Arrowhead Park Development Plan

In support of WDNR Development at Historic Fill Site or Licensed Landfill Exemption Application

Neenah, Wisconsin

NEENA 142426 | September 20, 2017

SEH

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September 20, 2017

RE: Arrowhead Park Development Plan
Neenah, Wisconsin
SEH No. NEENA 142426 4.00

Mr. Michael T. Kading
Director of Parks and Recreation, Parks and Recreation Department
211 Walnut Street, P.O. Box 426
Neenah, WI 54957-0426

Dear Mr. Kading:

Short Elliott Hendrickson, Inc. (SEH®) is pleased to continue to support the City of Neenah's (City) vision and implementation of a conceptual master plan for the City's Arrowhead Park. One of the regulatory requirements to be considered as the City continues to evaluate development options is the Wisconsin Department of Natural Resources' (WDNR) approval of the park development under NR 500, Wis. Admin Code. This approval will be required since the park site was historically filled with wastewater treatment solids from nearby industry.

Previous requests for WDNR approval have been submitted and conditional approvals granted by WDNR. Based on an April 7, 2017 meeting with representatives of WDNR, we believe an updated approval request reflecting current park conceptual plans and current site information is warranted to best position the City for ongoing refinement of development and design considerations. Therefore, SEH is presenting this report in support of the City's submission of a *Development at Historic Fill Site or Licensed Landfill Exemption Application* (Application) to the WDNR. The report is intended primarily to supplement Sections IV and V of the Application.

If you have any questions regarding the report or Application, please contact me at 920.380.2815 or Bruce Olson at 715.720.6244.

Sincerely,

Andrew Dane
Project Manager

Bruce Olson, PE
Senior Environmental Engineer

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Arrowhead Park Development Plan

Arrowhead Park Development Plan
Neenah, Wisconsin

Prepared for:
City of Neenah
211 Walnut Street
Neenah, WI 54957

Prepared by:
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Arrowhead Park Development Plan

Prepared for the City of Neenah

1 Introduction and Background

The City of Neenah (City) Parks and Recreation Department continues to evaluate preliminary design and development considerations for Arrowhead Park (referred to herein as Park, subject property, or landfill) located north of Main Street on the southern shore of Little Lake Butte des Morts. The subject property is located in the SE 1/4 of Section 21 and the SW 1/4 of Section 22, T 20 N, R 17 E in the City of Neenah, Winnebago County, Wisconsin (**Figure 1, "Site Location"**). The subject property was historically a fill area for wastewater treatment solids.

The Wisconsin Department of Natural Resources (WDNR) license number for the former landfill is 2299 and the facility identification number is 471013840. The subject property is also listed on WDNR's Bureau for Remediation and Redevelopment Tracking System (BRRTS) database under the following Activity Numbers:

- 02-71-270852 Arrowhead Park-Glatfelter LF, Closed ERP – The issue (diesel range organics contamination from a former aboveground storage tank (AST) transfer line) was closed out under NR708.09 and a No Further Action letter was issued by WDNR.
- 09-71-550537 (originally 02-71-550537) P.H. Glatfelter (Former) AST, No Action Required – Notification due to an AST tank closure assessment occurred in 2007. In 2012 the site was transferred from the WDNR's Remediation and Redevelopment program to WDNR's Waste Management program. The RR site was administratively closed and the landfill management was assigned to the Waste Program.

Demolition and development of portions of the Park have occurred over many years. In 2012, GRAEF, on behalf of the City, submitted a *Development at Historic Fill Site or Licensed Landfill Exemption Application* and associated report titled *Neenah Park Sites #1 and #2 Site Investigation and Development Plan* (GRAEF, March 2012). GRAEF's documentation was based on development plans being considered at that time.

In April 2012, the WDNR issued a letter concurring with the City's development proposal, with the condition that positive drainage be maintained across the site (the WDNR would not approve of a development plan that includes areas of closed drainage on the landfill) (WDNR, 2012). Phase one of development of recreational park space on the subject property was completed in 2012 and included landscaping and construction of a walking path.

In May 2013, GRAEF, of behalf of the City, submitted the *Neenah Park Site #1 Updated Development Plan* for grant of exemption from regulation under s. NR 506.085, Wis. Admin Code (GRAEF, 2013). The updated development plan was considered phases two (construction of a paved parking lot with associated lighting) and three (construction of a berm with associated walking trails and trees, paving of an existing multi-use trail, installation of lighting along a portion of multi-use trail, and installation of a prefabricated shelter).

In June 2013, the WDNR provided a *Conditional Grant of Exemption for Development on the Neenah Park Site #1* (WDNR, 2013). The WDNR's conditional grant of exemption excluded the proposed shelter and required additional shelter design information for approval prior to installation of a shelter. The conditional grant of exemption was limited to the proposed activities described in the City's application and required a new application be submitted to the WDNR for review and approval if the City considers additional changes beyond those described in the application. Phases two and three (except a shelter) were completed in 2014-2015.

Copies of select 2012 and 2013 correspondence between the City and WDNR are included in **Appendix A, "2012 and 2013 Documentation"**.

In 2016, the City retained Short Elliott Hendrickson, Inc. (SEH®) to update the conceptual master plan (the Plan) for the Park. The Plan, contained in **Appendix B, "Conceptual Master Plan for Arrowhead Park"**, incorporated prior studies and public input gathered throughout a planning period from September 2016 to January 2017. At the time of this submittal, the Plan includes structures such as a boat works building and multi-use community building, decked terrace and paved plaza, fixed and floating piers, playground, natural amphitheater, additional paved parking and trail areas, and vegetated areas, among other considerations. Determination of impacts may alter the existing conceptual plan. Best management practices as well as an open dialogue with the community and WDNR will be maintained throughout the project to assure development is handled in a safe and responsible manner. The City believes these improvements will have a positive impact on the City and its residents.

The Plan was discussed with WDNR during an April 17, 2017 meeting. During the meeting, the WDNR indicated an appropriate next step, since development considerations had changed since the WDNR's previous exemption request approval, would be to submit an updated *Development at Historic Fill Site or Licensed Landfill Exemption Application* reflecting as many of the current design considerations as possible for WDNR's review and approval. Although the Plan continues to be conceptual, approval is being requested for proposed features and development plans. The City understands that any approval or conditional approval from WDNR may have to be amended as additional design detail is developed.

This report is intended primarily to supplement Sections IV and V of an updated *Development at Historic Fill Site or Licensed Landfill Exemption Application.* Section IV and V request a summary of existing and potential impacts, including analytical data of various media, an assessment of the known or suspected releases to the environment, existing site conditions, proposed development summary, and summary of actions to be taken and engineering controls that will minimize adverse environmental impacts and potential threats to human health and welfare, including worker safety.

As stated above, substantial information regarding the history of and environmental conditions at the subject property have been previously developed and are included in Appendices herein. For ease of review, portions may also be summarized in the body of the document.

2 Park History

The history of the Park is summarized in Section 2 of GRAEF's report in **Appendix A**. Since 2014, the primary changes to the subject property and proposed development have been the following:

- Construction of a paved parking lot with associated lighting.

- Construction of a berm with associated walking trails and trees.
- Paving of an existing multi-use trail, installation of lighting along a portion of multi-use trail.
- Demolition of the Fox Valley Energy (FVE) Center in 2015 and 2016. The foundation of the building was retained for potential future use, however, only a very small portion of the foundation of the former structure is currently exposed at the surface.
- The City has placed clean fill in various locations on the subject property.
- The Conceptual Master Plan for the Park was updated in 2017.

3 Existing Site Conditions

On June 12, 2017 Mr. Rick Hodowanic (Surveyor, SEH) conducted a site visit as part of site survey activities conducted by SEH at Arrowhead Park. Existing site features are identified on the current site survey map **(Figure 2, "Site Features"**). Photo documentation of current site conditions are provided in **Appendix C, "Photographs".**

The site is currently largely vacant, with the exposed portion of the former FVE Center building observed consisting of small concrete portions at the surface (the remainder of the existing FVE Center building foundation is currently buried. No other buildings were present on the site. Active filling activities (placement of earthen fill) were ongoing in the central portion of the subject property during the site visit. Paved surfaces within the limits of the Park included an asphalt multi-use trail generally paralleling the lakeshore, and an asphalt parking lot in the southeast portion of the site. The general condition of the multi-use trail and parking lot appeared to be good. The multi-use trail enters the park on the southeast edge of the park, and exits the park at a bridge over the Neenah Slough at the western edge of the park. Street lights are present adjacent to the parking lot and lighted bollards line the paved multi-use trail. The existing roadway park access consists of Millview Road, which extends onto the southeast side of Arrowhead Park, where it turns to gravel and extends for a short distance to the west. Other manmade site features observed at the Park include several manholes, and the rip rap bulkhead located along the Little Lake Butte des Morts shoreline. A stormwater outfall was observed beneath the lake surface just north of the bulkhead. A cyclone fence is present along the southeast park boundary.

The site topography is generally flat, with some relatively small depression areas located on the western portion of the Park. Small ditches are present on the south central and north central side of the subject property. Site vegetation outside of the active fill area generally consists of tall grass cover, and some trees present adjacent to the walking trail.

Existing groundwater monitoring points observed during the site visit include wells PS-3, PS-15, and well nest PS-33, 33A, and 33B. These wells appeared to be in good condition based on observation of the protective casings. An effort to locate well PS-9 and well nest PS-32, 32A, and 32B was made during the site visit, but these monitoring points were not found due to thick vegetation at these locations.

No leachate seeps or evidence of seeps such as stained vegetation were observed during the site visit. No evidence of stressed vegetation was identified. Generally, the vegetative cover consists of tall grass, with some trees adjacent to the walking trail, and the quality of vegetation appears to be good. No odors indicating potential gas migration through the cap were noted

during the site visit. No erosion or desiccated cracks in the cap were visually observed during the site visit. Positive site drainage appears to be maintained outside of the small depressions and ditch areas.

3.1 Topography and Land Use

Arrowhead Park is located on an historic fill area within the former bed of Little Lake Butte des Morts. The surface of the park is fairly level, with a slightly more elevated area in the central part of the site, some small depressions located near the western portion of the site, and small ditch areas in the central portion of the site. The highest portion of the site is in the central area, where surface elevations range from approximately 750 to 753 ft MSL. Generally the site drains radially away from the central area, with much of the site eventually draining to Little Lake Butte des Morts. The surface elevation on the bulkhead dike, adjacent to Little Lake Butte des Morts, is approximately 744 ft MSL sloping down to a lake surface elevation of approximately 738 ft. MSL. Earthwork is ongoing in the central portion of the site, so elevation changes will likely occur in this area over time.

The site is currently vacant and used as a City park. The FVE Center previously occupied the central portion of the site, but has since been demolished. The concrete foundation system of the former FVE Center remains in place for potential future use. Outside of the active fill area, the site is vegetated with tall grass, as well as several trees along the lighted walking path. A paved parking lot is present near the site entrance on the southeast side of the site.

Arrowhead Park is bounded to the north by Little Lake Butte des Morts, to the east by commercial development, to the south by a rail line, Main Street, and a mixture of commercial and residential development and to the west by the Neenah Slough along with industrial, commercial, and residential development. The Arrowhead Park site is currently zoned as I2 General Industrial.

3.2 Geologic and Hydrogeologic Setting

3.2.1 Soils

Surficial soils at Arrowhead Park are recent fill soils consisting of largely silts and clays. The surficial fill soils are underlain by paper pulp material which was historically used as a fill material over the former Little Lake Butte des Morts lake bed. Shallow natural soils to the south of the park consist of silty clay soils of the Winneconne Series, which typically have a 1 to 4 percent slope, are moderately well drained, and have low permeabilities (USDA, 1980).

Fill soils and shallow soils in the vicinity are underlain by glacial lake deposits consisting mainly of silts and clays (Olcott, 1968). Based on review of eight historic well logs from the vicinity, thickness of unconsolidated deposits in the vicinity of the site ranges from approximately 20 to 65 feet. Hydraulic conductivity of the basal soils was very low (5x10 -8 cm/sec to 1x10 -9 cm/sec) based on previous studies conducted at Arrowhead Park. Soil fill occurs above the native clay soils at the location of the previous WWTP, bulkhead dike, and adjacent the south boundary of the historic fill area.

3.2.2 Bedrock

The uppermost bedrock unit in the Neenah area is comprised of the Sinipee Group (likely Platteville Formation) (Ostrom, 1981). These are Ordovician aged units consisting of dolomite with some limestone and shale, and are dipping generally to the southeast at approximately 15 to

20 feet per mile. The Sinipee Group is underlain by Ordovician aged St. Peter Sandstone and Prairie du Chien dolomite, followed by a thick sequence of Cambrian aged sandstone.

3.2.3 Groundwater

Regional direction of groundwater flow in the Neenah area is generally to the north toward Little Lake Butte des Morts and the Fox River *(Olcott, 1968)*. Data obtained from onsite monitoring wells indicates direction of shallow groundwater flow at the site migrates radially away from a high area located near the center of the site. Depth to groundwater at the site has historically been relatively shallow.

The unconsolidated deposits generally are fine grained in the Neenah vicinity, and are not typically used for groundwater production due to relatively low yields (5 to 10 gpm). The bedrock units in the vicinity are generally hydraulically connected comprising one aquifer, which is commonly used for groundwater production. Typical yields from bedrock wells in the region range from 500 to 1000 gpm (Olcott, 1968).

The cities of Neenah and Menasha both produce potable water from surface water attained from Lake Winnebago, so municipal wells are not utilized. Thus, there are no known potable water wells in the immediate vicinity of Arrowhead Park. The nearest identified municipal well in the vicinity of the site is in the Village of Fox Crossing, more than 0.5 miles to the north. No known potable wells were identified in the immediate vicinity of the site.

3.3 Waste Characterization

Waste characterization of the historic fill waste materials was performed prior to 2012. No additional waste characterization, waste limit or waste volume assessments have been performed between 2012 and present. The remainder of Sections 3.3 and 3.4 is a summary of waste characterization historically performed for the site fill waste materials as presented in the GRAEF *Development at Historic Fill Site or Licensed Landfill Exemption Application* (Appendix A).

Based on the physical character of the wastewater solids, it is expected the hydraulic conductivity, even at minimal loads, would likely be very slow, on the order of 4 by 10^6 centimeters per second (cm/sec). This is based on National Council for Air and Stream Improvement data (Appendix B of GRAEF Report). The low hydraulic conductivity of the wastewater solids is supported by a City 1975 drainage study, which indicated the lateral movement of liquid in the wastewater solids was very restricted.

The Institute of Paper Chemistry (IPC) completed an analysis of the wastewater solids in 1973 and clarifier solids were analyzed by the University of Arkansas for carbon and nutrients as part of a 2003 land application study. The results are summarized in the GRAEF report, but primarily indicated that solids that were landfilled contained 55% mineral ash on a dry weight basis. The mineral ash consisted primarily of silicon, aluminum, and calcium. The remaining 45 percent of the mass was organic matter consisting mostly of short wood fiber that was lost in the pulping and paper making process.

The wastewater solids disposed in the landfill were strictly from primary clarification and not from a biological system. Therefore, the solids are relatively inert with a low nutrient content. The high pH and carbon content, together with the low nutrient content, would indicate the solids would not readily decompose.

As a deinked pulp mill, the wastewater solids likely contained PCBs. The PCB concentration in the landfilled wastewater solids has been determined on several occasions since 1983. There is PCB data on a dry weight basis from borings completed in 1988, 1991, and 1999. The PCB concentration ranged from 1.3 to 4,500 milligrams per kilogram (mg/kg) in 53 samples of the wastewater solids. The data is highly skewed and best represented by the geometric mean, which is 60.5 mg/kg. The concentration of PCBs was found to increase from 1954 to 1969, after which time it declined. Most of the solids placed in the eastern portion of the landfill were placed from 1952 to 1964 and the geometric mean concentration of PCBs in the wastewater solids at that time was 38.4 mg/kg, or less.

PCBs have a high affinity to wastewater solids and PCB losses as leachate are small. IPC column leach tests found only 0.1 percent to 0.2 percent of the solids PCB content was lost as leachate. The IPC leachate PCB concentrations ranged from 0.5 to 4 parts per billion (ppb), whereas the solids subjected to the leach tests had PCB concentrations of 20 to 82 mg/kg. DNR sample results from Leachate Head Well PS-9 also suggest PCB losses from the solids are limited. The expected PCB concentration of the wastewater solids in the area of the Leachate Head Well is 21.4 to 29.6 mg/kg, or 21,400 to 29,600 ppb. The DNR leachate sample had a PCB concentration of 1.98 ppb, which is less than 0.1 percent of the solids PCB concentration.

The potential occurrence of other organic contaminants is low, considering the age of the fill and the characteristics of clarifier solids from similar paper mills.

3.4 Waste Limits and Waste Volume

The vertical and horizontal limits of waste were historically defined through a review and interpretation of design drawings, aerial photographs, survey documentation, soil borings, and hydraulic probe borings. The northern limit of waste coincides with the clay bulkhead dike. The southern limit of waste is located along the soil embankment of the railroad tracks. Approximately 26 acres of Arrowhead Park is underlain by waste fill materials. Thickness of fill materials generally ranges from eight to ten feet. An estimated volume of 387,000 cubic yards of waste fill material has been estimated to be in place at the site. This estimate was made prior to removal of some waste fill during construction of the FVE Center in 1996.

3.4.1 Base Soils

In general, the base of the historic fill area consists of native soils of the Little Lake Butte des Morts lake bed. Soil below the waste consists of slowly permeable clay and silt that extends approximately 59.5 feet below the base of the waste. Refer to Section 3.2.1 for more detail on the soil conditions below the historic fill area (Graef, 2012).

3.4.2 Bulkhead Dike

Fine-grained fill soils with varying percentages of gravel were reportedly used for bulkhead dike construction. The dike surface was observed as primarily a fine-grained soil with varying amounts of gravel prior to rip rap placement. Historically WDNR used in-field hydraulic conductivity test results to calculate the seepage rate along the entire bulkhead dike. A seepage rate of approximately 120 gallons per day was estimated for the entire length of the bulkhead (Graef, 2012).

3.4.3 Historic Fill Area Cover

The historic fill area cover was first evaluated in 1983 when cover thickness ranged from 0.25 foot to 4.5 feet with a mean thickness between one and two feet. Subsequent to the 1983 study, the City placed additional clay soil on the cap. Soil borings completed across the landfill in 1999 found the cover thickness to vary from 1.0 to 6.3 feet, with an average thickness of 3.3 feet and consisted of silty clay with inclusions and isolated areas of roadbed material. In 2011, 34 hydraulic probe borings were completed in the central and western portion of the site. The soil cover thickness in this study ranged from 1.0 to 5.8 feet, with an average thickness of 2.9 feet in the 2011 study (Graef, 2012).

4 Evaluation of Existing Impacts

The following is an evaluation of existing impacts for various media, including groundwater, soil, surface water quality, sediment, and explosive gas (methane).

4.1 Groundwater

The following subsections describe the network of monitoring points and provides an evaluation of recent groundwater quality results.

4.1.1 Monitoring Network

The locations of the groundwater and leachate head monitoring wells are shown in **Figure 2**, and Table 4-1 provides basic construction information on the wells. A total of nine monitoring wells or piezometers are currently monitored in April and October of each year in accordance with current groundwater monitoring requirements for the site. Groundwater levels are monitored in nested wells located south of the historic fill area, and saturated levels are monitored within the limits of the historic fill area and the bulkhead dike. The present groundwater monitoring program requires that all wells are monitored for water (or leachate) elevation, specific conductance, color, odor, turbidity, temperature and pH. Monitoring Wells PS-3R and PS-15RR are also monitored for chemical oxygen demand (COD), chloride, and, total sulfate, iron, hardness, and alkalinity.

Table 4-1 – Monitoring Well Summary

Well		**Construction Summary**			
Common Name	DNR Unique No	Depth (Feet)	Material Adjacent the Screen Section	Water Table or Leachate Head Well	Piezometer
PS-3R	012	9.2	Bulkhead Dike	X	--
PS-9	002	11.0	Waste	X	--
PS-15RR	003	9.0	Bulkhead Dike	X	--
PS-32	006	38.6	Native Soil	--	X
PS-32A	007	23.1	Native Soil	--	X
PS-32B	008	14.4	Fill and Native Soil	X	--
PS-33R	009	38.1	Native Soil	--	X
PS-33A	010	22.9	Native Soil	--	X
PS-33B	011	14.3	Fill and Native Soil	X	--

4.1.2 Groundwater Quality Evaluation

The groundwater monitoring network includes wells placed in waste, soil fill, and native soils. Because of this unique condition, groundwater quality assessments have been completed utilizing groundwater quality trends and the range of historical parameter concentrations, rather than comparisons to established standards. An initial evaluation of site groundwater conditions assessed groundwater monitoring results from 1986 through April 2006, and was utilized to request a plan modification for the site. The conclusion of the initial groundwater evaluation was that groundwater quality impacts potentially related to the landfill have declined over the years and groundwater quality monitored adjacent to the landfill was often influenced by factors other than the landfill. Based on the findings, the plan modification was implemented and the monitoring parameter list was reduced to indicator parameters, with the exception of two wells located in the bulkhead dike, Monitoring Wells PS-3R and PS-15RR. These wells are monitored for chloride, COD, and total sulfate, iron, hardness, and alkalinity. A second groundwater evaluation was performed of groundwater results from April 2006 through October 2011. The evaluation included specific conductance (an indicator parameter), chloride, COD, and total sulfate, iron, hardness, and alkalinity. Generally, groundwater monitoring results from 2006 through 2011 compared favorably with historic data. Results from a 1989 DNR monitoring study for PCBs was also evaluated as discussed below. Data from the groundwater quality evaluations was presented in an earlier *Development at Historic Fill Site or Licensed Landfill Exemption Application* (GRAEF, 2012).

An assessment of groundwater data has been performed to assess current groundwater conditions for the attached permit application. Groundwater analytical results recorded on the WDNR "Groundwater and Environmental Monitoring System" (GEMS) database were reviewed to perform this assessment. The results of past and current groundwater assessments were compared to historic data and are summarized below.

Table 4-2 includes a summary of specific conductivity readings from April 2006, October 2011, and April 2017. Specific conductivity has been a good indicator of groundwater quality adjacent to the landfill, which is one of the reasons it is monitored in all wells. Table 4-3 provides a summary of the parameter concentrations that are monitored in Wells PS-3R and PS-15RR from October 2011 and April 2017.

Table 4-2 – Summary of Specific Conductivity Results

Monitoring or Leachate Head Well	Specific Conductivity (µmhos/cm)		
	April 2006	October 2011	April 2017
PS-3R	3,180	2,920	2,900
PS-9	2,860	2,296	--
PS-15RR	,2,620	3,305	3,000
PS-32 PS-32A PS-32B	524 1,190 1,210	582 1,046 1,218	750 810 740
PS-33R PS-33A PS-33B	217 530 600	661 608 708	1,910 1,350 4,100

µmhos/cm – micro-mhos per centimeter

--Not analyzed

Table 4-3 – Summary of Parameter Concentrations in Monitoring Wells

Parameter	Concentration (mg/L)			
	PS-3R		PS-15RR	
	10/11	4/17	10/11	4/17
Chloride	167	120	748	826
COD	105	68.1	50.8	47.5
Sulfate	49.7	--	<2.0	--
Iron	17.7	--	34.4	--
Hardness	1,750	1,960	1,230	1,080
Alkalinity	1,930	2,170	737	943

mg/L – milligram per liter

--Not analyzed

4.1.3 Historic Leachate Headwell Results

Well PS-9 is the only monitoring point at the site screened in waste material. Thus results from PS-9 represent site leachate. Well PS-9 was historically monitored for laboratory analytical parameters, including chloride, COD, sulfate, iron, hardness, and alkalinity. Field parameters including specific conductance, head level, odor, color, temperature, and turbidity were also recorded. Leachate monitoring in PS-9 was terminated in 2011.

The specific conductivity of leachate, based on results from Leachate Head Well PS-9 once exceeded 90,000 µmhos/cm. The specific conductivity in the leachate at this well has declined over the years to a typical range of 2,000 µmhos/cm to 3,000 µmhos/cm when monitoring ended. The leachate chloride concentrations have also declined over the years from 854 mg/L in 1986 to a range of 50 mg/L to 300 mg/L prior to 2012 (Graef, 2012).

Historic leachate COD concentrations from Leachate Head Well PS-9 declined significantly until 2011 when COD monitoring at PS-9 was terminated. Initially, the COD was 30,000 mg/L. From 2000 until 2011, the COD concentration in the leachate was less than 200 mg/L.

Sulfate, iron, hardness, and alkalinity were monitored in Leachate Head Well PS-9 until 2011. Concentrations of sulfate and iron fluctuated over the years with no apparent trend. The sulfate concentration historically ranged from no detect to 250 mg/L and iron historically ranged in concentration from less than 5 mg/L to over 30 mg/L. Hardness and alkalinity historically monitored in Leachate Head Well PS-9 have varied, but both parameters were commonly near 1,000 mg/L.

4.1.4 Down Gradient Wells

Two groundwater monitoring points (PS-3R and PS-15RR) are located along the bulkhead adjacent to the Little Lake Butte des Morts shoreline and are screened hydraulically down gradient from the historic fill area, and between the waste materials and the lake. These two monitoring points are the only wells still monitored for laboratory indicator parameters as well as field parameters. Specific conductance increased (approximately doubled from historic results)

during the April 2012 in wells PS-3R and PS-15RR. Since this anomalously high reading, specific conductance levels have returned to approximate the historic range for this parameter. These readings may be associated with construction and/or filling activities at the site. Concentrations of chloride generally stayed consistent and within historic ranges from 2012 to 2017 at wells PS-3R and PS-15RR.

The COD concentration ranged from 47.5 mg/L to 106 mg/L in well PS-15RR, and from 66.7 mg/L to 178 mg/L during this time frame in well PS-3R. The COD concentrations in these wells during this time interval generally remained consistent with historic values or decreased slightly from historic levels.

Concentrations of chloride generally stayed consistent and within historic ranges from 2012 to 2017.

Based on the review of data it appears the specific conductivity and chloride values monitored at the site from 2012 to 2017 appear to be generally consistent (aside from the April 2012 anomaly and occasional other anomalous readings) and are considered normal.

Sulfate was monitored until April 2013 in well PS-15RR and until April 2016 in well PS-3R, with no results recorded after these dates for sulfate. Sulfate concentration in well PS-15RR ranged from 2.4 mg/L to 40.6 mg/L during this time interval. Historically, the sulfate concentration in this well has been low, (less than 50 mg/L), and these results are consistent with historic levels. Sulfate concentration ranged from 6.5 mg/L to 174 mg/L in well PS-3R during this time frame. Historically, the sulfate concentration in Monitoring Well PS-3R has ranged from no detect to more than 1,200 mg/L, so these concentrations are at the lower end of the historic range.

Iron concentrations from 2012 to 2017 in Monitoring Wells PS-3R and 15RR are within their historic range in concentration of 10 mg/L to somewhat greater than 60 mg/L. Concentrations of iron in well PS-15RR ranged from 5.99 mg/L and 40.8 mg/L during this time frame. Concentrations of iron in well PS-3R ranged from 5.9 mg/L to 51.4 mg/L.

Alkalinity and hardness continue to be monitored in wells PS-15RR and PS-3R. Concentrations of hardness ranged from 510 mg/L to 1020 mg/L in well PS-15RR, and from 1060 to 2080 in well PS-3R from 2012 to 2017. Alkalinity was measured at a concentration range of 510 mg/L to 1020 mg/L in well PS-15RR, and from 878 mg/L to 2170 mg/L in well PS-3R during this time frame. These recent hardness and alkalinity concentrations in Monitoring Wells PS-3R and 15RR were within their historic ranges.

Table 4-4 – Specific Conductivity Results for Monitoring Well PS-15RR –

Monitoring Date	Specific Conductance (µmohs/cm)
April 2006	2,620
April 2007	3,650
April 2008	3,590
October 2008	3,550
April 2009	3,120
October 2009	2,890
April 2010	2,690
October 2010	2,300
April 2011	2,595
October 2011	3,305
April 2012	7,360
October 2012	4,314
April 2013	4,210
October 2013	4,000
April 2016	4,100
October 2016	2,800
April 2017	3,000

4.1.5 Remaining Site Wells and Piezometers

A total of six wells and piezometers at the PS-32 and PS-33 well nests are monitored semi-annually for field parameters only. Generally, the level of specific conductance increased significantly in the April 2012 monitoring event at well nests PS-32 and PS-33. The increase appears to be anomalous and is likely attributable to construction activities at the site. The anomalous rise in specific conductance was not measured until April 2013 in piezometer PS-33B. Since the anomalously high readings recorded in spring 2012 or 2013, the specific conductance results at site monitoring points have generally returned to approximate the historical levels of specific conductance. However two anomalously higher readings were recorded in wells PS-32 and PS-33B during the April 2017 event. Aside from the anomalous readings, specific conductivity levels were within historic ranges.

Other field parameters measured at well nests PS-32 and PS-33 were generally consistent with historic values.

4.1.6 4.1.6 Historic PCB Migration Study

Significant migration of PCBs from site fill material (paper pulp) into the base soils below and adjacent to the landfill would not be expected based on soil characteristics, low solubility of PCBs, and on-site testing. WDNR has historically concluded monitoring results documented limited migration of PCBs into the bulkhead dike fill soil. Testing completed in 1983 found PCBs

were at non-detectable concentrations at two feet below the interface with the base of the waste and native soil, except at one location. The occurrence of detectable PCBs at this one location was attributed to cross contamination, and no detectable PCBs were identified at four feet below the interface in the same boring (Graef, 2012).

4.1.7 Summary

Generally, groundwater monitoring results from 2012 through 2017 compare similarly or favorably with historic data. Some anomalies in specific conductance were noted from 2012 through 2017 in the site monitoring well network. Monitoring results for other groundwater parameters generally appear to be stable or trending slightly lower over time.

4.2 Soil

Soil impacts have been limited, based on a review of available data, and no additional impacts that were not discussed in earlier site documentation were identified. The two previously identified potential sources of soil impacts at the site included contaminants (PCBs) associated with disposal of paper pulp waste at the site, and potential soils contamination from an historic release of No. 6 fuel oil from a former AST resulting in some low concentration organic compound soils impacts. These do not appear to be currently negatively impacting the subject property.

4.2.1 PCBs

WDNR conducted an historic study (concluded in 1983) of PCB migration from the historic fill area through the bulkhead and into Little Lake Butte des Morts. The results of the study indicated significant migration of PCBs from soils within the historic fill area are not occurring. Significant migration of PCBs into the base soils below and adjacent to the historic fill area would not be expected based on soil characteristics and the low solubility of PCBs (GRAEF, 2012).

4.2.2 AST

A No. 6 fuel oil AST was located in the southwest corner of the eastern portion of the historic fill area and was operated by Glatfelter. The AST was located above the waste and the foundation was supported by piles. Following demolition of the Glatfelter paper mill, diesel range organic compounds and polycyclic aromatic hydrocarbons were discovered in soil near the location of the former AST. The release was reported to WDNR, and the site is now listed as closed on the BRRTS database. Some clean soil has reportedly been recently placed in this area to limit the direct contact pathway from residual AST soil contaminants.

4.3 Surface Water and Sediment

During landfill operation there was a loss of wastewater solids to Little Lake Butte des Morts, which likely contributed to sediment in an area historically identified as Deposit A. It is estimated the loss of solids to Little Lake Butte des Morts occurred in 1953 and from 1957 into 1975. There has been no known loss of wastewater solids to surface waters since that time. Lost solids from the landfill were removed or capped during remediation of Little Lake Butte des Morts that occurred from 2004 through 2009. As stated in Section 3.4.2, WDNR historically calculated the seepage loss through the entire bulkhead dike at 120 gallons per day. Further, they calculated the maximum potential PCB contribution from seepage to Little Lake Butte des Morts at 0.035 gram per day and considered that load insignificant (GRAEF, 2012).

4.4 Methane Migration

The paper pulp fill material historically used to fill the Arrowhead Park site could potentially produce methane during decomposition, but the production rate is probably low because of the waste characteristics and age of this fill material. Two historic buildings on the former Glatfelter site were reportedly constructed with gas collection and venting systems. Methane was either not detected or detected near detection limits in these venting systems based on historical monitoring and reporting. If methane is currently generated at the site, it is likely vented through the cover soils and adjoining fill soil, and then dissipates into the atmosphere. The shallow water table at the site limits the potential for methane migration (GRAEF, 2012).

5 Proposed Development Summary

This section of the report summarizes development plans and includes an evaluation of how the development may impact the environment.

5.1 Proposed Development

5.1.1 Arrowhead Park Development

The Arrowhead Park Conceptual Master Plan (The Plan) establishes a long-term vision for transforming the current site into a major destination with multiple educational and recreational opportunities.

The Plan takes into consideration several prior studies and reflects significant public input gathered throughout the planning period from September 2016 through January 2017 including:

1. Lobby & On-Line Survey
2. Bergstrom-Mahler Museum
3. City Staff
4. Parks and Recreation Commission
5. Leadership Group
6. Common Council
7. Business Leaders
8. Public Workshop

See Appendix B for more detail regarding the park planning process.

5.1.1.1 Project Goals

The Plan is guided by the goals established in the 2008 Little Lake Butte des Morts Park Properties Master Plan:

Goal 1: Recreational Uses and Programming. Recreational opportunities which emphasize non-motorized and non-programmed forms of recreation that are generally “passive” in nature.

Goal 2: Path Access and Connectivity. Pedestrian and bicycle connectivity between parks, public facilities, and local destinations is established through improved access, trail development, and year-round trail maintenance.

Goal 3: Dynamic and Interactive Park Amenities. The parks include “signature” features that are dynamic in their appeal and entice repeat visitation.

Goal 4: Design Standards. The standards of park and recreational facility design achieve a high level of aesthetic and functional quality.

Goal 5: Natural Environment. Ecological values and natural processes are established, enhanced, and protected through environmental restoration efforts.

Goal 6: Sustainability. Park sites are designed and managed as sustainable public venues.

Goal 7: Safe Facilities. Park sites are perceived as safe environments.

Goal 8: Park Maintenance. Maintenance of facilities, natural resources, and trail system that do not require significant long-term costs, yet are supported through appropriate levels of staffing and funding.

Goal 9: Funding. Economic sustainability and stability of parks is afforded through efficient use of financial resources.

The park is intended to be a treasured local asset, well connected to the surrounding neighborhoods and providing unique, enriching experiences for all of Neenah’s residents. As a destination attraction it will also bring additional visitors to Neenah, helping support local businesses and organizations. Finally, the park will serve as a demonstration site for restoring ecological processes, creating wildlife habitat, and innovatively treating storm water.

5.1.1.2 Guiding Principles

As the City and its partners work collaboratively to implement the Master Plan over time, decisions should be informed by the following guiding principles, which were developed as part of the current plan.

1. Create a Great, Engaging Destination
2. Build a High Quality, Enduring Park
3. Embrace the Water
4. Promote Healthy Living
5. Embrace the Natural Environment
6. Leverage the Park to Encourage Investment
7. Make the Park Accessible to All

5.1.1.3 Description of Proposed Park Enhancements

The Conceptual Master Plan for Arrowhead Park identifies several key design features, including a reconfigured park entrance, two proposed buildings, a sledding hill, an arbor, several large open lawns, three piers/boardwalks to provide access to the water, multi-use trails, bicycle amenities, a vehicular access road with parking, natural planting areas, shoreline restoration, and near shore and aquatic habitat enhancements. In the Plan, Arrowhead Park has been designed and split up by Zones 1-7. Zonal enlargements and descriptions of use are described in more detail in the Plan (**Appendix B**).

5.1.1.4 Project Implementation

Implementation of the Master Plan is proposed to occur over three phases: Phase 1, 2, and 3. Phase 1A and 1B include improvements related to public access, fishing, and shoreline enhancements to the area, designed to get people down to the water and to provide direct access to the lake. A Boat Works building, or Activity Center, providing bathrooms and potentially equipment rentals and limited concessions is proposed for Phase 1A. Phase 1B focuses on access and circulation. This phase will increase access to the park and the lake through reconfiguration of the park entrance, construction of an access road and limited vehicular parking.

Phase 2 focuses on improvements to the interior parkland, including social gathering areas, playgrounds, and creation of large outdoor rooms for passive recreation and nature observation.

Phase 3 calls for construction of a Community Building at the center of the Park. A conceptual multi-use Community Building housing several different uses is located on the existing slab in order to minimize site disturbance. Slab boundaries are delineated with a faint, dashed red line on the Plan. The conceptual building incorporates multiples uses, such as a museum, educational facilities, artist studio spaces, classrooms, meeting space, public gathering areas, and rentable venues. Food service and a rooftop viewing area contribute to Arrowhead Park's appeal as a unique destination for visitors.

5.2 Potential for Impacts

The City intends to proceed with final planning and design of the Park using a phased approach. This section of the report provides a general overview of proposed improvements and their potential impacts by phase. See Section 6 of the Plan for a phasing diagram.

5.2.1 Phase 1 Potential Impacts

Most of these alterations to the park area will be focused on path construction and shoreline and lakefront improvements. Aside from proposed construction of a 3,500 sf boat works building, none of these actions are expected to impact the existing landfill cap. Construction of the boat works building will be conducted in accordance with the conditions described below for the Phase 3 community building. Changes to the shoreline will have negligible environmental impact and will likely have positive effects in the long run to fish populations as well as native vegetation and water quality. Phase 1B proposes to install landscaping and overhead structures for gathering areas. These changes will have to be implemented in a way that does not impact the landfill cap or create enclosed areas where gas accumulation could potentially occur.

	Groundwater	Soil	Surface Water and Sediment	Air and Explosive Gas	Relevant Proposed Documents as Enumerated in Section 6
Phase 1A					
Shoreline and aquatic habitat development and restoration	No anticipated impacts	Minor soil disturbance anticipated while removing existing vegetation and riprap prior to placing new vegetation, topsoil, and shoreline stabilization.	Potential minor impacts during construction and stabilization period.	No anticipated impacts.	1, 5
500’ long floating boardwalk; pull-up or pile supported	No anticipated impacts	Minor removal of soil to construct boardwalk connections and supports to existing ground.	No anticipated impacts.	No anticipated impacts.	1, 5
2 terraced limestone water access points	No anticipated Impacts.	Removal of soil to required elevations to construct access points. Potential impact to cap.	Potential Minor impacts during construction and stabilization period.	No anticipated impacts.	1, 5
250’ long solid paddle craft pier; with gangway and floating pier extension	No anticipated impacts.	Minor removal of soil to construct pier connections and supports to existing ground.	No anticipated impacts.	No anticipated impacts.	1, 5
6-finger floating paddle craft pier; anchored with gangway	No anticipated impacts.	No anticipated impacts.	No anticipated impacts.	No anticipated impacts.	None
Canoe and kayak livery	Potential increase in runoff from increase in impervious area.	Potential impact to cap materials by soil excavation/fill and building support system construction.	Potential increased runoff and sediment during excavation and construction of building.	Potential for gas to collect in structure coming through floor and building supports penetrating cap.	1, 2, 3 ,4, 5

	Groundwater	Soil	Surface Water and Sediment	Air and Explosive Gas	Relevant Proposed Documents as Enumerated in Section 6
Pile supported terrace deck connecting to pier	No anticipated impacts.	Minor removal of soil to construct supports to existing ground.	No anticipated impacts.	No anticipated impacts.	1, 5
3,500 Square Feet Activity Building	No anticipated impacts.	Potential impact to cap materials by soil excavation/fill and building support system construction.	Potential increased runoff and sediment during excavation and construction of building.	Potential for gas to collect in structure coming through floor and building supports penetrating cap.	1, 2, 3, 4, 5
Phase 1B					
Community gathering area landscaping and overhead structure (arbor or pergola)	No anticipated impacts.	Potential impact to cap and excavation/fill of soil needed during construction. Potential need to dispose of soil offsite.	Potential minor impacts during construction and stabilization period.	No anticipated impacts.	1, 2, 3, 4, 5
Main entrance and drop off zone	Potential increase in infiltration from storm water management, and from excavation for roadway and drainage construction.	Potential impact to cap and excavation/fill of soil needed during construction. Potential need to dispose of soil offsite.	Potential minor impacts during construction and stabilization period.	No anticipated impacts.	1, 5
Railroad crossing reconstruction	Potential increase in infiltration from storm water management, and from excavation for roadway and drainage construction.	Potential impact to cap and excavation/fill of soil needed during construction. Potential need to dispose of soil offsite.	Potential minor impacts during construction and stabilization period.	No anticipated impacts.	1, 5

	Groundwater	Soil	Surface Water and Sediment	Air and Explosive Gas	Relevant Proposed Documents as Enumerated in Section 6
Carriage road (Bituminous) and parking	No anticipated impacts.	Potential impact to cap and excavation/fill of soil needed during construction. Potential need to dispose of soil offsite.	Potential minor impacts during construction and stabilization period.	No anticipated impacts.	1, 5
6,000' paved and aggregate multi-use trails	No anticipated impacts.	Potential impact to cap and excavation/fill of soil needed during construction. Potential need to dispose of soil offsite.	Potential minor impacts during construction and stabilization period.	No anticipated impacts.	1, 5
Carriage road and path lighting	No anticipated impacts	Potential impact to cap and excavation/fill of soil needed during construction. Potential need to dispose of soil offsite.	Potential minor impacts during construction and stabilization period.	No anticipated impacts.	1, 5

5.2.2 Phase 2 Potential Impacts

Phase 2 of the proposed project includes addition of landscaping, vegetation, signage, playgrounds, and a seat wall. Maintenance of positive drainage on interior parkland will be included in the Phase 2 activities. A cap maintenance plan is proposed to be prepared and approved by WDNR to document maintenance of the cap, including addressing low areas (maintaining positive drainage) and maintenance of vegetation. The cap maintenance plan will be developed for those areas to be impacted as additional detailed plans are prepared.

	Groundwater	Soil	Surface Water and Sediment	Air and Explosive Gas	Relevant Proposed Documents as Enumerated in Section 6
Wayfinding and interpretive signage	No impacts anticipated.	Potential minimal impacts during sign installation.	No impacts anticipated.	No impacts anticipated.	None
2 natural playgrounds	No impacts anticipated.	Potential minimal soil disturbance during construction of equipment supports and play areas.	No impacts anticipated.	No impacts anticipated.	1, 5
20 acres grass and natural areas	No impacts anticipated.	Minor soil disturbance anticipated while removing existing vegetation prior to placing new vegetation, fill and topsoil.	No impacts anticipated.	No impacts anticipated.	1, 5
150 canopy trees	No impacts anticipated.	Minor soil disturbance when planting and potential need for disposal of soil offsite.	Potential minor impacts during construction and stabilization period.	No impacts anticipated.	1
600’ of seat wall	No impacts anticipated.	Potential impact to cap and excavation/fill of soil needed during construction. Potential need to dispose of soil offsite.	Potential minor impacts during construction and stabilization period.	No impacts anticipated.	1, 2, 3, 4, 5

5.2.3 Phase 3 Potential Impacts

Phase 3 proposes to install a 45,000 square foot multi-use community building. The City of Neenah and SEH are confident that engineering controls can be implemented to prevent harm to the public and natural environment. During construction, specific safety measures will be followed, and if the landfill cap is breeched, it is repaired with no harm to laborers or the environment, including the prevention of contaminating ground water. No on-site wells or wells within 1,200 feet, will be installed, as prohibited by Wis. Adm. Code NR 811 and 812. Electrical systems will be enclosed to prevent the possibility of exposure to toxic gases. Based on future geotechnical investigation for building development, the building may need to be placed on some form of deep foundation (e.g., driven piles) to prevent settling of the structure over the course of time. If waste materials are disturbed or removed during building construction, the waste materials will be appropriately managed and disposed. Per previous WDNR conditional permit approval, the following conditions will be implemented during planning, construction, and maintenance of the proposed community building:

- A gas barrier, such as bentonite plugs, prefabricated collars made of an impermeable material, or equivalent will be designed and installed at any utility entrance points into the structure to prevent gas migration into the structure at utility entrances.
- A utility and building foundation inspection, maintenance, and settlement monitoring program for the site will be prepared, submitted to WDNR for approval, and implemented.
- A passive gas venting system beneath the building floor slab will be designed and constructed. At minimum, the venting system will include;
  - A gas venting layer consisting of 6 to 12 inches of pea gravel interconnected with a 4-inch diameter PVC or corrugated drainage pipe system installed in the top four inches of the pea gravel layer.
  - A vapor barrier consisting of a minimum 30-mil thick polyethylene geomembrane or WDNR approved equivalent, welded at the seams to provide a continuous barrier between the venting system and the floor slab. The geomembrane will be overlain with either filter fabric or a six-inch layer of fine sand. Care will be taken during concrete placement to prevent damage to the membrane.
- The building design will include adequate ventilation to prevent accumulation of gas in “dead space” area.
- A plan will be prepared and approved by WDNR for sealing and inspecting the building foundation for the presence of gas on a routine basis.
- Appliances placed in the building will be spark proof and equipment within the building will not require a pilot light.
- The building will be fitted with automatic methane gas sensors approved by the local fire department, and designed to trigger an audible alarm if the volumetric concentration of methane is greater than 1.25 percent by volume.
- A plan to inspect and test all gas alarms on an annual basis to assure they continue to function properly will be prepared, submitted to WDNR for approval, and implemented.
- Construction documentation, including documentation of compliance with the conditions stated above, will be submitted to WDNR following construction completion.

