW846 3545	8270C-SIM
2-Methylnaphthalene	1600	21	70		5	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Acenaphthene	1600	10	34		5	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Acenaphthylene	790	36	120		5	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Anthracene	1300	14	47		5	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Benzo(a)anthracene	1300	81	270		5	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Benzo(a)pyrene	1100	66	220		5	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Benzo(b)fluoranthene	660	53	180		5	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Benzo(ghi)perylene	720	36	120		5	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Benzo(k)fluoranthene	780	72	240		5	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Chrysene	1400	74	250		5	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Dibenz(a,h)anthracene	150	22	72		5	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Fluoranthene	2700	62	210		5	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Fluorene	830	8.6	29		5	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Indeno(1,2,3-cd)pyrene	500	34	110		5	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Naphthalene	5100	16	53		5	ug/Kg		10/21/ 04	SW846 3545	8270C-SIM
Phenanthrene	4300	37	120		5	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Pyrene	3800	81	270		5	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Nitrobenzene-d5	52				5	%Recov		10/21/04	SW846 3545	8270C-SIM
2-Fluorobiphenyl	52				5	%Recov		10/21/04	SW846 3545	8270C-SIM
Terphenyl-d14	69				5	%Recov		10/21/04	SW846 3545	8270C-SIM

Analytical Report Number: 852196

1241 Bellevue Street Green Bay, WI 54302 920-469-2436

A Division of Pace Analytical Services, Inc.

Client :	ENSR-MN
Project Name :	SWL&P
Project Number :	09413-098
Field ID :	GP28-5-6
Field ID :	GP28-5-6

Matrix Type : SOIL Collection Date: 10/12/04 Report Date: 10/26/04

Lab Sample Number: 852196-008

INORGANICS

Test	Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
Percent Solids	82.0				1	%		10/15/04	SM 2540G M	SM 2540G M
BTEX									Prep Da	te: 10/21/04
Analyte	Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
Benzene	690	30	73		50	ug/kg		10/21/04	SW846 5030B	SW846 M8021
Ethylbenzene	63	30	73		50	ug/kg	Q	10/21/04	SW846 5030B	SW846 M8021
Toluene	100	30	73		50	ug/kg		10/21/04	SW846 5030B	SW846 M8021
Xylene, o	64	30	73		50	ug/kg	Q	10/21/04	SW846 5030B	SW846 M8021
Xylenes, m + p	90	61	150		50	ug/kg	Q	10/21/04	SW846 5030B	SW846 M8021
a,a,a-Trifluorotoluene	97				1	%Recov		10/21/04	SW846 5030B	SW846 M8021
PAH/PNA									Prep Dat	te: 10/20/04
Analyte	Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene	140	2.8	9.3		1	ug/Kg		10/21/04	SW846 3545	8270C-SIM
2-Methylnaphthalene	82	4.0	13		1	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Acenaphthene	170	1.9	6.4		1	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Acenaphthylene	72	6.8	23		1	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Anthracene	82	2.6	8.7		1	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Benzo(a)anthracene	100	15	51		1	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Benzo(a)pyrene	150	12	41		1	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Benzo(b)fluoranthene	89	10	33		1	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Benzo(ghi)perylene	100	6.8	23		1	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Benzo(k)fluoranthene	97	13	45		1	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Chrysene	110	14	47		1	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Dibenz(a,h)anthracene	17	4.0	13		1	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Fluoranthene	190	12	39		1	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Fluorene	73	1.6	5.4		1	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Indeno(1,2,3-cd)pyrene	77	6.5	22		1	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Naphthalene	120	3.0	10		1	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Phenanthrene	330	6.9	23		1	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Pyrene	180	15	51		1	ug/Kg		10/21/04	SW846 3545	8270C-SIM
Nitrobenzene-d5	66				1	%Recov		10/21/04	SW846 3545	8270C-SIM
2-Fluorobiphenyl	67				1	%Recov		10/21/04	SW846 3545	8270C-SIM
Terphenyl-d14	73				1	%Recov		10/21/04	SW846 3545	8270C-SIM