5.2.4 Groundwater

Significant groundwater impacts at the site are not anticipated to occur as a result of performing the proposed site development activities. Groundwater has been historically monitored during similar activities (e.g., building construction, grading, paving, site vegetation, etc.) with minimal

identified impacts beyond occasional anomalous results which have returned to historical ranges. Thus, negative groundwater impacts from the proposed site activities are not anticipated.

5.2.5 Soil

Historic impacts associated with waste materials disposed at the site and with the historic AST release are not currently considered likely to impact the environment adversely. Some disturbance of these areas could potentially occur during the proposed site development activities. If disturbance is required, plans will be made in advance of construction so waste streams generated during construction can be properly characterized and proper disposal can be planned and performed.

5.2.6 Surface Water and Sediment

Historic studies indicate surface water and sediment are not being impacted by site contaminants. Minimal disturbance, along with proper handling and disposal of impacted materials during site development will prevent impacts to surface water and sediments.

5.2.7 Air and Explosive Gas

Impacts to air or from explosive gases are not expected to occur as a result of proposed site development. However, extensive engineering controls as described in Section 5.2 will be implemented to prevent gas migration into proposed structures. Thus, adverse impacts would be prevented even if gas migration occurs at the site.

6 Summary of Actions to be Taken and Engineering Controls to Prevent or Minimize Adverse Environmental Impacts and Potential Threats to Human Health and Welfare, Including Worker Safety

Actions to be taken to prevent or minimize adverse environmental impacts and potential threats to human health and welfare including worker safety include the following:

1. Creation and implementation of a cap maintenance plan to prevent unplanned damage to the existing cap, and to properly repair cap damage during proposed site development.
2. A utility and building foundation inspection, maintenance, and settlement monitoring program for the site will be prepared, submitted for WDNR approval, and implemented.
3. Waste characterization, and planning and preparation for disposal of waste materials that are likely to be encountered during site development.
4. Preparation of OSHA HAZWOPER site safety plans and OSHA HAZWOPER training for workers likely to encounter site contaminants during construction if required based on waste characterization results.
5. Erosion control and storm water management plans prior to ground surface disturbance during construction.

Engineering controls specific to addressing potential gas migration as a result of site development are described in detail in Section 5.2. Other engineering controls (e.g., silt fences, tracking pads, ditch checks, etc.) would be identified in various project plans and permits.

7 Summary and Conclusion

The City has evaluated the current conceptual master plan development considerations against the criteria outlined in the WDNR's various Development on Historic Fill Site guidance documents and forms and summarized potential impacts above. Where potential impacts may occur, the City has identified engineering controls or best management practices to employ to protect the landfill, Park and human health and the environment. Based on the evaluation of media, no negative impacts are anticipated to be sustained as a result of the proposed development.

The City is requesting a grant of exemption from the WDNR for development on the former landfill as defined in the Conceptual Master Plan for Arrowhead Park. The City also is committed to notifying the WDNR if future design changes occur that vary substantially and materially from the current master plan. If alternate possible impacts may occur due to design changes, WDNR will be notified and an additional or alternate approval may be sought.

8 References

Graef, 2012, “Development at Historic Fill Site or Licensed Landfill Exemption Application Arrowhead Park Landfill,” City of Neenah Park Sites #1 and #2 Development.

Olcott, P. G., 1968, “Water Resources of Wisconsin, Fox-Wolf River Basin,” Hydrologic Investigations Atlas HA-321, University Extension, University of Wisconsin Geological and Natural History Survey.

Ostrom, M.E., 1981, “Bedrock Geology of Wisconsin,” University of Wisconsin Extension, Geological and Natural History Survey.

USDA, 1980, “Soil Survey of Winnebago County, Wisconsin,” United States Department of Agriculture Soil Conservation Service.

WDNR, “Groundwater and Environmental Monitoring System Database,” Landfill License Number 2299, Facility Identification Number 471013840.

Figures

Figure 1 – Site Location
Figure 2 – Site Features

REPRODUCED FROM

USGS NEENAH QUADRANGLE

WISCONSIN - WINNEBAGO CO. 7.5 MINUTE SERIES

1984



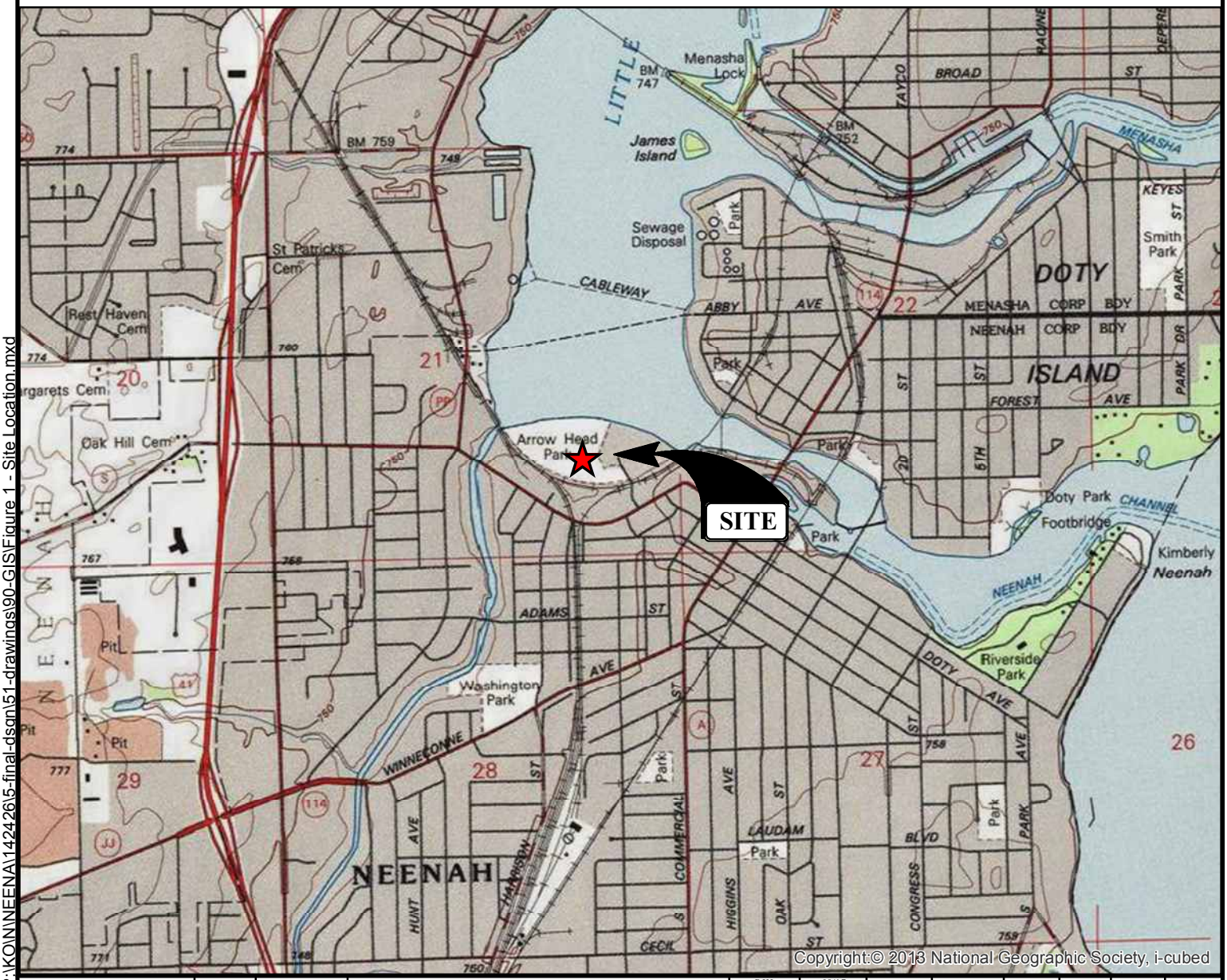
TOWNSHIP: 20
RANGE: 17
SECTION: 21

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0 1,000 2,000 Feet

1 inch = 2,000 feet

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NO.	DATE	ISSUES/REVISIONS	DRAWN BY	DESIGN	FIELD REVIEW	QC CHECK
1	09/21/17		RJH 09/17			

SEH

ARROWHEAD PARK DEVELOPMENT PLAN NEENAH, WISCONSIN

FIGURE 1 SITE LOCATION

PROJ. NO. NEENA142426

DATE 09/21/17

1 / 2

LITTLE LAKE BUTTE DES MORTS

ARROWHEAD PARK LANDFILL

TREATMENT PLANT

P.H. GLATFELTER

MAIN STREET

WISCONSIN AVENUE

N

scale 40 feet 80 0 80 160

LEGEND

- 740 SURFACE CONTOUR
- SAN CITY SANITARY SEWER
- STO STORM SEWER
- PHGWW P.H. GLATFELTER WASTEWATER SEWER
- STRUCTURE
- RAILROAD
- APPROXIMATE LIMITS OF DEPOSIT A
- 2.0 APPROXIMATE SEDIMENT THICKNESS (FEET)
- APPROXIMATE LIMITS OF SLUDGE IN LANDFILL
- 741.0 ELEVATION AT BORING PER SURVEY
- JUNE 2017 SURVEY DATA
- LIGHT POLE
- MANHOLE
- AREA DRAIN
- ELECTRIC MANHOLE
- CONTROL POINT

SEH SURVEY DATA ATTAINED IN JUNE 2017 IS SHOWN IN RED

BASE MAP PROVIDED BY CITY OF NEENAH, GIS DATA BASE. PHOTOGRAPH CONTROL, 1991 WITH CITY UPDATES THROUGH 1998. ERM MODIFICATIONS INCLUDED ADDITION OF CLARIFIER, SOIL STOCKPILE REMOVAL AND PROJECTION OF DEPOSIT A SEDIMENT (PER EWI 1992 FEASIBILITY STUDY).

REV. NO.	DESCRIPTION	DATE	REV. BY	CHK'D.	APP'D.

REVISIONS

DRAWN BY: SJL
DESIGNER: BKO
CHECKED BY: BKO
DESIGN TEAM

NO.	BY	DATE	REVISIONS

SEH
PHONE: 715.720.6200
10 NORTH BRIDGE STREET
CHIPPEWA FALLS, WI 54729
www.sehinc.com

ARROWHEAD PARK DEVELOPMENT PLAN NEENAH, WISCONSIN

SITE FEATURES

FILE NO. NEENA-142426

DATE 09-22-2017

FIGURE 2

Appendix A

2012 and 2013 Documentation

CITY COPY.

1150 Springhurst Dr., Ste 201
Green Bay, WI 54304-5947
920 / 592 9440
920 / 592 -9445 fax
www.graef-usa.com

GRAEF

ulate / innovate

March 19, 2012

Mr. Greg Tilkens
Wisconsin Department of Natural Resources
Northeast Region
2984 Shawano Avenue
Green Bay, WI 54307-0448

Subject: City of Neenah Park Sites #1 and #2 Development
Development at Historic Fill Site or Licensed Landfill Exemption Application
Arrowhead Park Landfill

Dear Greg:

On behalf of the City of Neenah, we are submitting the following documentation as part of the *Development at Historic Fill Site or Licensed Landfill Exemption Application (Form 4400-226 and 4400-226a)*:

- Completed Form 4400-226 – Development at Historic Fill Site or Licensed Landfill Exemption Application.
- Completed Form 4400-226a – Development at Historic Fill Site or Licensed Landfill Expedited Exemption Application
- 3 copies of report entitled: *Neenah Park Sites #1 and #2 – Site Investigation and Development Plan*
- Check for $500 application fee

The enclosed report is in support of the Exemption Application and addresses items IV through X of the application in more detail. If further information or clarification is necessary on any of the items in the application, please do not hesitate to call.

Sincerely,

Graef-USA Inc.

Patrick J. Skalecki, P.E., LEED AP
Principal
GRAEF

Steve Shimek
Member
Natural Resource Solutions, LLC

2011-2007.00

State of Wisconsin
Department of Natural Resources

Development at Historic Fill Site or Licensed Landfill Exemption Application

Form 4400-226 (R 12/05)

Notice: Use of this form is required by the DNR for any application to develop at a historic fill site or licensed landfill pursuant to secs. NR 506.085 and NR 500.08(4), Wis. Adm. Code. The Department will not consider your application unless you provide complete information requested. Personally identifiable information collected will be used to process your application and will also be accessible by request under Wisconsin's Open Records law [ss.19.31 - 19.39, Wis. Stats.]

Instructions: See *Development at Historic Fill Sites and Licensed Landfills: What you need to know* (PUB-RR-683, April 2002) for detailed instructions.

- All Exemption Application materials should be sent to the region where the site is located, as listed on page 6.
- Include $500 fee payment with this application unless a fee was already paid for the review of the remedial design report under the NR 700 process.
- Determine the appropriate exemption type for the site and check appropriate box below.
- Provide complete information requested for each type of exemption. Include the following attachments:
  Required: Summary of Existing and Potential Impacts described in Section V as an attachment, under the seal of a professional engineer or geologist registered to practice in Wisconsin.
  Optional: Site Visit Summary Comments (Section IX) including any photos, sketches or site visit notes.

Exemption Type

☐ **Remediation and Redevelopment Program NR 700 Rule Series Process Exemption:** Site with remedial actions conducted in accordance with NR 700 series
Required: Sections I - VI ***Optional:*** Sections VII - X

☐ **Case-by-Case Evaluation:** Sites with anticipated environmental impacts or wastes of special concerns
Required: Sections I - VI ***Optional:*** Sections VII - X

☒ **Expedited Exemption:** Site with no expected environmental impact
Required: Sections I - VI **and** Form 4400-256A Expedited Exemption Application ***Optional:*** Sections VII - X

I. Applicant Information

Owner - Last Name	First	MI	Telephone Number
City of Neenah Parks & Recreation Dept			920-886-6069

Contact Name (if different)
Eileen McCoy, Director of Parks and Recreation

Street Address	City	State	ZIP Code
P.O. Box 426	Neenah	WI	54956

Developer - Last Name	First	MI	Telephone Number
Same as Owner			

Street Address	City	State	ZIP Code

II. Site Name and Location

Site Name	Location / Address
Neenah Park Site #1 and Park Site #2	355 Millview Dr.

Is the site known by another name(s)?
☒ Yes ☐ No ☐ Unknown

☒ City ☐ Town ☐ Village of Neenah

If yes, provide name.	ZIP Code	State
Park Site Landfill	54957	WI

Does the site have a license number?	If yes, License Number	County
☒ Yes ☐ No ☐ Unknown	2299	Winnebago

A. Attach a map with site location and limits of fill/waste disposal area.

B. Global Positioning System Coordinates

Latitude: DEG	MIN	SEC	Longitude: DEG	MIN	SEC	Describe method for collecting GPS Coordinates
44	11	17.7 N	88	27	59.7 W	WDNR RR Sites Map

Program Lead, Fee Status and Regulatory ID Numbers *(This area for DNR use only)*

☐ Waste Management Bureau
☐ Remediation and Redevelopment Bureau - Exemption is part of remedy under NR 700 program
☐ Fee already paid for review of remedial design report.
☐ Review of remedial design report not requested and payment is attached.

☐ Payment Attached
Amount $

Hazardous Waste Facility License ID No. (5 digits)	DNR FID No. (9 digits)	USEPA ID No. (used for both RCRA and CERCLIS #s) (WI+Alpha+9 digits)

Region	Project Manager	Telephone Number

III. Site Ownership History

Previous Owner - Last Name	First	MI	Telephone Number
City of Neenah			920-886-6069

Street Address	City	State	ZIP Code
P.O. Box 426	Neenah	WI	54956

Responsible Municipal / Private Operator - Last Name (if applicable)	First	MI	Telephone Number
City of Neenah			

Street Address	City	State	ZIP Code
Same as owner			

IV. Evaluation of Existing and Potential Impacts. See Development at Historic Fill Sites and Licensed Landfill: Guidance for Investigation and Development at Historic Fill Sites and Licensed Landfill: Potential Problems and Considerations.

A. Analytical data for the following media have been collected and/or examined before completing this application:

1. Groundwater: ☒ Yes ☐ No
2. Soil: ☒ Yes ☐ No
3. Surface water / sediment: ☒ Yes ☐ No
4. Air: ☐ Yes ☒ No
5. Methane or other explosive gases: ☒ Yes ☐ No

B. Based on known or suspected sources and wastes, their physical characteristics, containment and geologic environment, do you suspect a release of pollutants to the environment?

☐ Yes: ☐ Groundwater ☐ Soil ☐ Surface Water / Sediment ☐ Methane or Other Explosive Gases
☒ No

If yes, an expedited exemption is not appropriate unless further investigation shows that a release of pollutants is not likely.

C. If there is NOT a likelihood of a release of pollutants or evidence of a release, would the impact of the proposed development be likely to cause a release to the environment?

☐ Yes **If yes, be sure to summarize actions to be taken to prevent adverse environmental impacts in V. Part C below.**
☒ No

V. Summary of Existing and Potential Impacts. See Development at Historic Fill Sites and Licensed Landfill: Guidance for Investigation and Development at Historic Fill Sites and Licensed Landfill: Potential Problems and Considerations.

Describe the following in an attached narrative under the signature of a qualified professional. Organize, label and package as listed below.

A. Existing Site Conditions
   1. existing site conditions including waste types,
   2. potential for impacts, and
   3. evaluation of existing impacts.

B. Proposed Development Summary. Include explanation for overall site decision.

C. Summary of actions to be taken and engineering controls that will prevent or minimize adverse environmental impacts and potential threats to human health and welfare, including worker safety.

VI. Certification of Application Information

I certify that information in this application and all its attachments is true and correct and in conformity with applicable Wis. statutes.

Print / Type Name of Applicant
Eileen McCoy - City of Neenah Parks & Recreation Director

Applicant Signature	Date Signed
Eileen McCoy	20 MAR 2012

Sections VII - IX are optional for all Applicants.

VII. Current and Historic Type of Waste Disposal Site (Check all that apply)

- [X] Licensed Landfill
- [ ] Non-approved {See s.289.01(3)}, Wis Stats.
- [ ] Approved
- [ ] One-time Disposal
- [ ] Construction / Demolition
- [ ] Historic Fill Site

Liner

- [ ] Unlined
- [ ] Lined
- [ ] Composite Liner
- [X] Other Liner (Describe): Native clay base soil and clay retention dike.
- [ ] Clay Liner
- [ ] Unengineered

Total Landfill Volume

- [ ] < 50,000 yd^3
- [X] 50,000-500,000 yd
- [ ] > 500,000 yd^3

Does the landfill have a closure plan? [ ] Yes [X] No [ ] Unknown
Does the landfill have a groundwater monitoring plan? [X] Yes [ ] No [ ] Unknown
Have groundwater monitoring wells been installed? [X] Yes [ ] No [ ] Unknown

Was a cover installed? [X] Yes [ ] No **If no, go to Past Land Uses.**

- [ ] Composite cap
- [ ] Layered soil cap with clay barrier
- [X] Clay cap
- [ ] Soil cap - not recompacted clay
- [ ] Other cover
- [ ] Unknown

What is the thickness of the cover? [ ] <6 in [ ] 6-12 in [ ] 12-24 in [X] >24 in Ave. [ ] Unknown

Past Land Uses. (Check all that apply)

- [ ] Agricultural co-op
- [ ] Brush pile
- [ ] Bulk plant
- [ ] Coal gas manufacturer
- [ ] Deer pit
- [ ] Dry cleaner
- [ ] Electroplater
- [ ] Lagoon
- [ ] Manufacturing Type: _____
- [ ] Old burn pit
- [ ] Pipeline
- [ ] RCRA generator
- [ ] Salvage yard
- [ ] Service Station
- [ ] Tannery
- [ ] Unknown
- [X] Other: Lake bed

Date(s) of Site Operation
From: 1952 To: 1975

No. of Years: 23

[ ] Unknown

VIII. Waste Information & Geologic Environment. **See Development at Historic Fill Sites and Licensed Landfills: Guidance for Investigation**

A. Known or Suspected Sources/Wastes. (Check all that apply)

- [ ] Abandoned containers
- [X] Above ground pipeline or tank
- [ ] Animal carcasses
- [ ] Buried drums
- [ ] Burning of materials
- [ ] Foundry sand
- [ ] Industrial accident
- [ ] Known or suspected hazardous materials
- [ ] Municipal waste
- [X] Paper mill sludge
- [ ] Transformer
- [ ] Trees/brush
- [ ] Surface spills
- [ ] Fly ash
- [ ] Demolition/construction waste
- [ ] Surface impoundment/lagoons
- [ ] Underground pipeline or tank
- [ ] Exempted fill {NR 500.08(1) and (2)}
- [ ] Unknown
- [ ] Other: _____

B. Physical Characteristics of Sources/Wastes

[X] Liquid [X] Solid [ ] Liquid & Solid [ ] Unknown

VIII. Waste Information & Geologic Environment *(continued)*

C. Waste Containment [X] Liner (Native clay) [ ] Unknown [ ] Not applicable

[X] ~~Engineered~~ cover
[X] Maintained [ ] Not maintained
East maintained, west generally not maintained.

[ ] Functioning leachate collection & removal system
[ ] Functioning & maintained run-off management system
[X] Functioning groundwater monitoring system

D. Soil Type: Estimate distances or determinations based on regional or site specific information.

[ ] Regional [X] Site specific

Clay, silt or other fine grained soils present? (lacustrine, tills, etc.) [X] Yes [ ] No

At surface? [X] Yes [ ] No At depth? [X] Yes [ ] No ~78 or more feet

Sand & gravel, coarse grained soils present? [ ] Yes [ ] No

At surface? [ ] Yes [X] No At depth? [X] Yes [ ] No Silty sand lenses below 78 feet feet

E. Depth to Groundwater

[ ] Regional [X] Site specific 0 feet

F. Direction of Groundwater Flow

[ ] Regional [X] Site specific Radial from center of landfill direction

G. Depth to Bedrock

[ ] Regional [X] Site specific 90 feet ~~direction~~

H. Bedrock Type

[ ] Regional [ ] Site specific [ ] Sandstone [X] Limestone/Dolomite [ ] Metamorphic/Igneous

IX. Site Visit

Conduct a site visit to complete site screening and determine general site conditions, on-site activities and adjacent land use encroachment issues. As appropriate to document the site, take photos, sketch the site and prepare a Site Visit Report.

On-site visit conducted? [X] Yes [ ] No

General site conditions: Document any observed releases and note whether or not you were able to walk the site. Examples of things to be aware of include the following:

- leachate seeps or evidence of seeps such as stained soil/vegetation
- stressed vegetation as a sign of gas migration to the surface or of leachate seeps;
- quality and coverage of vegetation on the cap;
- odors which may indicate gas migration to the atmosphere;
- erosion of the cap;
- maintenance of positive drainage over the capped area;
- visual desiccation cracks in the cap.

Attach the following to your application:

[X] Photographs, regular or digital [X] Site sketch [X] Sit Visit Report

Name(s) of Person(s) Conducting Site Visit	Date of Site Visit
Steven Shimek	March 1, 2012

IX. Site Visit *(continued)*

A. Adjacent Land Uses. Indicate all directions. (Check all that apply)

	N	S	E	W	NE	NW	SE	SW
☐ Agricultural	☐	☐	☐	☐	☐	☐	☐	☐
☒ Industrial On-site	☐	☐	☐	☒	☐	☐	☐	☐
☐ Recreational	☐	☐	☐	☐	☐	☐	☐	☐
☒ Residential	☐	☒	☐	☐	☐	☐	☐	☐
☐ Undeveloped	☐	☐	☐	☐	☐	☐	☐	☐
☒ Commercial	☐	☒	☒	☒	☐	☐	☐	☐
☒ Other: Lake	☒	☐	☐	☐	☐	☐	☐	☐

B. Potential Groundwater Receptors. Estimate distances. (1 mile = 5,280 ft)

Distance to and direction of nearest municipal well: _____ feet ☒ > ½ mile from the waste North direction

Distance to and direction of nearest other-than-municipal well: _____ feet ☒ > ½ mile from the waste West direction

Distance to and direction of nearest non-community well: _____ feet ☒ > ½ mile from the waste West direction

Distance to and direction of nearest private well: _____ feet ☒ > ½ mile from the waste West direction

Distance to and direction of nearest residence: 400 feet ☐ > ½ mile from the waste South direction

C. Potential For Gas Migration

0 No. of homes within 300 feet of waste (gas migration potential)

~132 No. of homes between 300 & 1,000 ft to waste (gas migration potential)

Distance to and direction of nearest building: <50 feet ☐ > ½ mile from the waste _____ direction

Type of building: ☐ On-site building ☐ Municipal ☐ Residential ☐ Commercial ☒ Industrial ☐ Unknown

D. Potential Surface Water Receptors. Estimate distances.

☒ Creek: ~50 feet ☐ Drainage ditch: _____ feet ☐ Intermittent stream _____ feet

☐ River: _____ feet ☒ Lake: ~20 feet ☐ Wetland: _____ feet

E. Based on the site visit, did you visually observe...

1. a release to a surface water body?	☐ Yes	☒ No	☐ Unknown
2. a leachate seep?	☐ Yes	☒ No	☐ Unknown
3. a release to soils?	☐ Yes	☒ No	☐ Unknown

X. Comments: Use this section to provide comments on any aspect of the site visit. Attach any information or explanations labeled with the appropriate section number to which the material applies.

Total number of includes 27 homes west of Neenah Slough and east of Little Lake Butte des Morts.

Region Map

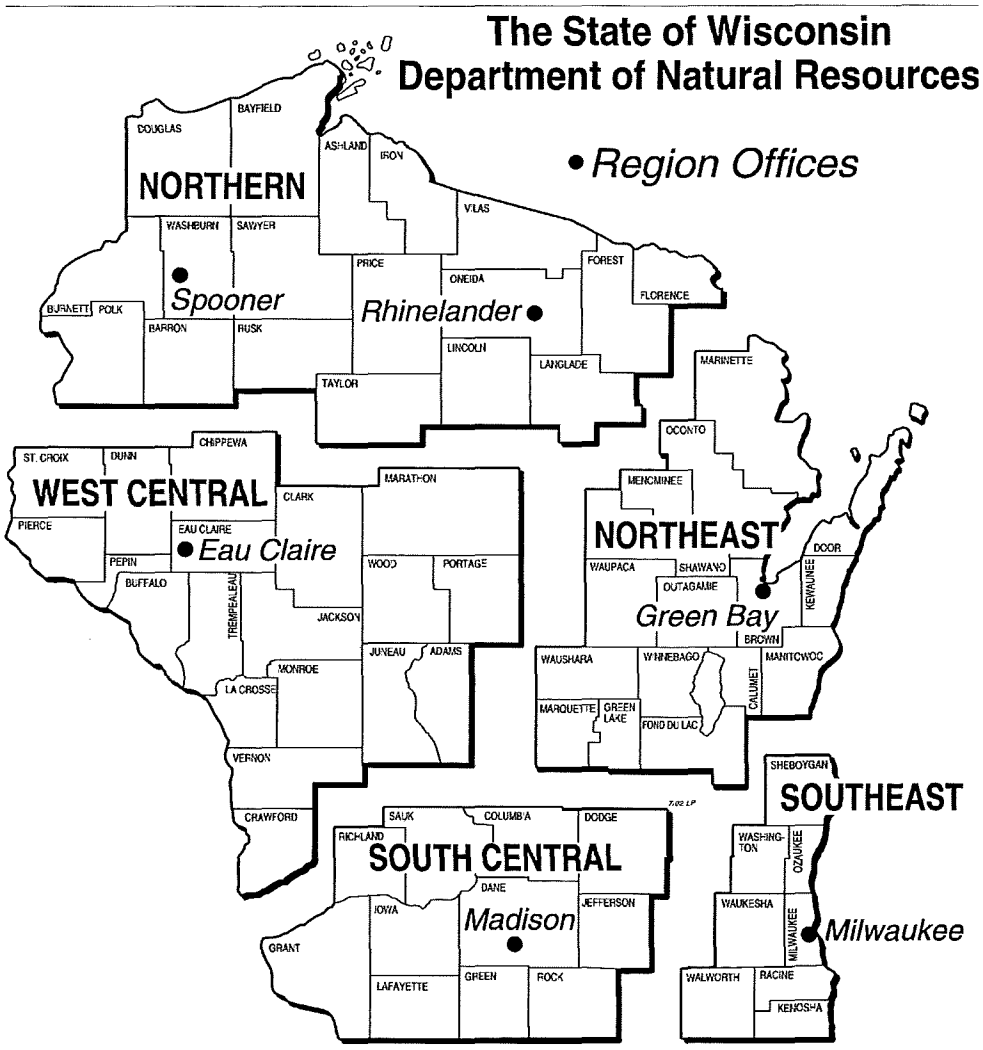
NORTHERN REGION
Remediation & Redevelopment
Team Supervisor
Department of Natural Resources
107 Sutliff Avenue
Rhinelander, WI 54501
(715) 365-8976
OR
Regional Waste Program Manager
Department of Natural Resources
107 Sutliff Avenue
Rhinelander WI 54501
(715) 365-8946

NORTHEAST REGION
Remediation & Redevelopment
Team Supervisor
Department of Natural Resources
2984 Shawano Avenue
Green Bay, WI 54307-0448
(920) 662-5160
OR
Regional Waste Program Manager
Department of Natural Resources
2984 Shawano Avenue
Green Bay, WI 54307-0448
(920) 662-5120

SOUTHEAST REGION
Remediation & Redevelopment
Team Supervisor
Department of Natural Resources
P.O. Box 12436
Milwaukee, WI 53212-0436
(414) 263-8561 or (414) 263-8714
OR
Regional Waste Program Manager
Department of Natural Resources
P.O. Box 12436
Milwaukee WI 53212-0436
(414) 263-8694 or (414) 263-8697

WEST CENTRAL REGION
Remediation & Redevelopment
Team Supervisor
Department of Natural Resources
1300 Clairemont Avenue
Eau Claire, WI 54701
(715) 839-3710
OR
Regional Waste Program Manager
Department of Natural Resources
1300 Clairemont Avenue
Eau Claire WI 54701
(715) 839-3708

SOUTH CENTRAL REGION
Remediation & Redevelopment
Team Supervisor
Department of Natural Resources
3911 Fish Hatchery Rd.
Fitchburg, WI 53711
(608) 275-3241
OR
Regional Waste Program Manager
Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg WI 53711
(608) 275-3466



State of Wisconsin
Department of Natural Resources

Development at Historic Fill Site or Licensed Landfill Expedited Exemption Application

Form 4400-226A (R 5/02)

Notice: This form and Form 4400-226 are required to apply for an expedited exemption to develop at a historic fill site or licensed landfill pursuant to secs. NR 506.085 and NR 500.08(4), Wis. Adm. Code. This form may only be used for landfill sites with no environmental impact. The Department will not consider your application unless you provide complete information requested. Personally identifiable information collected will be used to process your application and will also be accessible by request under Wisconsin's Open Records law [ss.19.31 - 19.69, Wis. Stats.]

Environmental Professional Evaluation

Professional Engineer or Geologist - Last Name	First	MI	Telephone Number (incl. area code)
Skalecki	Patrick	J	920-592-9440

Address	City	State	ZIP Code
1150 Springhurst Dr., Suite 201	Green Bay	WI	54304

I am a professional engineer or professional geologist registered to practice in Wisconsin and am qualified by training and experience to evaluate the potential for soil and groundwater contamination and the migration and concentration of explosive or toxic gases to occur from the disposal of solid waste.

I have evaluated the proposal described in this document for development on a property where solid waste has been disposed and it is my professional opinion that it is unlikely that "environmental pollution" exists or that there has been a significant "discharge" of a "hazardous substance" at the property (as these terms are defined in s. 292.01, Wis. Stats.). It is also my professional opinion that the development of the property as described in this document will not cause or exacerbate an exceedance of any applicable soil or groundwater standard and will not cause a significant increase in risk due to the migration or concentration of explosive or toxic gasses or cause any other significant risk to public health, safety or welfare or the environment.

My professional opinion is given to a reasonable degree of professional certainty, and is based upon my evaluation of reasonable and sufficient information and generally accepted engineering and scientific practices.

Signature	Date Signed	Wisconsin Registration Number
Patrick J Skalecki	3/20/12	E-32460

Site Owner and Developer Certification

Property Owner - Last Name	First	MI	Telephone Number (incl. area code)
McCoy	M. Eileen		920-886-6069

Address	City	State	ZIP Code
P.O. Box 426	Neenah	WI	54956

Developer - Last Name	First	MI	Telephone Number (incl. area code)
Same as Owner			

Address	City	State	ZIP Code

I certify that I have read the DNR publication, *Development at Historic Fill Sites and Licensed Landfills: Considerations and Potential Problems* (PUB-RR-685, April 2002), and understand the potential environmental, health and safety risks if the development of the property is not compatible with the waste disposed at the site.

I also understand that future decisions regarding the use of the property must consider whether those changes will create an adverse environmental impact and that activities causing a significant threat to public health, safety, or welfare are prohibited under s. 289.46(2), Stats. This exemption application and any exemption related to this document that is issued by the Department transfers to any future purchaser of this property.

Owner Signature	Date Signed
	20 MAR 2012
Developer Signature	**Date Signed**
N/A	

NEENAH PARK SITES #1 AND #2
SITE INVESTIGATION AND DEVELOPMENT PLAN
IN SUPPORT OF WDNR APPLICATION 4400-226

Neenah, Wisconsin
355 Millview Drive

Prepared for

City of Neenah
211 Walnut Street
Neenah, WI 54957

MARCH 2012

Prepared by

GRAEF
1150 Springhurst Drive, Suite 201
Green Bay, Wisconsin 54304-5950
Telephone: (920) 592-9440
FAX: (920) 592-9445

Project No. 2011-2007.00

Wisconsin DNR

2011-2007.00

Prepared for:

Mr. Greg Tilkens
Wisconsin WDNR

Site Address:

2984 Shawano Ave.
Green Bay, WI 54313-6727

Prepared By:

GRAEF
1150 Springhurst Drive, Suite 201
Green Bay, Wisconsin 54304-5950
(920) 592-9440

Mr. Steve Shimek
Natural Resource Solutions, LLC

Patrick J. Skalecki, P.E.
Principal
GRAEF

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Figure 1 – Master Soil Boring Map and Thin Cover Areas

APPENDICES

Appendix A: Historic Site Data

Appendix B: Waste Characterization

Appendix C: Soil Boring Logs and Waste Limits

Appendix D: Development Plans

Appendix E: Site Visit Photo Log

1. Introduction

The City of Neenah (City) Parks and Recreation Department is proposing to redevelop a landfill previously utilized by the P.H. Glatfelter Company (Glatfelter) for disposal of wastewater treatment solids. The proposed project will create recreational park space on the landfill located north of Main Street on the southern shore of Little Lake Butte des Morts. The landfill is located in the SE 1/4 of Section 21 and the SW 1/4 of Section 22, T 20 N, R 17 E in the city of Neenah, Winnebago County, Wisconsin. The landfill has been referred to as the Arrowhead Park Landfill and also the Park Site Landfill. The Wisconsin Department of Natural Resources (DNR) license number for the landfill is 2299 and the facility identification number is 471013840.

The recreational park space development is divided into two segments, referred to as Park Site #1 and Park Site #2. Park Site #1 is located at the east end of the landfill and Park Site #2 will occupy the central and western portion of the landfill. Construction work associated with Park Site #1 includes: site fill and grading, gravel path construction, and landscape elements. At this time, the recreational park space development for Park Site #2 will be limited to extending a path along the north boundary of the landfill and constructing a landing at the west end of the landfill. No modification or excavation through the existing landfill cover is anticipated.

In order to develop the recreational park space on the landfill, the City is required to obtain an exemption to Wisconsin Administrative Code (WAC) NR 506.085. A completed DNR Form 4400-226 is required for the exemption application to the DNR. This form includes a series of questions to provide the DNR with sufficient information to assess development proposed on the landfill. Sections IV and V of the exemption application require an evaluation of the landfill and an opinion on the potential environmental impacts that will be associated with its development. This report was prepared to provide the landfill evaluation and opinion on development impacts. The evaluation was completed with existing information. The information available for the landfill generally meets the DNR *Guidance for Investigation*[1]. The evaluation of the data considered the DNR guidance, titled *Considerations and Potential Problems*[2].

Pursuant to a telephone conversation with Mr. Gregory Tilkens of the DNR on February 22, 2012, the information that has been submitted to or developed by the DNR needs only to be referenced in this report. However, information that may not have been submitted to the DNR, and is available, should be included. Historical records are included in Appendix A, waste characterization data is

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[1] *Publication RR-684*, "Development at Historic Fill Sites and Licensed Landfills: Guidance for Investigation" (Madison, WI: Wisconsin Department of Natural Resources, 2006).

[2] *Publication RR-685*, "Development at Historic Fill Sites and Licensed Landfills: Considerations and Potential Problems" (Madison, WI: Wisconsin Department of Natural Resources, 2002).

included in Appendix B, soil boring logs are included in Appendix C, and recreational park space development plans are included in Appendix D. Appendix E includes photo documentation for a site visit.

2. Landfill History and Previous Construction

2.1. Landfill History and Configuration

Winnebago Paper Company was founded in 1874 and was located at the intersection of Main Street and Wisconsin Avenue. In 1904, Bergstrom Paper Company (Bergstrom) purchased Winnebago Paper Company. Based on a 1938 aerial photograph, which is included in Appendix A, the southern limits of Little Lake Butte des Morts extended south of the landfill area to the approximate location of Main Street where it joins Union Street. The railroad tracks that formed the southern boundary of the landfill were constructed on a narrow dike.

In 1950, the City was granted a bulkhead line across the south end Little Lake Butte des Morts. Bergstrom obtained the right from the City to use the area behind the bulkhead dike and they committed to the City that they would fill the area with solids extracted from Bergstrom's wastewater. Once Bergstrom had filled the area behind the bulkhead dike, the City planned to develop the property. A copy of the bulkhead line permit, the Bergstrom and City agreement, and bulkhead design drawings are included in Appendix A.

The original plans for landfill construction included several small cells adjacent to the wastewater disposal plant and then extension of a dike along the bulkhead line. Soil filling in the area to be occupied by the wastewater treatment plant (WWTP) started in late 1950 at the east end of the landfill, as shown in Environmental Resource Management (ERM) Drawing 3, included in Appendix A. The treatment plant was constructed in 1952. Solids from the Bergstrom wastewater treatment system were dewatered by a vacuum filter system and then landfilled.

The bulkhead dike was extended about 2,400 to 2,500 feet from the area of the treatment plant, west to the location of the Neenah Slough. The bulkhead dike was constructed from 1957 to 1970. A March 31, 1970, letter from the City to the US Army Corps of Engineers stated the dike was to be completed in the 1970 construction season. A 1971 aerial photograph shows the completed bulkhead dike. Both the correspondence and aerial photograph are included in Appendix A.

Wisconsin started to regulate landfills in 1969 under WAC RD 51 and subsequent WAC NR 151. In 1974, the DNR granted Bergstrom a conditional landfill license (2299) and exemptions from the water body setbacks required by WAC NR 151[3].

[3] John Reinhardt (Madison, WI: Wisconsin Department of Natural Resources) letter to Franklin Moore (Bergstrom), 27 November 1974.

From the late 1960s and into the 1970s, the City planned to develop the landfill into a public park. To this end, the City solicited assistance from the University of Wisconsin, Winnebago County, and local consultants. Vegetated test plots were established and drainage and consolidation studies were completed. Copies of correspondence related to the City park development are included in Appendix A. The City and DNR also negotiated appropriate cover requirements during this time period, as outlined in a DNR order dated September 23, 1976[4]. The landfill stopped receiving wastewater solids in 1976 and cover placement was completed sometime before November 1979[5].

The Bergstrom Neenah mill was purchased by Glatfelter in 1979. Glatfelter maintained roughly 6.5 acres of land leased from the City. The leased land occupied the eastern end of the landfill, generally in the area of Park Site #1.

2.2 Previous Construction Activities on the Landfill

2.1.1. Bergstrom and Glatfelter Construction

There was construction on the landfill in addition to the dikes and original treatment plant. Other Bergstrom-related construction in the proposed Park Site #1 development area included a clarifier and water treatment plant that were built in late 1967 to early 1968. A trailer truck parking area was constructed to the west of the clarifier in 1971. In 1976, the secondary WWTP was constructed and an aboveground fuel oil tank was erected. In 1990 and 1991, a combustor building and stabilization basin were constructed adjacent to the treatment plant. Other than the original treatment plant and parking lot, all construction was supported on pile foundations. The buildings and oil tank were demolished in 2007, after Glatfelter closed its Neenah mill. The construction features while the mill was operating are shown in a City 1979 aerial photograph included in Appendix A.

2.1.2. City of Neenah Construction

The City had constructed storm sewer extension and a sanitary sewer line below the landfill, as shown in ERM Drawing 9 in Appendix A. The sanitary sewer and the storm sewer extension were installed in 1975. Both sewers were designed and installed with an understanding of the anticipated loads associated with the landfill overburden. Their integrity should not be an issue.

---

[4] *Order Number 2A-76-1148* (Madison, WI: Wisconsin Department of Natural Resources, 1976).

[5] D. Misterek (Oshkosh, WI: Wisconsin Department of Natural Resources) letter to J. Wilke (City of Neenah) regarding Site Inspection on 17 October 1979.

The sanitary sewer extends from the south-central portion of the landfill to the northeast. Correspondence on the pipe installation is included in Appendix A. The correspondence was specific to concerns about a large clay stockpile located above the sewer at that time. The correspondence is included because it does provide some insight on how the sewer was installed. The sewer was within natural clay, with exception of a 50-foot long ditch crossing where 1 foot of sludge was over-excavated and replaced with 'fill stone' (gravel bedding). The ditch section referenced is located approximately 200 feet north of the south landfill boundary, along the alignment of the sanitary sewer. The correspondence suggests this is the only segment of the sewer line installed with gravel bedding and the trench was likely backfilled with the excavated clay. Backfilling the pipe trench with clay, versus gravel bedding, reduces the potential for the trench to be a pathway for leachate or gas migration.

The storm sewer traverses the landfill from south to north along the east side of the Fox Valley Energy (FVE) Center. The dike soil is in contact with the concrete outlet structure, based on site observations of the storm sewer outlet made in about 1998 by Mr. Steven Shimek, presently with Natural Resource Solutions LLC. This provides a barrier to interstitial flow from pipe bedding. Construction details at the connection of the sewer extension to pre-existing storm piping are not known.

Following closure of the Glatfelter mill, the City has utilized the area of Park Site #1 for storage, primarily soil and aggregate fill.

2.1.3. Fox Valley Energy Center

The FVE Center (previously Minergy) was constructed in the central portion of the landfill in 1996. The wastewater solids were removed from the footprint of the building prior to construction of the foundation. This facility location is shown in ERM Drawing 9 in Appendix A.

2.1.4. Fox River Remediation

Park Site #1 was used for sand storage during the 2008 sediment capping operations associated with the Fox River remediation. According to Mr. William Hartman, project manager for the Little Lake Butte des Morts clean up, 10,000 to 15,000 tons of sand were stored at Park Site #1 at any one time[6]. Mr. Hartman stated the sand was piled to a height of 15 to 20 feet, generally in the area south of Monitoring Well PS-15RR. Well locations are shown in Appendix C.

[6] William Hartman (Glatfelter), personal communication with Steven Shimek (Natural Resource Solutions, LLC), 2 March 2012.

3. Waste Characterization

Starting in 1952, wastewater from the Bergstrom deinking pulp mill was discharged to the disposal plant. The disposal plant was constructed with a Walker filter system, which discharged to three thickening basins. Solids from the thickening basins were sent to an Oliver vacuum filter where they were further dewatered to approximately a 30% consistency prior to landfilling.

Bergstrom constructed a clarifier and water treatment plant in late 1967 to early 1968. At that time, wastewater from not only the deinking pulp mill but also the paper machines, bleach plant, and beater room discharged to the disposal plant. Solids from the clarifier were dewatered with a belt press to about 40% consistency prior to landfilling.

Based on the physical character of the wastewater solids, it is expected the hydraulic conductivity, even at minimal loads, would likely be very slow, on the order of 4×10^{-6} centimeters per second (cm/sec). This is based on National Council for Air and Stream Improvement data, which is included in Appendix B. The low hydraulic conductivity of the wastewater solids is supported by the previously cited City 1975 drainage study, which indicated the lateral movement of liquid in the wastewater solids was very restricted.

The Institute of Paper Chemistry (IPC) completed an analysis of the wastewater solids in 1973. The results are provided in Table 1. Clarifier solids were analyzed by the University of Arkansas for carbon and nutrients as part of a 2003 land application study. The University of Arkansas results are included in Table 2.

Table 1 - Wastewater Solids Characteristics

Constituent	Concentration
Ash (%)	55.2
Silicon (% of ash)	24.0
Aluminum (% of ash)	28.0
Calcium (% of ash)	20.2
Titanium (% of ash)	4.7
Magnesium (% of ash)	1.7
Iron (% of ash)	0.4
pH (standard unit)	12.0

The solids that were landfilled contained 55% mineral ash on a dry weight basis. The mineral ash consisted primarily of silicon, aluminum, and calcium. The remaining 45% of the mass was organic matter consisting mostly of short wood fiber that was lost in the pulping and paper making process.

Table 2 - Carbon and Nutrients in Wastewater Solids

Constituent	Concentration
Total Carbon (%)	26.8
Organic Nitrogen (%)	0.45
Inorganic Nitrogen (%)	<0.01
Carbon:Nitrogen	60
Phosphorus (%)	0.104
Sulfur (%)	0.288

The wastewater solids disposed in the landfill were strictly from primary clarification and not from a biologic system. Therefore, the solids are relatively inert with a low nutrient content. The high pH and carbon content, together with the low nutrient content, would indicate the solids would not readily decompose.

According to a DNR technical memorandum entitled "Fox River and Green Bay PCB Fate and Transport Evaluation" prepared by the DNR on June 3, 1998, commercial production of carbonless copy paper using polychlorinated biphenyl (PCB) emulsions at Appleton Coated Papers began in the Fox Valley in 1954 and continued until the early 1970s[7]. It is assumed waste carbonless copy paper entered the recycle mills pulping system in 1954 or shortly after. As a deinked pulp mill, Bergstrom wastewater solids likely contained PCBs from 1954 through the final landfilling operations.

The PCB concentration in the landfilled wastewater solids has been determined on several occasions since 1983. Much of the early data was analyzed on an 'as-received' basis and is of limited value. However, there is PCB data on a dry weight basis from borings completed in 1988, 1991, and 1999. The data is summarized in Table B-1 of Appendix B. The PCB concentration ranged from 1.3 to 4,500 milligrams per kilogram (mg/kg) in 53 samples of the wastewater solids. The data is highly skewed and best represented by the geometric mean, which is 60.5 mg/kg. The

[7] R. Stoll and K. Erdman, "Fox River and Green Bay PCB Fate and Transport Evaluation" (Madison, WI: Wisconsin Department of Natural Resources memorandum, 3 June 1998).

concentration of PCBs was found to increase from 1954 to 1969, after which time it declined. Most of the solids placed in the eastern portion of the landfill, below Park Site #1, were placed from 1952 to 1964 and the geometric mean concentration of PCBs in the wastewater solids at that time was 38.4 mg/kg, or less.

PCBs have a high affinity to wastewater solids and PCB losses as leachate are small. IPC column leach tests found only 0.1% to 0.2% of the solids PCB content was lost as leachate. A copy of the results is included in Appendix B. The IPC leachate PCB concentrations ranged from 0.5 to 4 parts per billion (ppb), whereas the solids subjected to the leach tests had PCB concentrations of 20 to 82 mg/kg. DNR sample results from Leachate Head Well PS-9 also suggest PCB losses from the solids are limited[8]. The expected PCB concentration of the wastewater solids in the area of the Leachate Head Well is 21.4 to 29.6 mg/kg, or 21,400 to 29,600 ppb. The DNR leachate sample had a PCB concentration of 1.98 ppb, which is less than 0.1% of the solids PCB concentration.

The potential occurrence of other organic contaminants is low, considering the age of the fill and the characteristics of clarifier solids from similar paper mills.

[8] Ibid., 7.

4. Waste Limits, Volume and Confinement

4.1. Waste Limits

The waste vertical and horizontal limits have been defined through a review and interpretation of landfill design drawings, aerial photographs, survey documentation, and soil borings. These data are summarized in ERM Drawings 10 and 11 in Appendix C. It should be noted that most of the supporting information, including the original Bergstrom design drawings, photographs, and survey documentation was lost when the building in which they were stored flooded. Many of the soil boring logs used to prepare the drawings were included in DNR submittals; soil boring logs that have not been submitted to the DNR are included in Appendix C. Table C-1, in Appendix C, contains a summary of the soil borings completed on and adjacent the landfill through 1999. For ease in identification, the soil borings are consecutively numbered and their locations shown on ERM Drawing 9. It should be noted that ten soil boring logs, Master Soil Boring Nos. 68 through 78, have not been located. More recent soil borings have been included in site assessment submittals completed by Stantec for the City and Glatfelter. Soil boring logs completed for the City are attached in Appendix C. The soil boring logs completed in 2011 for Glatfelter were submitted to the DNR on August 18, 2011[9].

4.2. Waste Volume

The filled area covers approximately 33 acres to typical depth of approximately 8 to 10 feet. The base and top of waste elevations in ERM Drawings 10 and 11, in Appendix C, were used to estimate the waste volume in the landfill. The estimated volume of wastewater solids in the landfill is 387,000 cubic yards. This estimated volume is based on conditions prior to the solids removal for construction of the FVE Center.

4.3. Waste Containment

4.3.1. Base Soils

In general, the base of the landfill is the native soils of the Little Lake Butte des Morts lake bed. The northern limit of waste coincides with the clay bulkhead dike. The southern limit of waste is located along the soil embankment of the railroad tracks.

Soil below the waste consists of slowly permeable clay and silt that extends approximately 59.5 feet below the base of the waste. Refer to Section 5.2 for more detail on the soil conditions below the landfill.

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[9] Stuart Gross, "Summary of Waste Sampling Activities at Park Site Landfill, Neenah, Wisconsin" (Green Bay, WI: Bonestroo, unpublished report, 2011).

4.3.2. Bulkhead Dike

City correspondence discussed in Section 2.1, personal observations, and soil boring data all confirm fine-grained soil was used for bulkhead dike construction. Mr. Shimek had the opportunity to view the exterior dike slope several times before riprap placement in about 1998. The dike surface was primarily a fine-grained soil with varying amounts of gravel. At that time, there were no indications of seepage along the bulkhead dike. Master Soil Boring Nos. 33, 37, 38, and 56 were completed along the bulkhead dike. Master Soil Boring Nos. 33, 37, and 56 were completed as part of a Glatfelter 1983 site evaluation, which included a determination of the bulkhead dike cross-section and the soil fill hydraulic conductivity[10]. Clay borrow soils were found in all bulkhead dike sections. The top and base gravel layers depicted in one of the design drawings included in Appendix A were either poorly defined or absent. DNR utilized the in-field hydraulic conductivity test results to calculate the seepage rate along the entire bulkhead dike, which they estimated at only 120 gallons per day[11].

4.3.3. Soil Fill South of Landfill

Soil fill occurs above the native clay soils at the location of the previous WWTP, bulkhead dike, and adjacent the south boundary of the landfill. Master Soil Boring Nos. 64 and 65 were located approximately 75 to 150 feet south of the waste limit and penetrated the soil fill. The soil fill at these locations was classified as silty to sandy clay with pockets of silty and clayey sand, trace to some gravel, and trace to some concrete and cinders.

The City of Neenah has completed soil borings south of Park Site #1 as part of the Glatfelter mill site redevelopment[12]. A line of soil borings designated SL1 through SL6 were completed along and south of the railroad tracks. The soil description indicates 0.0 to 0.7 foot of sand and gravel surface material over sand and silty clay fill. Native clay soil was encountered from 5.3 feet to 11.5 feet below the ground surface. It should be noted that the exploration completed for the adjacent redevelopment did not identify landfill related impacts[13].

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[10] G. Bureau and C. Carter, "The Park Site Landfill in Neenah, Wisconsin: Existing Physical Conditions, Effect on Local Groundwater and Alternatives for Future Action" Spring Grove, PA: P.H. Glatfelter, 1984.

[11] Richard Schuff (Madison, WI: Wisconsin Department of Natural Resources) letter to Neal Carter (P.H. Glatfelter), 10 September 1984.

[12] Lynelle Caine. "City of Neenah Site Investigation Report" Crivitz, WI: Stantec, February 6, 2012.

[13] Lynelle Caine (Stantec) personal communication with Steve Shimek (Natural Resource Solutions, LLC), 17 March 2012.

4.3.4. Landfill Cover

The landfill cover was first evaluated in the Glatfelter 1983 site evaluation. They completed 26 borings to document the thickness of the cover. They found the cover to range from 0.25 foot to 4.5 feet with a mean thickness between 1 and 2 feet. The thickness of the cover was greatest near the center of the landfill and generally became thinner at the perimeter. The cover soil was primarily dark brown to reddish-brown silty clay with several inclusions of clayey silt, silty sand, gravel, and sand. Isolated areas of gravel and cinder roadbed material were also identified. Grain size analyses completed on the silty clay cover soil found the percent passing the No. 200 sieve to range from 50% to 95% by weight. The liquid limit ranged from 32 to 48 and the plastic index from 13 to 27. These values are indicative of relatively good quality clay liner soil. Hydraulic conductivity was also determined on undisturbed samples of the cover soil. The hydraulic conductivity ranged from $3x10^{-8}$ centimeters per second (cm/sec) to $1x10^{-5}$ cm/sec. The average hydraulic conductivity of the four samples was $3x10^{-6}$ cm/sec. Although faster than required by modern standards, the hydraulic conductivity is relatively low.

Subsequent to the 1983 study, the City placed additional clay soil. Soil borings completed across the landfill in 1999 found the cover thickness to vary from 1.0 to 6.3 feet, with an average thickness of 3.3 feet. Copies of the soil boring logs are included in Appendix C. As noted in the earlier study, the cover generally consisted of silty clay with inclusions and isolated areas of roadbed material. In 2011, Glatfelter completed 34 soil borings in the central and western portion of the landfill[14]. These soil boring logs were reviewed for cover thickness. The soil cover was found to range from 1.0 to 5.8 feet thick, with an average thickness of 2.9 feet. The locations of soil borings completed in both 1999 and 2011 that had less than 2.0 feet of cover in the profile were identified and the areas were plotted on Figure 1. No characterization, other than visual classification, of the cover soil was completed in 1999 or 2011.

[14] Ibid., 9.

5. Landfill Setting

5.1. Topography and Land Use

The landfill is located in an area of nearly level terrain, with a surface elevation that ranges from +748 feet mean sea level (msl) in the central and eastern portion of the landfill and gradually slopes downward in all directions. The surface elevation on the bulkhead dike, adjacent to Little Lake Butte des Morts, is +744 feet msl. The normal pool elevation of Little Lake Butte des Morts is near +738 feet msl. The land surface along the southern boundary of the landfill is at +744 feet msl to the southwest and +748 feet msl to the southeast.

Park Site #1 at the east end of the landfill is relatively level, but contains several large stockpiles. The existing topography is shown on the Graef Drawing C-203 in Appendix D.

The FVE Center occupies the central portion of the landfill. The area west of the FVE Center is relatively level and supports a grass cover with areas of brush and small trees.

The area east beyond the landfill includes new commercial development, primarily office space. A mix of commercial and residential use occurs about 500 feet south of the landfill south of Main Street. To the west of the landfill is a mix of industrial, commercial, and residential uses. Little Lake Butte des Morts occurs to the north.

5.2. Hydrogeologic Setting

5.2.1. Bedrock and Soil

The area is underlain by recent and glacial lake deposits. According to a DNR site review, the recent and glacial deposits are underlain with low permeability Prairie du Chien dolomite[15]. Master Soil Boring No. 78 was the deepest boring completed at the landfill. This boring was completed in the area of the FVE Center and extended to a depth of 95.0 feet. Refer to Figure 1 for the Master Soil Boring map. This boring encountered a continuous layer of hard to stiff silty clay to 59.5 feet below the waste. Below the silty clay layer, the boring encountered 5.0 feet of fine sandy silt and 7.5 feet of extremely dense clayey sand with a trace of gravel. Bedrock (not classified) was encountered 72.0 feet below the base of the waste. The silty clay and fine sandy silt deposits are likely lacustrine and glacial till. The clayey sand is probably a basal glacial till deposit. Other borings across the site document the consistency of the clay deposits. Testing completed in the

[15] Ibid., 7.

1983 Glatfelter study found the base soils to have a very low vertical hydraulic conductivity of $1x10^{-9}$ cm/sec to $5x10^{-8}$ cm/sec[16].

Soil fill occurs above the native clay soils at the location of the previous WWTP, bulkhead dike, and adjacent the south boundary of the landfill. Master Soil Boring Nos. 64 and 65 were located approximately 75 to 150 feet south of the waste limit and penetrated the fill, which was classified as silty to sandy clay with pockets of silty and clayey sand, trace to some gravel, and trace to some concrete and cinders. Recent soil borings completed south of Park Site #1 and east of Master Soil Boring No. 65 identified a thin surface deposit of sand and gravel over sand and silty clay soil fill. The soil fill was underlain by native silty clay soil.

5.2.2. Groundwater

Groundwater levels are monitored in nested wells located south of the landfill, and saturated levels are monitored within the landfill and the bulkhead dike. The locations of the monitoring wells are shown in Appendix C Groundwater in the area of the landfill is rather shallow and typically less than 10 feet below the ground surface. Water levels in the waste mass are generally higher than the normal pool level of Little Lake Butte des Morts and above the water table monitored south of the landfill. Monitoring data indicates water flows away from the landfill in all directions. Based on October 2011 monitoring results, water flowed from Leachate Head Well PS-9 at elevation +745.57 feet msl to the bulkhead dike where the water elevation in Monitoring Wells PS-3R and PS-15RR was at +738.02 feet msl and +735.04 feet msl, respectively. Water also flowed south from Leachate Head Well PS-9 toward the south boundary of the landfill. Monitoring Well PS-32B is located southwest of the landfill and Monitoring Well PS-33B is located to the southeast. The groundwater elevation in Monitoring Wells PS-32B and PS-33B was 746.32 feet and 739.35 feet, respectively. Water levels in nested wells located south of the landfill have indicated varying directions of vertical gradient. In October 2011, the vertical gradient in Well Nest PS-32 was upward and in PS-33 it was downward. This same variation has been noted in previous years.

There are no known potable water wells in the vicinity of the landfill. The City and the nearby City of Menasha do not utilize groundwater for their water supply; rather they treat and utilize water from Lake Winnebago. The closest municipal well is in the Town of Menasha, more than 0.5 mile north of the landfill.

[16] Ibid., 10 (10).

6. Site Visit

On March 1, 2012, Mr. Shimek conducted a site visit. Photo documentation is included in Appendix E. The surface of Park Site #1 is shown in Photos 2 through 7 in Appendix E. The east portion of the landfill, Park Site #1, is relatively level with the exception of several stockpiles. The surface consists of a combination of pavement, building foundations, gravel, sand, and debris (primarily fragments of concrete and brick). There was a stockpile of aggregate in the south part of Park Site #1 that appeared to be about 10 feet high, possibly higher (Photos 2 and 3). A circular depression was observed at the location once occupied by the wastewater clarifier (Photo 3). The spill retention berms that surrounded the decommissioned No. 6 fuel oil AST were observed at the southwest area of Park Site #1 (Photos 2 and 4). Long and narrow berms were noted adjacent to the FVE Center (Photos 3, 5, and 6). The berms appeared to be about 4 to 8 feet high. A concrete storm sewer outlet was observed immediately northeast of the FVE Center (Photo 8). There were no observations of cover clay, except outside developed areas along the periphery of the landfill. There were no observations of wastewater solids or seeps that would indicate the cover was compromised and waste was exposed.

The western portion of the landfill, or Park Site #2, is nearly level with localized shallow depressions. Photos 9 through 20 show the conditions on the western portion of the landfill. The area of Park Site #2 is primarily grass-covered with isolated areas of small trees and shrubs. The bulkhead dike, which extends the length of the landfill, is primarily grass-covered and riprap has been placed on the exterior slope (Photos 9, 18, and 20). There were sporadic small shallow depressions, which were water filled (Photos 11, 12, and 14). The water in the depressions was clear and likely the result of a recent snowmelt. There were no observed leachate seeps or evidence of seeps or gas migration, such as stained soil or sparse vegetation, in the western portion of the landfill. An exception was a small area about 3,000 square feet in size, located approximately 200 feet west of the FVE Center that had sparse vegetation (Photo 12). The surface had very shallow water accumulations, but the water appeared clear and not associated with leachate. It was noted that the surface did contain gravel and asphalt fragments. It is a possibility the sparse vegetation is a result of several factors including wet soil conditions and poor quality surface soil. There were also several areas near the south-central portion of the landfill, south of the FVE Center, where vegetation was sparse or lacking because of equipment tracking, and shallow soil or gravel fill placement or grading (Photo 14, foreground and left side).

7. Previous or Existing Environmental Impacts

Known or potential environmental impacts that have occurred at the landfill have been evaluated for various media, including groundwater, soil, surface water, sediment, air, and explosive gas (methane).

7.1. Groundwater

Groundwater and leachate heads have been routinely monitored at the landfill since 1968. The following describes the groundwater monitoring network and provides an evaluation of recent groundwater quality results.

7.1.1. Groundwater Monitoring Network

The locations of the groundwater and leachate head monitoring wells are shown in Figure 2, and Table 3 provides basic construction information on the wells. The wells are monitored in April and October of each year. Groundwater levels are monitored in nested wells located south of the landfill, and saturated levels are monitored within the landfill and the bulkhead dike. The present groundwater monitoring program requires that all wells are monitored for water (or leachate) elevation, specific conductance, color, odor, turbidity, temperature and pH. Additionally, Monitoring Wells PS-3R and PS-15RR are monitored for chemical oxygen demand (COD), chloride, and, total sulfate, iron, hardness, and alkalinity.

Table 3 - Monitoring Well Summary

Well		Construction Summary			
Common Name	DNR Unique No.	Depth (Feet)	Material Adjacent the Screen Section	Water Table or Leachate Head Well	Piezometer
PS-3R	012	9.2	Bulkhead Dike	X	---
PS-9	002	11.0	Waste	X	---
PS-15RR	003	9.0	Bulkhead Dike	X	---
PS-32	006	38.6	Native Soil	---	X
PS-32A	007	23.1	Native Soil	---	X
PS-32B	008	14.4	Fill and Native Soil	X	---
PS-33R	009	38.1	Native Soil	---	X
PS-33A	010	22.9	Native Soil	---	X
PS-33B	011	14.3	Fill and Native Soil	X	---

7.1.2. Groundwater Quality Evaluation

The groundwater monitoring network includes wells placed in waste, soil fill, and native soils. Because of this unique condition, groundwater quality assessments have been completed utilizing groundwater quality trends and the range of historical parameter concentrations, rather than comparisons to established standards. The most recent groundwater evaluation was completed in 2007 and included groundwater monitoring results from 1986 through April 2006[17]. The conclusion of the report was that groundwater quality impacts potentially related to the landfill have declined over the years and groundwater quality monitored adjacent to the landfill was often influenced by factors other than the landfill. Based on the findings, the required monitoring parameter list was reduced to indicator parameters, with the exception of two wells located in the bulkhead dike, Monitoring Wells PS-3R and PS-15RR. These wells are also monitored for chloride, COD, and total sulfate, iron, hardness, and alkalinity.

This groundwater evaluation includes a comparison of the 2011 monitoring results to those presented in the 2007 report. The evaluation includes specific conductance (an indicator parameter), chloride, COD, and total sulfate, iron, hardness, and alkalinity. The 1989 DNR monitoring results for PCBs are also provided for informational purposes.

Table 4 includes a summary of specific conductivity readings from April 2006 and October 2011. Specific conductivity has been a good indicator of groundwater quality adjacent to the landfill, which is one of the reasons it is monitored in all wells. Table 5 provides a summary of the parameter concentrations that were monitored in Wells PS-3R and PS-15RR.

[17] Steven Shimek, "Groundwater Evaluation and Request for Operating Plan Modification, Glatfelter Park Site Landfill, Winnebago County Wisconsin" (Green Bay, WI: STS Consultants, Ltd., 2007).

Table 4 - Summary of Specific Conductivity Results

Monitoring or Leachate Head Well	Specific Conductivity (µmohs/cm)	
	April 2006	October 2011
PS-3R	3,180	2,920
PS-9	2,860	2,296
PS-15RR	2,620	3,305
PS-32 PS-32A PS-32B	524 1,190 1,210	582 1,046 1,218
PS-33R PS-33A PS-33B	217 530 300	661 608 708

µmohs/cm - micro-mohs per centimeter

Table 5 - Summary of Parameter Concentrations in Monitoring Wells

Parameter	Concentration (mg/L)	
	PS-3R	PS-15RR
Chloride	167	748
COD	105	50.8
Sulfate	49.7	<2.0
Iron	17.7	34.4
Hardness	1,750	1,230
Alkalinity	1,930	737

mg/L - milligram per liter

7.1.3. Specific Conductance and Chloride

The specific conductivity of leachate, based on results from Leachate Head Well PS-9 once exceeded 90,000 µmohs/cm. The specific conductivity in the leachate at this well has declined over the years and is now typically in the range of 2,000 µmohs/cm to 3,000 µmohs/cm. The leachate chloride concentrations have also declined over the years from 854 mg/L in 1986 to a range of 50 mg/L to 300 mg/L in recent years.

The October 2011 specific conductivity measurements and chloride concentrations in all groundwater monitoring wells were within their respective historic range of values. However, the

specific conductivity was somewhat elevated in two monitoring well locations in October 2011 as compared to April 2006. These locations included Monitoring Well PS-15RR and Well Nest PS-33.

The elevated specific conductivity value in Monitoring Well PS-15RR does not correspond with the results of any other parameters analyzed. In reviewing all the specific conductivity results from 2006 through 2011 it was found the values ranged from 2,595 to 3,650, with no trend. Also, in the past, any unusual increases in specific conductivity in Monitoring Well PS-15RR were associated with increases in chlorides. Such an occurrence was monitored in April 2005 that was attributed to salting operations at the previous truck parking area. Based on the review of data it appears the October 2011 specific conductivity value is normal.

Table 6 - Specific Conductivity Results for Monitoring Well PS-15RR

Monitoring Date	Specific Conductance (µmohs/cm)
April 2006	2,620
April 2007	3,650
April 2008	3,590
October 2008	3,550
April 2009	3,120
October 2009	2,890
April 2010	2,690
October 2010	2,300
April 2011	2,595
October 2011	3,305

The October 2011 specific conductivity values in Monitoring Wells PS-33 and PS-33B were elevated above the values recorded in 2006. Well Nest PS-33 was viewed during the March 1, 2012, site visit (Photo 1 in Appendix E Photo Log). An excavation for a stormwater basin had been excavated next to the well nest. The crest of the pond sidewall was within several feet of the wells. One of the protector pipes was found to be loose. The excavation was water-filled with runoff from the adjacent construction site, Millview Drive, and Main Street. According to Lynelle Caine of Stantec, the excavation was completed in autumn 2011[18]. The monitoring event also occurred at approximately the same time. It should be noted that specific conductivity in the shallow Monitoring

[18] Lynelle Cain (Stantec) personal communication with Steven Shimek (Natural Resource Solutions, LLC), Green Bay, WI, 5 March 2012.

Well PS-33B rose from 440 µmohs/cm in April 2011 to 708 µmohs/cm in October 2011. This shallow well is the most likely to be influenced by surface disturbances. It does not appear the somewhat elevated specific conductivity values in well nest PS-33 are related to the landfill.

7.1.4. COD

Leachate COD concentrations from Leachate Head Well PS-9 have declined significantly over the years. Initially, the COD was 30,000 mg/L. After 2000, the COD concentration in the leachate has been less than 200 mg/L.

The recent COD concentrations in Monitoring Wells PS-3R and PS-15RR are within their respective historic range. The COD in Monitoring Well PS-3R in October 2011 was almost identical to its concentration in April 2006 of 102 mg/L. The COD concentration in Monitoring Well PS-15RR in October 2011 was near the mid-point of the long-term range.

7.1.5. Sulfate and Iron

Both sulfate and iron monitored in Leachate Head Well PS-9 fluctuated over the years with no apparent trend. The sulfate concentration has ranged from no detect to 250 mg/L and iron has ranged in concentration from less than 5 mg/L to over 30 mg/L.

The October 2011 sulfate concentration in Monitoring Well PS-3R was similar to results recorded in April 2006 (50 mg/L) and well within the long-term range in concentration. Historically, the sulfate concentration in Monitoring Well PS-3R has ranged from no detect to more than 1,200 mg/L. Sulfate was not detected in the recent analysis of water from Monitoring Well PS-15RR. Historically, the sulfate concentration in this well has been low, less than 50 mg/L.

Iron concentrations from October 2011 in Monitoring Wells PS-3R and 15RR are somewhat lower than detected in 2006 and within their historic range in concentration of 10 mg/L to somewhat greater than 60 mg/L.

7.1.6. Hardness and Alkalinity

Hardness and alkalinity monitored in Leachate Head Well PS-9 have varied, but both parameters are commonly near 1,000 mg/L.

The recent hardness and alkalinity concentrations in Monitoring Wells PS-3R and 15RR were within their historic range. The hardness concentrations in both monitoring wells were lower than monitored in April 2006. The concentration of alkalinity in Monitoring Well PS-15RR has decreased

somewhat from April 2006 when the concentration was 798 mg/L. Conversely, the alkalinity in Monitoring Well PS-3R has increased somewhat from 1,817 mg/L.

7.1.7. PCBs

In November 1989, the DNR sampled for PCBs in Monitoring Wells PS-3R and PS-15RR, and Leachate Head Well PS-9[19]. They found the PCB concentration of leachate in Well PS-9 was 1.981 ppb. This contrasted with the PCB concentration of 0.462 ppb in Monitoring Well PS-3R and 0.023 ppb in Monitoring Well PS-15RR. The DNR concluded that the bulkhead dike was successful in restricting PCB movement off site.

7.1.8. Summary

Generally, groundwater monitoring results from 2011 compare favorably with historic data.

Specific conductance increased somewhat in 2011 in Monitoring Well PS-15RR and Well Nest PS-33. The increases were found to be normal in Monitoring Well PS-15RR and attributed to construction activities in Well Nest PS-33.

7.2. Soil

Soil impacts have been limited, based on a review of available data. Two specific potential sources of soil impacts have been identified; one being PCBs from the wastewater treatment solids and the other being organic compounds associated with the loss of product from a No. 6 fuel oil AST.

7.2.1. PCBs

Significant migration of PCBs into the base soils below and adjacent to the landfill would not be expected based on soil characteristics, low solubility of PCBs, and on-site testing. As indicated in Section 7.1.5, the DNR concluded monitoring results documented limited migration of PCBs into the bulkhead dike fill soil. Testing completed in 1983 found PCBs were at non-detectable concentrations at 2 feet below the interface with the base of the waste and native soil, except at one location[20]. The occurrence of detectable PCBs at this one location was attributed to cross-contamination, and no detectable PCBs were identified at 4 feet below the interface in the same boring.

[19] Ibid., 7.
[20] Ibid., 10 (10).

7.2.1. AST

A No. 6 fuel oil AST was located in the southwest corner of the eastern portion of the landfill in Park Site #1. The AST was located above the waste and the foundation was supported by piles. Following demolition of the paper mill, diesel range organic compounds and polycyclic aromatic hydrocarbons were discovered in soil near the location of the former AST (WDNR BRRTS No. 0271550537). The impacted soil occurs within the limits of the landfill. As will be discussed in Section 8.1, the proposed development will involve covering the impacted soil with clean soil, thereby removing the direct contact pathway.

7.3. Surface Water and Sediment

During landfill operation there was a loss of wastewater solids to Little Lake Butte des Morts, which likely contributed to sediment in an area identified as Deposit A. It is estimated the loss of solids to Little Lake Butte des Morts occurred in 1953 and from 1957 into 1975. There has been no loss of wastewater solids to surface waters since that time. Lost solids from the landfill were removed or capped during remediation of Little Lake Butte des Morts that occurred from 2004 through 2009[21].

As stated in Section 4.3.2, DNR calculated the seepage loss through the entire bulkhead dike at 120 gallons per day. Further, they calculated the maximum potential PCB contribution from seepage to Little Lake Butte des Morts at 0.035 gram per day and considered that load insignificant[22].

7.4. Air and Explosive Gas

It is unlikely the landfill has contributed to any significant air quality impacts since it was closed in 1976. There is a potential that the waste mass could produce methane, but the production rate is probably low because of the waste characteristics and its age. Glatfelter Buildings 45 and 46 were constructed with gas collection and venting systems. Mr. Hartman indicated that methane was either not detected or near detection limits when monitored[23]. Methane that is produced is likely vented through the cover and adjoining fill soil, where it dissipates into the atmosphere. The shallow water table in the vicinity of the landfill further reduces the potential for methane migration.

7.5. Summary

The landfill has had some impact on the environment in the past. These impacts have been identified and addressed appropriately. The landfill is not currently causing negative impacts to the

[21] http://www.littlelakecleanup.com/cleanupfacts.html

[22] Ibid., 7.

[23] William Hartman (Glatfelter), personal communication with Steven Shimek (Natural Resource Solutions, LLC), 27 February 2012.

environment based on an evaluation of the landfill setting and available information, and from a review of groundwater monitoring data.

8. Proposed Development and Potential Environmental Impacts

This section of the report summarizes development plans and includes an evaluation of how the development may impact the environment.

8.1. Proposed Development

8.1.1. Park Site #1 Development

The Park Site #1 development covers the eastern portion of the landfill, as shown on attached Graef Drawings C-202 and C203 located in Appendix D. In general, the near-term plan includes:

- Removal of the aggregate stockpile that exists in the southern portion of Park Site #1.
- Relocation of fill in the existing berm adjacent the FVE Center.
- Construction of a topsoil-covered screening berm east of the FVE Center to a maximum height of approximately 12 feet above existing grade.
- Placement of approximately 2 feet of clean soil and topsoil in areas beyond the screening berm.
- Seeding.
- Placement of an aggregate-surfaced path that will extend from the southeast corner of Park Site #1 to the northwest and connect to the western portion of the landfill, Park Site #2.

No excavation into the landfill cap is proposed.

Long-term plans are to improve the surface of the proposed path and new pathways with an asphaltic surface. Limited parking may also be provided in the south-central portion of Park Site #1.

8.1.1. Park Site #2 Development

The western portion of the landfill has been designated Park Site #2. Development at Park Site #2 will be limited to an aggregate-based pathway along the bulkhead dike and a landing near the Neenah Slough. The landing will connect with a boardwalk across the slough and a path system that will extend north into the town of Menasha. The landing will be constructed where the path joins the boardwalk across the Neenah Slough. The landing is planned to be constructed on a floating slab, largely supported on the underlying bulkhead dike. A boring completed at this location in June 2011 found the dike to be 12 to 13 feet high and constructed of silty clay with fine gravel over native silty clay soil. The boring location diagram and boring field log are included in Appendix C. Non-surfaced pathways may also be cut through the grass cover in Park Site #2. These development plans are shown on a PDI drawing in Appendix D.

In the future, the City may provide additional landscaping at Park Site #2, such as low (6-foot) drumlins to provide more topographic relief. The drumlin features are shown on the PDI drawing in Appendix D.

During Park Site #2 development additional soil can be applied to those areas identified as having less than two feet of existing cover.

8.2. Potential Environmental Impacts

The potential for environmental impacts associated with development were evaluated for each of the media discussed in Section 7.0. Following is an assessment of each of those media.

8.2.1. Groundwater

Negative groundwater impacts are not anticipated from the proposed development.

There are no plans to modify the confinement features of the landfill. No excavations into the landfill cover are proposed.

In Park Site #1, the existing surface will be covered with about 2 feet of vegetative growth media and a vegetative cover will be established. The vegetated area will cover the trailer truck parking area that was routinely salted; thereby reducing groundwater impacts from salts. The vegetation will take up and transpire precipitation potentially reducing infiltration in areas that were not underlain with pavements or foundations.

An evaluation has been completed to determine the potential of a proposed screening berm to cause excessive consolidation of the underlying waste, which could result in a release. The screening berm will be constructed to approximately 12 feet above existing grade in the western half of Park Site #1. The screening berm cross-section is included in Appendix D. The berm will consist of an ash core with an internal (temporary) and external (permanent) clay cap. The berm will be covered with topsoil. The estimated load imposed by the screening berm based on the cross-section is provided in Table 7.

The potential load that will be exerted by the screening berm can be compared to past loads which based on a review of monitoring data, has not caused a release. The greatest load known to have been placed on the site was the capping sand in 2008. Sand placement started in April 9, 2008 and was stored into June 2008[24]. As noted earlier, the sand pile height was in a range of 15 to 20 feet.

[24] William Hartman (Glatfelter), personal communication with Steven Shimek (Natural Resource Solutions, LLC), 9 March 2012.

Assuming a particle density of 2.65 grams per cubic centimeter, a porosity of 25% and a moisture content of 0 to 5% by weight, the calculated load near the center of the pile was 1,860 to 2,600 pounds per square foot (psf).

Table 7 - Estimated Load Below Screening Berm

Berm Component	Thickness (feet)	Estimated Wet Density (pcf)	Load (psf)
Topsoil	0.5	90	45
Clay	4.0	125	500
Ash	7.5	100	750
Total			**1,295**

pcf – pounds per cubic foot
psf – pounds per square foot

Monitoring Well PS-15RR was located downgradient of the stockpile storage area. In reviewing the specific conductivity values in Table 6 it can be seen that there were elevated values in late 2007 and early 2008, which predated the sand placement. The sand placement started five days after Monitoring Well PS-15RR was monitoring in April 2008. From April 2008 to October 2010 the specific conductivity in the well decreased and starting in 2010 to late 2011 increased to the same level seen in late 2007. All reading in the time period were within the historic range in concentration and it does not appear the load caused a release.

The load imposed by the screening berm is estimated to be 595 to 1,305 psf less than the capping sand storage piles. The sand storage piles were located in the approximate area of the screening berm. The screening berm construction should not cause a release.

Although contamination associated with the past fuel oil AST would probably not impact groundwater, soil capping further assures there will not be groundwater impacts because it will reduce infiltration.

8.2.2. Soil

No negative impacts to soil are anticipated.

Clean soil fill and topsoil will cover the majority of Park Site #1. The screening berm will have an ash core, but the ash will be capped with compacted clay, which will be covered with topsoil.

Existing impacted soil at the location of the former fuel oil AST will be covered and the potential for contact with the contaminants will be eliminated.

The very limited development at Park Site #2 will not introduce any soil contaminants.

8.2.3. Surface Water and Sediment

There are no anticipated negative impacts to surface water and sediment.

Placement of topsoil and seeding of Park Site #1 will likely improve runoff quality to Little Lake Butte des Morts. There will be an elimination of salts that were contributed by past salting of pavement. The vegetative cover will reduce the sediment load to Little Lake Butte des Morts as compared to the previous developed condition.

There will be continued seepage through the bulkhead dike, but there will be no increase in the seepage rate or decrease in quality.

8.2.4. Air and Explosive Gas

There are no anticipated negative impacts to air or additional risk associated with potential methane generation.

The proposed passive development will not result in air pollutants. There will generally be an improvement in air quality at Park Site #1 in comparison to the previous development. The development plans should not increase methane generation or migration. Methane that may be generated will dissipate through the cover and adjacent soil, as it has in the past. No structures are proposed that could confine the gas. The vegetative growth layer will consist of loose soil that will not confine gas movement.

9. Summary and Conclusion

In 1950, the City was granted a bulkhead line across the south end Little Lake Butte des Morts and Bergstrom obtained the right from the City to use the area behind the bulkhead dike to landfill wastewater treatment solids from their paper mill. The bulkhead dike was constructed in a westerly direction from the mill to the outlet of the Neenah Slough between 1950 and 1970. The bulkhead dike defined the northern limit of the landfill. The southern limit was defined by a dike supporting railroad tracks. The elliptical shaped landfill covers approximately 33 acres.

Wastewater solids were disposed in the landfill from 1952 into 1975. The estimated volume of wastewater solids disposed in the landfill is 387,000 cubic yards. The wastewater solids that were landfilled contained 55% mineral ash. The mineral ash consisted primarily of silicon, aluminum, and calcium. The remaining 45% of the mass was organic matter consisting mostly of short wood fiber that was lost in the pulping and paper making process. Starting in about 1954, the solids contained PCBs, resulting from the pulping of waste paper and broke produced by Appleton Coated Paper.

The landfill closure activities started in 1976 and were substantially complete in 1979. Ongoing cover maintenance is completed by the City.

Waste in the landfill is contained by deep clay base soils, the clay bulkhead dike, clay soil fill along the railroad tracks to the south, and a clay cover.

Soil testing and groundwater monitoring have both documented the landfill has had limited impact on the environment since filling ceased.

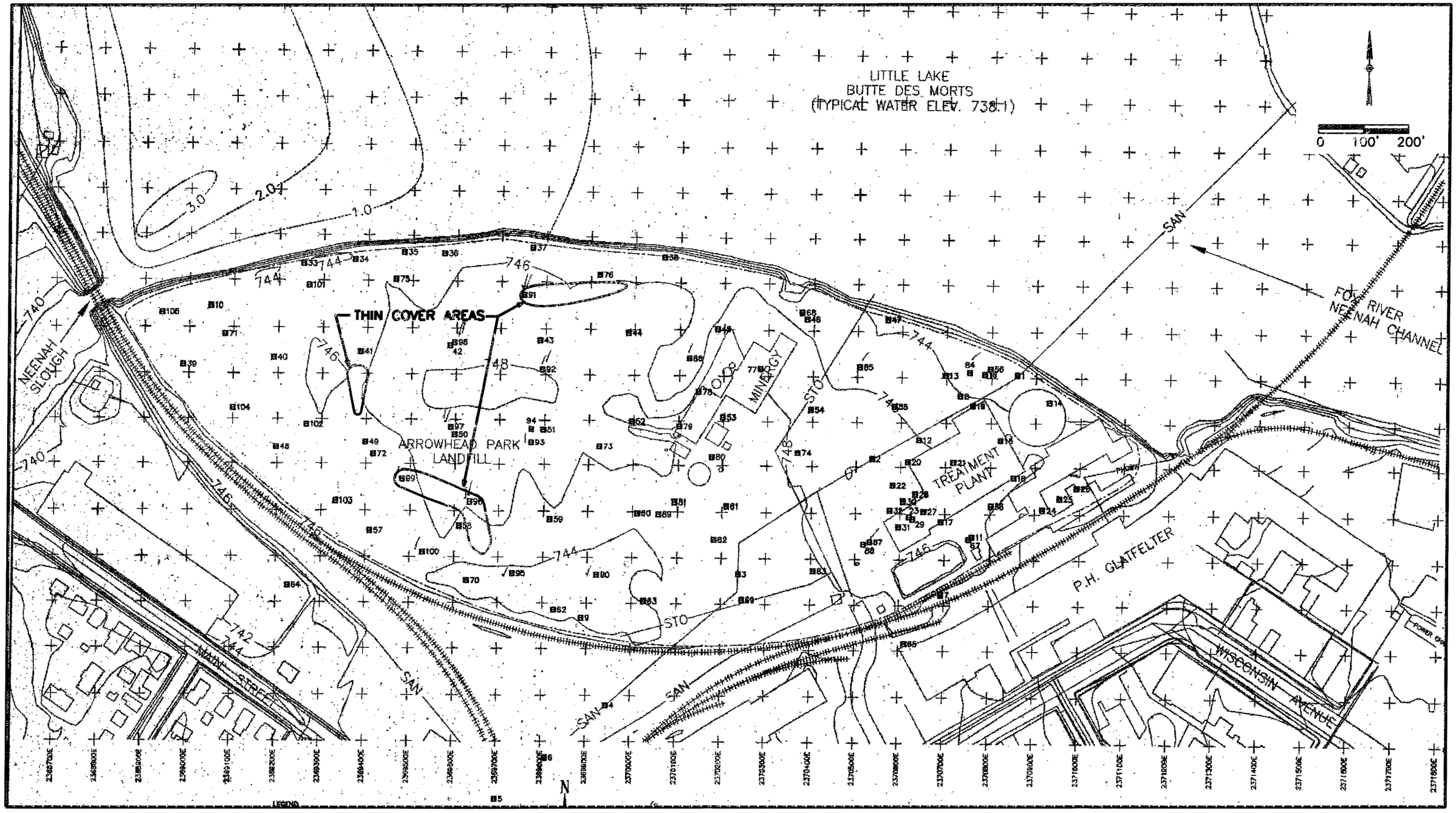
Various media have been evaluated to determine past impacts. Landfill-related groundwater impacts have been limited. Somewhat elevated specific conductivity values monitored in a bulkhead dike well may have been caused by storing large volumes of sand at Park Site #1 in 2009. The sand has been removed and the specific conductivity levels will probably decline. Soil impacts related to landfilling have been limited.

Surface water and sediment had been impacted during landfill operations, but not since the landfill has been closed, other than runoff from developed areas. Air quality has not been significantly impacted by the closed landfill. Methane production has been limited due to the nature of the waste.

The media have also been evaluated in light of proposed recreational park space development at Park Sites #1 and #2. Park Site #1 will be developed by placement and seeding of a vegetative growth layer, installation of gravel-based paths, and construction of a screening berm. Park Site #2 will have limited development including a gravel-based path along the bulkhead dike and a landing near the outlet of the Neenah Slough. There may be non-paved paths cut through the grass across the western portion of the landfill. **Based on the evaluation of media, no negative impacts are anticipated as a result of the proposed development.** It is probable the development of Park Site #1 will result in less impact to groundwater and surface water.

FIGURE 1

MASTER SOIL BORING MAP AND THIN COVER AREAS



GRAEF

PROJ. NUMBER:	2011-2007
DATE:	03-20-2012
PROJECT MGR:	PJS
DRAWN BY:	KH
SCALE:	1"=200'
REVISED:	

MASTER SOIL BORING MAP AND THIN COVER AREAS

PARK SITE #2
CITY OF NEENAH, WI

FIGURE

1

J:\Jobs2011\20112007\CAD\Site\dgn\misc\Fill Areas Exhibit.dgn

APPENDIX A – HISTORIC SITE DATA

- 1938 Aerial Photo
- 1950 Corp of Engineers Permit
- 1951 Bergstrom Paper Treatment Plant Land Lease
- 1970 Bulkhead Dike Design
- Environmental Resources Management Drawing #3
- 1970 Dike Completion Schedule
- 1971 Aerial Photo
- 1971 City Statement to USACOE on Park Use
- 1973 City Park Plan
- 1975 Park Interim Study
- 1979 Aerial Photo
- 1976 Sanitary Sewer Construction Letter


4 12 38
AIW-5 408

District Permit Filo

DEPARTMENT OF THE ARMY

NOTE.—It is to be understood that this instrument does not give any property rights either in real estate or material, or any exclusive privileges; and that it does not authorize any injury to private property or invasion of private rights, or any infringement of Federal, State, or local laws or regulations, nor does it obviate the necessity of obtaining *State assent* to the work authorized. IT MERELY EXPRESSES THE ASSENT OF THE FEDERAL GOVERNMENT SO FAR AS CONCERNS THE PUBLIC RIGHTS OF NAVIGATION. (See *Cummings* v. *Chicago*, 188 U. S., 410.) 16—12166-2

GLKKS

PERMIT

Office, District Engineer
Milwaukee District, Corps of Engineers.
628 Federal Building,
Milwaukee 1, Wisconsin, 12 July 1950.

City of Neenah
Neenah, Wisconsin

Sirs:

Referring to written request dated 29 June 1950,

I have to inform you that, upon the recommendation of the Chief of Engineers, and under the provisions of Section 10 of the Act of Congress approved March 3, 1899, entitled "An act making appropriations for the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes," you are hereby authorized by the Secretary of the Army,

to construct a rubble stone retaining wall and to fill shoreward thereof
(Here describe the proposed structure or work.)

in Little Lake Butte des Morts (south shore)
(Here to be named the river, harbor, or waterway concerned.)

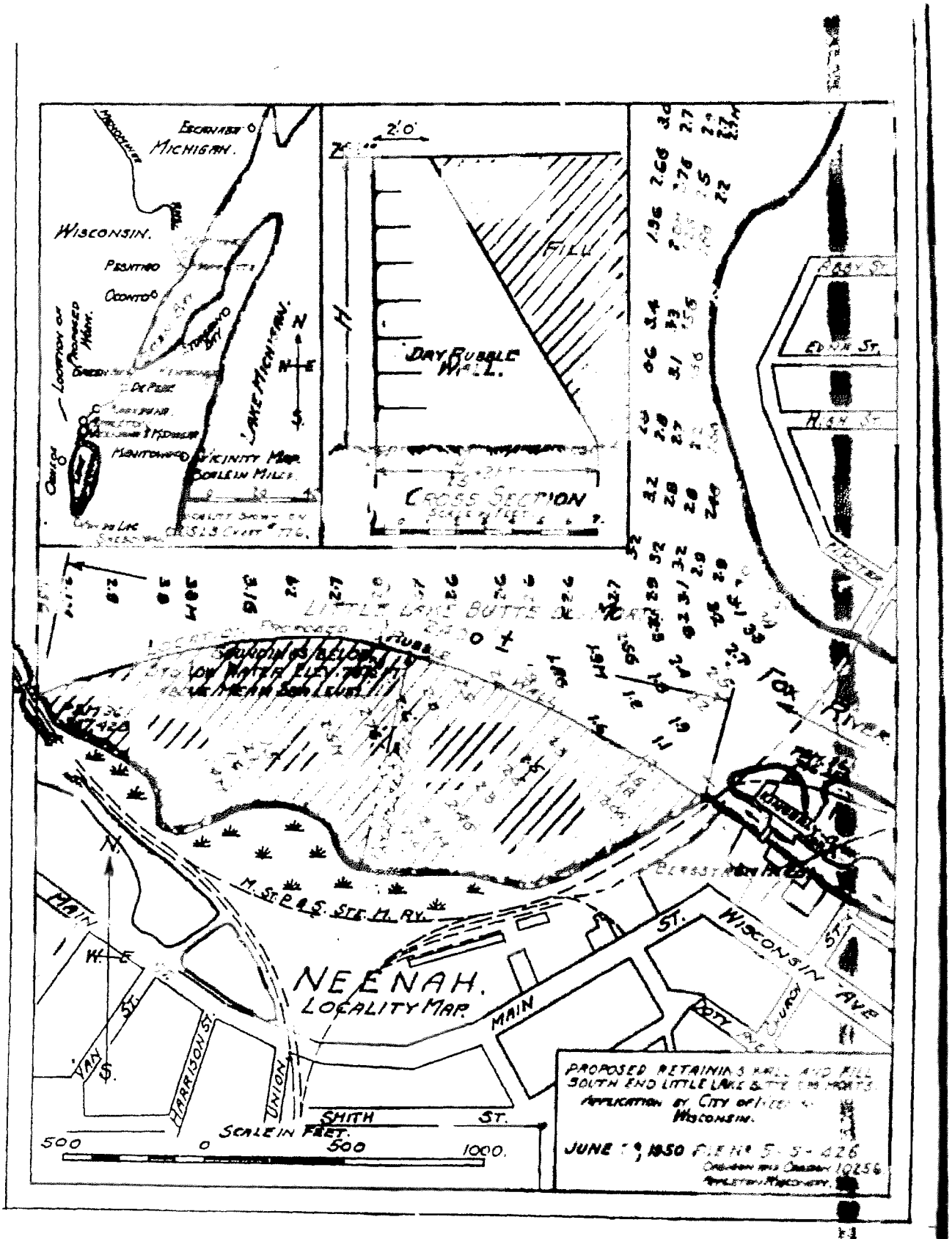
at Neenah, Wisconsin, westerly from outlet of Neenah Channel of Fox River,
(Here to be named the nearest well-known locality—preferably a town or city—and the distance in miles and tenths from some definite point in the same, stating whether above or below or giving direction by points of compass.)

in accordance with the plans shown on the drawing attached hereto marked "Proposed Retaining Wall and Fill, south end Little Lake Butte des Morts, Application by City of Neenah, Wisconsin, June 29, 1950, File No. 5-S-426,"
(Or drawings: give file number or other definite identification marks.)

subject to the following conditions:

5-S-426

CORPSFOIA0000110



CORPSFOIA0000111

(a) That the work shall be subject to the supervision and approval of the District Engineer, Corps of Engineers, in charge of the locality, who may temporarily suspend the work at any time, if in his judgment the interests of navigation so require.