En Chem, Inc. A Division of Pace Analytical Services, Inc.				lytical	Repo	rt Nu	mber: 85	1241 Bellevue Street Green Bay, WI 54302 920-469-2436				
Client : ENSR-M Project Name : SWL&P Project Number : 09413-0	/IN 198								Mata Collecti Rep	rix Type: WATE on Date: 10/12/ ort Date: 10/26/	R 04 04	
Field ID: GP-25								La	ab Sample I	Number: 85219	6-010	
BTEX										Prep Da	te: 10/16/04	
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method	
Benzene		11000	6.9	23		50	ug/L		10/16/04	SW846 5030B	SW846 M8021	
Ethylbenzene		280	20	67		50	ug/L		10/16/04	SW846 5030B	SW846 M8021	
Toluene	<	18	18	60		50	ug/L		10/16/04	SW846 5030B	SW846 M8021	
Xylene, o		88	18	60		50	ug/L		10/16/04	SW846 5030B	SW846 M8021	
Xylenes, m + p		130	37	120		50	ug/L		10/16/04	SW846 5030B	SW846 M8021	
a,a,a-Trifluorotoluene		94				1	%Recov		10/16/04	SW846 5030B	SW846 M8021	
PAH/ PNA									Prep Date: 10/19/04			
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method	
1-Methylnaphthalene		380	91	300		4000	ug/L	D	10/20/04	SW846 3510C	8270C-SIM	
2-Methylnaphthalene		510	100	340		4000	ug/L	D	10/20/04	SW846 3510C	8270C-SIM	
Acenaphthene		590	88	290		4000	ug/L	D	10/20/04	SW846 3510C	8270C-SIM	
Acenaphthylene	<	88	88	290		4000	ug/L	D	10/20/04	SW846 3510C	8270C-SIM	
Anthracene		200	80	270		4000	ug/L	QD	10/20/04	SW846 3510C	8270C-SIM	
Benzo(a)anthracene		130	89	300		4000	ug/L	QD	10/20/04	SW846 3510C	8270C-SIM	
Benzo(a)pyrene		96	83	280		4000	ug/L	QD	10/20/04	SW846 3510C	8270C-SIM	
Benzo(b)fluoranthene		51	2.0	6.8		100	ug/L		10/19/04	SW846 3510C	8270C-SIM	
Benzo(ghi)perylene	<	94	94	310		4000	ug/L	D	10/20/04	SW846 3510C	8270C-SIM	
Benzo(k)fluoranthene	<	88	88	290		4000	ug/L	D	10/20/04	SW846 3510C	8270C-SIM	
Chrysene		140	75	250		4000	ug/L	QD	10/20/04	SW846 3510C	8270C-SIM	
Dibenz(a,h)anthracene		16	2.5	8.4		100	ug/L		10/19/04	SW846 3510C	8270C-SIM	
Fluoranthene		320	75	250		4000	ug/L	D	10/20/04	SW846 3510C	8270C-SIM	
Fluorene		200	99	330		4000	ug/L	QD	10/20/04	SW846 3510C	8270C-SIM	
Indeno(1,2,3-cd)pyrene		44	1.9	6.5		100	ug/L		10/19/04	SW846 3510C	8270C-SIM	
Naphthalene		1200	100	340		4000	ug/L	D	10/20/04	SW846 3510C	8270C-SIM	
Phenanthrene		900	93	310		4000	ug/L	D	10/20/04	SW846 3510C	8270C-SIM	
Pyrene		420	74	250		4000	ug/L	D	10/20/04	SW846 3510C	8270C-SIM	
Nitrobenzene-d5		0				100	%Recov	D	10/19/04	SW846 3510C	8270C-SIM	

100

100

%Recov

%Recov

D

D

10/19/04 SW846 3510C 8270C-SIM

10/19/04 SW846 3510C 8270C-SIM

1

2-Fluorobiphenyl Terphenyl-d14

0

0

Analytical Report Number: 852196

1241 Bellevue Street Green Bay, WI 54302 920-469-2436

En	Chem,	Inc.						
A Division of Pace Analytical Services, Inc.								