(b) That any material dredged in the prosecution of the work herein authorized shall be removed evenly and no large refuse piles, ridges across the bed of the waterway, or deep holes that may have a tendency to cause injury to navigable channels or to the banks of the waterway shall be left. If any pipe, wire, or cable hereby authorized is laid in a trench, the formation of permanent ridges across the bed of the waterway shall be avoided and the back filling shall be so done as not to increase the cost of future dredging for navigation. Any material to be deposited or dumped under this authorization, either in the waterway or on shore above high-water mark, shall be deposited or dumped at the locality shown on the drawing hereto attached, and, if so prescribed thereon, within or behind a good and substantial bulkhead or bulkheads, such as will prevent escape of the material in the waterway. If the material is to be deposited in the harbor of New York, or in its adjacent or tributary waters, or in Long Island Sound, a permit therefor must be previously obtained from the Supervisor of New York Harbor, Whitehall Building, New York City.

(c) That there shall be no unreasonable interference with navigation by the work herein authorized.

(d) That if inspections or any other operations by the United States are necessary in the interest of navigation, all expenses connected therewith shall be borne by the permittee.

(e) That no attempt shall be made by the permittee or the owner to forbid the full and free use by the public of all navigable waters at or adjacent to the work or structure.

(f) That if future operations by the United States require an alteration in the position of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army, it shall cause unreasonable obstruction to the free navigation of said water, the owner will be required upon due notice from the Secretary of the Army, to remove or alter the structural work or obstructions caused thereby without expense to the United States, so as to render navigation reasonably free, easy, and unobstructed; and if, upon the expiration or revocation of this permit, the structure, fill, excavation, or other modification of the watercourse hereby authorized shall not be completed, the owners shall, without expense to the United States, and to such extent and in such time and manner as the Secretary of the Army may require, remove all or any portion of the uncompleted structure or fill and restore to its former condition the navigable capacity of the watercourse. No claim shall be made against the United States on account of any such removal or alteration.

(g) That the United States shall in no case be liable for any damage or injury to the structure or work herein authorized which may be caused by or result from future operations undertaken by the Government for the conservation or improvement of navigation, or for other purposes, and no claim or right to compensation shall accrue from any such damage.

(h) That if the display of lights and signals on any work hereby authorized is not otherwise provided for by law, such lights and signals as may be prescribed by the U. S. Coast Guard, shall be installed and maintained by and at the expense of the owner.

(i) That the permittee shall notify the said district engineer at what time the work will be commenced, and as far in advance of the time of commencement as the said district engineer may specify, and shall also notify him promptly, in writing, of the commencement of work, suspension of work, if for a period of more than one week, resumption of work, and its completion.

(j) That if the structure or work herein authorized is not completed on or before 31st day of December, 1953, this permit, if not previously revoked or specifically extended, shall cease and be null and void.

By authority of the Secretary of the Army:

Plan attached

D. A. MORRIS
Colonel, Corps of Engineers
District Engineer

ENG FORM 1 SEP 48 1721 (Civil) This form supersedes ED Form 96, dated 1 Apr 45, which may be used until exhausted.

U. S. GOVERNMENT PRINTING OFFICE 16-13188-3

CORPSFOIA0000112

VOL 1004 PAGE 0[illegible] EXHIBIT B

THIS INDENTURE made this 2nd day of July, 1951, by and between the City of Neenah, Winnebago County, Wisconsin, Lessor, and Bergstrom Paper Company, a Wisconsin Corporation of Neenah, Winnebago County, Wisconsin, Lessee.

WHEREAS, Lessee requires a parcel of land upon which it must erect a waste treatment plant for the purpose of providing and contributing fill for the area recently acquired by Lessor by Act of the Wisconsin Legislature at the South end of Little Lake Butte des Morts, and WHEREAS, Lessor desires and is in need of material for such fill in said area,

WITNESSETH that the Lessor does hereby, in consideration of the rent hereinafter reserved and all of the covenants and agreements herein expressed, demise and lease unto the Lessee all of the following described premises situated in the City of Neenah, Winnebago County, Wisconsin.

Commencing at the South corner of Lot 8, Block 1, North Neenah, Neenah, Wisconsin, on the Northwest side of Main Street; thence North twenty-eight degrees thirty-five minutes (28°35') West along the line between Lots 8 and 9 a distance of two hundred and eighty-three (283) feet to the Northwest side of the Soo Line right-of-way, the place of beginning; thence North sixty degrees fifteen minutes (60°15') East along the South line of said right-of-way a distance of Five Hundred (500) feet to a point (on the Northerly boundary of the property referred to in the law recently enacted by the State of Wisconsin); thence North sixty degrees twenty-nine minutes (60°29') West three Hundred forty-eight (348) feet to a point; thence North sixty-seven degrees five minutes (67°05') West a distance of two hundred (200) feet to a point; thence South twenty-two degrees fifty-five minutes (22°55') West a distance of two hundred forty-five (245) feet; thence South twenty-eight degrees thirty-five minutes (28°35') East a distance of three hundred five (305) feet, more or less, to the place of beginning; containing three and twenty-nine one hundredths (3.29) acres, more or less.

NCR-FOX-0548683

VOL [illegible]

TO HAVE AND TO HOLD the above described premises, with the rights, privileges, easements and appurtenances thereunto attaching and belonging unto the Lessee for and during the term of ninety-nine (99) years from and after the first day of June, 1951 and until the 31st day of May, 2050, paying rent therefor and yielding thereof as hereinafter provided; said rent in the amount of One ($1.00) Dollar to be paid on or before the first day of June, 1951, and yearly thereafter on or before said month and day until the expiration of the term of this agreement, specifically reserving unto lessor the right to construct, lay, maintain and extend any and all sewer mains that it is now or may be to the advantage of said City to lay, extend or maintain over and across the aforedescribed property agreeing, however, that said sewer or sewers are to be so laid, extended or maintained in such a manner and so located as not to interfere with lessee's right to erect or maintain the aforementioned waste treatment plant.

IT IS FURTHER AGREED that lessee in conformity with the purposes of this lease shall build, construct and erect a waste treatment installation sufficient for treatment of its waste water at Lessee's [illegible] and to operate such installation in such a manner that the soils derived from this operation may be utilized as fill for the area lying West of and adjacent thereto acquired by Lessor by Act of the Wisconsin Legislature on the South end of Little Lake Butte des Morts.

IT IS FURTHER AGREED that said Lessor is hereby released from any and all liability arising out of the construction or operation of said installation by the said Lessee, and said Lessee agrees hereby to save harmless the said Lessor from any such liability that might arise, and that said installation shall at all times remain the property of Lessee and may be removed at Lessee's [illegible]

[illegible] that Lessee [illegible] maintain around the above described property [illegible] it

NCR-FOX-0548684

a suitable rubble wall or dike at its own expense and will save Lessor harmless from any and all liability as to the construction or maintenance of that particular wall, but the Lessor promises and agrees to utilize and deliver to the proper site any and all available materials suitable for the construction of a rubble wall or dike such as broken concrete slabs, etc., for the construction and maintenance of a rubble wall or dike enclosing the remainder of the land acquired by lessor by Act of the Wisconsin Legislature. Lessor specifically agrees that should it ever divert any such available material to another project when such material is needed for the extension of said rubble wall or dike that it will then substitute other satisfactory material, even though it may be necessary for Lessor to purchase such other material.

In the event that sufficient suitable material is not available for the extension of said rubble wall or dike at as rapid a rate as may be desirable, then it is agreed that both Lessor and Lessee will mutually discuss said problem and work out together a proper solution.

AGREED and in consideration of the granting of the [illegible] lease and other good and valuable consideration, the [illegible] whereof is hereby confessed and acknowledged, Lessee hereby grants and conveys unto said Lessor an easement and right to maintain and keep in repair all existing sewer mains running through Lessee's property and more specifically described as follows:

A strip of land Ten feet (10') wide the southerly line of which is One Hundred Five (105) feet northerly and parallel to the northerly line of Wisconsin Avenue, extended thru the vacated Sixty-six (66) foot strip of land formerly used as street between Canal Street and Wisconsin Avenue and thru Lot Seven (7), Block Two [illegible], Palmers Map, Second Ward, City of [illegible], Winnebago County, Wisconsin, said strip being [illegible] an existing 24" storm sewer from Canal [illegible] Lake Butte des[illegible]

The easterly Eight (8) feet of Lot [illegible] and the easterly Eight (8) feet of Lot Four [illegible] Block One (1), Plat of North Neenah, Second Ward, City of Neenah, Winnebago County, Wisconsin, being the location of an existing 12x20 inch storm sewer.

-3-

NCR-FOX-0548685

VOL 004 PAGE

The westerly twenty-five (25) feet of Lot Seven (7), Block One (1), Plat of North Neenah, Second Ward, City of Neenah, Winnebago County, Wisconsin, being the location of an existing twenty-one (21) inch sanitary sewer and a forty-two (42) inch storm sewer.

together with the right at all times to extend said sewer mains to the shore of Little Lake Butte des Morts.

And the said Lessee does promise and agree to pay the rent and perform the covenants herein contained and in the manner aforesaid and not to underlease or sublet said premises or any part thereof, or assign this lease without the written consent of the Lessor and to quit and deliver up the same to the Lessor peaceably and quietly at the end of said term.

And the covenants herein contained shall bind the parties mutually and their respective successors and assigns and shall be irrevocable during said term.

IN WITNESS WHEREOF, The parties have hereunto set their hands and seals the day and year first herein written.

In the presence of:

CITY OF NEENAH, WINNEBAGO COUNTY, WIS.

BY: _____ (SEAL)
Mayor

BY: _____ (SEAL)
City Clerk

Lessor

In the Presence of:

BERGSTROM PAPER COMPANY.

BY: _____ (SEAL)
President

BY: _____ (SEAL)
Secretary.

Lessee

State of Wisconsin }
Winnebago County } ss.

On this _____ day of _____ 1961, _____ and _____ of the above named City of Neenah, to me known to be the persons who executed the foregoing lease, and to me known to be such Mayor and

NCR-FOX-0548686

City Clerk of said City of Neenah, and acknowledged that they executed the foregoing lease as such officers as the lease of said City of Neenah, by its authority.

Notary Public, Winnebago County, Wis.
My commission expires _____

Notary Public, Winnebago County, Wisconsin.
My Commission Expires December 7, 1952

State of Wisconsin)
) ss.
Winnebago County)

Personally came before me this 2nd day of July 1951, Mathew H. Bergstrom and Bust B. Fiedler of the above named corporation, to me known to be the persons who executed the foregoing lease, and to me known to be such President and Secretary of said Corporation, and acknowledged that they executed the foregoing lease as such officers as the lease of said Corporation, by its authority.

Notary Public, Winnebago County, Wis.
My commission expires My Commission Expires Mar. 15, 1952

NOTARY PUBLIC WINNEBAGO CO. WIS.

DEPARTMENT OF THE ARMY
CHICAGO DISTRICT CORPS OF ENGINEERS
219 SOUTH DEARBORN STREET
CHICAGO ILLINOIS 60604

NCCOD-S
69-83

14 April 1970

REVISED

PUBLIC NOTICE

Extension of Time

The City of Neenah, Wisconsin 54956 has requested a three year extension of time to a Department of the Army Permit issued 12 July 1950 to "construct a rubble stone retaining wall and to fill shoreward thereof, in Little Lake Butte des Morts at Neenah, Wisconsin." The project is presently 75% complete.

The City of Neenah has revised the plans to show a clay filled retaining wall with broken concrete and stone riparp 12" thick on the lake side and the top of the structure to be at an elevation of 744.0 U.S.C.S. The material to be used for the structure is clay obtained from street construction and trenching operations and completion of the structure is expected this season. The material used in the retaining wall will be impervious and clean. The fill material is approximately 50% inorganic clay and 50% wood fibre from the industrial waste treatment plant of the Bergstrom Paper Company. The work is shown on the reverse side of this notice.

The determination as to whether a perm t will be issued will be based on an evaluation of all relevant factors including the effect of the proposed work on navigation, fish and wildlife, conservation, pollution, and the general public interest. Comments on these factros will be accepted and made part of the record and will be considered in determining whether it would be in the best public interest to grant a permit. Any objection to or any statements or information on aspects of the proposed work should be mailed to reach this office on or before 30 April 1970.

FOR THE DISTRICT ENGINEER:

Sketch on reverse side

L. S. KREGER
Chief, Operations Division

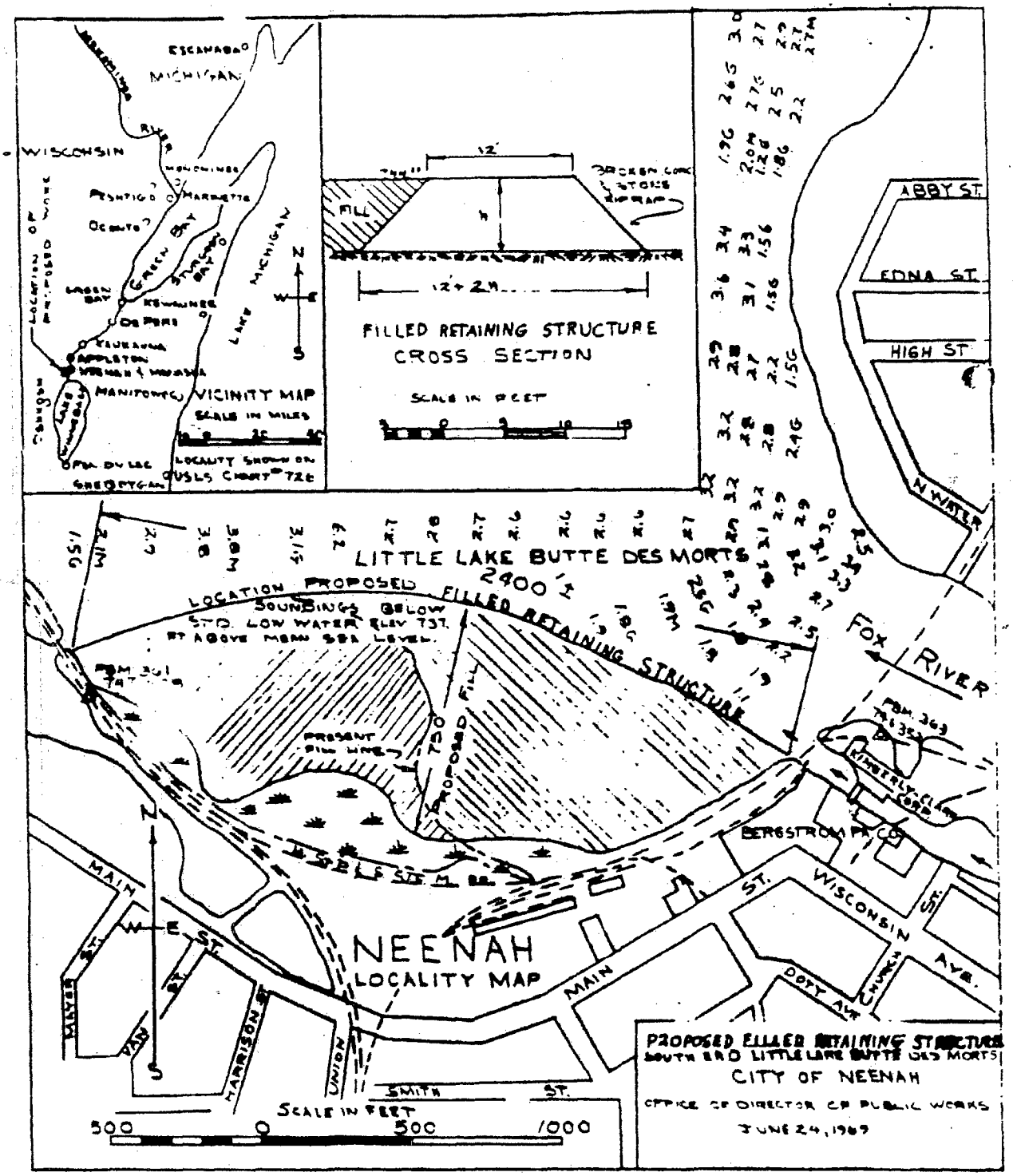
NO COMMENT
National Park Service
North East Region

Signature

May 19, 1970
Date

107

WDNRFOIA0008948



106

WDNRFOIA0008947

TYPICAL EARTH DIKE SECTION

SCALE : 1" = 5'-0"

Master Copy

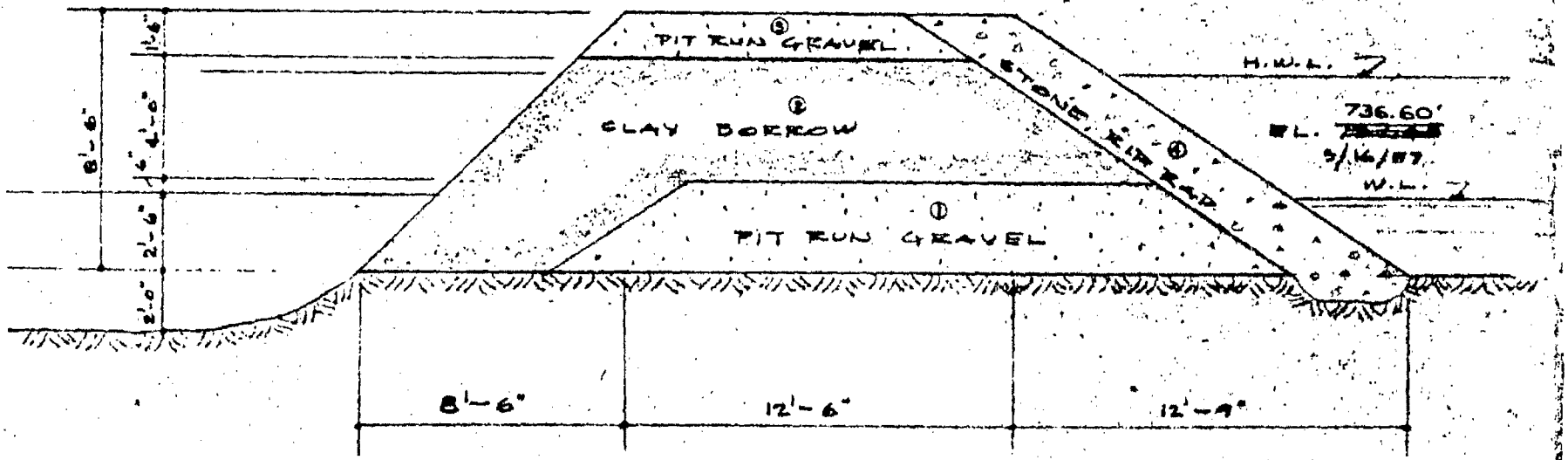


FIGURE 2

EARTH DIKE FOR WASTE DISPOSAL
BERGSTROM PAPER CO.
NEENAH, WIS.

C.R. MEYER & SONS CO.
OSHKOSH, WIS.

ELEVATIONS
BASED ON
USC & GS DATA

X-B-17-E-1145-A

LITTLE LAKE
BUTTE DES MORTS
(TYPICAL WATER ELEV. 738.1)

ARROWHEAD PARK
LANDFILL

NEENAH SLOUGH

MINERGY

DIKE

TREATMENT PLANT

DISPOSAL PLANT

POTENTIAL EDGE OF FILL

P.H. GLATFELTER

MAIN STREET

WISCONSIN AVENUE

POWER CHANNEL

FOX RIVER
NEENAH CHANNEL

3.0
2.0
1.0
740
742
744
746
748
SAN
STO
PHGWW

802700N
802600N
802500N
802400N
802300N
802200N
802100N
802000N
801900N
801800N
801700N
801600N
801500N
801400N
801300N
801200N
801100N
801000N
800900E

368700E
368800E
368900E
369000E
369100E
369200E
369300E
369400E
369500E
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370100E
370200E
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370500E
370600E
370700E
370800E
370900E
371000E
371100E
371200E
371300E
371400E
371500E
371600E
371700E
371800E

N

LEGEND

—740— SURFACE CONTOUR
—SAN— CITY SANITARY SEWER
—STO— STORM SEWER
PHGWW— P.H. GLATFELTER WASTEWATER SEWER
STRUCTURE
RAILROAD
APPROXIMATE LIMITS OF DEPOSIT A
--2.0-- APPROXIMATE SEDIMENT THICKNESS (FEET)
APPROXIMATE LIMITS OF SLUDGE IN LANDFILL
TOP OF BULKHEAD DIKE

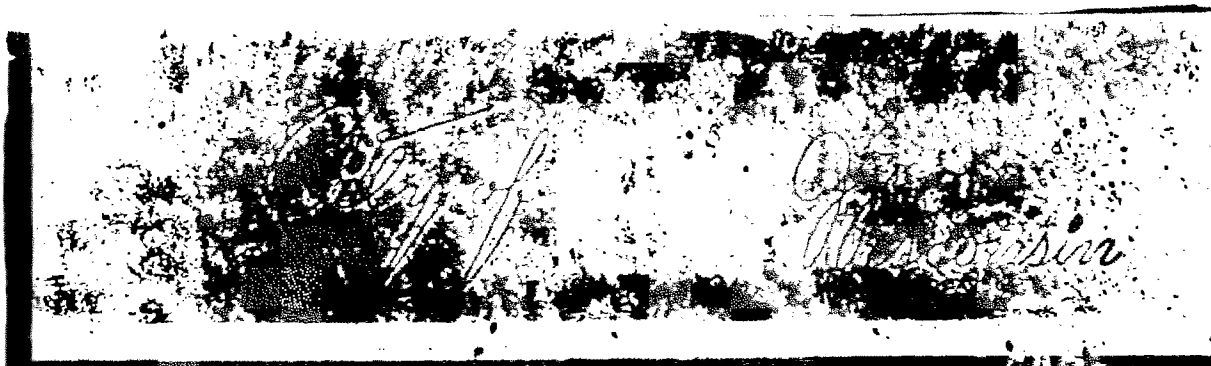
BASE MAP PROVIDED BY CITY OF NEENAH, GIS DATA BASE. PHOTOGRAPH CONTROL, 1991 WITH CITY UPDATES THROUGH 1998. ERM MODIFICATIONS INCLUDED ADDITION OF CLARIFIER, SOIL STOCKPILE REMOVAL AND PROJECTION OF DEPOSIT A SEDIMENT (PER EWI 1992 FEASIBILITY STUDY).

REV. NO.	DESCRIPTION	DATE	REV. BY	CHK'D.	APP'D.
	REVISIONS				

ENVIRONMENTAL RESOURCES MANAGEMENT
ERM

Arrowhead Park Landfill
Neenah, Wisconsin

DRAWN:	CHECKED:	May 31, 1953 Landfill Development and Utilities	DRAWING:
SCALE: 1"=100'	APPROVED:		98276-3



GEO BRYAN, DIRECTOR OF PUBLIC WORKS — March 31, 1970

APR

Mr. Ross R. Plainse, Project Engr.
Corps of Engineers
Department of the Army
905 S. Oneida Street
Appleton, Wisconsin 54911

Dear Ross:

You asked for certain information relative to our application for extension of time for the permit covering the retaining structure and fill in Little Lake Butte des Mortes near Bergstrom Paper Company.

It is anticipated that the clay filled retaining structure will be completed this construction season. In the event sufficient material is not available from street construction and trenching operations, the work might be delayed until adequate material is available. The City does not contemplate purchasing fill for this purpose.

Bergstrom estimates the time required to fill the area shoreward of the retaining structure at about ten years but point out that economic conditions controlling the use of waste paper in their operations could change this.

The material being used to fill this area is approximately 50% inorganic clay and 50% wood fibre. The source of the material is the industrial waste treatment plant which removes this material from the discharge of Bergstrom's waste paper deinking process.

Upon completion of the retaining structure and as it progresses, broken concrete riprap approximately 12 inches thick will be, is being and has been placed along the lake side of the retaining structure.

The elevation of the top of the retaining structure will be maintained at about 744.0 USGS. At final grading, the westerly end may be raised to about 745.0. I enclose a copy of a final grading plan worked out in this office.

Upon completion of the filling operation and as the material settles to its final density, soil and seed will be applied to provide a grass cover as the area is developed for the intended recreational use.

I [illegible] Mr. Moore [illegible] March 19, 1970, relating to the above information and [illegible] this and similar projects.

Very truly yours,

WGB/ [illegible]
Enclosure

George L. Bryan
Director of Public Works

CORPSFOIA0000243


9-7-71
A1W 1 MM 250

City of Wisconsin

54956

WAYNE G. BRYAN, DIRECTOR OF PUBLIC WORKS
PHONE: 722-6427 AREA CODE: 414

December 10, 1971

is this true?
request
Revised
amended permit

The District Engineer
U. S. Army Engineer District, Chicago
219 S. Dearborn Street
Chicago, Illinois 60604

Re: NCCCO-P
69-83
Project Office No. 5-5-426

Gentlemen:

A further extension of the above referenced permit originally dated 12, July, 1950, and subsequently extended to December 31, 1971, to "construct a rubble stone retaining wall and fill shoreward thereof in Little Lake Butte de Morts (South Shore) of Neenah, Wisconsin, westerly from the outlet of Neenah Channel of Fox River" and as amended 10, November, 1970, is hereby requested.

To date, the project is roughly 80% complete. The impervious earth type bulkhead referred to ~~in your letter of 10, November, 1970,~~ is complete and is pierced by temporary drainage culverts at the westerly end.

As noted in our extension request of 11, July, 1969, the fill material used in this project is clay and paper fiber wasted by the Bergstrom Paper Company in their recycling of newspaper and magazine paper. In 1950, at the start of this project it was estimated the time required to complete the fill would be 30-35 years. In our request of 11, July, 1969, we estimated 7 to 10 years. We now believe the filling will be completed in about 5 years. In 1972, we expect to start development of the most stable areas with trees and grass looking to the ultimate park development.

Since it appears the completion of this project will take about 5 years, we request consideration of extending the permit to 31, December, 1977.

We are enclosing a copy of our drawing submitted in July of 1969, on which we have indicated the progress to date and a copy of an aerial photo of the area taken April, 1971, showing the filling operation.

By direction of the
Public Works Committee
of the Neenah Common Council

Director of Public Works

WGB/cac - Enclosure

130

WDNRFOIA0008972

SHATTUCK, SIEWERT AND ASSOCIATES, INC.
250 N. GREEN BAY ROAD • P.O. BOX 396 • NEENAH, WISCONSIN 54956 • 414-725-6346

ARCHITECTS
ENGINEERS
PLANNERS

MEMORANDUM
10/31/73

Project: Bergstrom Land Fill Park
Client: Bergstrom Paper Company/City of Neenah
Location: Neenah, Wisconsin
Time: 10:00 a.m. Date: 10/31/73
Place: Architects Office
Participants:

Job No. 424
Partner-in-charge: MFS
Project Manager: HGW

Dr. Art Peterson (University of Wisconsin)
Vern Peroutky (Winnebago County Agricultural Agent)
Wayne Bryan (Director of Public Works)
Bill Miller (Park & Recreation Commission)
Orv Ross (Bergstrom Paper Company)
Harley Wagner (Shattuck, Siewert and Associates)

To orient participants, a composite sketch of the site was reviewed. The sketch was a markup of City of Neenah drawing dated 4/2/68 of the Bergstrom Fill Area upon which was superimposed the proposed new sanitary sewer and the proposed park layout of the Park and Recreation Department scheme dated 7/27/73. Dr. Peterson and Vern Peroutky commented that a recent (spring 1973) aerial photograph of the site is available; Vern Peroutky to check his files and inform Harley Wagner of the photo number and where copies may be obtained.

Dr. Peterson presented his report on tests and recommendations on the Bergstrom sludge fill and the Neenah-Menasha treatment plant sludge; copy of his report attached (letter to Vern Peroutky dated October 30, 1973). Discussion about items in the report and ideas about the fill site follows:

The report gives the analysis of the Bergstrom Paper Company sludge based on tests by the State Soil Testing Lab 7/11/73. The analysis of the Neenah-Menasha sewage sludge is presented as percent of solids and parts per million based upon samples taken by Dr. Peterson 9/4/73 and samples taken by Bergstrom Paper Company 9/11/73. Although there are some variances in the test results between the two samplings, the recorded values are within reasonable expected limitations.

The Bergstrom sludge fill has the physical properties of a dense clay. Percolation through this material is essentially non-existent, therefore surface drainage (and perhaps some inlets and drain tiles) is essential. Wayne Bryan will contact George Framberger of the Soil Conservation Service for their direction and assistance in designing the drainage system.

Ideas about positive surface drainage were discussed. An undulating type surface (rises or hills along with slight ravines or swales) appears to be the idea to pursue. Ditching definitely not recommended; see comments hereinafter. Orv Ross commented on how a paper mill waste was

NEENAHFOIA0003841

used in Canada to create a ski hill (copies of an article in Chem 26 about the ski hill were given to Vern Peroutky and Dr. Peterson.)

The idea of creating "hills" was discussed. The hills discussed were really mounds or small hills as opposed to a large hill or hills. The hills would function in a manner to create the positive drainage required on the site and could possibly be used to screen the southerly view of the old buildings and railroad trackage area. Bill Miller commented on small hills recently created in the City of Neenah for use as children sliding hills. The idea of creating hills will be seriously considered; in addition to the foregoing esthetic and recreational values, it may be able to provide an answer to Bergstrom's and the City of Neenah continuing problem of disposal of mill sludge and soils from city excavations.

The idea of using a ditch or ditches to carry City storm water or to provide drainage on the site was discussed. Dr. Peterson stated, and it was generally agreed, that ditches would not be good. Reasons: Slope stability of the sludge material; plant growth on relatively steep slopes; intermittent flow from the City storm system; erosion of the ditch area. Orv Ross stated that if a ditch is definitely not to be used that the present existing ditch could be filled with mill sludge after the City storm line is installed. Orv Ross also stated that he had read an article on slope stability and structural strength of paper mill sludge at a disposal site in Ohio; he will obtain reprints of this report if possible and send copies to the participants.

Dr. Peterson discussed his recommendations for conditioning the mill sludge material and the site surface to promote plant growth. He recommended that test plots of planting be made at the site. His recommendations -- as stated in the report -- range from covering the present surface with a mixture of soil and fertilizer to mixing soil with paper mill sludge and Neenah-Menasha sewage sludge. The soil for surfacing or mixing that he recommends is a "sandy loam". Sandy loam is not what we usually consider as "a black dirt top soil". A sandy textured soil is needed. "Black dirt" or clay soils should not be used because physically they would be similar to the existing dense paper mill sludge fill.

Test plots (each plot 15' x 15', two plots of each treatment) should be made at the site. Dr. Peterson recommended that the plots be prepared this fall and then planted in the spring. Dr. Peterson emphasized that the existing site material must be graded for proper drainage; Wayne Bryan stated that the City grader could be used for this; Orv Ross also volunteered the use of their cat at the site. The layout of the plots will be made by Wayne Bryan's department with discussions with Bill Miller. The City will provide the man power to create the plots. Dr. Peterson recommended that Kentucky Bluegrass and/or Bluestem be the type of seed used for the test plots. Both of these types of grass thrive well in sunny areas.

NEENAHFOIA0003842

Dr. Peterson expressed concern about the rooting area for trees due to the density of the sludge fill and its alkalinity. He suggested that holes be dug in the existing fill to provide space for the root structure, with this space being backfilled with natural soils. Because of the density of the existing fill material, the holes dug would probably become "cups" holding excess moisture. Dr. Peterson suggested that it may be necessary to run a drain line from the "cupped" root area to ravine areas or to Little Lake Butte Des Morts. French drain type drains may be able to be used instead of tile conduits in some areas.

NEXT STEPS

Vern Peroutky - track down source of "sandy loam"; provide information to Harley Wagner who will in turn inform Wayne Bryan. Determine source of recent aerial photograph; provide this information to Harley Wagner who in turn will inform Wayne Bryan.

Wayne Bryan - request assistance in drainage planning from Soil Conservation Service (George Framberger). Lay out test plots at the Bergstrom site.

Bill Miller - assist Wayne Bryan in layout of test plots.

Orv Ross - obtain information from the tests in Ohio on sludge stability and structural strength.

Harley Wagner - work on preliminary layouts of the park site, indicating existing conditions and proposed changes -- the new sanitary and storm sewers, recreational layout and possible drainage systems.

Shattuck, Siewert and Associates, Inc.

Harley G. Wagner

Harley G. Wagner

HGW/a

NEENAHFOIA0003843

UNIVERSITY OF WISCONSIN–MADISON

DEPARTMENT OF SOIL SCIENCE 1525 Observatory Drive
Madison, Wisconsin 53706
608-262-2633

October 30, 1973

V. W. Peroutky, Agriculture Agent
Winnebago County Office
Room 51, Court House
Oshkosh, WI 54901

Re: Bergstrom Paper Company Sludge Demonstration,
Little Lake Butte des Morts, Neenah.

Dear Vern:

The analysis of the Bergstrom Paper Company sludge is as follows:

Tests by State Soil Testing Lab. 7/11/73

pH	Phosphorus	Potassium	Organic Matter	Soluble Salts
9.0	5 #/A	250 #/A	3.4%	50

The analysis of the Neenah-Menasha Sewage sludge cakes are as follows:

Per Cent of Solids

	Sample	N	P	K	Ca	Mg	Na
①	Coil Media	0.376	.637	2.18	2.55	.438	.363
	~~Flat~~ Felt Wire	0.376	.668	2.27	3.30	.446	.370
②	Coal Filter	0.784	1.88	1.95	4.16	.327	.273
	Stand Dryer	0.840	1.98	2.05	2.65	.336	.303

ppm

	Sample	Al	Ba	Fe	Sr	B	Cu	Zn	Mn	Cr
①	Coil Media	36,500	142.	2860.	75.2	56.3	129.	563.	121.	129.
	~~Flat~~ Felt Wire	40,700	152.	2980.	82.3	62.3	141.	578.	128.	135.
②	Coal Filter	17,350	121.	25,150	136.	331.	224.	604.	153.	252.
	Stand Dryer	18,700	197.	25,600	145.	362.	234.	685.	157.	264.

The chemical analysis of the sewage sludge indicates no unusual heavy metal concentration, nor any other chemicals that would be toxic to plant growth when used in the recommended amounts.

① Samples taken by Art Peterson 9/4/73.
② " " " Bergstrom Paper Co. 9/11/73.

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The physical analysis of the paper mill sludge sample is listed as clay and this is the reason the site is so poorly drained and will require exact surface drainage of the sludge prior to placement of any surface material.

The pH of the paper mill sludge is strongly alkaline and thus no plants common to this part of the country will grow directly in the sludge. This also includes most weeds. Considering the physical and chemical condition of the paper mill sludge, it seems most desirable to level the sludge, and then place soil and/or sewage sludge on top of the paper mill sludge and use this as the media for growing grass. In order that the best ratio of soil/sewage sludge can be demonstrated, the following treatments on a small area are suggested:

1) Five inches of soil (sandy loam or loamy sand texture preferred) plus recommended fertilizer (such as 700#/Acre 10-10-10).

2) Five inches soil mixed with 50 tons/Acre of sewage sludge.

* 3) Five inches of soil mixed with 100 tons/Acre of sewage sludge. * Probable best mixture.

4) Five inches of soil mixed with 200 tons/Acre of sewage sludge.

5) Five inches of soil mixed with 4-5 inches of paper mill sludge and 100 tons/Acre of sewage sludge.

We have used individual plots that are 15 feet by 15 feet and this is a good size for such a study. Large enough to show results but small enough to be workable. The treatments should be duplication (or 2 plots of each treatment).

The surface of the paper mill sludge should have about a 2% grade and care taken to avoid any depressions where water will sit and the alkalinity come out of the paper mill sludge and kill the vegetation.

Kentucky bluegrass and Bluestem could each be seeded on half of each treatment. However, using other grasses may make the treatment area too small to evaluate.

I am concerned about the rooting area for trees but one might try some willow, popple, cedar, and/or tamarack plantings.

I have discussed these suggestions with Leo Walsh and others in the Soil Science Department and we are very interested in observing the results of these demonstrations.

Sincerely,

Arthur E Peterson

Arthur E. Peterson
Professor

AEP:lew

NEENAHFOIA0003845

2nd INTERIM REPORT

BERGSTROM LANDFILL

Neenah, Wisconsin

May 1975

by John Wilke
Engineering Department
City of Neenah

NEENAHFOIA0003485

2nd Interim Report - Bergstrom Landfill

Neenah, Wisconsin

May 1975

INTRODUCTION

The 1st interim report was written in November 1974. That report recommended continued observation of the test plots seeded in June 1974, establishment of consolidation test plots, and monitoring the tile test area. The first winter has now passed and the purpose of the second interim report is to evaluate this testing to date and make recommendations concerning seed mixtures and necessary soil cover depth.

DISCUSSION

Seeded Test Plots - All of the plots were observed during May 1975. Plot #11 (White Clover and Creeping Red Fescue) had about 70% cover and #12 (White Clover and Red Top) had about 80% cover. The other plots did not winter well as indicated below:

Test Plot No.	Test Plot Species	Description - May 1975
1	Park Department Mix	Poor
2	White Clover	Poor
3	K 31 Tall Fescue	Very Poor
4	NK - 20 Rye	Dead
5	Creeping Red Fescue	Approx. 30% cover
6	Park K Blue	Approx. 50% cover
7	Reeds Canary	Approx. 50% cover
8	Red Top	Poor
9	Colonial Bent	Poor
10	White Clover, K 31 Tall Fescue	Approx. 40% Clover only cover
11	White Clover, Creeping Red Fescue	Approx. 70% cover
12	White Clover, Red Top	Good-grass & clover, Approx. 75-80% cover
13	White Clover, NK - 20 Rye	Approx. 40% clover only cover
14	White Clover, Colonial Bent	Approx. 20% grass & clover cover
15	Crested Wheatgrass	Old growth dead, new growth (¼") Approx. 20% cover
16	Crested Wheatgrass & Alfalfa	Old growth dead, young alfalfa approx. 30% cover

The above results are in the "soil only" area. All of the crops planted in the "soil and paper sludge" area died. Also, the cottonwood tree and weed which were transplanted last year into paper sludge, died.

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Consolidation Test Plots - A 200 x 200 foot square area (approximately one acre) of one foot deep clay sub-soil was established directly over the paper fill during November 1974 just before frost. A second area of equal size and material but two feet deep was established in the same vicinity about one week later. Elevations were taken in a grid before the cover was placed, a few days after it was placed and again in spring after the frost had left and the snow had melted. These elevations are shown in the appendix. The data for each point on the grid is in chronological order with the oldest data on top.

Tile Test Area - No measurable discharge has been observed coming from the outfall of this area during any of the times that it has been checked since it was laid in August 1974. About eight inches of settlement of paper fill has occurred in the tile trenches but no appreciable change has occurred in the adjoining area.

A hole dug about 40 inches deep in the paper fill during summer 1974 stood over winter with nearly vertical walls. Although water was standing during May 1975 approximately 16 to 18 inches from the surface in this hole, only a little standing water was observed in the bottom of the 42 inch deep riser on the tile line which is only approximately 15 feet (horizontally) from the dug hole. Apparently, lateral movement of water in the paper fill at least in this area is very restricted. Incidently, this finding is consistent with all prior observations of these two holes.

CONCLUSIONS AND RECOMMENDATIONS

Dr. Art Peterson with the University of Wisconsin Soils Department, Madison, Mr. George Framberger, Drainage Specialist with the Winnebago County Soil Conservation Service, Mr. Howard Kaerwer with Northrup King's research and product deveopment section, Minneapolis, several other Northrup King officials, City of Neenah Park Department officials, and the writer, have observed all of the foregoing test areas this spring. We have compared and discussed our conclusions and are in agreement as follows:

Seed Mixtures - Experience with the test plots has shown that White Clover, Creeping Red Fescue and Red Top grow well and winter well together in the approximately four inches of sandy loam soil at this site. Establishment of such a mix on the one foot deep consolidation plot over an area about 50 x 100 feet in size is recommended this June to determine its suitability in the clay subsoil cover (a material which could be made available to cover the entire Bergstrom landfill). Since this subsoil is low in organic matter it is further recommended that at least one inch of leaf compost be worked into the upper five inches along with commercial fertilizer. The rate of application of commercial fertilizer should be determined through a soil test of the subsoil.

Mr. Kaerwer with Northrup, suggested the following mix and fertilizer after observing the test plots. It is the writer's feeling that this would be worthwhile to try if money, time, and help are available this summer. A 50 x 100 foot area on the one foot deep consolidation plot should be utilized for this test.

Percent by Weight	Description
30%	Chewings Fescue
25%	Creeping Red Fescue
10%	Kentucky Blue
15%	Red Top
20%	White Clover

Seeding rate: 150 lb per acre

Fertilizer rate: 250 lb per acre of 22-5-9 or equivalent

Soil Cover Depth - From the success of the aforementioned seed varieties in four inches of soil cover, there is now no question that one foot of soil cover is adequate to establish a vegetative cover suitable for recreational use.

Furthermore, a comparison of the one foot and two foot deep consolidation plots shortly after the frost left, after a heavy rain and then after a few days drying time, has revealed that the support ability of one foot of depth should be quite adequate for park maintenance equipment once a vegetative cover has been established. Therefore, one foot of clay subsoil cover material is recommended.

Consolidation of the underlying paper fill is, for all practical purposes, negligible.

Drainage - Benefits from tiling have not been demonstrated. The one foot deep consolidation plot should provide adequate surface drainage to prevent downward movement of water into the paper fill if 1.) clay soil is used as the cover material, 2.) the surface of the paper fill is carefully shaped to conform with the final grading plan less one foot (finished grade includes swales and slopes necessary to provide surface drainage), 3.) the surface of the cover material is carefully shaped to conform to the final grading plan before it is seeded, and 4.) the final graded area is provided with a good cover crop which provides high evapo-transpiration.

SUMMARY

The clay subsoil cover material is available from local construction. Probably four or five years will be necessary to obtain enough to cover the entire landfill. However, it is excellent for the purpose and would be the most desirable cover material to use. Leaves are available from the City each fall and probably enough would be available in composted form within this same time period to use as organic matter in establishing a vegetative cover.

Use of these materials has the following benefits: 1.) locally available, 2.) sufficient quantities, 3.) ideally suited for the purpose, and 4.) low cost. They should be utilizied if at all possible.

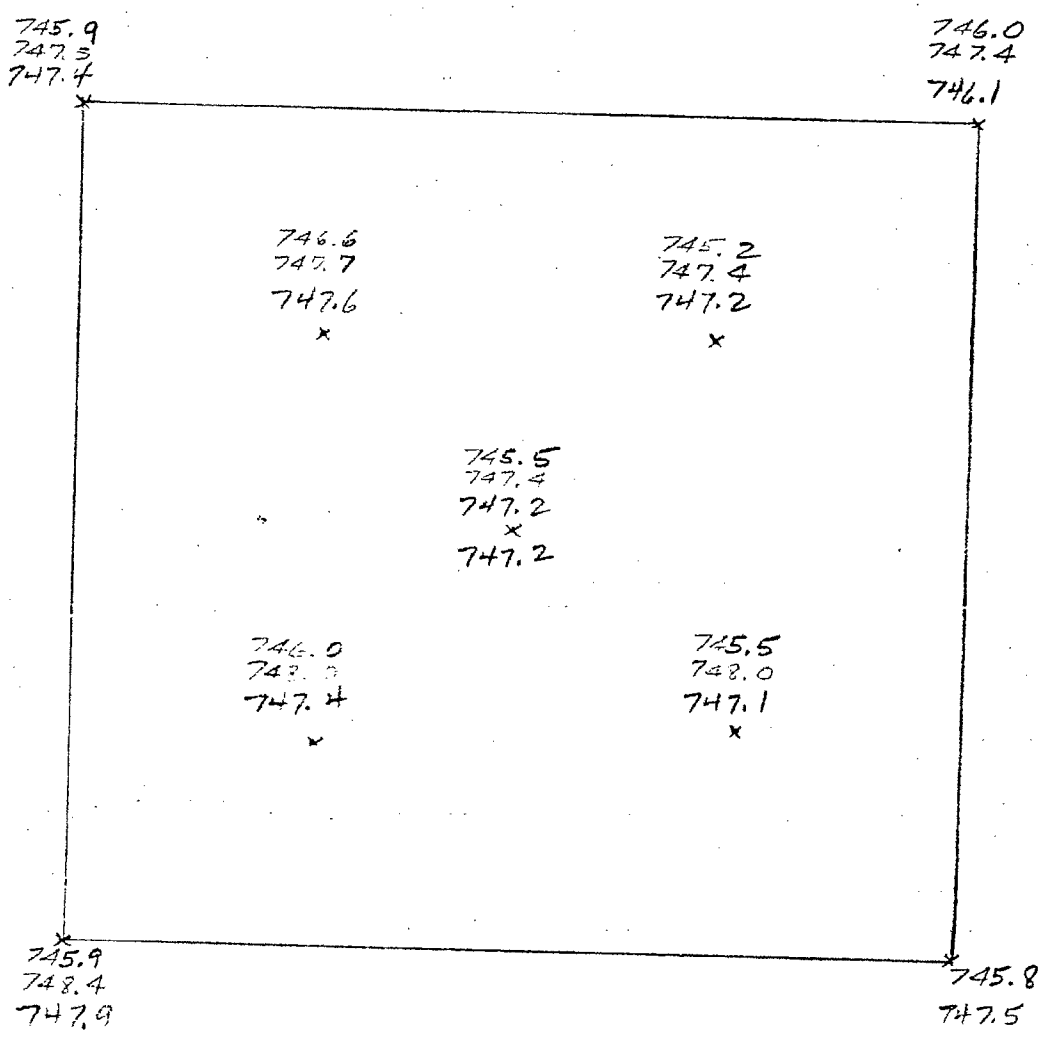
Incidentally, use of topsoil is not thought to be necessary.

Respectfully submitted,

John Wilke, P.E.
City of Neenah
Engineering Department

NEENAHFOIA0003488

APPENDIX



2' contour data

Engineering Landfill

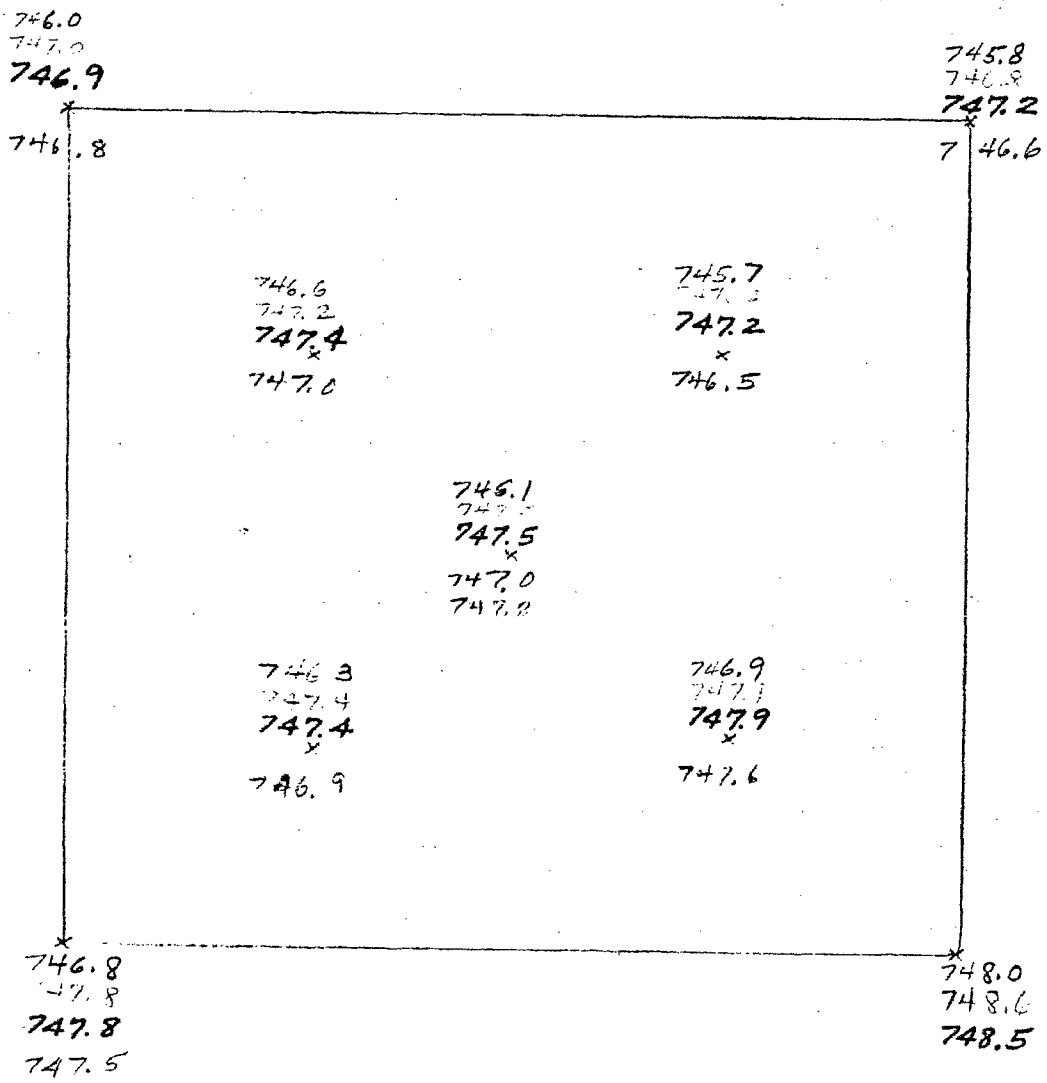
pencil data Nov. 15, 74 prior to placement of fill (avg. 745.82)

pencil data May 8, 75 (avg. 747.27)

(avg. 747.72)

NEENAHFOIA0003489

APPENDIX



1' consolidation area

Boreholes Landfill

pencil data Nov. 15, 74 prior to placement of fill (avg. 746.47)
pencil data Dec. 13, 74 5 days after placement of fill (avg. 747.49)
(<0.1' snow) green data Dec. 27, 74 21 days after placement of fill (avg. 747.53)
pencil data May 8, 75 (avg. 747.00)

NEENAHFOIA0003490


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15199
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6 4

CHARLES E. MANEY, DIRECTOR OF PUBLIC WORKS
PHONE: 722-6427 AREA CODE: 414

December 6, 1976

Mr. Robert Bues
Neenah-Menasha Sewerage Commission
Garfield Avenue
Menasha, WI 54952

Dear Bob:

This letter will confirm my telephone call to you on December 6, with respect to the proposed hill over your interceptor in the Bergstrom fill.

Mr. Tony Resop, who was backhoe operator for Central Contracting for the stretch of sewer in question and Mr. Elmer Klaman, who was field supervisor for this project (and has had many years experience in sewer construction) were both contacted. They indicated that some fill material was encountered in the upper part of the trench in the proposed hill area. However, they said that, except for approximately a 50 foot length of trench crossing the old drainage ditch from the City of Neenah's bypass pumps, the bottom of the trench was in undisturbed clay. In the approximately 50 foot length crossing the old ditch, it was indicated that the unstable material (approximately 1 foot in thickness) was excavated and replaced with fill stone so that only fill stone remains between the pipe bottom and undisturbed clay.

I explained the proposed hill to Mr. Klaman and our concern regarding stability and he said, "You should have no trouble."

We appreciate your assistance and direction in this matter and if there is any further information you need, please let me know.

Sincerely,

John Wilke
Engineer

JW:el

"AN EQUAL OPPORTUNITY EMPLOYER"

NEENAHFOIA0002103

APPENDIX B – WASTE CHARACTERIZATION

- NCASI Technical Bulletin No. 257
- Table B-1 – Summary of PCB Data
- IPC Leach Test Report
- Univ. of Arkansas Paper Mill Sludge Evaluation

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ncasi

technical bulletin

NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT, INC., 260 MADISON AVENUE, NEW YORK, N.Y. 10016

CONSOLIDATION BEHAVIOR OF HIGH ASH PULP AND PAPERMILL SLUDGES

Forestry Library

MAY 09 1977

University of Washington

STREAM IMPROVEMENT
TECHNICAL BULLETIN NO. 257

JUNE 1972

TABLE 2. PHYSICAL PROPERTIES OF THE SLUDGE MATERIALS

Sludge[1]	Consistency limits[2] L_w	P_w	S_w	Ash[3] content %	Organic[4] content	Specific gravity	Solids[5] content % by wt.
*H-1	162.3	74.8	47.6	79.9	27.5	2.19	28.3
*H-2							
43 % organic content	175.5	108.0	83.7	61.1	43.6	2.27	25.7
43 % organic + 10 % lime	155.3	127.3	94.8	63.9	40.2	2.34	
43 % organic + 10 % flyash	162.1	113.5	82.1	64.7	39.9	2.20	
H-3							
40 % organic content	174.4	103.3		54.7	40.4	2.14	26.1
31 % organic content	131.2	83.4		63.5	31.3	2.25	
50 % organic content	215.6	147.3		45.7	49.5	2.04	
68 % organic content	382.5	215.2		28.4	67.6	1.84	
C-1*	245.3	169.0	124.8	48.5	51.3	2.30	30.7
C-2	413.0	203.5		27.4	65.2	1.95	23.9
D-1	325.4	141.6		35.7	56.8	2.01	28.5

*Data after Andersland and Laza (1971).

[1]H -- Secondary fiber mill sludge, samples 1, 2, and 3.
C -- Integrated pulp and papermill sludge, samples 1 and 2.
D -- Secondary fiber mill sludge, sample 1.

[2]L_w -- liquid limit. P_w -- plastic limit. S_w -- shrinkage limit

[3]Test method ASTM D 586-63.

[4]Test method given in Agronomy No. 9, Sec. 92-3.3. Tests run by Soil Science Dept. staff, Michigan State University.

[5]Solids content of sludge obtained at mill.

TABLE 6. CONSOLIDATION TEST RESULTS FOR SLUDGES D-1 AND C-2

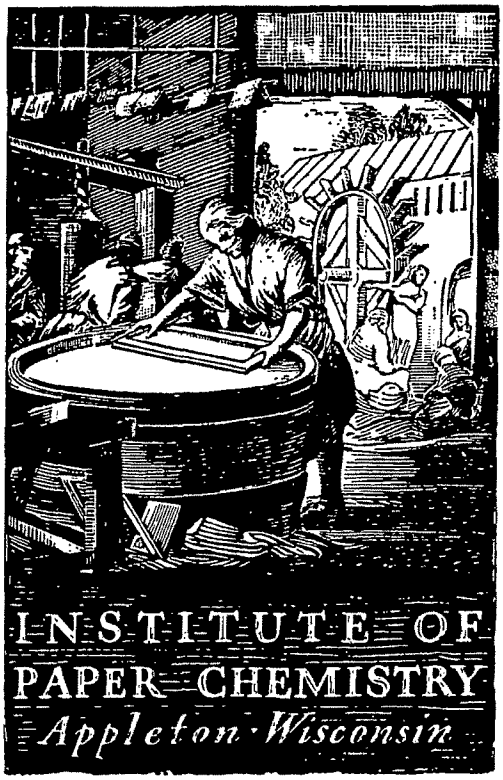
Test No.	A-17				A-18			
Sludge	D-1				C-2			
Date	9-29-71				10-18-71			
Initial solids content	28.0% by wt.				24.1% by wt.			
Compression index, C_c	1.45				1.95			
Load increment kg/cm^2	c_v $\times 10^{-3}$ in^2/min	k $\times 10^{-8}$ cm/sec	r	C_a $\times 10^{-3}$	c_v $\times 10^{-3}$ in^2/min	k $\times 10^{-8}$ cm/sec	r	C_a $\times 10^{-3}$
0.00-0.25	13.31	57.6	0.79	19.4	98.4	404.6	0.51	15.4
0.25-0.50	16.11	54.3	0.71	22.5	108.6	238.6	0.47	26.6
0.50-1.00	17.44	35.7	0.75	-	62.5	138.2	0.49	19.6
1.00-2.00	26.31	26.9	0.53	18.5	120.7	149.0+	0.36	-
2.00-4.00	17.18	9.8	0.70	12.9	33.5	23.6	0.49	23.4
4.00-8.00	6.55	2.1	0.70	28.2	25.0	10.2	0.45	25.3
8.00-16.0	5.60	1.0	0.58	26.4	16.43	3.8	0.32	25.7

c_v -- coefficient of consolidation k -- coefficient of permeability

C_a -- coefficient of secondary compression r -- primary compression ratio

Table B-1 Summary of PCB Data

Master Boring Number	Common Boring Identification and Report Number		Date Drilled	Sample Interval	PCB Concentration in mg/Kg, dry weight basis	Laboratory
66	B-1-88	15396XA	May-88	742.0-740.5	348	Badger Laboratories & Eng.
	B-1-88	15396XA	May-88	738.0-736.5	6.7	Badger Laboratories & Eng.
67	B-2-88	15396XA	May-88	742.0-740.5	231	Badger Laboratories & Eng.
	B-2-88	15396XA	May-88	738.0-736.5	9.7	Badger Laboratories & Eng.
27	BS-1-91	18899	Aug-91	740.0-738.5	235	Enviroscan
	BS-1-91	18899	Aug-91	737.5-736.0	127	Enviroscan
	BS-1-91	18899	Aug-91	735.5-734.0	No detect	Enviroscan
28	BS-2-91	18899	Aug-91	742.7-741.2	4	Enviroscan
	BS-2-91	18899	Aug-91	738.7-737.2	18	Enviroscan
	BS-2-91	18899	Aug-91	735.2-733.7	69	Enviroscan
31	BS-5-91	18899	Aug-91	742.7-741.2	19	Enviroscan
	BS-5-91	18899	Aug-91	739.7-738.2	20	Enviroscan
	BS-5-91	18899	Aug-91	736.2-734.7	73	Enviroscan
84	SB99-1	99052	Mar-99	739.5-737.5	41.5	U.S. Filter
	SB99-1	99052	Mar-99	736.5-734.5	143	U.S. Filter
85	SB99-2	99052	Mar-99	742.7-741.7	84.2	U.S. Filter
	SB99-2	99052	Mar-99	738.7-736.7	122	U.S. Filter
87	SB99-3A	99052	Mar-99	743.8-741.8	154	U.S. Filter
	SB99-3A	99052	Mar-99	737.8-735.8	10.5	U.S. Filter
88	SB99-4	99052	Mar-99	742.4-740.7	94.7	U.S. Filter
	SB99-4	99052	Mar-99	736.7-734.9	214	U.S. Filter
89	SB99-5	99052	Mar-99	741.3-739.3	1.35	U.S. Filter
	SB99-5	99052	Mar-99	738.3-736.3	3.55	U.S. Filter
90	SB99-6	99052	Mar-99	738.9-736.9	30.8	U.S. Filter
	SB99-6	99052	Mar-99	735.9-735.4	147	U.S. Filter
91	SB99-7	99052	Mar-99	745.1-743.1	511	U.S. Filter
	SB99-7	99052	Mar-99	742.1-740.1	847	U.S. Filter
	SB99-7	99052	Mar-99	737.1-735.1	1180	U.S. Filter
92	SB99-8	99052	Mar-99	740.5-738.5	3390	U.S. Filter
	SB99-8	99052	Mar-99	735.5-733.9	251	U.S. Filter
93	SB99-9	99052	Mar-99	741.7-739.7	19.3	U.S. Filter
	SB99-9	99052	Mar-99	737.7-735.7	125	U.S. Filter
95	SB99-10	99052	Mar-99	740.0-738.0	185	U.S. Filter
	SB99-10	99052	Mar-99	736.0-735.6	13.1	U.S. Filter
96	SB99-11	99052	Mar-99	742.9-740.9	32.3	U.S. Filter
	SB99-11	99052	Mar-99	736.9-734.9	4500	U.S. Filter
97	SB99-12	99052	Mar-99	744.8-742.8	67.1	U.S. Filter
	SB99-12	99052	Mar-99	737.8-735.8	1550	U.S. Filter
98	SB99-13	99052	Mar-99	744.2-742.2	2.71	U.S. Filter
	SB99-13	99052	Mar-99	737.2-735.3	1,150	U.S. Filter
99	SB99-14	99052	Mar-99	744.0-742.0	21.8	U.S. Filter
	SB99-14	99052	Mar-99	737.0-735.0	126	U.S. Filter
100	SB99-15	99052	Mar-99	741.7-740.1	140	U.S. Filter
	SB99-15	99052	Mar-99	739.1-737.1	47.6	U.S. Filter
101	SB99-16	99052	Mar-99	742.0-740.0	24.1	U.S. Filter
102	SB99-17	99052	Mar-99	741.9-739.9	6.14	U.S. Filter
	SB99-17	99052	Mar-99	737.9-735.9	12.9	U.S. Filter
103	SB99-18	99052	Mar-99	743.3-741.3	35.6	U.S. Filter
	SB99-18	99052	Mar-99	737.3-735.3	33.4	U.S. Filter
104	SB99-19	99052	Mar-99	743.5-741.7	17.7	U.S. Filter
	SB99-19	99052	Mar-99	737.7-735.7	24.5	U.S. Filter
105	SB99-20	99052	Mar-99	739.0-737.0	20.8	U.S. Filter
	SB99-20	99052	Mar-99	733.0-732.3	10.7	U.S. Filter
Geomtric Mean					60.5	



POLYCHLORINATED BIPHENYLS IN PULP AND PAPER MILLS
PART II. DISTRIBUTION AND REMOVAL

Project 3295

Report Two
A Progress Report
to
MEMBERS OF THE INSTITUTE OF PAPER CHEMISTRY

July 22, 1977

TABLE XIII

LOSS AND CAPTURE OF PCB DURING THE DRYING OF FIBERS AT MILL A[a]

Sample[b]	Trial 1 g/day	Trial 1 %	Trial 2 g/day	Trial 2 %
Paper Machine Loss[c]				
1	347	72	44	29
2	131	51	41	32
3	65	36	49	38
4	84	54	62	46
5	86	44	55	42
6	--	--	64	47
7	--	--	134	35
Average	146	52	64	38
Captured				
Over drier roll	158	56		
On mill roof				
Trap 1			60	
Trap 2			50	

[a] See appendix, Tables XXIV and XXV for details.
[b] Individual samples for couch, starch and paper - traps were composites.
[c] Calculated as difference between PCB (dry basis) in couch and paper roll samples (couch + starch size = 100%).

LEACHING OF POLYCHLORINATED BIPHENYLS FROM SLUDGE

PCBs have been shown to have a marked affinity for pulp fines. The sorbed PCBs are difficult to remove completely by solvent extraction (5). The removal of the fines by clarification has been postulated as one method for reducing the concentration of PCBs in mill effluents. It should be recognized

that the PCBs are not destroyed in the clarification process but are removed with the sludges. Sludges are used as landfill or as soil additives and if the PCBs were leachable, they would pollute the environment.

Therefore four 10 x 120 cm (4 x 48 inch) glass columns were set up in the laboratory to determine the amount of PCB which would be leached from sludges containing high (82 ppm) and low (20 ppm) concentrations of PCB. Two of the columns, used as controls, were filled with sludge and flooded with water but not percolated during the twelve weeks of the test period. The other two were percolated with distilled water at average rates of 125 and 1100 ml per day. To minimize PCB losses during sampling, the column tips went to the bottom of small-mouth sample bottles containing 50 ml of hexane.

The concentration of PCB in the leachate from the two percolated columns ranged from 0.5-4 ppb, with an average concentration of 1.5 and 2.5 ppb for the high and low PCB sludges, respectively (Table XIV and appendix, Table XXVI for details). This amounted to 0.2% (146 micrograms) of the high PCB (82 ppm) containing sludge, which had been leached at an average rate of 1100 ml per day (97 liters total volume). The low PCB (20 ppm) sludge leached at a rate of 125 m/day (10 liters total volume), lost only 0.1% (25 micrograms) of the PCB.

At the end of the test, all four columns were drained and the final drained fluid and sludges were analyzed for PCBs. The PCB losses based on sludge data were 13% (13 milligrams) for the high and 22% (7 milligrams) for the low PCB sludge columns (Table XIV). The control columns for the two sets showed a gain of 3 milligrams for the high PCB column and a loss of 3 milligrams for the low PCB column. These values are negligible and fall within the analytical variance for PCB determinations.

TABLE XIV

LEACHING OF PCB FROM CLARIFIER SLUDGES FROM MILL B[a]

Column	Sludge PCB			Leachate		
	Initial, mg[c]	Final, mg[c]	Change, %	Volume, liter	Av. PCB, ppb	Leached %
1. Control[b]	88	91	+3	--	--	--
2. Leached	97	84	-13	97	1.5	0.2
3. Leached	31	24	-22	10	2.5	0.1
4. Control[b]	27	24	-11	--	--	--

[a] See appendix, Table XXVI for details.

[b] Control — wet sludge flooded with distilled water during test period.

[c] Milligrams based on dry weight of sludge in columns.

More simulated and actual field studies would be required to further answer the PCB-sludge stability question.

PROCESS FOR THE REMOVAL OF PCBs FROM MILL EFFLUENTS

The efficient operation of a waste treatment plant's primary clarifier should markedly reduce the PCB concentration in effluent streams from mills utilizing recycled paper as a source of fiber. The present aqueous discharge limit of 10 ppb can, in many cases, be met with primary treatment processes alone or with a combined primary-secondary treatment system. If, however, the limits were to be reset to lower values (1-5 ppb), other processes might be required to polish the effluents.

In our investigation of adjunctive processes, we deliberately omitted those systems currently under study by equipment manufacturers: carbon adsorption,

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June 5, 2003 (Final)

Paper Mill Sludge Evaluated

Glatfelter Primary Sludge, 10 dry tons/acre

Glatfelter Secondary Sludge, 10 dry tons/acre

Glatfelter Primary/Secondary Mix Sludge, 10 dry tons/acre

Soil Used in Evaluation

Typic Hapludalf

Analytical Data (University of Arkansas)

Analysis (dry basis)	Primary Sludge	Secondary Sludge	Mix Sludge
% total C	26.8	41.0	29.4
% Organic N	0.45	6.44	1.03
C:N ratio	59.6	6.37	28.5
% Inorganic N	<0.01	0.017	<0.01
% solids	44.7	9.7	34.2
% Total P	0.104	2.10	0.296
mg/kg Soluble P	3.3	39.9	0.4
%Total S	0.288	5.83	0.301

APPENDIX C – SOIL BORING LOGS AND WASTE LIMITS

- Environmental Resources Management Drawing #9
- Master Soil Boring Table C-1 – Soil Boring Summary
- Master Soil Boring Logs
- 2011 Bulkhead Dike Borings
- Monitoring Well Location Map
- Environmental Resources Management Drawing #10
- Environmental Resources Management Drawing #11

LITTLE LAKE
BUTTE DES MORTS
(TYPICAL WATER ELEV. 738.1)

ARROWHEAD PARK
LANDFILL

NEENAH SLOUGH

MINERGY

TREATMENT PLANT

P.H. GLATFELTER

MAIN STREET

WISCONSIN AVENUE

FOX RIVER
NEENAH CHANNEL

POWER CHANNEL

802700N
802600N
802500N
802400N
802300N
802200N
802100N
802000N
801900N
801800N
801700N
801600N
801500N
801400N
801300N
801200N
801100N
801000N
800900N

2368700E
2368800E
2368900E
2369000E
2369100E
2369200E
2369300E
2369400E
2369500E
2369600E
2369700E
2369800E
2369900E
2370000E
2370100E
2370200E
2370300E
2370400E
2370500E
2370600E
2370700E
2370800E
2370900E
2371000E
2371100E
2371200E
2371300E
2371400E
2371500E
2371600E
2371700E
2371800E

LEGEND

- —740— SURFACE CONTOUR
- —SAN— CITY SANITARY SEWER
- —STO— STORM SEWER
- PHGWW— P.H. GLATFELTER WASTEWATER SEWER
- STRUCTURE
- RAILROAD
- APPROXIMATE LIMITS OF DEPOSIT A
- --2.0-- APPROXIMATE SEDIMENT THICKNESS (FEET)
- APPROXIMATE LIMITS OF SLUDGE IN LANDFILL
- B7 SOIL BORING & INDEX NUMBER

N

BASE MAP PROVIDED BY CITY OF NEENAH, GIS DATA BASE. PHOTOGRAPH CONTROL, 1991 WITH CITY UPDATES THROUGH 1998. ERM MODIFICATIONS INCLUDED ADDITION OF CLARIFIER, SOIL STOCKPILE REMOVAL AND PROJECTION OF DEPOSIT A SEDIMENT (PER EWI 1992 FEASIBILITY STUDY).

REV. NO.	DESCRIPTION	DATE	REV. BY	CHK'D.	APPD.
REVISIONS					

ENVIRONMENTAL RESOURCES MANAGEMENT

Arrowhead Park Landfill
Neenah, Wisconsin

DRAWN:	CHECKED:		DRAWING:
SCALE: 1"=100'	APPROVED:	Soil Boring Locations	98276-9

Table C-1 Soil Boring Summary

Refer to end notes concerning location of soil logs

Master Boring No.	Project Boring No.	Project No.	Drilling Date	Boring Location	Surface El.	Top of Sludge El.	Bottom of Sludge El.	Top of Organics El.	Bottom of Organics El.	Top of Clay	Accuracy of Locating
1	B7	5863	12/73	N801705, E2370859	742	742	738.2	--	--	738.2	± 50 ft., hand sketch
2	B8	5863	12/73	801518, 2370537	747	745	744	Mixed fill 744	Mixed fill 730.2	730.2	± 50 ft., hand sketch
3	B9	5863	12/73	801265, 2370238	748	748	739.5	739.5	734.5	734.5	± 50 ft., hand sketch
4	B10	5863	12/73	800980, 2369945	747	Other fill materials				728.5	± 50 ft., hand sketch
5	B-11	5863	12/73	800772, 2369702	748	Other fill materials				734.5	± 50 ft., hand sketch
6	B-13	5863	12/73	800865, 2369813	747	Other fill and silt				733.5	± 50 ft., hand sketch
7	B-12	5863	12/73	801225, 2370693	745	Other fill		736.7	732.5	732.5	± 50 ft., hand sketch
8	B-1, (B-2)	4978B	4/74	801660, 2370733	740.8	740.8	730.5	--	--	730.5	± 50 ft., hand sketch
9	B-3, (B-4- 5)	4978B	4/74	801170, 2369888	739.9	739.9	731.9	731.9	729.4	729.4	± 50 ft., hand sketch
10	B-6, (B-7)	4978B	4/74	801845, 2369049	741.6	741.6	731.1	731.1	730.7	730.7	± 50 ft., hand sketch
11	B-11	1443A	8/66	801351, 2370760	745.5	743.8	735.5	735.5	732.0	732.0	± 10 ft., dim. from #22
12	B-12	1443A	8/66	801560, 2370640	743.1	741.4	733.1	--	--	733.1	± 10 ft., dim. from #22
13	B-13	1443A	8/66	801705, 2370700	744.1	744.1	735.1	--	--	735.1	± 10 ft., dim. from #22
14	B-14	1443A	8/66	801648, 2370930	743.9	743.9	734.1	--	--	734.1	± 10 ft., dim. from #22
15	B-15	1443A	8/66	801560, 2370820	744.4	744.4	733.4	--	--	733.4	± 10 ft., dim. from #22
16	B-16	1443A	8/66	801708, 2370783	NA (743.3)	0 (743.3)	8 (735.3)	--	--	8 (735.3)	± 10 ft., dim. from #22
17	B-1	6626	4/75	801385, 2370690	101.0 (747.0)	95.0 (741.0)	86.0 (732.0)	--	--	86.0 (732.0)	± 5 ft., ref. to equip. bldg.
18	B-2	6626	4/75	801478, 2370851	97.7 (743.7)	97.7 (743.7)	91.7 (737.7)	--	--	91.7 (737.7)	± 5 ft., ref. to equip. bldg.
19	B-4	6626	4/75	801635, 2370759	97.5 (743.5)	97.5 (743.5)	87.5 (733.5)	--	--	87.5 (733.5)	± 5 ft., ref. to equip. bldg.
20	B-5	6626	4/75	801510, 2370615	99.9 (745.9)	95.9 (741.9)	93.9 (739.9)	--	--	93.9 (739.9)	± 5 ft., ref. to equip. bldg.
21	B-6		4/75	801510, 2370718	98.8 (744.8)	98.8 (744.8)	96.8 (742.8)	92.8 (738.8)	83.8 (729.8)	83.8 (729.8)	± 5 ft., ref. to equip. bldg.
22	PS-34	12228-A	11/83	N801460, E2370583	747.1	744.6	≤ 738.1	--	--	--	± 5 ft., ref. to equip. bldg. SW corner
23	PS-35	12228-A	11/83	801395, 2370620	748.2	743.3	≤ 738.7	--	--	--	± 5 ft., ref. to equip. bldg. SW corner
24	B-1-90	18068XH	7/90	801410, 2370918	744.23	741.7	733.2	--	--	733.2	± 5 ft., ref. to Bldg. 26 SW corner
25	B-2-90	18068XH	7/90	801432, 2370955	744.07	739.1	733.1	--	--	733.1	± 5 ft., ref. to Bldg. 26 SW corner
26	B-3-90	18068XH	7/90	801457, 2370993	744.26	744.26* 730.8* *Mixture of S&G and sludge				730.8	± 5 ft., ref. to Bldg. 26 SW corner
27	BS-1-91	18899	8/91	801405, 2370653	747.0	740.5		734.0	1 ft. of buried topsoil?	734.0	± 5 ft., ref. to equip. bldg. SW corner
28	BS-2-91	18899	8/91	801440, 2370633	746.7	742.7	732.7	--	--	732.7	± 5 ft., ref. to equip. bldg.

Table C-1 Soil Boring Summary

Refer to end notes concerning location of soil logs

Master Boring No.	*Project Boring No.*	*Project No.*	*Drilling Date*	*Boring Location*	*Surface El.*	*Top of Sludge El.*	*Bottom of Sludge El.*	*Top of Organics El.*	*Bottom of Organics El.*	*Top of Clay*	*Accuracy of Locating*
29	BS-3-91	18899	8/91	801390, 2370627	747.3	742.3	734.3	--	--	734.3	± 5 ft., ref. to equip. bldg. SW corner
30	BS-4-91	18899	8/91	801425, 2370607	746.7	743.7	732.7	--	--	732.7	± 5 ft., ref. to equip. bldg. SW corner
31	BS-5-91	18899	8/91	801372, 2370597	747.2	742.7	734.2	1 ft. of buried topsoil?		734.2	± 5 ft., ref. to equip. bldg. SW corner
32	BS-6-91	18899	8/91	801405, 2370578	746.4	743.4	732.9			732.9	± 5 ft., ref. to equip. bldg. SW corner
33	PS-1A	12228	4/83	N801937, E2369255	NA (745.0)	None	None	Other fill		10.5 (734.5)	Overlaid STS boring figure
	PS-1B	12228	4/83	N801937, E2369255	NA (745.0)	None	None	Other fill		11.0 (734.0)	Overlaid STS boring figure
	PS-1C	12228	4/83	N801937, E2369255	NA (745.0)	None	None	Other fill		10.0 (735.0)	Overlaid STS boring figure
	PS-1D	12228	4/83	N801937, E2369255	NA (745.0)	None	None	Other fill		11.0 (734.0)	Overlaid STS boring figure
34	PS-2	12228	4/83	801947, 2369370	NA (744.3)	1.5 (742.8)	≥ 4 (≤ 740.3)				Overlaid STS boring figure
35	PS-3	12228	4/83	801960, 2369480	744.3	None Other fill		734.3	733.8	733.8	Overlaid STS boring figure
36	PS-4	12228	4/83	801960, 2369569	NA (745.2)	1 (744.2)	≥ 2 (≤ 743.2)				Overlaid STS boring figure
37	PS-5	12228	4/83	801974, 2369767	NA	None	None	Other fill			Overlaid STS boring figure
38	PS-6A	12228	4/83	N801957, 2370061	NA (745.0)	None	None	Other fill		11.0 (734.0)	Overlaid STS boring figure
	PS-6B	12228	4/83	N801957, 2370061	NA (745.0)	None	None	Other fill		13.0 (732.0)	Overlaid STS boring figure
	PS-6C	12228	4/83	N801957, 2370061	NA (745.0)	None	None	Other fill		13.5 (731.5)	Overlaid STS boring figure
	PS-6D	12228	4/83	N801957, 2370061	NA (745.0)	None Other fill		12 (733.0)	≥ 13.5 (< 731.5)		Overlaid STS boring figure
39	PS-7	12228	4/83	801717, 2368988	NA (745.6)	0.8 (744.8)	≥ 2.0 (≤ 743.6)				Overlaid STS boring figure
40	PS-8	12229	4/83	801732, 2369190	NA (746.6)	3.5 (743.1)	11.0 (735.6)	11.0 (735.6)	12.5 (734.1)	12.5 (734.1)	Overlaid STS boring figure
41	PS-9	12228	4/83	801745, 2369385	746.9	744.7	734.9	734.9	≤ 732.9		Overlaid STS boring figure
42	PS-10	12228	4/83	801760, 2369584	NA (748.0)	1.2 (746.8)	≥ 4.0 (≤ 744)				Overlaid STS boring figure
43	PS-11	12228	4/83	801775, 2369787	NA (748.8)	1.6 (747.2)	≥ 2.0 (≤ 746.8)				Overlaid STS boring figure
44	PS-12	12228	4/83	801790, 2369985	NA (748.4)	4.0 (744.4)	13.5 (734.9)	13.5 (734.9)	20.0 (728.4)	20.0 (728.4)	Overlaid STS boring figure

Table C-1 Soil Boring Summary

Refer to end notes concerning location of soil logs

Master Boring No.	Project Boring No.	Project No.	Drilling Date	Boring Location	Surface El.	Top of Sludge El.	Bottom of Sludge El.	Top of Organics El.	Bottom of Organics El.	Top of Clay	Accuracy of Locating
45	PS-13	12228	4/83	801805, 2370184	NA (746.3)	1.5 (744.8)	≥ 2.0 (≤ 744.3)				Overlaid STS boring figure
46	PS-14	12228	4/83	801825, 2370384	NA (745.4)	1.5 (743.9)	≥ 3.0 (≤ 742.4)				Overlaid STS boring figure
47	PS-15	12228	4/83	801825, 2370567	743.5	743.5	742.8	Other fill		733.5	Overlaid STS boring figure
48	PS-16	12228	4/83	801537, 2369197	NA (745.8)	2.0 (743.8)	≥ 4.0 (≤ 741.8)				Overlaid STS boring figure
49	PS-17	12228	4/83	801548, 2369400	NA (747.3)	1.5 (745.8)	≥ 3.5 (≤ 743.8)				Overlaid STS boring figure
50	PS-18	12228	4/83	801567, 2369598	NA (748.5)	3.0 (745.5)	≥ 4.0 (≤ 744.5)				Overlaid STS boring figure
51	PS-19	12228	4/83	801580, 2369795	NA (748.0)	1.7 (746.3)	≥ 4.0 (≤ 744)				Overlaid STS boring figure
52	PS-20	12228	4/83	801598, 2369995	NA (749.3)	4.0* (745.3) *Sludge as seams within other fill	6.0* (743.3)			6.0 (743.3) Fill?	Overlaid STS boring figure
53	PS-21	12228	4/83	N801608, E2370199	748.9	744.4	736.4	736.4	≤ 734.4		Overlaid STS boring figure
54	PS-22	12228	4/83	801627, 2370396	NA (747.3)	1.5 (745.8)	≥ 4.0 (≤ 743.3)				Overlaid STS boring figure
55	PS-23	12228	4/83	801635, 2370585	NA (746.0)	1.3 (744.7)	14.0 (732.0)			14.0 (732.0)	Overlaid STS boring figure
56[A]	PS-24A	12228	4/83	801718, 2370798	NA (743.0)	None	None	Other fill		10.0 (733.0)	Overlaid STS boring figure
	PS-24B	12228	4/83	801718, 2370798	NA (743.0)	Trace within other fill to 9.7 ft. ?				10.4 (732.6)	Overlaid STS boring figure
	PS-24C	12228	4/83	801718, 2370798	NA (743.0)	Trace at 2.0 (741.0)				10.0 (733.0)	Overlaid STS boring figure
	PS-24D	12228	4/83	801718, 2370798	NA (743.0)	0 (743.0)	1.0 (742.0)	Trace organics 4 ft. to 8 ft.		11.0 (732.0)	Overlaid STS boring figure
57	PS-25	12228	4/83	801359, 2369410	NA (745.8)	2.5 (743.3)	≥ 3.0 (≤ 742.8)				Overlaid STS boring figure
58	PS-26	12228	4/83	801370, 2369610	NA (746.8)	0.8 (746.0)	≥ 2.0 (≤ 744.8)				Overlaid STS boring figure
59	PS-27	12228	4/83	801385, 2369813	NA (746.7)	2.2 (744.5)	11.0 (735.7)	11.0 (735.7)	14.0 (732.7)	14.0 (732.7)	Overlaid STS boring figure
60	PS-28	12228	4/83	801398, 2370010	NA (745.7)	2.0 (743.7)	> 2.0 (≤ 743.7)				Overlaid STS boring figure
61	PS-29	12228	4/83	801412, 2370210	NA (746.2)	0.3 (745.9)	≥ 2.0 (≤ 744.2)				Overlaid STS boring figure

[A] 56 location is different in that sludge may be present as a minor constituent in fill to ≈ 10 ft. bgs. Also a nested location with different stratigraphy at the various boring locations. Map values are a combination of the various PS-24 locations.

Table C-1 Soil Boring Summary

Refer to end notes concerning location of soil logs

Master Boring No.	*Project Boring No.*	*Project No.*	*Drilling Date*	*Boring Location*	*Surface El.*	*Top of Sludge El.*	*Bottom of Sludge El.*	*Top of Organics El.*	*Bottom of Organics El.*	*Top of Clay*	*Accuracy of Locating*
62	PS-30	12228	4/83	801188, 2369826	NA (743.4)	2.0 (741.4)	≥ 4.0 (≤ 739.4)				Overlaid STS boring figure
63	PS-31	12228	5/83	801205, 2370028	744.2	742.2	734.7	734.7	≤ 732.7		Overlaid STS boring figure
64	PS-32, 32A, 32B	12228	6/83	801237, 2369228	740.9	None	None	Other fill		733.4	Overlaid STS boring figure
65	PS-33, 33A, 33B	12228	6/83	801116, 2370613	744.5	None	None	Other fill		738.5	Overlaid STS boring figure
66	B-1-88	15396XA	5/88	N801418, E2370802	NA (746.0)	3.8 (742.2)	9.7 (736.3)	9.7 (736.3)	12.6 (733.4)	12.6 (733.4)	Overlaid STS boring figure
67	B-2-88	15396XA	5/88	801345, 2370753	NA (746.0	4.0 (742.0)	12.0* (734.0) *Incl. 10-12 ft. interval sludge mixed with OL	12.0 (734.0)	13.5 (732.5)	13.5 (732.5)	Overlaid STS boring figure
68	TT-9	10839	10/80	801840, 2370375	NA (745.2)	1.0 (744.2)	> 9.5 (≤ 735.7)				Proportioned from unscaled diagram
	TT-9A	10839	2/81	801840, 2370375	NA (745.2)	2.0 (743.2)	> 3.5 (≤ 741.7)				Proportioned from unscaled diagram
	TT-9B	10839	2/81	801840, 2370375	NA (745.2)	2.3 (742.9)	>3.5 (≤ 741.7)				Proportioned from unscaled diagram
	TT-9C	10839	2/81	801840, 2370375	NA (745.2)	2.0 (743.2)	> 3.5 (≤ 741.7)				Proportioned from unscaled diagram
69	TT-1	10839	10/80	801210, 2370245	NA (748.0)[1]	1.5 (746.5)	> 9.5 (≤ 738.5)				Proportioned from unscaled diagram
70	TT-2	10839	10/80	801250, 2369630	NA (743.7)	1.0[2] (742.7)	> 9.5 (≤ 734.2)				Proportioned from unscaled diagram
71	TT-3	10839	10/80	801780, 2369080	NA (746.4)	1.0 (745.0)	> 9.5 (≤ 736.9)				Proportioned from unscaled diagram
72	TT-4	10839	10/80	801525, 2369412	NA (747.4)	1.0 (746.4)	> 9.5 (≤ 737.9)				Proportioned from unscaled diagram
73	TT-5	10839	10/80	801548, 2369925	NA (747.8)	1.5 (746.3)	> 7.5 (≤ 740.3)				Proportioned from unscaled diagram
74	TT-6	10839	10/80	801528, 2370368	NA (747.5	1.0 (746.5)	> 9.5 (≤738.0)				Proportioned from unscaled diagram
75	TT-7	10839	10/80	801900, 2369462	NA (747.2)	1.0 (746.2)	> 9.5 (< 737.7)				Proportioned from unscaled diagram
76	TT-8	10839	10/80	801915, 2369918	NA (747.0)	1.53 (745.5)	> 9.5 (< 737.5)				Proportioned from unscaled diagram
77	STS-1	84779	10/95	801715, 2370285	747.0	742.0	730.0			730.0	Location per STS diagram
78	STS-2	84779	10/95	801675, 2370140	748.8	742.3	730.8			730.8	Location per STS diagram

Table C-1 Soil Boring Summary

Refer to end notes concerning location of soil logs

Master Boring No.	*Project Boring No.*	*Project No.*	*Drilling Date*	*Boring Location*	*Surface El.*	*Top of Sludge El.*	*Bottom of Sludge El.*	*Top of Organics El.*	*Bottom of Organics El.*	*Top of Clay*	*Accuracy of Locating*
79	STS-3	84779	10/95	801590, 2370100	749.5	744.5	734.5	734.5	732.5	732.5	Location per STS diagram
80	STS-4	84779	10/95	801520, 2370175	748.9	743.9	732.4			732.4	Location per STS diagram
81	STS-5	84779	10/95	801420, 2370090	748.5	742.0	733.5			733.5	Location per STS diagram
82	STS-6	84779	10/95	801340, 2370180	748.5	742.0	731.5			731.5	Location per STS diagram
83	STS-7	84779	10/95	801275, 2370405	745.0	739.0	≤735.5				Location per STS diagram
84	SB99-1	99052	3/99	801712, 2370751	743.5	740.9	733.6			733.6	± 2 ft.
85	SB99-2	99052	3/99	801722, 2370505	745.7	742.7	735.4	735.4			± 2 ft.
86	SB99-3	99052	3/99	801334, 2370518	747.8	744.8	741.0				± 2 ft.
87	SB99-3A	99052	3/99	801339, 2370532	747.8	744.8	734.8	734.8	734.4	734.4	± 3 ft.
88	SB99-4	99052	3/99	801738, 2370122	746.7	742.4	734.9	734.9			± 2 ft.
89	SB99-5	99052	3/99	801395, 2370057	745.3	742.1	735.4	735.4			± 2 ft.
90	SB99-6	99052	3/99	801262, 2369921	742.9	740.4	735.4	735.4			± 2 ft.
91	SB99-7	99052	3/99	801872, 2369750	747.1	745.5	734.3	734.3			± 2 ft.
92	SB99-8	99052	3/99	801712, 2369793	749.5	743.2	733.9	733.9			± 2 ft.
93	SB99-9	99052	3/99	801550, 2369770	746.7	744.9	734.7	734.7			± 2 ft.
94	SB99-9A	99052	3/99	801580, 2369770	746.8	743.8	734.5	734.5			± 2 ft.
95	SB99-10	99052	3/99	801264, 2369732	744.0	741.0	735.6	735.6			± 2 ft.
96	SB99-11	99052	3/99	801770, 2369595	746.9	744.9	733.6	733.6			± 2 ft.
97	SB99-12	99052	3/99	801584, 2369589	746.8	745.0	735.3				± 2 ft.
98	SB99-13	99052	3/99	801420, 2369634	746.2	744.6	735.3	735.3			± 2 ft.
99	SB99-14	99052	3/99	801467, 2369482	746.0	745.0	734.2	734.2			± 2 ft.
100	SB99-15	99052	3/99	801311, 2369529	744.1	741.7	735.8	735.8			± 2 ft.
101	SB99-16	99052	3/99	801890, 2369267	746.0	744.0	740.0				± 2 ft.
	SB99-16A	99052	3/99	801890, 2369267	746.0	744.0	740.0				± 2 ft.
102	SB99-17	99052	3/99	801588, 2369265	745.9	742.9	735.9	735.9			± 2 ft.
103	SB99-18	99052	3/99	801420, 2369333	745.3	743.3	734.0	734.0	733.1	733.1	± 2 ft.
104	SB99-19	99052	3/99	801624, 2369100	745.7	743.5	735.7	735.7			± 2 ft.
105	SB99-20	99052	3/99	801831, 2368938	744.0	742.0	732.3			732.3	± 2 ft.

[1]Estimated value based on proximity to MB #3 (a pre-temporary soil pile boring). [2]Includes zone from 1.0 to 3.5 feet where sludge is mixed with silty clay. [3]Includes zone from 1.5 to 3.5 feet where sludge is mixed with sand.

Boring Log Locations

- Master Boring Log Nos. 1 through 21 attached.
- Master Boring Log Nos. 22, 23 and 33 through 65 included in DNR submittal: P.H. Glatfelter, 1984. The Park Site Landfill in Neenah, Wisconsin: Existing Physical Conditions, Effect on Local Groundwater and Alternatives for Future Action. Spring Grove, PA.
- Master Boring Log Nos. 24 through 32 attached.
- Master Boring Log Nos. 66 through 76 could not be located.
- Master Boring Log Nos. 77 through 105 attached.
- 2011 Glatfelter Soil Boring submitted to DNR on August 18, 2011. Refer to letter to Gregory Tilkens (DNR) from Stu Gross (Stantec).
- Boring completed for City of Neenah Site Investigation south of Park Site #1 submitted to DNR on February 6, 2012..