A DIVISION OF FACE AN	arylical Servic	.es, mc.									
Client :	ENSR-MN								Mat	rix Type: WATE	R
Project Name :	SWL&P								Collecti	on Date: 10/12/	04
Project Number :	09413-098								Rep	ort Date: 10/26/	04
Field ID :	GP-26							La	b Sample	Number: 85219	6-012
BTEX										Prep Dat	te: 10/18/04
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
Benzene		6100	6.9	23		50	ug/L		10/18/04	SW846 5030B	SW846 M8021
Ethylbenzene	•	< 20	20	67		50	ug/L		10/18/04	SW846 5030B	SW846 M8021
Toluene		< 18	18	60		50	ug/L		10/18/04	SW846 5030B	SW846 M8021
Xylene, o		< 18	18	60		50	ug/L		10/18/04	SW846 5030B	SW846 M8021
Xylenes, m + p		< 37	37	120		50	ug/L		10/18/04	SW846 5030B	SW846 M8021
a,a,a-Trifluorotoluene		96				1	%Recov		10/18/04	SW846 5030B	SW846 M8021
PAH/ PNA										Prep Dat	te: 10/14/04
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method
1-Methylnaphthalene		5.1	0.43	1.4		20	ug/L		10/15/04	SW846 3510C	8270C-SIM
2-Methylnaphthalene		1.1	0.49	1.6		20	ug/L	Q	10/15/04	SW846 3510C	8270C-SIM
Acenaphthene		3.6	0.42	1.4		20	ug/L		10/15/04	SW846 3510C	8270C-SIM
Acenaphthylene	•	< 0.41	0.41	1.4		20	ug/L		10/15/04	SW846 3510C	8270C-SIM
Anthracene		0.71	0.38	1.3		20	ug/L	Q	10/15/04	SW846 3510C	8270C-SIM
Benzo(a)anthracene		0.49	0.42	1.4		20	ug/L	Q	10/15/04	SW846 3510C	8270C-SIM
Benzo(a)pyrene	•	< 0.39	0.39	1.3		20	ug/L		10/15/04	SW846 3510C	8270C-SIM
Benzo(b)fluoranthene	•	< 0.38	0.38	1.3		20	ug/L		10/15/04	SW846 3510C	8270C-SIM
Benzo(ghi)perylene	•	< 0.44	0.44	1.5		20	ug/L		10/15/04	SW846 3510C	8270C-SIM
Benzo(k)fluoranthene		< 0.41	0.41	1.4		20	ug/L		10/15/04	SW846 3510C	8270C-SIM
Chrysene		0.56	0.35	1.2		20	ug/L	Q	10/15/04	SW846 3510C	8270C-SIM
Dibenz(a,h)anthracen	e ·	< 0.47	0.47	1.6		20	ug/L		10/15/04	SW846 3510C	8270C-SIM
Fluoranthene		1.5	0.35	1.2		20	ug/L		10/15/04	SW846 3510C	8270C-SIM
Fluorene		0.80	0.47	1.6		20	ug/L	Q	10/15/04	SW846 3510C	8270C-SIM
Indeno(1,2,3-cd)pyrer	ne -	< 0.37	0.37	1.2		20	ug/L		10/15/04	SW846 3510C	8270C-SIM
Naphthalene		1.9	0.48	1.6		20	ug/L		10/15/04	SW846 3510C	8270C-SIM
Phenanthrene		3.4	0.44	1.5		20	ug/L		10/15/04	SW846 3510C	8270C-SIM
Pyrene		1.8	0.35	1.2		20	ug/L		10/15/04	SW846 3510C	8270C-SIM
Nitrobenzene-d5		0				20	%Recov	D	10/15/04	SW846 3510C	8270C-SIM
2-Fluorobiphenyl		0				20	%Recov	D	10/15/04	SW846 3510C	8270C-SIM
Terphenvl-d14		0				20	%Recov	D	10/15/04	SW846 3510C	8270C-SIM