LOG OF BORING NO. 7

OWNER	ARCHITECT-ENGINEER
Neenah Menasha Sewerage Commission	Consoer Townsend & Associates
SITE Neenah-Menasha	**PROJECT NAME** Interceptor Sewer

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.³
					SURFACE ELEVATION 742	
	1	PA			Paper sludge fill with sand and gravel-trace clay-loose to medium dense-fill	
	2	SS				
5	3	SS			Brown clay-trace sand,gravel, topsoil,roots-stiff to tough-fill	
	4	ST				
10	5	ST			Gray-brown silt-trace clay, fine sand thin seam of red brown silty clay-11 - 12' (ML)	111
15	6	ST			Brown silty clay-trace to some sand and gravel-very tough to hard(CL)	
20	7	SS				
25	8	ST				
27					End of Boring	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.²
1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
STANDARD "N" PENETRATION (BLOWS/FT.)
10 20 30 40 50

*Calibrated Penetrometer

WATER LEVEL OBSERVATIONS		
W.L.	9.0	~~W.C.~~ OR W.D.
W.L.	B.C.R.	A.C.R.
W.L.	8.7' AB	
	6.5' 24 hours Ab	

SOIL TESTING SERVICES
OF WIS., INC.
540 LAMBEAU STREET
GREEN BAY, WIS. 54303

BORING STARTED	12-19-73		
BORING COMPLETED	12-19-73		
RIG	Acker	FOREMAN	EV
DRAWN	KK	APPROVED	KCM
JOB #	5863	SHEET	

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

DBS-81471

NEENAHFOIA0003465

LOG OF BORING NO. 8

OWNER	ARCHITECT • ENGINEER
Neenah Menasha Sewerage Commission	Consoer Townsend & Associates
SITE Neenah-Menasha	**PROJECT NAME** Interceptor Sewer

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST. RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.³
				SURFACE ELEVATION 747	
	1	PA		Silty sand and gravel-fill	
	2	SS		Paper waste sludge-loose-fill	
	2A	SS			
5	3	SS			
	4	SS		Cinders, sand, gravel, brown clay, wood paper waste-loose to medium dense-fill	
10	5	SS			
15	6	SS			
	7	SS			
20	8	SS		Brown silty clay-trace sand and gravel-very tough to hard (CL)	
25	9	SS			
30	10	SS			
31.5				End of Boring	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.²
1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
STANDARD "N" PENETRATION (BLOWS/FT.)
10 20 30 40 50

*Calibrated Penetrometer

WATER LEVEL OBSERVATIONS		
W.L	5.5	While/After W.D.
W.L	B.C.R.	A.C.R.
W.L	4.5' AB	
	4.4' 24 hours AB	

SOIL TESTING SERVICES
OF WIS., INC.
GREEN BAY, WISCONSIN
540 LAMBEAU STREET

BORING STARTED	12-19-73		
BORING COMPLETED	12-19-73		
RIG	Acker	FOREMAN	EV
DRAWN	KK	APPROVED	KCM
JOB #	5863	SHEET	

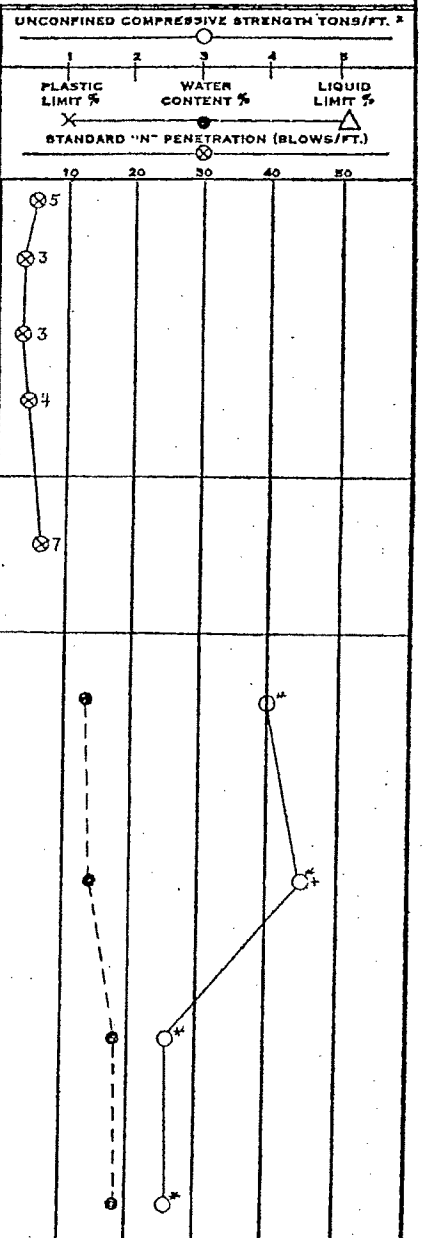
No. 2 The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

NEENAHFOIA0003466

LOG OF BORING NO. 9

OWNER	ARCHITECT-ENGINEER
Neenah Menasha Sewerage Commission	Consoer Townsend & Associates
SITE Neenah Menasha, Wisconsin	**PROJECT NAME** Interceptor Sewer

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.³
					SURFACE ELEVATION 748	
	1	SS			Paper waste trace clay and wood-loose-fill	
	2	SS				
5	3	SS				
	4	SS				
10	5	SS			Gray organic silt-trace sand partially decayed wood-loose(OL)	
15	6	ST			Brown silty clay-trace to some sand and gravel-hard(CL)	
20	7	ST				
25	8	ST				
30	9	ST				
32					End of Boring	



*Calibrated Penetrometer

WATER LEVEL OBSERVATIONS		
W.L.	11.0'	W.S. OR W.D.
W.L.	B.C.R.	A.C.R.
W.L.	9.4' AB	
	8.4' 24 hours AB	

SOIL TESTING SERVICES
OF WIS., INC.
GREEN BAY, WISCONSIN
540 LAMBEAU STREET

BORING STARTED	12-19-73		
BORING COMPLETED	12-19-73		
RIG	Acker	FOREMAN	EV
DRAWN	KCM	APPROVED	KCM
JOB #	5863	SHEET	

No. 1 The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

NEENAHFOIA0003467

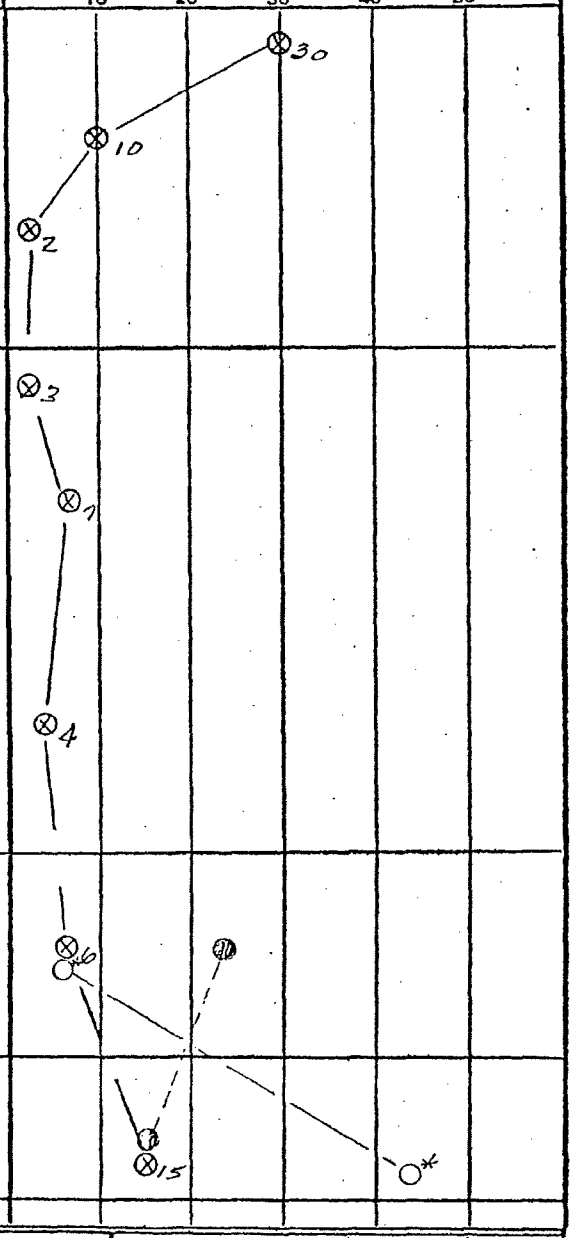
LOG OF BORING NO. 10

OWNER: Neenah Menasha Sewerage Commission	ARCHITECT-ENGINEER: Consoer Townsend & Associates
SITE: Neenah-Menasha	PROJECT NAME: Interceptor Sewer

SURFACE ELEVATION: 747

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.³
	1	SS			Miscellaneous fill consisting of paper waste topsoil, sand, gravel, bricks and cinders-loose to dense	
	2	SS				
5	3	SS				
	4	SS			Miscellaneous fill-predominately partially decayed wood with gray silt, sand and gravel-loose	
10	5	SS				
15	6	SS				
20	7	SS			Red brown and gray silty clay trace sand and gravel-soft(CL)	
25	8	SS			Brown silty clay-trace sand and gravel-hard(CL)	
26.5					End of Boring	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.²
1 2 3 4 5
PLASTIC LIMIT % · WATER CONTENT % · LIQUID LIMIT %
STANDARD "N" PENETRATION (BLOWS/FT.)
10 20 30 40 50



WATER LEVEL OBSERVATIONS		
W.L.	7.5'	W.S. ~~CR XWX~~
W.L.	B.C.R.	A.C.R.
W.L.	7.0 AB	
	7.0 24 hours AB	

SOIL TESTING SERVICES
OF WIS., INC.
540 LAMBEAU STREET
GREEN BAY, WIS. 54303

BORING STARTED	12-19-73		
BORING COMPLETED	12-19-73		
RIG	Acker	FOREMAN	EV
DRAWN	HH	APPROVED	KCM
JOB #	5863	SHEET	

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

BDS-81471

NEENAHFOIA0003468

LOG OF BORING NO. 11

OWNER	ARCHITECT · ENGINEER
Neenah Menasha Sewerage Commission	Consoer Townsend & Associates
SITE	**PROJECT NAME**
Neenah-Menasha	Interceptor Sewer

SURFACE ELEVATION 748

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.³
	1	SS			Brown silty sand and gravel-medium dense-fill	
	2	SS			Red brown silty clay-trace sand and gravel-very tough to tough(CL)possible fill	
5	3	ST				
	4	ST				
10					Brown silty sand and gravel (SP)possible fill	
	5	ST				
	6	SS			Black sand and gravel with decayed wood and other organic material-medium dense-possible fill	
15					Red brown silty clay-trace black partially decayed wood chips and black topsoil-tough (CL)	
	7	SS				
20						
	8	ST			Brown silty clay-trace sand and gravel-hard(CL)	
	9	SS			Lost sample at 20 to 22 and 25 to 26	
25						
	10	ST				
27.5	11	SS				
					End of Boring	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.² (1 2 3 4 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %

STANDARD "N" PENETRATION (BLOWS/FT.) (10 20 30 40 50)

*Calibrated Penetrometer

WATER LEVEL OBSERVATIONS		
W.L.	10'	W.S. on 12-XX-XX
W.L.	B.C.R.	A.C.R.
W.L.	9.7' AB	
	9.3' 4 hours AB	

SOIL TESTING SERVICES
OF WIS., INC.
GREEN BAY, WISCONSIN
540 LAMBEAU STREET

BORING STARTED	12-20-73		
BORING COMPLETED	12-20-73		
RIG	Acker	FOREMAN	EV
DRAWN	KK	APPROVED	KCM
JOB #	5863	SHEET	

No. 8 The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

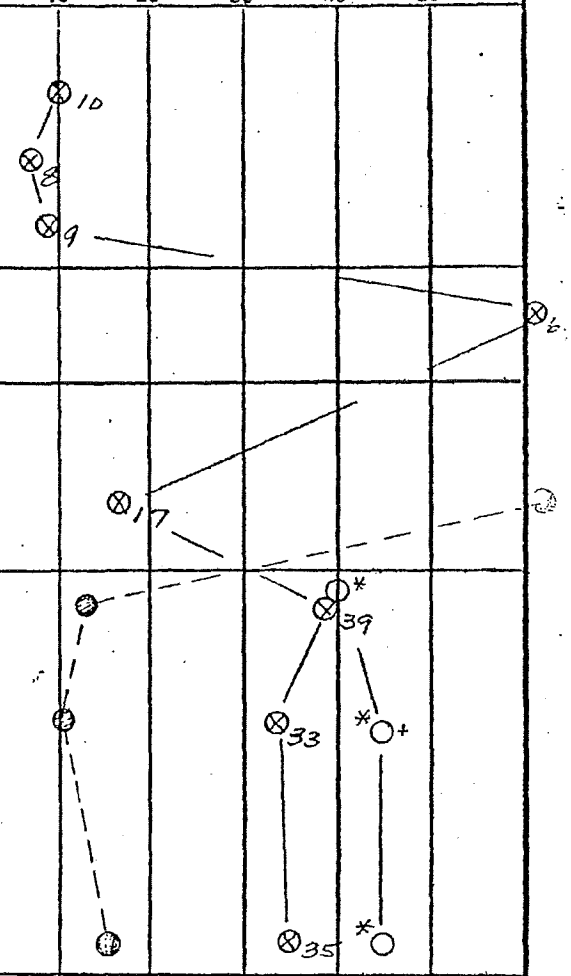
NEENAHFOIA0003469

LOG OF BORING NO. 12

OWNER	ARCHITECT-ENGINEER
Neenah Menasha Sewerage Commission	Consoer Townsend & Associates
SITE Neenah-Menasha	**PROJECT NAME** Interceptor Sewer

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.³
					SURFACE ELEVATION 745	
	1	SS			Paper waste with brown silty clay-loose to medium dense-fill	
	2	SS				
5	3	SS				
	4	SS			Fine brown silty sand-trace coarse gravel-very dense(SP) possible fill	
10					Gray organic silt with partially decayed wood chips-trace shells-medium dense(OL)	
	5	SS				
	6	SS				
15						
	7	SS			Brown silty clay-trace sand and gravel-hard(CL)	
20						
21.5	8	SS				
					End of Boring	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.²
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
STANDARD "N" PENETRATION (BLOWS/FT.)
10 20 30 40 50



*Calibrated Penetrometer

WATER LEVEL OBSERVATIONS		
W.L.	Dry	W.S. ~~OR W.D.~~
W.L.	B.C.R.	A.C.R.
W.L.	Dry AB	
	19.9 24 hours AB	

SOIL TESTING SERVICES
OF WIS., INC.
540 LAMBEAU STREET
GREEN BAY, WIS. 54303

BORING STARTED	12-18-73		
BORING COMPLETED	12-18-73		
RIG	Acker	FOREMAN	EV
DRAWN	KK	APPROVED	KCM
JOB #	5863	SHEET	

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

BBS-81471

NEENAHFOIA0003470

LOG OF BORING NO. 15

OWNER	ARCHITECT-ENGINEER
Neenah Menasha Sewerage Commission	Consoer Townsend & Associates
SITE Neenah-Menasha	**PROJECT NAME** Interceptor Sewer

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.³
					SURFACE ELEVATION 747	
	1	PA			Miscellaneous fill consisting of cinders, wood sand and gravel-loose	
5	2	SS				
10	3	SS			Gray brown silt-trace to some sand-trace gravel-medium dense(ML)	
15	4	SS			Red brown silty clay-very tough(CL)	
20	5	ST			Brown silty clay-trace sand and gravel-hard(CL)	
25						
26.5	6	SS			End of Boring	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.²
1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
STANDARD "N" PENETRATION (BLOWS/FT.)
10 20 30 40 50

*Calibrated Penetrometer

WATER LEVEL OBSERVATIONS		
W.L.	9.5' XXXXXX W.D.	
W.L.	B.C.R.	A.C.R.
W.L.	9.5 AB	
	9.5' - 2½ hours AB	

SOIL TESTING SERVICES
OF WIS., INC.
540 LAMBEAU STREET
GREEN BAY, WIS. 54303

BORING STARTED	12-20-73		
BORING COMPLETED	12-20-73		
RIG	Acker	FOREMAN	EV
DRAWN	KK	APPROVED	KCM
JOB #	5863	SHEET	

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

BBS-81471

NEENAHFOIA0003471

LOG OF BORING NO. B-1

OWNER: Berg strom Paper Company

ARCHITECT-ENGINEER:

SITE: Neenah, Wisconsin

PROJECT NAME: Solid Waste Disposal Site

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.³
			SURFACE ELEVATION 740.8	
	1	ST	Light gray paper sludge-Fill	
	2	ST		
	2A	ST		
5	3	ST		
	4	ST		
10	5	ST	Tough to hard gray brown silty sandy clay-trace grave (CL)	
15	6	ST		
20	7	ST		
25	8	ST	Very tough to hard gray brown silty clay-trace sand, gravel (CL)	
30	9	ST		
35	10	ST		
40	11	ST	Very tough to hard gray brown silty clay-trace sand, gravel (CL-CH) irregular small seams red clay	
45	12	ST		
50	13	ST	Very tough gray brown silty clay (CL) thin seams light gray silt	
55			End of Boring 1 1/2" Ø well installed to 5[illegible] 50 to 46' sand and pea gravel [illegible] to 41' bentonite	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.²

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %

STANDARD "N" PENETRATION (BLOWS/FT.)

10 20 30 40 50

*Calibrated Penetrometer

Top of protector pipe at elevation +744.0

WATER LEVEL OBSERVATIONS

W.L. W.S. OR W.D.

W.L. B.C.# Z.C.P.

W.L.

SOIL TESTING SERVICES OF WIS., INC.

GREEN BAY, WISCONSIN
540 LAMBEAU STREET

BORING STARTED 3-15-74

BORING COMPLETED 3-16-74

RIG [illegible] FOREMAN [illegible]

CHKD. [illegible] APPROVED [illegible]

JOB # [illegible] SHEET

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

NEENAHFOIA0003462

LOG OF BORING NO. B-3

OWNER: Bergstrom Paper Company

ARCHITECT-ENGINEER:

SITE: Neenah, Wisconsin

PROJECT NAME: Solid Waste Disposal Site

SURFACE ELEVATION: 739.9

DEPTH IN ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST. RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.³
0	1	ST		Light gray paper sludge	
	2	ST			
5	3	ST			
	4	ST			
	4A	ST			
	5	ST		Dark gray brown silty clayey topsoil-changing to a peaty topsoil	
10	6	ST		Red brown silty clay-trace sand (CL-CH) irregular gray seams	
15	7	ST			
20	8	ST		Hard gray brown silty sandy clay-trace gravel (CL)	
	9	ST			
	9A	ST			
25				Hard gray brown silty clay-trace sand, gravel (CL)	
	10	ST			
30	11	ST			
35	12	ST		Very tough to hard gray brown silty clay-trace sand, gravel (CL-CH)	
40	13	ST			
45	14	ST			
50				1 1/2" Ø well installed to 50 feet 50 to 46 feet sand 46' to 41 feet bentonite	
	15	ST			
				End of Boring 15' of 4" Casing	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.²

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %

STANDARD "N" PENETRATION (BLOWS/FT.)

10 20 30 40 50

*Calibrated Penetrometer

Top of Protector Pipe at elevation +742.11

WATER LEVEL OBSERVATIONS

W.L. W.S. CR W.D.

W.L. B.C.R. A.C.R.

W.L.

SOIL TESTING SERVICES OF WIS., INC.

GREEN BAY, WISCONSIN
540 LAMBEAU STREET

BORING STARTED

BORING COMPLETED

DRAWN APPROVED

JOB # SHEET

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

NEENAHFOIA0003463

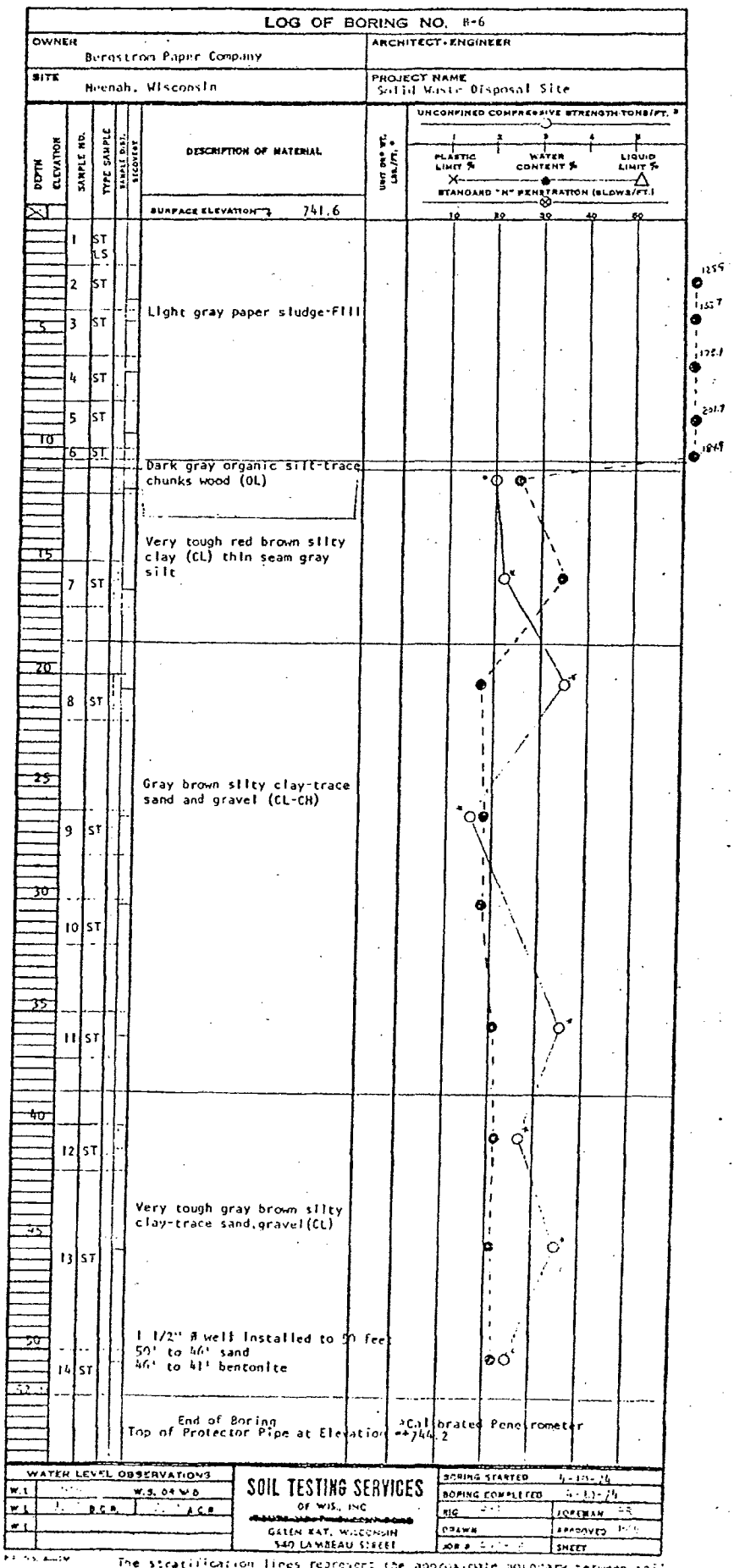
LOG OF BORING NO. B-6

OWNER: Berostrom Paper Company

ARCHITECT-ENGINEER:

SITE: Neenah, Wisconsin

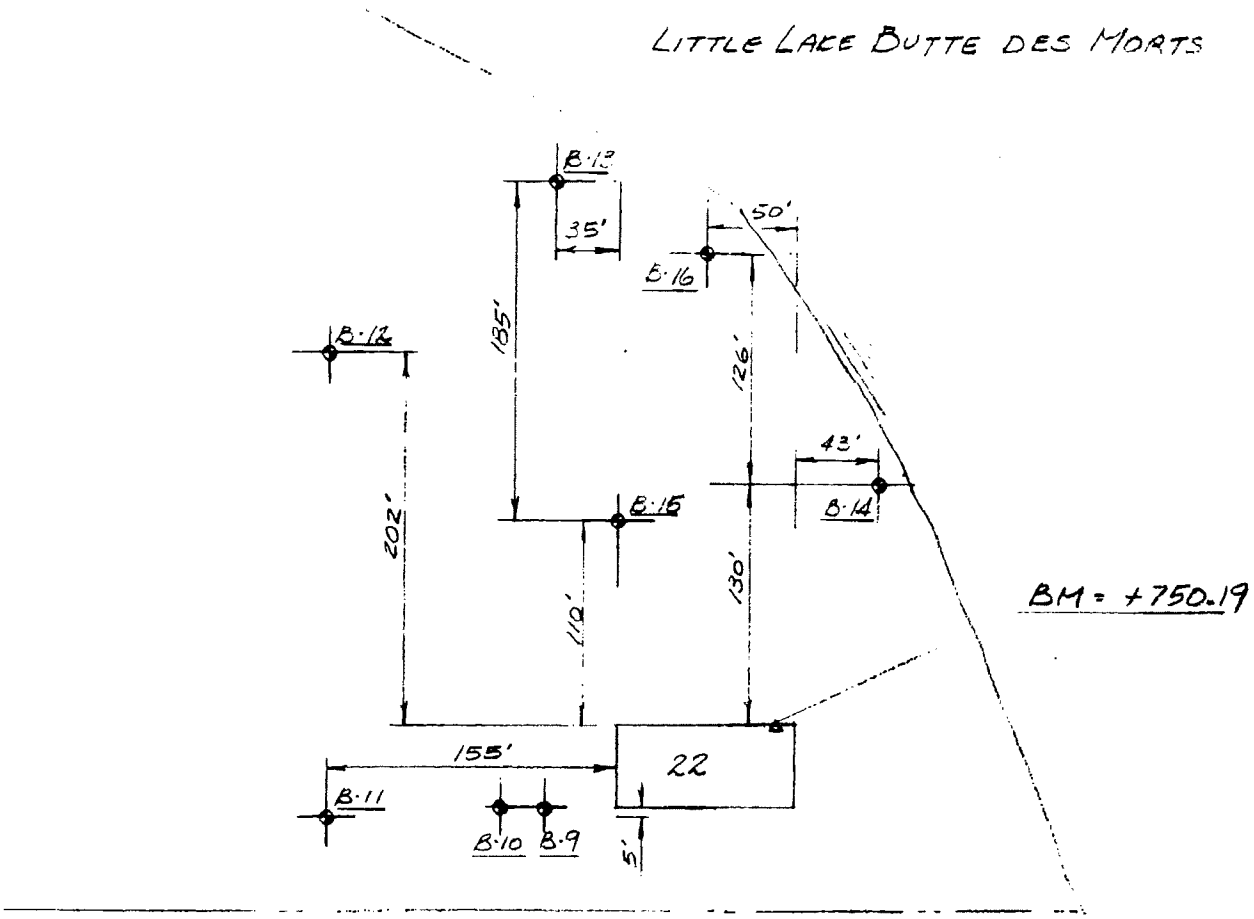
PROJECT NAME: Solid Waste Disposal Site



WATER LEVEL OBSERVATIONS		SOIL TESTING SERVICES OF WIS., INC.	BORING STARTED	
W.L.	W.S. 04 W.D.	GREEN BAY, WISCONSIN 540 LAMBEAU STREET	BORING COMPLETED	
W.L.	B.C.B. A.C.B.		RIG	FOREMAN
W.L.			DRAWN	APPROVED
			JOB #	SHEET

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

NEENAHFOIA0003464



SOIL BORING LOCATION DIAGRAM
PROPOSED TREATMENT PLANTS
BERGSTROM PAPER CO., NEENAH, WISC.

SOIL TESTING SERVICES OF WIS., INC.
Route 7, Boston Road
GREEN BAY WISCONSIN

BP	1"=100'	443A	9-5-60

P.P. No. 6—1M

LOG OF BORING NO. 11

OWNER
Bergstrom Paper Company

ARCHITECT - ENGINEER
S.J. Baisch Associates

SITE
Neenah, Wisconsin

PROJECT NAME
Proposed Treatment Plants

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.³
					SURFACE ELEVATION 745.5	
	1	SS			FINE-MEDIUM SAND-TRACE GRAVEL AND WOOD-BROWN AND GRAY-FILL	
	2	SS				
5	3	SS			GRAY PAPER SLUDGE-FILL	
	4	SS				
10	5	SS			ORGANIC SILT-TRACE FIBERS-DARK GRAY-(OL)	
15	6	ST				
					SILTY CLAY-TRACE GRAVEL AND SAND-BROWN-HARD-(CL)-COBBLES AT 13.5' TO 15'	
20	7	SS				
25	8	SS				
26.5					END OF BORING 10' NX CASING	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.²
1 2 3 4 5
PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %
STANDARD "N" PENETRATION (BLOWS/FT.)
10 20 30 40 50

*CALIBRATED PENETROMETER

WATER LEVEL OBSERVATIONS

W.L.	W.S. OR W.D.	
W.L.	8.5' B.C.R.	8.5' A.C.R.
W.L.	CT AT SURFACE 24 HOURS AB	

SOIL TESTING SERVICES
OF WIS., INC.
ROUTE NO. 7—BAETEN ROAD
GREEN BAY, WISCONSIN

BORING STARTED	8/19/66		
BORING COMPLETED	8/19/66		
RIG	W-6	FOREMAN	KN
DRAWN		APPROVED	WMP
JOB #	1443A	SHEET	

P.P. No. 8—1M

LOG OF BORING NO. 12

OWNER	ARCHITECT - ENGINEER
Bergstrom Paper Company	S. J. Baisch Associates
SITE	**PROJECT NAME**
Neenah, Wisconsin	Proposed Treatment Plants

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.³
					SURFACE ELEVATION 743.05	
	1				BROWN SANDY CLAY-TRACE GRAVEL-FILL	
	1A	SS			BLACK CINDERS-FILL	
	2	SS			GRAY PAPER SLUDGE-TRACE COARSE GRAVEL AT 4'-TRACE CINDERS AT 7'-SWAMP GAS NOTED WHILE DRILLING AT 2'	
5	3	SS				
	4	SS				
10						
	5	SS				
15						
	6	ST				
					SILTY CLAY-TRACE GRAVEL AND SAND-BROWN-TOUGH TO HARD-(CL)	
20						
	7	SS				
25						
	8	SS				
26.5					END OF BORING 10' NX CASING	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.²

1 2 3 4 5

PLASTIC LIMIT % WATER CONTENT % LIQUID LIMIT %

STANDARD "N" PENETRATION (BLOWS/FT.)

10 20 30 40 50

6"

*CALIBRATED PENETROMETER

WATER LEVEL OBSERVATIONS		
W.L.	W.S. OR W.D.	
W.L.	7' B.C.R.	7' A.C.R.
W.L.	WCI AT 6' 24 HOURS AB	

SOIL TESTING SERVICES
OF WIS., INC.
ROUTE NO. 7—BAETEN ROAD
GREEN BAY, WISCONSIN

BORING STARTED	8/19/66		
BORING COMPLETED	8/19/66		
RIG	W-6	FOREMAN	KN
DRAWN		APPROVED	WMP
JOB #	1443A	SHEET	

P.P. No. 8—1M

LOG OF BORING NO. 15

OWNER	ARCHITECT - ENGINEER
Bergstrom Paper Company	S. J. Baisch Associates
SITE	**PROJECT NAME**
Neenah, Wisconsin	Proposed Treatment Plants

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.³
					SURFACE ELEVATION 744.4	
	1	SS			GRAY PAPER SLUDGE	
	2	SS				
5	3	SS				
	4	SS				
10	5	SS				
	5A					
15	6	SS			SILTY CLAY-TRACE GRAVEL AND SAND-BROWN-HARD TO VERY TOUGH (CL)	
20	7	SS				
25	8	SS				
30	9	SS				
31.5					END OF BORING	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.² (1, 2, 3, 4, 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %

STANDARD "N" PENETRATION (BLOWS/FT.) (10, 20, 30, 40, 50)

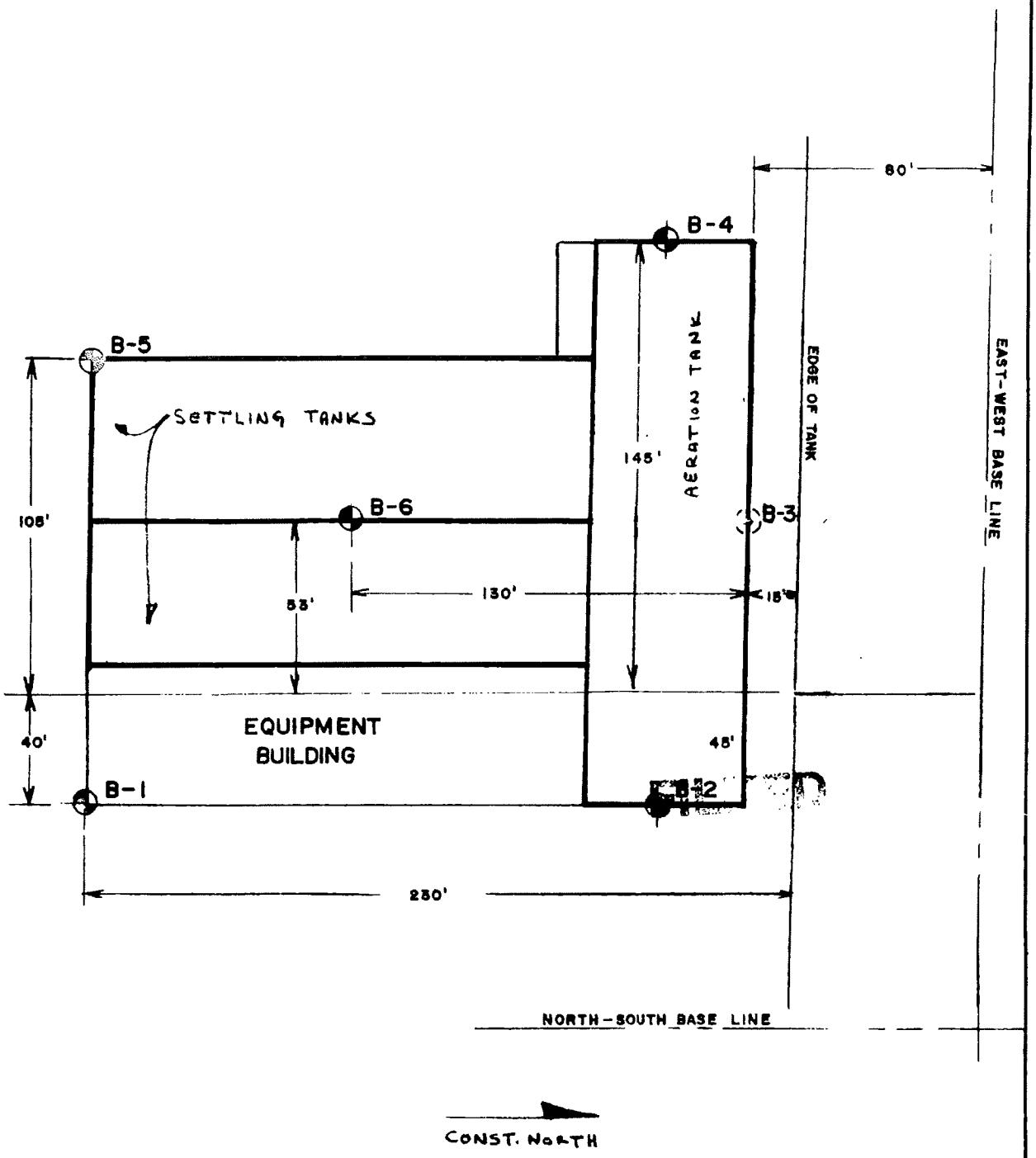
*CALIBRATED PENETROMETER

WATER LEVEL OBSERVATIONS		
W.L.	W.S. OR W.D.	
W.L.	B.C.R.	A.C.R.
W.L.	4' AB	
	7' 24 HOURS AB	

SOIL TESTING SERVICES
OF WIS., INC.
ROUTE NO. 7—BAETEN ROAD
GREEN BAY, WISCONSIN

BORING STARTED	8/19/66		
BORING COMPLETED	8/19/66		
RIG	W-6	FOREMAN	KN
DRAWN		APPROVED	WMP
JOB #	1443A	SHEET	

P.P. No. 8—1M.



SOIL BORING LOCATION DIAGRAM
EFFLUENT TREATMENT PLANT
BERGSTROM PAPER CO.
NEENAH, WISCONSIN

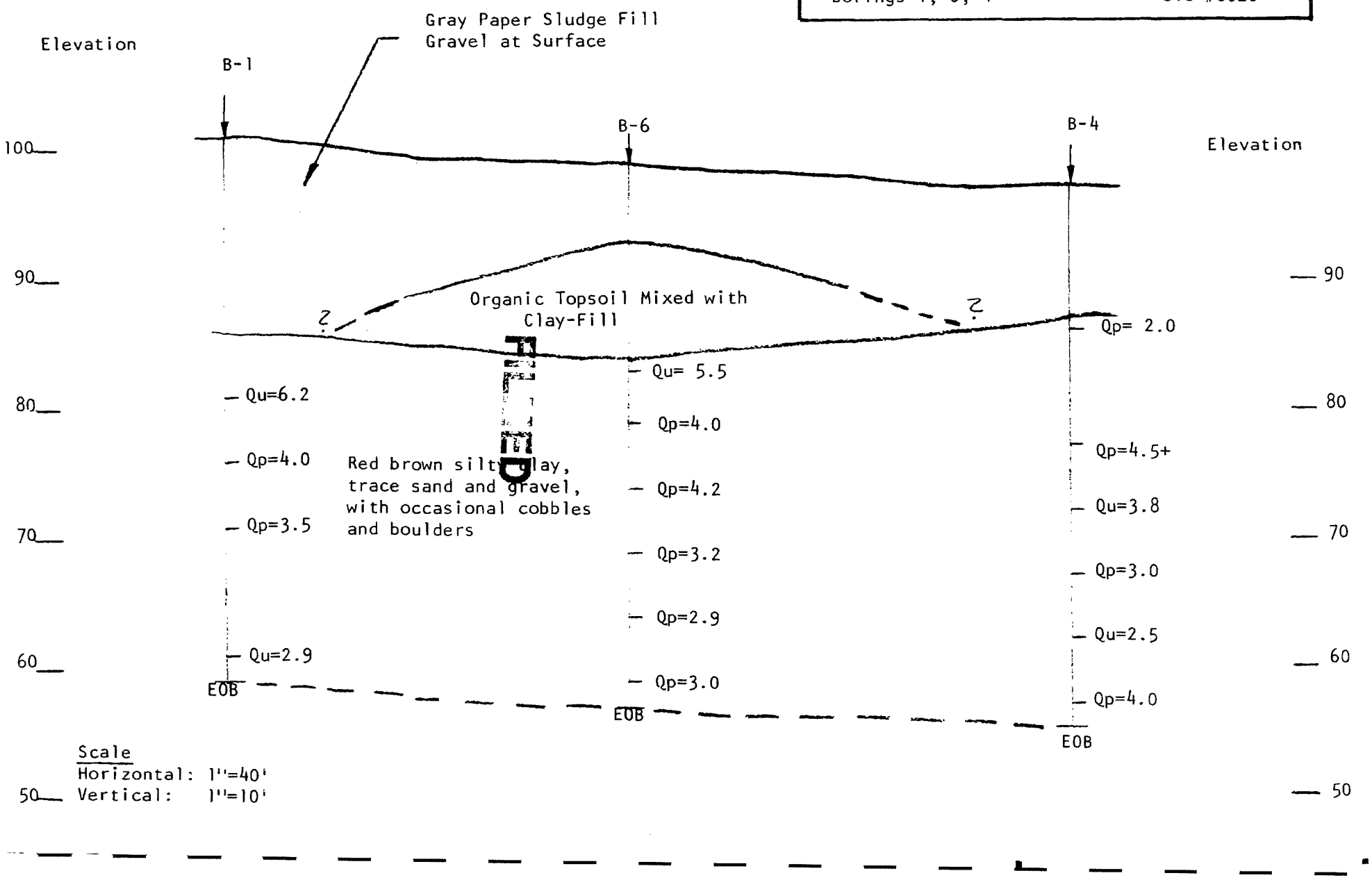
N

SOIL TESTING SERVICES OF WISCONSIN, INC.
540 LAMBEAU ST. GREEN BAY, WISCONSIN 54303

H.H	4-29-75	1" = 50'	6626

GENERALIZED SOIL PROFILE
EFFLUENT TREATMENT PLANT
BERGSTROM PAPER COMPANY

Borings 1, 6, 4 STS #6626



LOG OF BORING NO. 1

OWNER: Bergstrom Paper Company	ARCHITECT-ENGINEER: VanLuven Consultants
SITE: Neenah, Wisconsin	PROJECT NAME: Proposed Waste Water Treatment Plant

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE WT.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.³
SURFACE ELEVATION 701.0						
	1	SS			Gray brown fine to coarse sand and gravel-fill	
	2	SS				
5	3	SS				
	4	SS			Gray paper sludge-fill	
10	5	SS				
15	6	SS			Red gray to red brown silty clay, trace to some fine to coarse gravel, with pieces of large gravel at 35 feet-very tough to hard-(CL)	
20	7	ST				117
25	8	ST				
30	9	ST				
35	10	ST				
40	11	ST			Red brown silty clay, trace fine sand-very tough-(CL-CH)	107
42					End of Boring Auger boring to 15 feet. Wash boring below 15 feet. 15 feet of NX casing used.	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.² (1, 2, 3, 4, 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %

STANDARD "N" PENETRATION (BLOWS/FT.) (10, 20, 30, 40, 50)

*Calibrated Penetrometer

WATER LEVEL OBSERVATIONS		
W.L.	3'	W.S. CRIB
W.L.	2.1' B.C.B.	A.C.B.
W.L.	5.9' 24 hrs. AB	

SOIL TESTING SERVICES
OF WIS., INC.
GREEN BAY, WISCONSIN
540 LAMBEAU STREET

BORING STARTED	4-15-75		
BORING COMPLETED	4-15-76		
RIG	8	FOREMAN	EVH
DRAWN	JK	APPROVED	WCK
JOB #	6626	SHEET	

FORM NO. 4—1M

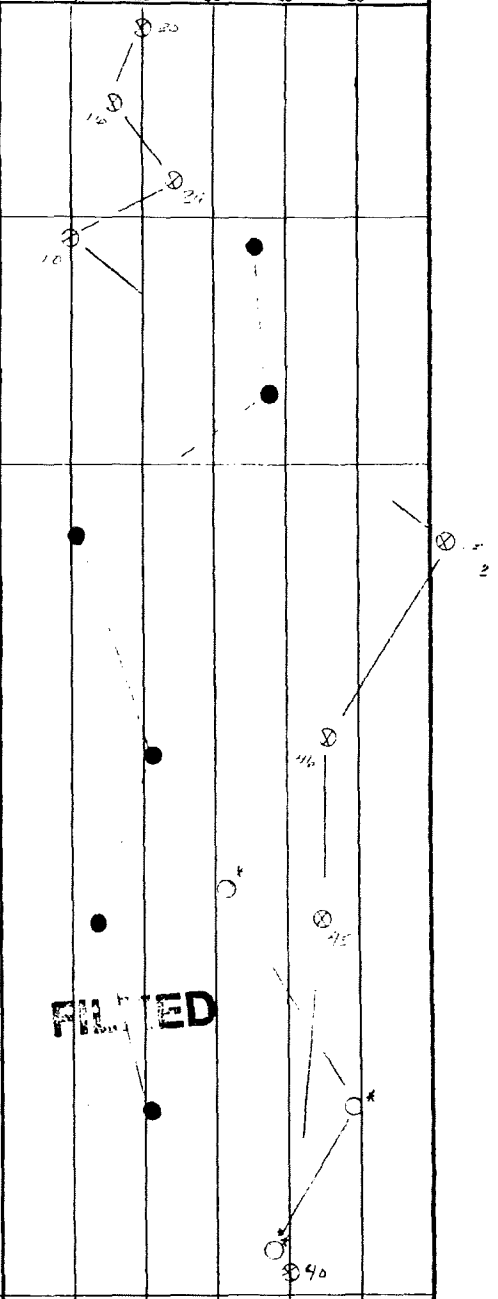
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

LOG OF BORING NO. 2

OWNER	ARCHITECT-ENGINEER
Bergstrom Paper Company	Van Luven Consultants
SITE	**PROJECT NAME**
Neenah, Wisconsin	Proposed Waste Water Treatment Plant

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.³
					SURFACE ELEVATION 97.7	
	1	SS			Gray paper sludge mixed with gravel from 0 to 1 foot, mixed with peat and topsoil from 4 feet to 6 feet-fill	
	2	SS				
5	3	SS				
	4	SS			Red brown silty clay, mixed with topsoil, cinders, sludge and sand-fill	
10	5	SS				
15	6	SS				
20	7	SS			Red brown silty clay, some fine to coarse sand and fine to coarse gravel-hard-(CL)	
25	8	SS				
30	9	ST				
35	10	SS				
36.5					End of boring Auger boring to 15 feet Wash boring below 15 feet 15 feet of NX casing used	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.² (1 2 3 4 5)
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
STANDARD "N" PENETRATION (BLOWS/FT.) (10 20 30 40 50)



*Calibrated Penetrometer

WATER LEVEL OBSERVATIONS		
W.L.	3' W.S. ORIGIN	
W.L.	2.1' B.C.R.	A.C.R.
W.L.	5.9' 24 hrs. AB	

SOIL TESTING SERVICES
OF WIS., INC.
GREEN BAY, WISCONSIN
540 LAMBEAU ST.

BORING STARTED	4-14-75		
BORING COMPLETED	4-14-75		
RIG	8	FOREMAN	EVH
DRAWN	JK	APPROVED	WCK
JOB #	6626	SHEET	

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

BBS-81671

LOG OF BORING NO. 4

OWNER: Bergstrom Paper Company	ARCHITECT-ENGINEER: Van Luven Consultants
SITE: Neenah, Wisconsin	PROJECT NAME: Proposed Waste Water Treatment Plant

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.³
SURFACE ELEVATION 97.5						
0	1	SS			Gray paper sludge-fill	
	2	SS				
5	3	SS				
	4	SS				
10	5	SS			Red brown silty clay, trace to some sand and fine to coarse gravel-very tough to hard-(CL) possible cobble or boulder at 15 feet	
15	6	SS				
20	7	ST				117
25	8	SS				
30	9	ST				109
35	10	ST				105
40	11	ST				
42					End of boring Auger boring to 6 feet. Wash boring below 6 feet. 15 feet of NX casing used.	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.²
1 2 3 4 5
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
STANDARD "N" PENETRATION (BLOWS/FT.)
10 20 30 40 50

8/12 9 4 4 8/10 9 11 65

FILLED

*Calibrated Penetrometer

WATER LEVEL OBSERVATIONS			
W.L.	6.2'	W.S. OBSVD.	
W.L.	7.1' B.C.B.	6.5' A.C.B.	
W.L.			

SOIL TESTING SERVICES
OF WIS., INC.
GREEN BAY, WISCONSIN
540 LAMBEAU STREET

BORING STARTED	4-15-75
BORING COMPLETED	4-15-75
RIG 8	FOREMAN EVH
DRAWN JK	APPROVED WCK
JOB # 6626	SHEET

P.P. No. 4—1M

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

LOG OF BORING NO. 5

OWNER: Bergstrom Paper Company	ARCHITECT - ENGINEER: Van Luven Consultants
SITE: Neenah, Wisconsin	PROJECT NAME: Proposed Waste Water Treatment Plant

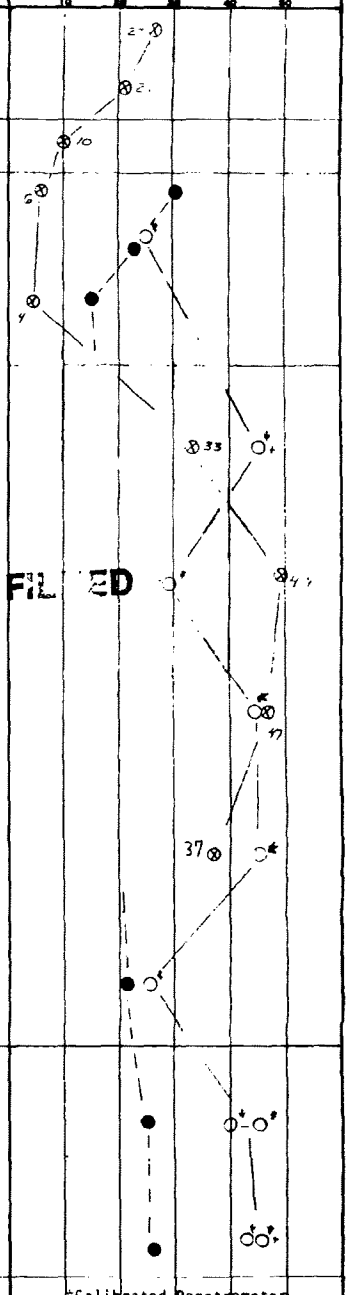
SURFACE ELEVATION: 99.9

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	DESCRIPTION OF MATERIAL
	1	SS	Gray fine to coarse sand and gravel-fill
	2	SS	
5	3	SS	Gray paper sludge-Fill
	4	SS	Red brown, brown, and gray silty clay, mixed with cinders, topsoil, and sand-fill
	5	ST	
10	6	SS	
15	7	SS	Red brown silty clay, trace sand and fine gravel-hard to very tough-(CL)
20	8	SS	
25	9	SS	
30	10	SS	
35	11	ST	
40	12	ST	Red brown silty clay, trace sand, with numerous thin seams and layers of gray silt below 45 feet-hard-(CL-CH)
45	13	ST	
46.5			End of Boring Auger boring to 7.5 feet Wash boring below 7.5 feet 15 feet of NX Casing used

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.²

PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT %

STANDARD "N" PENETRATION (BLOWS/FT.)



FILED

*Calibrated Penetrometer

WATER LEVEL OBSERVATIONS		
W.L.	2'	W.L. on Rods
W.L.	6.2' A.C.B.	5.7' A.C.B.
W.L.	2' 24 hrs. AB	

SOIL TESTING SERVICES
OF WI., INC.
GREEN BAY, WISCONSIN
540 LAMBEAU STREET

BORING STARTED	4-16-75
BORING COMPLETED	4-16-75
RIG	8
FOREMAN	EVH
DRAWN	JK
APPROVED	WCK
JOB #	6626
SHEET	

P.P. No. 4—1M

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

LOG OF BORING NO. 6

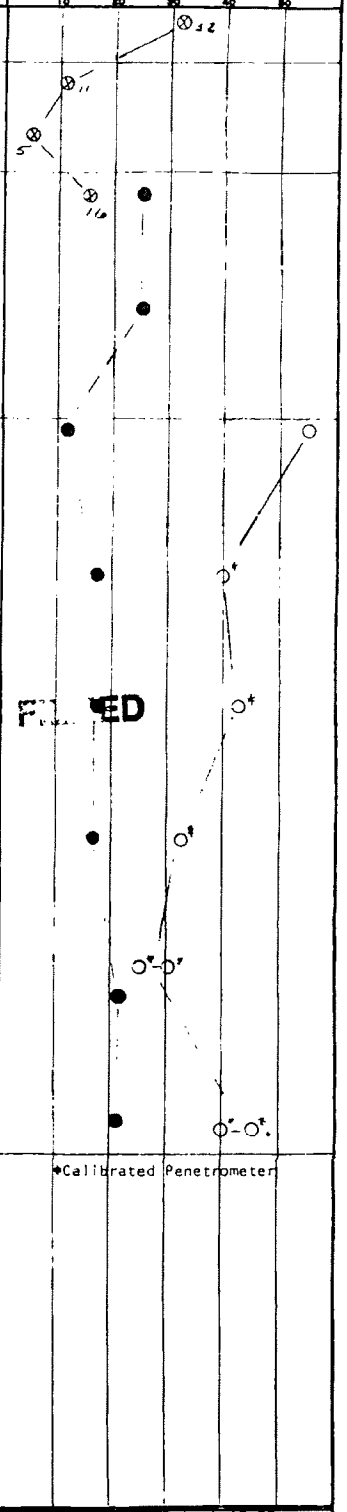
OWNER: Bergstrom Paper Company	ARCHITECT-ENGINEER: Van Luven Consultants
SITE: Neenah, Wisconsin	PROJECT NAME: Proposed Waste Water Treatment Plant

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.³
			SURFACE ELEVATION 98.8	
	1	SS	Black topsoil, gray paper sludge and gravel-fill	
	2	SS	Black cinders-fill	
2	3	SS		
	4	SS	Dark brown clayey topsoil, mixed with brown silty clay-fill-(OL-OH)	
10	5	ST		
15	6	ST	Red brown silty clay, trace sand and fine to medium gravel-with irregular seams of gray brown clayey silt-(ML-CL)-hard to very tough-(CL)	12.5
20	7	ST		
25	8	ST		
30	9	ST		
35	10	ST		
40	11	ST		
42			End of boring Auger boring to 6 feet Wash boring below 6 feet 20 Feet of NX Casing used	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.²

PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT %

STANDARD "N" PENETRATION (BLOWS/FT.)



*Calibrated Penetrometer

WATER LEVEL OBSERVATIONS		
W.L.	3.5' W.B. ON BOR.	
W.L.	5.1' B.C.B.	4.7' A.C.B.
W.L.		

SOIL TESTING SERVICES
OF WIS., INC.
GREEN BAY, WISCONSIN
540 LAMBEAU STREET

BORING STARTED	4-15-75
BORING COMPLETED	4-15-75
RIG B	FOREMAN EVH
DRAWN JK	APPROVED WCK
JOB # 6626	SHEET

P.P. No. 4—1M

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

STS Consultants Ltd.

OWNER	LOG OF BORING NUMBER
P. H. Glatfelter Company	B-1-90
PROJECT NAME	**ARCHITECT—ENGINEER**
Proposed Combustor Building	

SITE LOCATION Neenah, Wisconsin

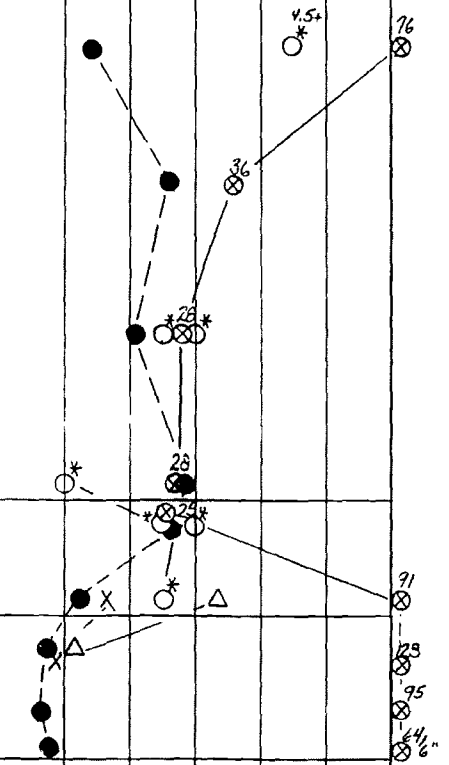
DEPTH ELEVATION	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT³
					SURFACE ELEVATION 744.23	
2.5					Fill: Black cinders mixed with gravel, clay and sand - driller's observation	
5					Fill: Gray paper sludge - driller's observation	
10						
11						
15	1	SS			Brown silty clay (CL-CH) - trace of gravel - moist - stiff to hard	
20	2	SS				
25	3	SS				
30						
32	4	SS				
35	5	SS			Varved brown silty clay (CL-CH) and gray clayey silt (ML-CL) - alternating 1/8-inch to 1/2-inch thick seams - trace of sandy silt seams from 34 feet to 36 feet - moist - very stiff to hard	
36	6	SS				
40	7	SS			Gray clayey sandy silt (ML) - trace of gravel - moist to wet - extremely dense	
41	8	SS				
	9	SS				
					End of boring - Boring advanced to 15 feet with solid-stem auger and no sampling - Boring advanced from 15 feet to 41 feet with tri-cone roller bit and wash water HW casing driven to 15 feet Grouted borehole with bentonite upon completion	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT² — 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %

10 20 30 40 50

STANDARD PENETRATION BLOWS/FT. — 10 20 30 40 50



*Calibrated penetrometer

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN SITU. THE TRANSITION MAY BE GRADUAL.

WL	BORING STARTED 7-31-90	STS OFFICE	540 Lambeau Street Green Bay, WI 54303
WL BCR ACR	BORING COMPLETED 7-31-90	DRAWN BY JJT	SHEET NO. 1 OF 1
WL	RIG Mobile B61 FOREMAN TT	APP'D BY MJW	STS JOB NO18068XH

BL:3-1183

STS Consultants Ltd.

OWNER: P. H. Glatfelter Company	LOG OF BORING NUMBER: B-3-90
PROJECT NAME: Proposed Combustor Building	ARCHITECT—ENGINEER:
SITE LOCATION: Neenah, Wisconsin	

DEPTH / ELEVATION	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT³
					SURFACE ELEVATION 744.26	
5					Fill: Brown sand and gravel mixed with topsoil, gravel and paper sludge - driller's observation	
10	1	SS				
13.5						
15	2	SS			Brown silty clay (CL) - trace of gravel - moist - very stiff to hard	
20	3	SS				
25	4	SS				
30	5	SS				
	6	SS				
35	7	SS				
36	8	SS			Varved brown silty clay (CL) and gray clayey silt (ML-CL) - alternating 1/4-inch thick to 1/2-inch thick seams - moist - very stiff to hard	
40	9	SS				
41	10	SS			Brown sandy silty clay (CL) - a little gravel - wet - hard	
					End of boring - Boring advanced to 15 feet with solid-stem auger and no sampling - boring advanced from 15 feet to 41 feet with tri-cone roller bit and wash water HW casing driven to 15 feet Boring terminated at 41 feet due to extremely dense drilling Grouted borehole with bentonite upon completion	

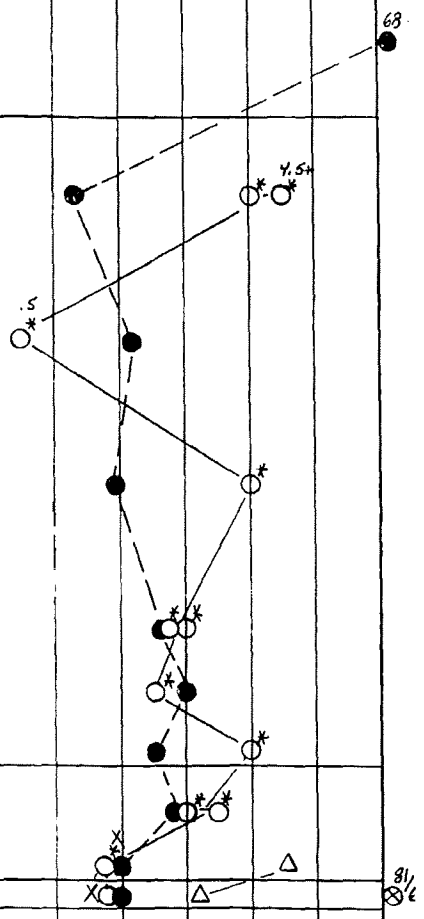
UNCONFINED COMPRESSIVE STRENGTH TONS/FT² — 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %

10 20 30 40 50

STANDARD PENETRATION BLOWS/FT

10 20 30 40 50



*Calibrated penetrometer

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION MAY BE GRADUAL.

WL	BORING STARTED 7-30-90	STS OFFICE	540 Lambeau Street Green Bay, WI 54303
WL BCR ACR	BORING COMPLETED 7-30-90	DRAWN BY JJT	SHEET NO. 1 OF 1
WL	RIG Mobile B61 FOREMAN TT	APP'D BY MJW	STS JOB NO. 18068XH

BL:3-1183

STS Consultants Ltd.

OWNER: P.H. Glatfelter Co.

LOG OF BORING NUMBER 1

PROJECT NAME: Waste Treatment Expansion

ARCHITECT-ENGINEER: Foth & Van Dyke

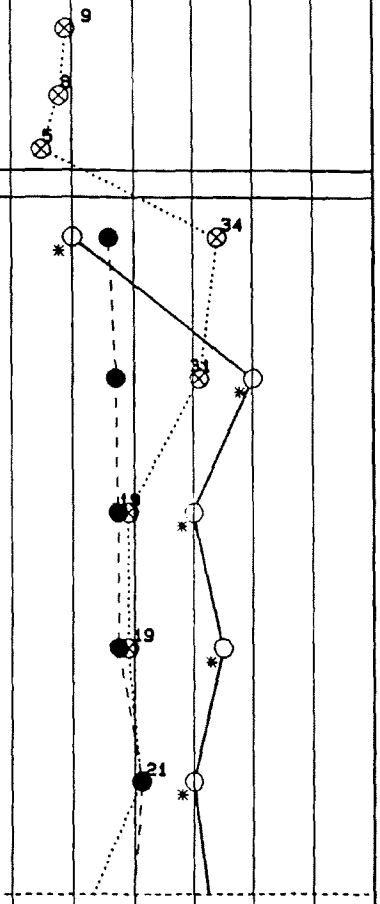
SITE LOCATION: 225 W. Wisconsin Avenue, Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.^{3}
					SURFACE ELEVATION 747.0	
					Asphalt (Driller's observation)	
5.0			HSA		Fill: Base course (Driller's observation)	
		1	SS		Fill: Paper sludge	
10.0		2	SS			
		3	SS			
					Buried topsoil (Driller's observation)	
15.0		4	SS		Brown silty clay (CL) - with trace to little gravel and sand - moist - stiff to hard	
20.0		5	SS			
25.0		6	SS			
30.0		7	SS			
35.0		8	SS			
40.0						



* Calibrated Penetrometer

... continued

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

STS JOB NO. 18899

STS Consultants Ltd.

OWNER: P.H. Glatfelter Co.

LOG OF BORING NUMBER: 1

PROJECT NAME: Waste Treatment Expansion

ARCHITECT-ENGINEER: Foth & Van Dyke

SITE LOCATION: 225 W. Wisconsin Avenue, Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.^{3}
					SURFACE ELEVATION 747.0	
					Continued from previous page	
40.0	9	SS			Brown silty clay (CL) - with trace to little gravel and sand - moist - stiff to hard	
45.0	10	SS				
50.0	11	SS				
51.5					End of Boring Boring advanced to 14 feet with hollow stem auger Boring advanced from 14 to 52 feet with roller bit and Revert drilling mud HW casing driven to 15 feet Borehole abandoned with bentonite chips	

12 21 16

* Calibrated Penetrometer

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

WL WS OR WD	BORING STARTED 08/19/91	STS OFFICE	1035 Kepler Drive Green Bay, WI 54311
WL BCR ACR	BORING COMPLETED 08/19/91	ENTERED BY MKM	SHEET NO. 2 OF 2
WL	RIG/FOREMAN CME 45/TT	APP'D BY WB	STS JOB NO. 18899

STS Consultants Ltd.

OWNER: P.H. Glatfelter Co.

LOG OF BORING NUMBER 2

PROJECT NAME: Waste Treatment Expansion

ARCHITECT-ENGINEER: Foth & Van Dyke

SITE LOCATION: 225 W. Wisconsin Avenue, Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % × — WATER CONTENT % ● — LIQUID LIMIT % △ (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. ⊗ (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE / RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.^{3}
				SURFACE ELEVATION 746.7	
				Asphalt (Driller's observation)	
		HSA		Fill: Base course (Driller's observation)	
5.0	1	SS		Fill: Paper sludge	
	2	SS			
10.0	3	SS			
15.0	4	SS		Brown silty clay (CL) - with trace to little gravel and sand - moist - hard	
20.0	5	SS			
25.0	6	SS			
30.0	7	SS		Gray fine to coarse sand (SW) - with trace of gravel - wet - dense	
31.5				Note: Artesian water pressure was encountered at 31.5 feet. Borehole abandoned.	

End of Boring
Boring advanced to 15' with hollow stem auger
Boring advanced from 15 to 31.5 feet with roller bit and Revert drilling mud
HW casing driven to 15 feet
Borehole abandoned with bentonite chips

* Calibrated Penetrometer

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

WL 28 ft WS OR WD WD	BORING STARTED 08/15/91	STS OFFICE	1035 Kepler Drive Green Bay, WI 54311
WL BCR ACR	BORING COMPLETED 08/15/91	ENTERED BY MKM	SHEET NO. 1 OF 1
WL	RIG/FOREMAN CME 45/TT	APP'D BY WB	STS JOB NO. 18899

STS Consultants Ltd.

OWNER
P.H. Glatfelter Co.

LOG OF BORING NUMBER 3

PROJECT NAME
Waste Treatment Expansion

ARCHITECT-ENGINEER
Foth & Van Dyke

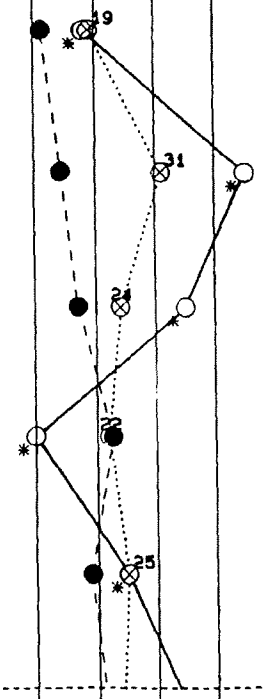
SITE LOCATION
225 W. Wisconsin Avenue, Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.^{3}
						SURFACE ELEVATION 747.3	
						Asphalt (Driller's observation)	
5.0						Fill: Base course (Driller's observation)	
			HSA			Fill: Paper sludge	
15.0		1	SS			Brown silty clay (CL) with trace of gravel and sand - moist - stiff to hard	
20.0		2	SS				
25.0		3	SS				
30.0		4	SS				
35.0		5	SS				
40.0							



* Calibrated Penetrometer

... continued

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

STS JOB NO. 18899

STS Consultants Ltd.

OWNER: P.H. Glatfelter Co.

LOG OF BORING NUMBER: 3

PROJECT NAME: Waste Treatment Expansion

ARCHITECT-ENGINEER: Foth & Van Dyke

SITE LOCATION: 225 W. Wisconsin Avenue, Neenah, Wisconsin

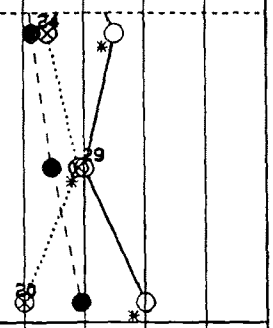
SURFACE ELEVATION: 747.3

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % × — WATER CONTENT % ● — LIQUID LIMIT % △ (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. ⊗ (10 20 30 40 50)

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.^{3}
						Continued from previous page	
40.0		6	SS			Brown silty clay (CL) with trace of gravel and sand - moist - stiff to hard	
45.0		7	SS				
50.0		8	SS				
51.5						End of Boring Boring advanced to 15 feet with hollow stem auger Boring advanced from 15 to 51.5 feet with roller bit and Revert drilling mud HW casing driven to 15 feet Borehole abandoned with bentonite chips	



* Calibrated Penetrometer

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

WL 12-15 ft WS OR WD WD	BORING STARTED 08/19/91	STS OFFICE	1035 Kepler Drive Green Bay, WI 54311
WL BCR ACR	BORING COMPLETED 08/19/91	ENTERED BY MKM	SHEET NO. 2 OF 2
WL	RIG/FOREMAN CME 45/TT	APP'D BY WB	STS JOB NO. 18899

STS Consultants Ltd.

OWNER: P.H. Glatfelter Co.

LOG OF BORING NUMBER 4

PROJECT NAME: Waste Treatment Expansion

ARCHITECT-ENGINEER: Foth & Van Dyke

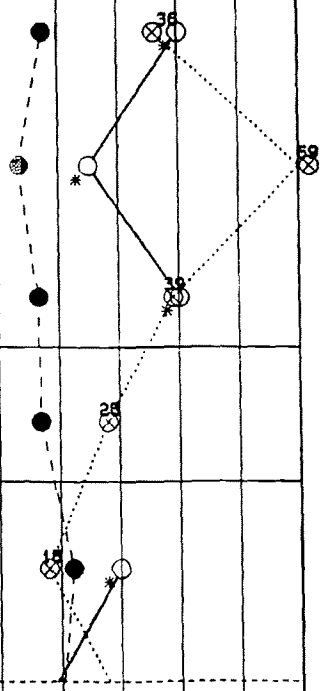
SITE LOCATION: 225 W. Wisconsin Avenue, Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE / RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.^{3}
				SURFACE ELEVATION 746.7	
				Asphalt (Driller's observation)	
				Fill: Base course (Driller's observation)	
5.0		HSA		Fill: Paper sludge	
10.0					
15.0	1	SS		Brown silty clay (CL) with trace of gravel, sand, and sand seams at 20.0 feet - moist - hard	
20.0	2	SS			
25.0	3	SS			
30.0	4	SS		Brown clayey sand (SC) - with little gravel - wet - medium dense	
35.0	5	SS		Reddish brown silty clay (CL) - with trace of gravel and sand - moist - very stiff to stiff	
40.0					



* Calibrated Penetrometer

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The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

STS JOB NO. 18899

SHEET NO. 1 OF 2

STS Consultants Ltd.

OWNER: P.H. Glatfelter Co.

LOG OF BORING NUMBER: 4

PROJECT NAME: Waste Treatment Expansion

ARCHITECT-ENGINEER: Foth & Van Dyke

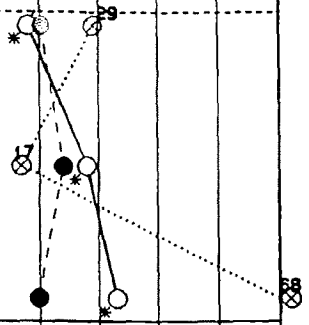
SITE LOCATION: 225 W. Wisconsin Avenue, Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE / RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.^{3}
				SURFACE ELEVATION 746.7	
				Continued from previous page	
40.0	6	SS		Reddish brown silty clay (CL) - with trace of gravel and sand - moist - very stiff to stiff	
45.0	7	SS			
50.0	8	SS			
51.5				End of Boring Boring advanced to 15 feet with hollow stem auger Boring advanced from 15 to 56.5 feet with roller bit and Revert drilling mud HW casing driven to 15 feet Borehole abandoned with bentonite chips	



* Calibrated Penetrometer

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

WL WS OR WD	BORING STARTED 08/14/91	STS OFFICE	1035 Kepler Drive Green Bay, WI 54311
WL BCR ACR	BORING COMPLETED 08/15/91	ENTERED BY MKM	SHEET NO. 2 OF 2
WL	RIG/FOREMAN CME 45/TT	APP'D BY WB	STS JOB NO. 18899

STS Consultants Ltd.

OWNER: P.H. Glatfelter Co.

LOG OF BORING NUMBER 5

PROJECT NAME: Waste Treatment Expansion

ARCHITECT-ENGINEER: Foth & Van Dyke

SITE LOCATION: 225 W. Wisconsin Avenue, Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.^{3}
					SURFACE ELEVATION 747.2	
					Asphalt (Driller's observation)	
		HSA			Fill: Base course (Driller's observation)	
5.0	1	SS				
	2	SS			Fill: Paper sludge	
10.0	3	SS				
					Buried topsoil (Driller's observation)	
15.0	4	SS				
					Brown silty clay (CL) - with trace of gravel and sand - moist - hard to very stiff	
20.0	5	SS				
25.0	6	SS				
30.0	7	SS				
35.0	8	SS				
40.0						

10 7 5 16 38 25 50/0" 16

* Calibrated Penetrometer

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The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

STS JOB NO. 18899

STS Consultants Ltd.

OWNER: P.H. Glatfelter Co.

LOG OF BORING NUMBER: 5

PROJECT NAME: Waste Treatment Expansion

ARCHITECT-ENGINEER: Foth & Van Dyke

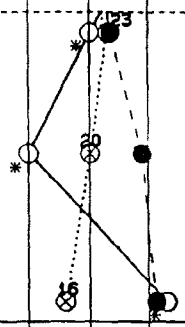
SITE LOCATION: 225 W. Wisconsin Avenue, Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.^{3}
				SURFACE ELEVATION 747.2	
				Continued from previous page	
40.0	9	SS			
45.0	10	SS	1	Brown silty clay (CL) - with trace of gravel and sand - moist - hard to very stiff	
50.0	11	SS			
51.5				End of Boring Boring advanced to 15 feet with hollow stem auger Boring advanced from 15 feet to 51.5 feet with roller bit and Revert drilling mud HW casing driven to 15 feet Borehole abandoned with bentonite chips	



* Calibrated Penetrometer

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

WL WS OR WD	BORING STARTED 08/20/91	STS OFFICE	1035 Kepler Drive Green Bay, WI 54311
WL BCR ACR	BORING COMPLETED 08/20/91	ENTERED BY MKM	SHEET NO. 2 OF 2
WL	RIG/FOREMAN CME 45/TT	APP'D BY WB	STS JOB NO. 18899

STS Consultants Ltd.

OWNER: P.H. Glatfelter Co.

LOG OF BORING NUMBER 6

PROJECT NAME: Waste Treatment Expansion

ARCHITECT-ENGINEER: Foth & Van Dyke

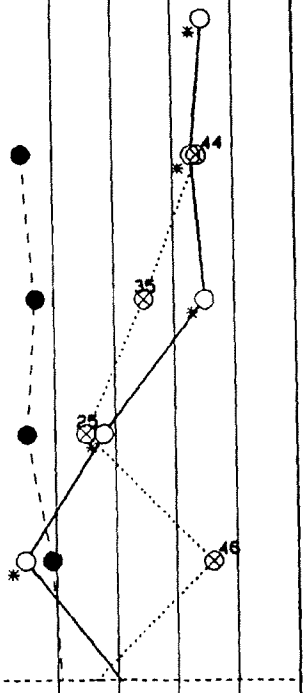
SITE LOCATION: 225 W. Wisconsin Avenue, Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % × — WATER CONTENT % ● — LIQUID LIMIT % △ (10 20 30 40 50)

STANDARD PENETRATION ⊗ BLOWS/FT. (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE / RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.^{3}
				SURFACE ELEVATION 746.4	
				Asphalt (Driller's observation)	
				Fill: Base course (Driller's observation)	
5.0		HSA		Fill: Sludge	
10.0					
15.0	1	ST		Brown silty clay (CL) - with trace to little gravel and sand - moist - hard to stiff	
20.0	2	SS			
25.0	3	SS			
30.0	4	SS			
35.0	5	SS			
40.0					



* Calibrated Penetrometer

... continued

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

STS JOB NO. 18899

SHEET NO. 1 OF 2

STS Consultants Ltd.

OWNER: P.H. Glatfelter Co.

LOG OF BORING NUMBER: 6

PROJECT NAME: Waste Treatment Expansion

ARCHITECT-ENGINEER: Foth & Van Dyke

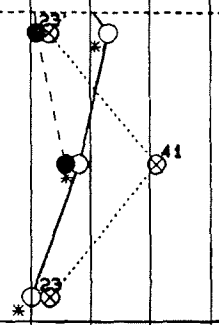
SITE LOCATION: 225 W. Wisconsin Avenue, Neenah, Wisconsin

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE / RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.3
				SURFACE ELEVATION 746.4	
				Continued from previous page	
40.0	6	SS			
45.0	7	SS		Brown silty clay (CL) - with trace to little gravel and sand - moist - hard to stiff	
50.0	8	SS			
51.5				End of Boring Boring advanced to 15 feet with hollow stem auger Boring advanced from 15 to 51.5 feet with roller bit and Revert drilling mud HW casing driven to 15 feet Borehole abandoned with bentonite chips	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.2: 1 2 3 4 5

PLASTIC LIMIT x — WATER CONTENT x — LIQUID LIMIT x: 10 20 30 40 50

STANDARD PENETRATION BLOWS/FT.: 10 20 30 40 50



* Calibrated Penetrometer

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

WL 10-15 ft WS OR WD WD	BORING STARTED 08/14/91	STS OFFICE	1035 Kepler Drive Green Bay, WI 54311
WL BCR ACR	BORING COMPLETED 08/14/91	ENTERED BY MKM	SHEET NO. 2 OF 2
WL	RIG/FOREMAN CME 45/TT	APP'D BY WB	STS JOB NO. 18899

STS Consultants Ltd.

CLIENT: ESI, Inc. of Tennessee

LOG OF BORING NUMBER: STS-1

PROJECT NAME: Minergy Glass Aggregate Plant

ARCHITECT-ENGINEER:

SITE LOCATION: Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION 747.0 ft
		PA			
	1	SS			Fill: Fine to coarse sand and gravel, trace to little clay-brown-moist-medium dense (Fill: SP and GP)
		PA			
	2	ST			Fill: Silty clay, trace fine to coarse sand and fine gravel-brown-moist (Fill: CL)
5.0		PA			
	3	SS			Fill: Paper sludge-gray-moist-soft to very stiff (Fill: Paper sludge)
		PA			
	4	ST			
10.0		PA			
	5	ST			
		PA			
15.0					
	6	ST			
		PA			Silty clay, trace fine to coarse sand and fine gravel-red brown to gray-moist to wet-firm to hard (CL)
20.0					
	7	SS			(Driller's observation: Obstructions from 53 to 59.5 feet) (Infrequent thin silt seams at a depth of 75 feet)
		RB			
25.0					
	8	ST			
		RB			
30.0					
	9	SS			
		RB			
35.0					
	10	ST			
		RB			
40.0					

107.1

* Calibrated Penetrometer

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The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

STS JOB NO. 84779

STS Consultants Ltd.

CLIENT: ESI, Inc. of Tennessee

LOG OF BORING NUMBER: STS-1

PROJECT NAME: Minergy Glass Aggregate Plant

ARCHITECT-ENGINEER:

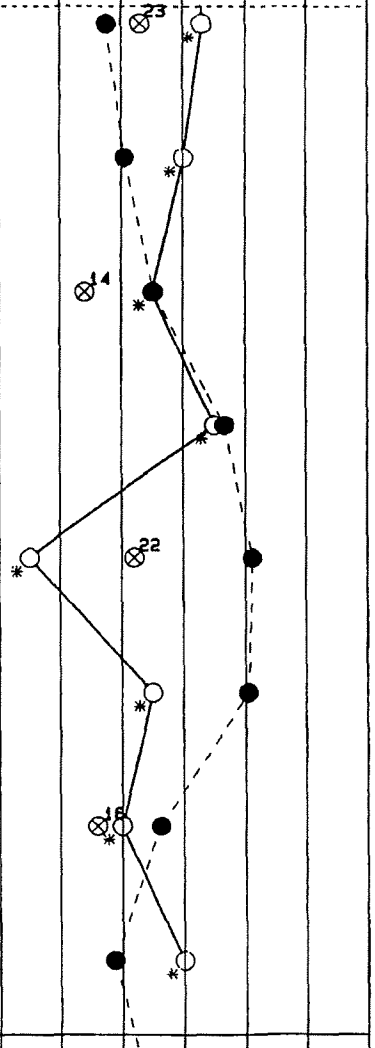
SITE LOCATION: Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % × — WATER CONTENT % ● — LIQUID LIMIT % △ (10 20 30 40 50)

STANDARD PENETRATION ⊗ BLOWS/FT. (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION 747.0 ft
					Continued from previous page
40.0	11	SS			Silty clay, trace fine to coarse sand and fine gravel-red brown to gray-moist to wet-firm to hard (CL)
		RB			(Driller's observation: Obstructions from 53 to 59.5 feet) (Infrequent thin silt seams at a depth of 75 feet)
45.0	12	ST			
		RB			
50.0	13	SS			
		RB			
55.0	14	ST			
		RB			
60.0	15	SS			
		RB			
65.0	16	ST			
		RB			
70.0	17	SS			
		RB			
75.0	18	ST			
		RB			
80.0					Silty fine sand-gray-moist-very dense (SM)



* Calibrated Penetrometer

... continued

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

STS JOB NO. 84779

STS Consultants Ltd.

CLIENT: ESI, Inc. of Tennessee

LOG OF BORING NUMBER: STS-1

PROJECT NAME: Minergy Glass Aggregate Plant

ARCHITECT-ENGINEER:

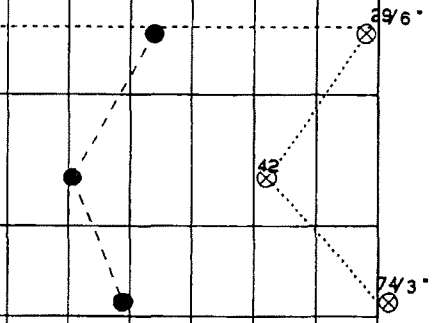
SITE LOCATION: Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % × — WATER CONTENT % ● — LIQUID LIMIT % △ (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. ⊗ (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION 747.0 ft
					Continued from previous page
80.0	19	SS			Silty fine sand-gray-moist-very dense (SM)
		RB			Clayey fine to coarse sand-gray-moist-dense (SC)
85.0	20	SS			
		RB			Silty fine sand-gray-moist-extremely dense (SM)
90.0					
90.9	21	SS			
					END OF BORING
					Boring advanced to 20 feet by solid stem auger. Boring advanced from 20 to 90 feet by rotary bit and drilling fluid. 20 feet of temporary casing installed. Boring backfilled wtih bentonite slurry.



* Calibrated Penetrometer

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

WL WS OR WD	BORING STARTED 10/04/95	STS OFFICE Milwaukee-05	
WL BCR ACR	BORING COMPLETED 10/04/95	ENTERED BY KJP	SHEET NO. 3 OF 3
WL	RIG/FOREMAN 21/GR	APP'D BY SAS	STS JOB NO. 84779

STS Consultants Ltd.

CLIENT: ESI, Inc. of Tennessee

LOG OF BORING NUMBER: STS-2

PROJECT NAME: Minergy Glass Aggregate Plant

ARCHITECT-ENGINEER:

SITE LOCATION: Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION 748.8 ft
		PA			
	1	SS			Fill: Fine to coarse sand and gravel, trace silt and clay-gray-moist-medium dense to loose (Fill: SP and GP)
		PA			
	2	SS			
5.0		PA			
	3	SS			Fill: Silty clay, trace to little sand and gravel, trace organics and roots-dark brown (Fill: CL)
		PA			
	4	ST			Fill: Cohesive paper sludge-gray-moist to wet-soft to firm (Fill: Paper sludge)
10.0		PA			
	5	ST			
		PA			
15.0	6	ST			
		PA			
20.0	7	ST			Silty clay, trace fine to coarse sand and fine gravel-red brown to gray-moist to wet-hard to stiff (CL)
		RB			
25.0	8	SS			
		RB			
30.0	9	ST			
		RB			
35.0	10	SS			
		PA			
40.0					

137.0

85.4

72.2

4.5+

40

4.5+

45

* Calibrated Penetrometer

... continued

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

STS JOB NO 84779

STS Consultants Ltd.

CLIENT: ESI, Inc. of Tennessee

LOG OF BORING NUMBER: STS-2

PROJECT NAME: Minergy Glass Aggregate Plant

ARCHITECT-ENGINEER:

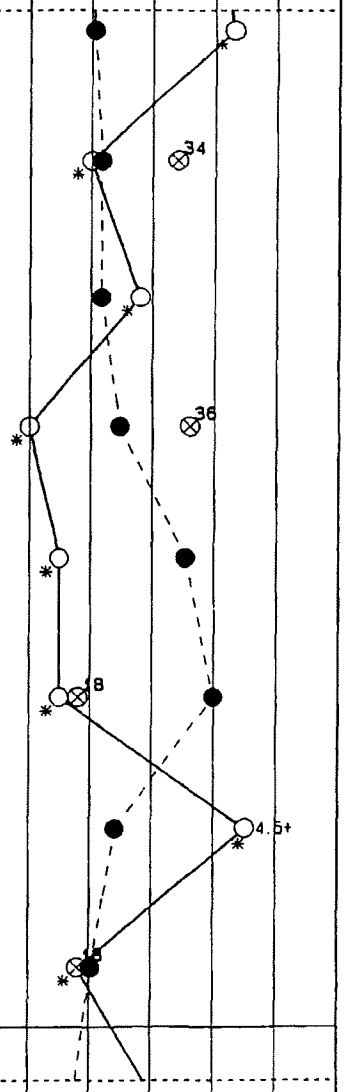
SITE LOCATION: Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} 1 2 3 4 5

PLASTIC LIMIT % × — WATER CONTENT % ● — LIQUID LIMIT % △ 10 20 30 40 50

STANDARD PENETRATION ⊗ BLOWS/FT. 10 20 30 40 50

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION 748.8 ft
					Continued from previous page
40.0	11	ST			Silty clay, trace fine to coarse sand and fine gravel-red brown to gray-moist to wet-hard to stiff (CL)
		RB			
45.0	12	SS			
		RB			
50.0	13	ST			
		RB			
55.0	14	SS			
		RB			
60.0	15	ST			
		RB			
65.0	16	SS			
		RB			
70.0	17	ST			
		RB			
75.0	18	SS			
		RB			
80.0					Fine sandy silt-gray-moist (ML)



* Calibrated Penetrometer

... continued

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

STS JOB NO. 84779

STS Consultants Ltd.

CLIENT: ESI, Inc. of Tennessee

LOG OF BORING NUMBER: STS-2

PROJECT NAME: Minergy Glass Aggregate Plant

ARCHITECT-ENGINEER:

SITE LOCATION: Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION 748.8 ft
					Continued from previous page
80.0	19	ST			Fine sandy silt-gray-moist (ML)
		RB			Clayey fine to coarse sand, trace gravel-gray-extremely dense (SC)
85.0	20	SS			
		RB			
90.0	21	DB			Rock core
95.0					END OF BORING

Boring advanced to 20.0 feet by solid stem auger.
Boring advanced from 20 to 90 feet by rotary bit and drilling fluid.
20 feet of temporary casing installed.
Boring backfilled with grout.

* Calibrated Penetrometer

75/6"

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

WL WS OR WD	BORING STARTED 10/02/95	STS OFFICE Milwaukee-05	
WL BCR ACR	BORING COMPLETED 10/03/95	ENTERED BY KJP	SHEET NO. 3 OF 3
WL	RIG/FOREMAN 21/GR	APP'D BY SRS	STS JOB NO. 84779

STS Consultants Ltd.

CLIENT: ESI, Inc. of Tennessee

LOG OF BORING NUMBER: STS-3

PROJECT NAME: Minergy Glass Aggregate Plant

ARCHITECT-ENGINEER:

SITE LOCATION: Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.2 (1 2 3 4 5)

PLASTIC LIMIT % × — WATER CONTENT % ● — LIQUID LIMIT % △ (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. ⊗ (10 20 30 40 50)

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
						SURFACE ELEVATION 749.5 ft
			PA			
		1	SS			Fill: Fine to coarse sand and gravel, trace to little silt and clay, trace cinders or slag-gray to dark brown-moist to wet-medium dense (Fill: SP and GP)
			PA			
		2	SS			
5.0			PA			
		3	SS			Fill: Cohesive paper sludge-gray-moist-firm (Fill: Paper sludge)
			PA			
		4	ST			
10.0			PA			
		5	ST			
			PA			
15.0						
		6	ST			Organic silty clay, little fine to coarse sand, trace shells, wood and roots-black-moist (OC)
			PA			Silty clay, trace fine to coarse sand and fine gravel-red brown-moist to wet-stiff to hard (CL)
20.0						
		7	SS			
			RB			
25.0						
		8	ST			
			RB			
30.0						
		9	SS			
			RB			
35.0						
		10	ST			
			RB			
40.0						

19 18 6 39 31 97.3

* Calibrated Penetrometer

... continued

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

STS JOB NO. 84779

STS Consultants Ltd.

CLIENT: ESI, Inc. of Tennessee

LOG OF BORING NUMBER: STS-3

PROJECT NAME: Minergy Glass Aggregate Plant

ARCHITECT-ENGINEER:

SITE LOCATION: Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.² (1 2 3 4 5)

PLASTIC LIMIT % × — WATER CONTENT % ● — LIQUID LIMIT % △ (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. ⊗ (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION 749.5 ft
					Continued from previous page
40.0	11	SS			Silty clay, trace fine to coarse sand and fine gravel-red brown-moist to wet-stiff to hard (CL)
		RB			
45.0	12	ST			
		RB			
50.0	13	SS			
		RB			
55.0	14	ST			
		RB			
60.0	15	SS			
61.5					END OF BORING

Boring advanced to 20 feet by solid stem auger.
Boirng advanced from 20 to 60 feet by rotary bit and drilling fluid.
20 feet of temporary casing installed.
Boring backfilled with slurry.

* Calibrated Penetrometer

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

WL 3.0 ft WS OR WD WD	BORING STARTED 10/10/95	STS OFFICE Milwaukee-05	
WL BCR ACR	BORING COMPLETED 10/10/95	ENTERED BY KJP	SHEET NO. 2 OF 2
WL	RIG/FOREMAN 21/JD	APP'D BY SRS	STS JOB NO. 84779

STS Consultants Ltd.

CLIENT: ESI, Inc. of Tennessee

LOG OF BORING NUMBER: STS-4

PROJECT NAME: Minergy Glass Aggregate Plant

ARCHITECT-ENGINEER:

SITE LOCATION: Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % × — WATER CONTENT % ● — LIQUID LIMIT % △ (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. ⊗ (10 20 30 40 50)

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
						SURFACE ELEVATION 748.9 ft
			PA			Fill: Fine to coarse sand and gravel, little silt-gray-dry (Fill: SP and GP)
		2	SS			Fill: Silty clay, trace fine to coarse sand and fine gravel-moist-brown (Fill: CL)
5.0			PA			
		3	ST			Fill: Cohesive paper sludge-gray-moist-stiff to very stiff (Fill: Paper sludge)
			PA			
		4	ST			(No recovery from Sample No. 5)
10.0			PA			
		5	ST			
		6	AS			
		7	ST			
15.0			PA			
		8	SS			
			HW			Silty clay, trace fine to coarse sand and fine gravel-red brown to gray-moist to wet-stiff to hard (CL)
20.0		9	SS			
			RB			
25.0		10	ST			
			RB			
30.0		11	SS			
			RB			
35.0		12	SS			
			RB			
40.0						

Plotted values: 16, 14, 19, 58, 79.1, 93.6, 132.9

* Calibrated Penetrometer

... continued

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

STS JOB NO. 84779

STS Consultants Ltd.