En Chem, Inc. A Division of Pace Analytical Services, Inc.				lytical	Repo	rt Nu	mber: 8	1241 Bellevue Street Green Bay, WI 54302 920-469-2436					
Client : ENSR-MN Project Name : SWL&P Project Number : 09413-098 Field ID : GP-28						La	Mat Collecti Rep ab Sample	rix Type: WATE on Date: 10/12/ ort Date: 10/26/ Number: 85219	ER 04 04 6-014				
BTEX										Prep Da	te: 10/18/04		
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method		
Benzene		1300	1.4	4.6		10	ug/L		10/18/04	SW846 5030B	SW846 M8021		
Ethylbenzene		100	4.0	13		10	ug/L		10/18/04	SW846 5030B	SW846 M8021		
Toluene		340	3.6	12		10	ug/L		10/18/04	SW846 5030B	SW846 M8021		
Xylene, o		90	3.6	12		10	ug/L		10/18/04	SW846 5030B	SW846 M8021		
Xylenes, m + p		220	7.4	25		10	ug/L		10/18/04	SW846 5030B	SW846 M8021		
a,a,a-Trifluorotoluene		96				1	%Recov		10/18/04	SW846 5030B	SW846 M8021		
PAH/ PNA										Prep Da	te: 10/14/04		
Analyte		Result	LOD	LOQ	EQL	Dil.	Units	Code	Anl Date	Prep Method	Anl Method		
1-Methylnaphthalene		55	3,3	11		100	ug/L		10/15/04	SW846 3510C	8270C-SIM		
2-Methylnaphthalene		23	3.8	13		100	ug/L		10/15/04	SW846 3510C	8270C-SIM		
Acenaphthene		59	3.2	11		100	ug/L		10/15/04	SW846 3510C	8270C-SIM		
Acenaphthylene		3.5	3.2	11		100	ug/L	Q	10/15/04	SW846 3510C	8270C-SIM		
Anthracene		6.2	2.9	9.7		100	ug/L	Q	10/15/04	SW846 3510C	8270C-SIM		
Benzo(a)anthracene	<	3.2	3.2	11		100	ug/L		10/15/04	SW846 3510C	8270C-SIM		
Benzo(a)pyrene	<	3.0	3.0	10		100	ug/L		10/15/04	SW846 3510C	8270C-SIM		
Benzo(b)fluoranthene	<	3.0	3.0	9.9		100	ug/L		10/15/04	SW846 3510C	8270C-SIM		
Benzo(ghi)perylene	<	3.4	3.4	11		100	ug/L		10/15/04	SW846 3510C	8270C-SIM		
Benzo(k)fluoranthene	<	3.2	3.2	11		100	ug/L		10/15/04	SW846 3510C	8270C-SIM		
Chrysene		2.8	2.7	9.0		100	ug/L	Q	10/15/04	SW846 3510C	8270C-SIM		
Dibenz(a,h)anthracene	<	3.6	3.6	12		100	ug/L		10/15/04	SW846 3510C	8270C-SIM		
Fluoranthene		6.7	2.7	9.1		100	ug/L	Q	10/15/04	SW846 3510C	8270C-SIM		
Fluorene		17	3.6	12		100	ug/L		10/15/04	SW846 3510C	8270C-SIM		
Indeno(1,2,3-cd)pyrene	<	2.8	2.8	9.4		100	ug/L		10/15/04	SW846 3510C	8270C-SIM		
Naphthalene		96	7.4	25		200	ug/L	D	10/19/04	SW846 3510C	8270C-SIM		
Phenanthrene		40	3.4	11		100	ug/L		10/15/04	SW846 3510C	8270C-SIM		
Pyrene		8.0	2.7	9.0		100	ug/L	Q	10/15/04	SW846 3510C	8270C-SIM		

100

100

100

%Recov

%Recov

%Recov

D

D

D

10/15/04

10/15/04

10/15/04

SW846 3510C 8270C-SIM

SW846 3510C 8270C-SIM

SW846 3510C 8270C-SIM

Nitrobenzene-d5

2-Fluorobiphenyl

Terphenyl-d14

0

0

0

Analytical Report Number: 852196

1241 Bellevue Street Green Bay, WI 54302 920-469-2436

Matrix Type : WATER

A Division of Pace Analytical Services, Inc.

Client :	ENSR-MN
Project Name :	SWL&P
Project Number :	09413-098
Field ID :	TRIP BLANK

BTEX

					Collecti	on Date: 10/12/	/04
					Repo	ort Date: 10/26/	/04
				La	b Sample I	Number: 85219	6-016
						Prep Da	te : 10/18/04
100	FOL	БŰ	Unite	Code	Ani Data	Prop Method	Anl Mothod

Analyte		Result	LOD	LOQ	EQL	DII.	Units	Code	Anl Date	Prep Method	Ani Method
Benzene	<	0.14	0.14	0.46		1	ug/L		10/18/04	SW846 5030B	SW846 M8021
Ethylbenzene	<	0.40	0.40	1.3		1	ug/L		10/18/04	SW846 5030B	SW846 M8021
Toluene	<	0.36	0.36	1.2		1	ug/L		10/18/04	SW846 5030B	SW846 M8021
Xylene, o	<	0.36	0.36	1.2		1	ug/L		10/18/04	SW846 5030B	SW846 M8021
Xylenes, m + p	<	0.74	0.74	2.5		1	ug/L		10/18/04	SW846 5030B	SW846 M8021
a,a,a-Trifluorotoluene		102				1	%Recov		10/18/04	SW846 5030B	SW846 M8021

Analysis Summary by Laboratory

A Division of Pace Analytical Services, Inc.

1241 Bellevue Street Green Bay, WI 54302

1090 Kennedy Avenue Kimberly, WI 54136

Test Group Name	852196-001	852196-002	852196-003	852196-004	852196-005	852196-006	852196-007	852196-008	852196-009	852196-010	852196-011	852196-012	852196-013	852196-014	852196-015	852196-016
BTEX	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
PAH/ PNA									G	G	G	G	G	G	G	
PAH/PNA	G	G	G	G	G	G	G	G								
PERCENT SOLIDS	G	G	G	G	G	G	G	G								

Wisconsin Certification								
G = En Chem Green Bay	405132750 / DATCP: 105 000444							
K = En Chem Kimberly	445134030							
S = En Chem Superior	Not Applicable							
C = Subcontracted Analysis								

PACE ANALYTICAL SERVICES, INC. Corporate Headquarters

1700 Elm Street Minneapolis, MN 55414

> TEL: (612) 607-1700 FAX: (612) 607-6444

www.pacelabs.com

Pace Analytical purchases the laboratory operations of En Chem, Inc. in Green Bay and Kimberly, Wisconsin.

ace Analytical

Effective October 1, 2004, En Chem is now a division of Pace Analytical Services. Pace Analytical/En Chem will continue to operate service centers in Madison, Superior and Mosinee, Wisconsin – and also in Chicago and Minneapolis.

By combining the leading laboratories in Minnesota and Wisconsin, Pace Analytical and En Chem can provide the best and broadest scope of services to you, our valued customers.

Pace Analytical has retained most of En Chem's employees, including senior management at both locations. The Green Bay and Kimberly labs will operate under the direction of Bruce Warden, Pace's General Manager in Minnesota. Pace plans to coordinate work between Minnesota and Wisconsin laboratories to enhance both the quality of service and the type of services offered in the market place.

This acquisition will not disrupt any service work you currently have with En Chem or any future projects you have scheduled. Your contact person(s) at En Chem will remain the same. Please direct any questions you have regarding the acquisition to your En Chem Sales Rep or Project Manager, or feel free to contact Bill Blau, Corporate Marketing Manager at Pace, with any of your concerns: (612) 607-6355.

We sincerely appreciate your patience and understanding during this transition, and we look forward to providing you with exceptional service in the future.



A Division of Pace Analytical Services, Inc.

Company Name:ENSR Comp Branch or Location:		CHEM	1241 F Green 92 Fax 9	Bellevue St., Suite 9 Bay, WI 54302 0-469-2436 920-469-8827	б vr.999,9920, З сент ант н ³ предполной
Project Contact:	CH	AIN OF CUSTO	DY Nº 12529	Pag Outre	ge of
Project Number: <u>09413-098</u>		*Preservation	Codes	Mail Repor	tto Chris Bushin Carlson
Project Name: SWL+ P	· · · · · · · · · · · · · · · · · · ·	A=None B=HCL C=H2SO4 D= H=Sodium Bisulfate Solution I=Sodi	HNO3 E=EnCore F=Methanol Im Thiosulfate J=Other	G=NaOH Company:	ENSR
Project State:	FI	TERED? (YES/NO)		Address:	1K Glen Rd. Sinte 210
Sampled By (Print) : Chris Baching G	ar Son			St. Louis	Park, MN 55416
PO #-				Invoice To:	Same
Data Package Options - (plaase circle if requested)	Regulatory Matrix Program Codes			Company:	
Sample Results Only (no QC)	UST W=Water BCBA S=Soil		Addr	ess:	
EPA Level II (Subject to Surcharge) EPA Level III (Subject to Surcharge)	SDWA A=Air NPDES C=Charcoal	Stranger States	× × · · · · · · · · · · · · · · · · · ·		
EPA Level IV (Subject to Surcharge)	CERCLA SI=Sludge	K X X / /	Mail Invoice	To:	``
LABORATORY ID (Lab Use Only) FIELD ID	COLLECTION DATE TIME MATRIX	\$ 12 QX	CLIENT COMMI	ENTS	LAB COMMENTS (Lab Use Only)
001 GP24-5-6 1	0/12/04/1045 S X	XX	3	1-402	; 1-802; 1-202H
002 GP30-8-9	1140				
003 GP25-7-8	1215				
6100	ium l				
025 GP27-7-9	1 un				
A AND G G					
006 INV-7-8-9	1630				
00-7 Gtan-6-1					
008 GP28-5-6	V 1520 V V	1 1	4		<u> </u>
009 67-24	1750 W X	X	4	1-11 U	udua; 3-9014
010 GP-25	1808				
011 GP-30	185				
012, GP-26	1 820 V V	V	V		\checkmark
Rush Turnaround Time Requested (TAT) - Prelim	Relinquished By:	Date/Time: Re	ceived By:	Date/Time:	En Chem Project No.
Rush TAT subject to approval/surcharge)	Ch Bellal	10/13/14/700 7	Multo-	10/13/01 0990	15×196
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Samples on HOLD are subject to	Relinquished By:	, Date/Time: Re	ceived By:	Date/Time:	Present / Not Present
special pricing and release of liability					Intact / Not Intact