CLIENT: ESI, Inc. of Tennessee

LOG OF BORING NUMBER: STS-4

PROJECT NAME: Minergy Glass Aggregate Plant

ARCHITECT-ENGINEER:

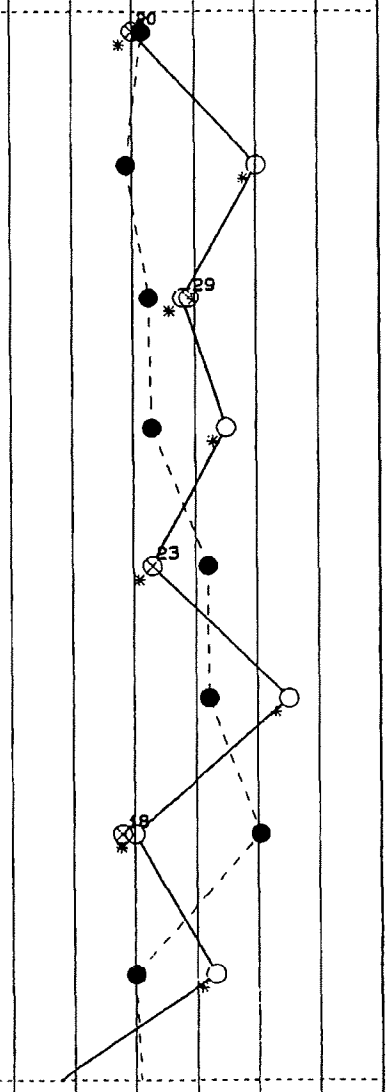
SITE LOCATION: Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} 1 2 3 4 5

PLASTIC LIMIT % × — WATER CONTENT % ● — LIQUID LIMIT % △ 10 20 30 40 50

STANDARD PENETRATION ⊗ BLOWS/FT. 10 20 30 40 50

DEPTH (FT) ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION 748.9 ft
					Continued from previous page
40.0	13	SS			Silty clay, trace fine to coarse sand and fine gravel-red brown to gray-moist to wet-stiff to hard (CL)
		RB			
45.0	14	ST			
		RB			
50.0	15	SS			
		RB			
55.0	16	ST			
		RB			
60.0	17	SS			
		RB			
65.0	18	SS			
		RB			
70.0	19	SS			
		RB			
75.0	20	ST			
		RB			
80.0					... continued



* Calibrated Penetrometer

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

STS JOB NO. 84779

STS Consultants Ltd.

CLIENT: ESI, Inc. of Tennessee

LOG OF BORING NUMBER: STS-4

PROJECT NAME: Minergy Glass Aggregate Plant

ARCHITECT-ENGINEER:

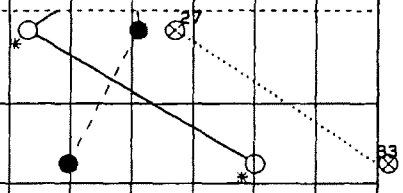
SITE LOCATION: Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.2 (1 2 3 4 5)

PLASTIC LIMIT % × — WATER CONTENT % ● — LIQUID LIMIT % △ (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. ⊗ (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION 748.9 ft
					Continued from previous page
80.0	21	SS			Silty clay, trace fine to coarse sand and fine gravel-red brown to gray-moist to wet-stiff to hard (CL)
		RB			
85.0					Clayey fine to coarse sand, trace fine gravel-gray-moist-extremely dense (SC)
86.5	22	SS			
					END OF BORING
					Boring advanced to 15 feet by solid stem auger. Boring advanced from 15 to 20 feet by hollow stem auger. Boring advanced from 20 to 85 feet by rotary bit and drilling fluid. 20 feet of temporary casing installed. Boring backfilled with bentonite slurry.



* Calibrated Penetrometer

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

WL 3 ft	WS OR WD WD	BORING STARTED 10/10/95	STS OFFICE Milwaukee-05
WL	BCR ACR	BORING COMPLETED 10/10/95	ENTERED BY KJP / SHEET NO. 3 OF 3
WL		RIG/FOREMAN 21/JD	APP'D BY SRS / STS JOB NO. 84779

STS Consultants Ltd.

CLIENT: ESI, Inc. of Tennessee

LOG OF BORING NUMBER: STS-5

PROJECT NAME: Minergy Glass Aggregate Plant

ARCHITECT-ENGINEER:

SITE LOCATION: Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE / RECOVERY	DESCRIPTION OF MATERIAL
				SURFACE ELEVATION 748.5 ft
		PA		
	1	SS		Fill: Fine to coarse sand and gravel, trace silt and clay-gray-moist-medium dense (Fill: SP and GP)
		PA		
	2	SS		Fill: Silty clay, trace sand and gravel-brown to red brown-moist-very stiff to firm (Fill: CL)
5.0		PA		
	3	SS		
		PA		Fill: Cohesive paper sludge-gray-moist-stiff (Fill: Paper sludge)
	4	SS		
10.0		PA		
	5	ST		
		PA		
15.0				
	6	SS		Silty clay, trace fine to coarse sand and fine gravel-red brown to gray-moist-wet-stiff to hard (CL)
		RB		(Driller's observation: Obstructions at depths of 31.5 and 55 feet)
20.0				
	7	SS		
		RB		
25.0				
	8	ST		
		RB		
30.0				
	9	SS		
		RB		
35.0				
	10	ST		
		RB		
40.0				

* Calibrated Penetrometer

... continued

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

STS JOB NO. 84779

STS Consultants Ltd.

CLIENT: ESI, Inc. of Tennessee

LOG OF BORING NUMBER: STS-5

PROJECT NAME: Minergy Glass Aggregate Plant

ARCHITECT-ENGINEER:

SITE LOCATION: Neenah, Wisconsin

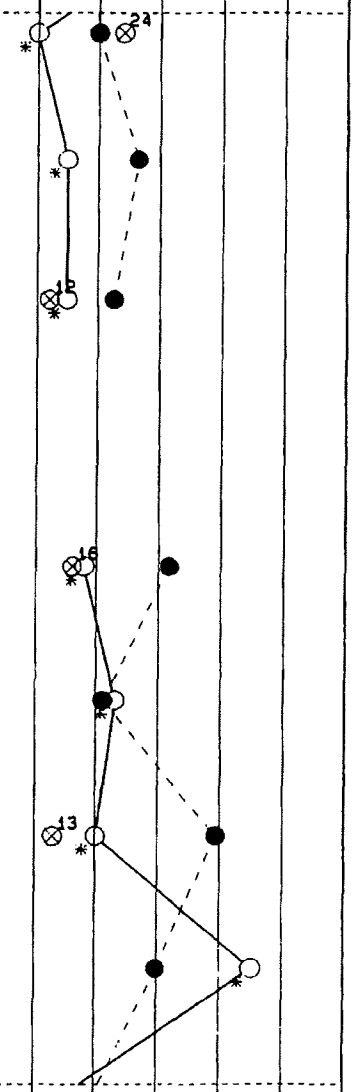
UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)

SURFACE ELEVATION 748.5 ft

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
						Continued from previous page
40.0		11	SS			Silty clay, trace fine to coarse sand and fine gravel-red brown to gray-moist-wet-stiff to hard (CL)
			RB			(Driller's observation: Obstructions at depths of 31.5 and 55 feet)
45.0		12	ST			
			RB			
50.0		13	SS			
			RB			
55.0		14	ST			
			RB			
60.0		15	SS			
			RB			
65.0		16	ST			
			RB			
70.0		17	SS			
			RB			
75.0		18	ST			
			RB			
80.0						



* Calibrated Penetrometer

... continued

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

STS JOB NO. 84779

STS Consultants Ltd.

CLIENT: ESI, Inc. of Tennessee

LOG OF BORING NUMBER: STS-5

PROJECT NAME: Minergy Glass Aggregate Plant

ARCHITECT-ENGINEER:

SITE LOCATION: Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} 1 2 3 4 5

PLASTIC LIMIT % × — WATER CONTENT % ● — LIQUID LIMIT % △ 10 20 30 40 50

STANDARD PENETRATION ⊗ BLOWS/FT. 10 20 30 40 50

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION 748.5 ft
					Continued from previous page
80.0					
81.5	19	SS			Silty clay, trace fine to coarse sand and fine gravel-red brown to gray-moist-wet-stiff to hard (CL)
					(Driller's observation: Obstructions at depths of 31.5 and 55 feet)
					END OF BORING
					Boring advanced to 15 feet by solid stem auger. Boring advanced from 15 to 80 feet by rotary bit and drilling fluid. 20 feet of temporary casing installed. Boring backfilled with bentonite slurry.

* Calibrated Penetrometer

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

WL 9 ft WS OR WD WD	BORING STARTED 10/11/95	STS OFFICE Milwaukee-05	
WL BCR ACR	BORING COMPLETED 10/11/95	ENTERED BY KJP	SHEET NO. 3 OF 3
WL	RIG/FOREMAN 21/JD	APP'D BY SRS	STS JOB NO. 84779

STS Consultants Ltd.

CLIENT: ESI, Inc. of Tennessee

LOG OF BORING NUMBER: STS-6

PROJECT NAME: Minergy Glass Aggregate Plant

ARCHITECT-ENGINEER:

SITE LOCATION: Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} 1 2 3 4 5

PLASTIC LIMIT % × — WATER CONTENT % ● — LIQUID LIMIT % △ — 10 20 30 40 50

STANDARD PENETRATION ⊗ BLOWS/FT. 10 20 30 40 50

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE / RECOVERY	DESCRIPTION OF MATERIAL
		PA		SURFACE ELEVATION 748.5 ft
	1	SS		Fill: Silty fine to coarse sand, trace fine gravel and clay-gray-dry-medium dense (Fill: SP)
		PA		
	2	SS		Fill: Silty clay, trace fine to coarse sand and fine gravel-red brown-moist (Fill: CL)
5.0		PA		
	3	SS		
		PA		Fill: Cohesive paper sludge-gray-moist-firm to very stiff (Fill: Paper sludge)
	4	ST		
10.0		PA		
	5	ST		
		PA		
15.0	6	ST		
		RB		Silty clay, trace fine to coarse sand-red brown-moist to wet-soft to very stiff (CL
20.0	7	SS		(Driller's observation: Obstruction at a depth of 25 feet) (No recovery form Sample No. 8)
		RB		
25.0	8	ST		
		RB		
30.0	9	SS		
		RB		
35.0	10	ST		
		RB		
40.0				

69.9

130.9

90.8

* Calibrated Penetrometer

... continued

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

STS JOB NO. 84779

STS Consultants Ltd.

CLIENT: ESI, Inc. of Tennessee

LOG OF BORING NUMBER: STS-6

PROJECT NAME: Minergy Glass Aggregate Plant

ARCHITECT-ENGINEER:

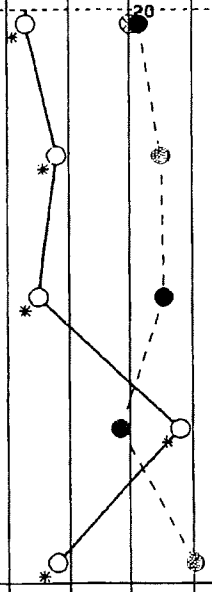
SITE LOCATION: Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.2 (1 2 3 4 5)

PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE / RECOVERY	DESCRIPTION OF MATERIAL
				SURFACE ELEVATION 748.5 ft
				Continued from previous page
40.0	11	SS		Silty clay, trace fine to coarse sand-red brown-moist to wet-soft to very stiff (CL
		RB		(Driller's observation: Obstruction at a depth of 25 feet) (No recovery form Sample No. 8)
45.0	12	ST		
		RB		
50.0	13	SS		
		RB		
55.0	14	ST		
		RB		
60.0	15	SS		
61.5				END OF BORING
				Boring advanced to 15 feet by solid stem auger. Boring advanced from 15 to 60 feet by rotary bit and drilling fluid. 20 feet of temporary casing installed. Boring backfilled wtih bentonite slurry.



* Calibrated Penetrometer

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

WL 9 ft WS OR WD WD	BORING STARTED 10/12/95	STS OFFICE Milwaukee-05	
WL BCR ACR	BORING COMPLETED 10/12/95	ENTERED BY KJP	SHEET NO. 2 OF 2
WL	RIG/FOREMAN 21/GR	APP'D BY SRS	STS JOB NO. 84779

STS Consultants Ltd.

CLIENT: ESI, Inc. of Tennessee

LOG OF BORING NUMBER: STS-7

PROJECT NAME: Minergy Glass Aggregate Plant

ARCHITECT-ENGINEER:

SITE LOCATION: Neenah, Wisconsin

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT x — WATER CONTENT % — LIQUID LIMIT x (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION 745.0 ft
		PA			
	1	SS			Asphalt concrete pavement
	1A	SS			Fill: Fine to coarse sand and gravel-gray-dry-medium dense (Fill: SP and GP)
		PA			
	2	SS			Fill: Silty clay, trace to little fine to coarse sand and gravel-red brown-moist (Fill: CL)
		PA			
5.0	3	ST			
	3A	ST			Fill: Cohesive paper sludge-gray-moist-stiff (Fill: Paper sludge)
		PA			
	4	ST			
9.5					END OF BORING

Boring advanced to 7.5 feet by solid stem auger.
Boring backfilled with bentonite chips.

116.8

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

WL: Dry	WS OR WD: WD	BORING STARTED: 10/09/95	STS OFFICE: Milwaukee-05
WL	BCR / ACR	BORING COMPLETED: 10/09/95	ENTERED BY: KJP / SHEET NO.: 1 OF 1
WL		RIG/FOREMAN: 21/GR	APP'D BY: SRS / STS JOB NO.: 84779

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Superfund ☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-14*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/09/99*	*03/09/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*746.0 Feet MSL*	*6.25 inches*

Boring Location		Local Grid Location (if applicable)
State Plane *801467 N, 2369482 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Lat ° Long °	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	18	5/1'	0	Grasses at surface Fill, reddish brown silty clay, moist										
			2	Gray paper sludge										
2/SS	24	2/1'												Sample 99-14-2 t=1005
			4	Light gray paper sludge, fibrous										
3/ST	8													Shelby tube 99-14-3 t=1100
4/SS	24	1/1'	6											
5/SS	12	1/6"												
			8											
6/ST	8													Shelby tube 99-14-6 t=1110
7/SS	24	2/1'	10											Sample 99-14-7 t=1115
8/ST	6		12	Brown hemic peat, moist	Pt									Shelby tube 99-14-8 t=1120
				End of Boring at 12.0 feet Abandoned borehole with bentonite chips										
			14											
			16											
			18											
			20											
			22											

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

Signature	Firm
	ERM-North Central, Inc., Green Bay, WI

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.08, Wis. Stats.

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Superfund ☐ Other:

SOIL BORING LOG INFORMATION
Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-13*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/09/99*	*03/09/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*746.2 Feet MSL*	*6.25 inches*

Boring Location	Lat °	Local Grid Location (If applicable)
State Plane *801420 N, 2389634 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Long °	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	13	7/1'	2	Grasses at surface Fill, reddish brown silty clay, moist										
2/SS	14	2/1'	4	Dark gray paper sludge, dense										Sample 99-13-2 t=1235
3/ST	9			Light gray paper sludge, fibrous										Shelby tube 99-13-3 t=1237
4/SS	23	0	6											
5/SS	12	1/6"	8											
6/ST	9													Shelby tube 99-13-8 t=1245
7/SS	24	2/1'	10											Sample 99-13-7 t=1250
			12	Brown hemic peat, moist	Pt									
				End of Boring at 11.0 feet Abandoned borehole with bentonite chips										
			14											
			16											
			18											
			20											
			22											

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

Signature	Firm
Richard Pan	ERM-North Central, Inc., Green Bay, WI

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State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Superfund ☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-12*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/09/99*	*03/09/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*746.8 Feet MSL*	*6.25 inches*

Boring Location		Local Grid Location (if applicable)
State Plane *801584 N, 2369589 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Lat ° Long °	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	12	5/1'	2	Grasses at surface Fill, reddish brown silty clay, moist										
2/SS	23	2/1'	4	Gray to dark gray paper sludge										Sample 99-12-2 t=1145
3/ST	9													Shelby tube 99-12-3 t=1147
4/SS	18	0/1'	6	Light gray paper sludge, fibrous										
5/SS	12	1/6"	8											
6/ST	7													Shelby tube 99-12-6 t=1153
7/SS	24	1/1'	10											Sample 99-12-7 t=1155
8/SS	0	5/1'	12	Blow counts indicate a material denser than paper sludge										Bottom of sludge based on blow count change
9/SS	0	9/1'	14											
			16	End of Boring at 15.0 feet Abandoned borehole with bentonite chips										
			18											
			20											
			22											

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

Signature	Firm
Richard Hamm	ERM-North Central, Inc., Green Bay, WI

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State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Superfund ☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-11*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/10/99*	*03/10/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*746.9 Feet MSL*	*6.25 inches*

Boring Location	Lat ·	Local Grid Location (If applicable)
State Plane *801770 N, 2369595 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Long ·	*Feet S* *Feet N*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	14	8/1"	2	Grasses at surface Fill, reddish brown brown silty clay, trace of fine gravel, moist										Sludge in tip of spoon
2/SS	0	3/1"	4											
3/SS	24	1/1"												Sample 99-11-3 t=1220
4/ST	7		6	Light gray paper sludge, fibrous										Shelby tube 99-11-4 t=1223
5/SS	24	0	8											
6/ST	4													Shelby tube 99-11-6 t=1230
7/SS	24	1/1"	10											Sample 99-11-7 t=1235
8/SS	24	0	12											
			14	Dark brown organic silt, moist	OL									
				End of Boring at 14.0 feet Abandoned borehole with bentonite chips										
			16											
			18											
			20											
			22											

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

Signature	Firm
Brian Repinski	ERM-North Central, Inc., Green Bay, WI

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State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-10*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/08/99*	*03/08/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*744.0 Feet MSL*	*6.25 inches*

Boring Location	Lat ·	Local Grid Location (if applicable)
State Plane *801264 N, 2369732 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Long ·	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	14	4/1'	2	Grasses at surface Fill, reddish brown silty clay (upper 4 inches) over mottled orangish brown and brown silty sand and sandy silt, moist to wet										
2/SS	0	3/1'	4	Dark gray to gray paper sludge										Paper sludge on outside of spoon
3/SS	9	1/1'	6											Sample 99-10-3 t=1505
ST	0													
4/ST	9		8											Shelby tube 99-10-4 t=1512
5/SS	24	1/1'	10	Dark brown to black hemic peat, wet	Pt									Sample 99-10-5 t=1520 (paper sludge only)
			12	End of Boring at 10.0 feet Abandoned borehole with bentonite chips										
			14											
			16											
			18											
			20											
			22											

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

Signature	Firm
Mark Pan	ERM-North Central, Inc., Green Bay, WI

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State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION
Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-9A (30 ft. N of SB99-9)*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/10/99*	*03/10/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*746.8 Feet MSL*	*6.25 inches*

Boring Location		Local Grid Location (If applicable)
State Plane *801580 N, 2369770 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Lat ° Long °	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	6	4/1'	2	Grasses at surface Fill, reddish brown and brown silty clay, few fine gravel, frozen										
2/SS	8	2/1'	4	Light gray paper sludge, dense										
3/SS	22	1/1'	6	Light gray paper sludge, fibrous										
4/SS	18	1/1'	8											
5/SS	24	1/1'	10											
6/SS	10	1/1'	12											
7/SS	16	3/1'	14	Black changing to dark brown organic silt, moist	OL									
			16	End of Boring at 14.0 feet Abandoned borehole with bentonite chips										
			18											
			20											
			22											

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

Signature	Firm
Richard Pan	ERM-North Central, Inc., Green Bay, WI

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State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-9*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/09/99*	*03/09/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*746.7 Feet MSL*	*6.25 inches*

Boring Location	Lat °	Local Grid Location (if applicable)
State Plane *801550 N, 2369770 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Long °	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	15	4/1'	2	Grasses at surface Fill, reddish brown silty clay, moist				2.5						
2/SS	0	1/1'	4											
3/ST	9			Light gray paper sludge, fibrous										Shelby tube 99-9-3 t=1313
4/SS	23	1/1'	6											
5/SS	12	1/8"	8											Sample 99-9-4 t=1320
6/ST	9													Shelby tube 99-9-6 t=1328
7/SS	20	1/1'	10											
8/SS	12	1/1'	12	Black sapric peat over dark brown hemic peat, moist	Pt									Sample 99-9-7 t=1335
			14	End of Boring at 13.0 feet Abandoned borehole with bentonite chips										
			16											
			18											
			20											
			22											

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

Signature	Firm
Richard Pan	ERM-North Central, Inc., Green Bay, WI

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State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-8*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/10/99*	*03/10/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*749.5 Feet MSL*	*6.25 inches*

Boring Location		Local Grid Location (If applicable)
State Plane *801712 N, 2369793 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Lat ° Long °	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	14	8/1'	2	Grasses at surface Fill, reddish brown silty clay, moist				1.75						
2/SS	12	12/1'	4	Fill, brown to dark reddish brown fine gravelly silty clay, fine gravel wet layer at 3.0 to 3.3 feet				1.5						
3/SS	12	10/1'	6	Fill, reddish brown silty clay, trace of fine gravel, moist				1.5						
4/SS	18	1/1'	8											
5/ST	8			Light gray paper sludge, fibrous										Shelby tube 99-8-5 t=1102
6/SS	13	2/1'	10											Sample 99-8-6 t=1105
7/ST	9		12											Shelby tube 99-8-7 t=1108
8/SS	12	2/1'	14											
9/SS	24	2/1'	16	Very dark brown organic silt, moist	OL									Sample 99-8-9 t=1115
			18	End of Boring at 16.0 feet Abandoned borehole with bentonite chips										
			20											
			22											

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

Signature	Firm
Richard Pan	ERM-North Central, Inc., Green Bay, WI

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State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Superfund ☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-7*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EOS *Brian Repinski*	*03/10/99*	*03/10/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*747.1 Feet MSL*	*6.25 inches*

Boring Location	Lat °	Local Grid Location (if applicable)
State Plane *801872 N, 2369750 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Long °	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	12	2/1'	2	Grasses at surface Fill, reddish brown silty clay, moist										
2/SS	14	2/1'	4											Sample 99-7-2 t=1138
3/ST	9			Light gray paper sludge, fibrous										Shelby tube 99-7-3 t=1140
4/SS	16	2/1'	6											Sample 99-7-4 t=1143
5/SS	24	2/1'	8											
6/ST	1													Sample 99-7-7 t=1155
7/SS	24	2/1'	10											Shelby tube 99-7-8 t=1158 (sludge only)
8/ST	9		12	Very dark brown organic silt, moist	OL									
			14	End of Boring at 13.0 feet Abandoned borehole with bentonite chips										
			16											
			18											
			20											
			22											

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

Signature	Firm
Richard Repinski	ERM-North Central, Inc., Green Bay, WI

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State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION
Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*S899-6*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/08/99*	*03/08/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*742.9 Feet MSL*	*6.25 inches*

Boring Location	Lat °	Local Grid Location (if applicable)
State Plane *801262 N, 2369921 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Long °	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	12	7/1'	2	Grasses at surface Fill, reddish brown silty clay, moist				2.25						
2/SS	0	1/1'												Paper sludge on outside of spoon at 2.5 ft.
3/SS	24	0/1'	4	Gray paper sludge										
4/ST	10		6											Sample 99-6-3 t=1220
5/SS	24	2/1'	8	Brown hemic peat, moist	Pt									Shelby tube 99-6-4 t=1415
			10	End of Boring at 9.0 feet Abandoned borehole with bentonite chips										Sample 99-6-5 t=1425 (paper sludge only)
			12											
			14											
			16											
			18											
			20											
			22											

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

Signature	Firm
Richard Pan	ERM-North Central, Inc., Green Bay, WI

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State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Superfund ☐ Other:

SOIL BORING LOG INFORMATION
Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-5*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/10/99*	*03/10/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*745.3 Feet MSL*	*6.25 inches*

Boring Location		Local Grid Location (If applicable)
State Plane *801395 N, 2370057 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Lat ° Long °	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	24	31/1'	2	Grass at surface Fill, reddish brown clayey fine gravel, moist										
2/SS	18	23/1'		Fill, reddish brown silty clay, moist										
3/SS	14	4/1'	4	Gray paper sludge, dense										Sample 99-5-3 t=0840
4/ST	9		6	Light gray paper sludge, fibrous										Shelby tube 99-5-4 t=0945
5/SS	24	1/1'	8											Sample 99-5-5 t=0950
6/ST	9													Shelby tube 99-5-6 t=0955
7/SS	24	2/1'	10	Black sapric peat changing to black and very dark brown organic silt, moist	Pt OL									
			12	End of Boring at 12.0 feet Abandoned borehole with bentonite chips										
			14											
			16											
			18											
			20											
			22											

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

Signature *Robert Pierce* Firm ERM-North Central, Inc., Green Bay, WI

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-4*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EOS *Brian Repinski*	*03/10/99*	*03/10/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*746.7 Feet MSL*	*6.25 inches*

Boring Location		Local Grid Location (If applicable)	
State Plane *801738 N, 2370122 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Lat ° Long °	*Feet S*	*Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	18	2/1'	2	Grasses at surface Fill, brown and reddish brown fine sandy silty clay and silty clay, frozen to 1 foot, moist										
2/SS	14	4/1'	4					2.25						
3/SS	15	2/1'												Sample 99-4-3 t=1018
4/ST	9		6	Light gray paper sludge										Shelby tube 99-4-4 t=1020
5/SS	24	2/1'	8											
6/ST	3													Shelby tube 99-4-6 t=1026
7/SS	24	4/1'	10											
			12	Black hemic peat, moist	Pt									Sample 99-4-7 t=1030 (sludge only)
			14	End of Boring at 12.0 feet Abandoned borehole with bentonite chips										
			16											
			18											
			20											
			22											

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

Signature	Firm
Kristal Pan	ERM-North Central, Inc., Green Bay, WI

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.08, Wis. Stats.

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION
Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-3A*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/11/99*	*03/11/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*747.8 Feet MSL*	*6.25 inches*

Boring Location	Lat	Long	Local Grid Location (if applicable)
State Plane *801339 N, 2370532 E* *SE 1/4 of Section 21, T 20 N, R 17 E*			*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			0	Asphalt at surface with gravelly base course										
1/SS	8	11/8"	2	Fill, light brown sandy gravel, moist										
2/SS	2	11/1"												
3/SS	2	2/1"	4	Gray paper sludge, dense										Sample 99-3A-3 t=1118 (sample is spoon and cuttings)
4/ST	9		6											
5/SS	20	7/1"	8	Gray paper sludge, fibrous										Shelby tube 99-3A-4 t=1122
6/ST	1		10											
7/SS	24	5/1"												Sample 99-3A-7 t=1130
8/ST	9		12											
9/SS	24	12/1"	14	Dark brown to black organic silt, moist, over 1 inch thick wet sand and gravel layer	OL									Shelby tube 99-3A-8 t=1135
				Reddish brown silty clay, moist	CL			2.0-4.0						
			16	End of Boring at 15.0 feet Abandoned borehole with bentonite chips										
			18											
			20											
			22											

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

Signature [signature] Firm ERM-North Central, Inc., Green Bay, WI

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State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-3*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/11/99*	*03/11/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*747.8 Feet MSL*	*6.25 inches*

Boring Location	Lat °	Local Grid Location (If applicable)
State Plane *801334 N, 2370518 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Long °	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	8	26/6"	2	Asphalt at surface Fill, light brown fine to medium sandy gravel, moist										
2/SS	2	6/1'	4	Gray paper sludge, dense										Top of sludge based on blow counts and sludge in tip of spoon
3/SS	2	2/1'	6											
4/ST	7		8	Fill, dark brown to black sandy silty clay, trace to few gravel, moist										
5/SS	24	9/1'	10	End of Boring at 9.0 feet Abandoned borehole with bentonite chips Concrete cap at surface										
			12											
			14											
			16											
			18											
			20											
			22											

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

Signature *Richard Pan* Firm ERM-North Central, Inc., Green Bay, WI

This form is authorized by Chapters 144.147 and 182, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 182.08, Wis. Stats.

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION
Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-2*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/11/99*	*03/11/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*745.7 Feet MSL*	*6.25 inches*

Boring Location		Local Grid Location (if applicable)
State Plane *801722 N, 2370505 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Lat ° Long °	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
1/SS	18	124/1"	0	Gravelly parking lot surface Fill, gray sandy fine gravel, moist										
			2	Fill, reddish brown silty clay, moist										
2/SS	14	17/1"												Sample 99-2-2 t=0945 (sludge only)
			4	Gray paper sludge, fibrous										
3/SS	4	8/1"												
4/ST	7		6											Shelby tube 99-2-4 t=0952
5/SS	14	4/1"	8											Sample 99-2-5 t=0955
6/ST	9													
7/SS	24	4/1"	10	Dark brown hemic peat changing to dark brown organic silt, moist	Pt OL									Shelby tube 99-2-6 t=1000
			12	End of Boring at 12.0 feet Abandoned borehole with bentonite chips										
			14											
			16											
			18											
			20											
			22											

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

Signature *Richard Sam* Firm ERM-North Central, Inc., Green Bay, WI

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State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/~~Borehole~~ Location

County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 ; T. 20 N; R. 17 ☒ E ☐ W

(If applicable) Gov't Lot ____ Grid Number ____

Grid Location ____ ft. ☐ N. ☐ S. ____ ft. ☐ E. ☐ W.

Civil Town Name:

Street Address of Well: Arrowhead Park LandFill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

~~Original Well Owner~~ (If Known):

~~Present Well~~ Owner: City of Neenah

~~Street or~~ Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-20

WI Unique Well No.: _ _ _ _ _ _

Reason for Abandonment: Investigative Only

Date of Abandonment: 3-10-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date): 3-10-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify)

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 13 (From groundsurface)

Casing Diameter (in.) 6¼

Casing Depth (ft.) 11

Lower Drillhole Diameter (in.) 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? ____ Feet

(4) Depth to Water (Feet) >11

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials — For monitoring wells and monitoring well boreholes only
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Hole plug® Bentonite Chips (3/8")	Surface	11	2¾ bags	
In situ Soils (2" ø split spoon hole)	11	13		

(8) Comments: Unwound w/ 10 gals of water after pouring bentonite into borehole

(9) Name of Person or ~~Firm~~ Doing Sealing Work: Environmental Drilling Services, Inc.

Signature of Person Doing Work: [signature] Date Signed: 3-10-99

Street or Route: 3671 Monroe Rd Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected: ____ District/County: ____

Reviewer/Inspector: ____ ☐ Complies ☐ Violation ☐ Noncompliance ☐ Waiver

Follow-up No.: ____ Date: ____

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location — County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 : T. 20 N; R. 17 ☒ E ☐ W (If applicable)

Gov't Lot _____ Grid Number _____

Grid Location _____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original Well Owner (If Known)

Present Well Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-19

WI Unique Well No.: _ _ _ _ _ _

Reason For Abandonment: Investigative Only

Date of Abandonment: 3-9-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date): 3-9-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify)

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 12 (From groundsurface)

Casing Diameter (in.) 6 1/4

Casing Depth (ft.) 10

Lower Drillhole Diameter (in.) 6 1/4

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) >10

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials — For monitoring wells and monitoring well boreholes only
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Holeplug® Bentonite Chips (3/8")	Surface	10	2 3/4 bags	
In situ Soils (2"ø split-spoon hole)	10	12		

(8) Comments: Charged w/ 7 1/2 gals of water after pouring bentonite into borehole.

(9) Name of Person or Firm Doing Sealing Work: Environmental Drilling Services, Inc.

Signature of Person Doing Work: [signature] Date Signed: 3-9-99

Street or Route: 3671 Monroe Rd

Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected: _____ ☐ DNR ☐ County

Reviewer/Inspector: _____ ☐ Complying Document ☐ Noncompliance Work

Follow-up Required: _____

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 ; T. 20 N; R. 17 ☒ E ☐ W

(If applicable) Gov't Lot ____ Grid Number ____

Grid Location ____ ft. ☐ N. ☐ S. ____ ft. ☐ E. ☐ W.

Civil Town Name:

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original Well Owner (If Known):

Present Well Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-18

WI Unique Well No.:

Reason For Abandonment: Investigative Only

Date of Abandonment: 3-8-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date): 3-8-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify)

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 13 (From ground surface)

Casing Diameter (in.) 6¼

Casing Depth (ft.) 11

Lower Drillhole Diameter (in.) 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? ____ Feet

(4) Depth to Water (Feet) >11

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials — For monitoring wells and monitoring well boreholes only

☐ Neat Cement Grout	☐ Bentonite Pellets
☐ Sand-Cement (Concrete) Grout	☐ Granular Bentonite
☐ Concrete	☐ Bentonite - Cement Grout
☐ Clay-Sand Slurry	
☐ Bentonite-Sand Slurry	
☒ Chipped Bentonite	

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Hole plug® Bentonite Chips (3/8")	Surface	11	3 bags	
Insitu Soils (2" ϕ split-spoon hole)	11	13		

(8) Comments: Chased w/10 gals water after pouring bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work: Environmental Drilling Services, Inc.

Signature of Person Doing Work: Duane Kujawski — Date Signed: 3-8-99

Street or Route: 3671 Monroe Rd — Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected: ____ — District/County: ____

Reviewer/Inspector: ____ — ☐ Complaint ☐ Noncompliance ☐ Monitoring Well

Follow-up Needed: ____

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B
Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/~~Borehole~~ Location

County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 : T. 20 N; R. 17 ☒ E ☐ W
(If applicable)

Gov't Lot _____ Grid Number _____

Grid Location
_____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original ~~Well~~ Owner (If Known)

Present ~~Well~~ Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-17

WI Unique Well No.: _ _ _ _ _ _ _ _

Reason For Abandonment: Investigative Only

Date of Abandonment: 3-9-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On
(Date) 3-9-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify) _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 12 (From groundsurface)
Casing Diameter (in.) 6¼
Casing Depth (ft.) 10

Lower Drillhole Diameter (in.) 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) >10

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials — For monitoring wells and monitoring well boreholes only
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7)

Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Holeplug® Bentonite Chips (3/8")	Surface	10	2½ bags	
In situ Soils (2" ø split-spoon hole)	10	12		

(8) Comments: Cleaned w/ 7½ gals of water after pouring bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work
Environmental Drilling Services, Inc.

Signature of Person Doing Work: [signature] Date Signed: 3-7-99

Street or Route: 3671 Monroe Rd

Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Received: _____ Date Entered: _____

Reviewed By: _____ ☐ Complete ☐ Incomplete - Work

Follow-up Needed: _____

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location — County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 ; T. 20 N; R. 17 ☒ E ☐ W

(If applicable) ____ Gov't Lot ____ Grid Number

Grid Location ____ ft. ☐ N. ☐ S. ____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original ~~Well~~ Owner (If Known)

~~Present Well~~ Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-16A

WI Unique Well No.: _ _ _ _ _ _

Reason for Abandonment: Investigative Only

Date of Abandonment: 3-10-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date): 3-10-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify)

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total ~~Well~~ Depth (ft.) 7 (From groundsurface)

Casing Diameter (in.) 6¼

Casing Depth (ft.) 6

Lower Drillhole Diameter (in.) 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? ____ Feet

(4) Depth to Water (Feet) >6

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials — For monitoring wells and monitoring well boreholes only
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Hole plug® Bentonite Chips (3/8")	Surface	6	1¾ bags	
In situ Soils (2" ø shelby tube hole)	6	7		

(8) Comments: Charged w/ 5 gals of water after pouring bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work: Environmental Drilling Services, Inc.

Signature of Person Doing Work: Brian Kupsh — Date Signed: 3-10-99

Street or Route: 3671 Monroe Rd — Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Imported — District/County

Reviewer — ☐ Complete ☐ Incomplete - Needs Work

Follow-up Needed

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 : T. 20 N; R. 17 ☒ E ☐ W

(If applicable) Gov't Lot ____ Grid Number ____

Grid Location ____ ft. ☐ N. ☐ S., ____ ft. ☐ E ☐ W.

Civil Town Name:

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original Well Owner (If Known):

Present Well Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-16

WI Unique Well No.:

Reason For Abandonment: Investigative Only

Date of Abandonment: 3-10-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date): 3-10-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify)

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 12 (From groundsurface)
Casing Diameter (in.) 6¼
Casing Depth (ft.) 10

Lower Drillhole Diameter (in.) 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? ____ Feet

(4) Depth to Water (Feet) >10

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite

For monitoring wells and monitoring well boreholes only
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Holeplug® Bentonite Chips (3/8")	Surface	10	2½ bags	
In situ Soils (2"ø split-spoon hole)	10	12		

(8) Comments: Charged w/ 7½ gals of water after pouring bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work: Environmental Drilling Services, Inc.

Signature of Person Doing Work: [signature] Date Signed: 3-10-99

Street or Route: 3671 Monroe Rd Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Entered	Destroyed/County
Reviewer/Inspector	☐ Complying ☐ Non-complying Work
Follow-up No.	

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 ; T. 20 N; R. 17 ☒ E ☐ W

(If applicable) Gov't Lot ____ Grid Number ____

Grid Location ____ ft. ☐ N. ☐ S. ____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original Well Owner (If Known)

Present Well Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-15

WI Unique Well No.

Reason for Abandonment: Investigative Only

Date of Abandonment: 3-8-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date) 3-8-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify)

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 10 (From ground surface)
Casing Diameter (in.) 6¼
Casing Depth (ft.) 8

Lower Drillhole Diameter (in.) 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? ____ Feet

(4) Depth to Water (Feet) >8

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite

For monitoring wells and monitoring well boreholes only
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Holeplug® Bentonite Chips (3/8")	Surface	8	2¼ bags	
In-Situ Soils (2"ø split-spoon hole)	8	10		

(8) Comments: Charged w/ 5 gals water after pouring bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work

Environmental Drilling Services, Inc.

Signature of Person Doing Work: Dave Rep. Date Signed: 3-8-99

Street or Route: 3671 Monroe Rd

Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Received

District/County

Reviewer

Comp/Unit Well Rec'd
Incomplete - Need

Follow-up Needed

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/~~Borehole~~ Location

County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 : T. 20 N. R. 17 ☒ E ☐ W.

(If applicable) Gov't Lot _____ Grid Number _____

Grid Location _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original ~~Well~~ Owner (If Known)

~~Present Well~~ Owner: City of Neenah

~~Street or Route~~: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-14

WI Unique Well No.: _ _ _ _ _ _ _

Reason for Abandonment: Investigative Only

Date of Abandonment: 3-9-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date): 3-9-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify) _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 12 (From ground surface)

Casing Diameter (in.) 6¼

Casing Depth (ft.) 11

Lower Drillhole Diameter (in.) 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) > 11

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials — For monitoring wells and monitoring well boreholes only
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Hole Plug® Bentonite Chips (3/8")	Surface	11	3 bags	
In situ Soils (2" ø shelby tube hole)	11	12		

(8) Comments: Charged w/ 10 gals of Water after pouring bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work: Environmental Drilling Services, Inc.

Signature of Person Doing Work: _____ Date Signed: 3-9-99

Street or Route: 3671 Monroe Rd

Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected	Decision/County
Reviewer/Inspector	☐ Approved ☐ Denied
Follow-up Required	☐ Incomplete ☐ Wrong

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/~~Borehole~~ Location: County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 ; T. 20 N; R. 17 ☒ E ☐ W

(If applicable) _____ Gov't Lot _____ Grid Number

Grid Location _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original ~~Well~~ Owner (If Known)

Present ~~Well~~ Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-13

WI Unique Well No.: _ _ _ _ _ _

Reason For Abandonment: Investigative Only

Date of Abandonment: 3-9-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date): 3-9-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify)

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total ~~Well~~ Depth (ft.): 11 (From groundsurface)

Casing Diameter (in.): 6¼

Casing Depth (ft.): 9

Lower Drillhole Diameter (in.): 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet): 7.9

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials — For monitoring wells and monitoring well boreholes only
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Hole plug® Bentonite Chips (3/8")	Surface	9	2½ bags	
In Situ Soils (2" ø split-spoon hole)	9	11		

(8) Comments: Charged w/ 7½ gallons of water after pouring bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work: Environmental Drilling Services, Inc

Signature of Person Doing Work: [signature] Date Signed: 3-9-99

Street or Route: 3671 Monroe Rd

Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY
Date Received / Inspected: Date Filed / Entered:
Reviewed / Inspected: ☐ Complete & Acceptable ☐ Noncompliance Noted
Follow-up Needed:

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 : T. 20 N; R. 17 ☒ E ☐ W

(If applicable) _____ Gov't Lot _____ Grid Number

Grid Location _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original Well Owner (If Known)

Present Well Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-12

WI Unique Well No. _ _ _ _ _ _ _ _

Reason For Abandonment: Investigative Only

Date of Abandonment: 3-9-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On

(Date) 3-9-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify) _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 15 (From ground surface)

Casing Diameter (in.) 6¼

Casing Depth (ft.) 13

Lower Drillhole Diameter (in.) 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown

If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) > 13

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material

☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials

For monitoring wells and monitoring well boreholes only

☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Hole Plug® Bentonite Chips (3/8")	Surface	13	3¼ bags	
In situ Soils (2"ø split-spoon hole)	13	15		

(8) Comments: Grouted w/ 10 gals of water after pouring bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work: Environmental Drilling Services, Inc

Signature of Person Doing Work: [signature] Date Signed: 3-9-99

Street or Route: 3671 Monroe Rd

Telephone Number: (920 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected | Date Approved

Reviewed By | ☐ Complete ☐ Incomplete - Explain

Follow-up Necessary

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 : T. 20 N; R. 17 ☒ E ☐ W

(If applicable) _____ Gov't Lot _____ Grid Number

Grid Location _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original ~~Well~~ Owner (If Known)

Present ~~Well~~ Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-11

WI Unique Well No.

Reason for Abandonment: Investigative Only

Date of Abandonment: 3-10-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On

(Date) 3-10-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify)

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 14 (From groundsurface)

Casing Diameter (in.) 6¼

Casing Depth (ft.) 12

Lower Drillhole Diameter (in.) 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown

If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) >12

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Barrier Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material

☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials

☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite

For monitoring wells and monitoring well boreholes only

☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Hole plug® Bentonite Chips (3/8")	Surface	12	3¼ bags	
In situ Soils (2" ϕ split-spoon hole)	12	14		

(8) Comments: Charged w/ 10 gals of water after pouring bentonite into borehole

(9) Name of Person or ~~Firm~~ Doing Sealing Work: Environmental Drilling Services, Inc

Signature of Person Doing Work: [signature] Date Signed: 3-10-99

Street or Route: 3671 Monroe Rd

Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected | Date Filed/Entered

Reviewed/Inspected by | ☐ Complete ☐ Incomplete

Follow-up Needed

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 ; T. 20 N; R. 17 ☒ E ☐ W

(If applicable) _____ Gov't Lot _____ Grid Number

Grid Location _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: Arrowhead Park LandFill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original ~~Well~~ Owner (If Known)

Present ~~Well~~ Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-10

WI Unique Well No.: _ _ _ _ _ _

Reason for Abandonment: Investigative Only

Date of Abandonment: 3-8-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On

(Date) 3-8-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify) _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 10 (From groundsurface)

Casing Diameter (in.) 6¼

Casing Depth (ft.) 8

Lower Drillhole Diameter (in.) 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) >8

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite

For monitoring wells and monitoring well boreholes only
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Lbs. Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Hole plug® Bentonite Chips (3/8")	Surface	8	2¼ bags	
In situ Soils (2"ø split-spoon hole)	8	10		

(8) Comments: Charged w/5 gals water after pouring bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work
Environmental Drilling Service, Inc.

Signature of Person Doing Work: [signature] Date Signed: 3-8-99

Street or Route: 3671 Monroe Rd

Telephone Number: (920 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected	District/County
Reviewer	☐ Complete ☐ Incomplete
Follow-up Needed	

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/~~Borehole~~ Location: County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 : T. 20 N; R. 17 ☒ E ☐ W

(If applicable) Gov't Lot ____ Grid Number ____

Grid Location ____ ft. ☐ N. ☐ S., ____ ft. ☐ E. ☐ W.

Civil Town Name:

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original ~~Well~~ Owner (If Known):

~~Present Well~~ Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-9A

WI Unique Well No.:

Reason For Abandonment: Investigative Only

Date of Abandonment: 3-10-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date): 3-10-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify)

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.): 14 (From ground surface)

Casing Diameter (in.): 6 1/4

Casing Depth (ft.): 12

Lower Drillhole Diameter (in.): 6 1/4

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown

If Yes, To What Depth? ____ Feet

(4) Depth to Water (Feet): 21Z

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials — For monitoring wells and monitoring well boreholes only
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Hole Plug® Bentonite Chips (3/8")	Surface	12	3 1/4 bags	
In situ Soils (2" ϕ split-spoon hole)	12	14		

(8) Comments: Grouted w/ 10 gals of water after pouring bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work: Environmental Drilling Services, Inc.

Signature of Person Doing Work: [signature] Date Signed: 3-10-99

Street or Route: 3671 Monroe Rd Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Received (mm-dd-yyyy) | Distribution Code

Reviewed by | ☐ Complete ☐ Noncompliance - Work

Follow-up Needed | ☐ Yes ☐ No

DNR / COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 : T. 20 N; R. 17 ☒ E ☐ W

(If applicable) Gov't Lot ____ Grid Number ____

Grid Location ____ ft. ☐ N. ☐ S., ____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original Well Owner (If Known)

Present Well Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-9

WI Unique Well No. ____

Reason for Abandonment: Investigative Only

Date of Abandonment: 3-9-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date): 3-9-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify) ____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 13 (From groundsurface)
Casing Diameter (in.) 6¼
Casing Depth (ft.) 11

Lower Drillhole Diameter (in.) 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? ____ Feet

(4) Depth to Water (Feet) >11

Pump & Piping Removed? ☐ Yes ☐ No ☒ Not Applicable
Liner(s) Removed? ☐ Yes ☐ No ☒ Not Applicable
Screen Removed? ☐ Yes ☐ No ☒ Not Applicable
Casing Left in Place? ☐ Yes ☒ No
If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface? ☐ Yes ☐ No
Did Sealing Material Rise to Surface? ☒ Yes ☐ No
Did Material Settle After 24 Hours? ☐ Yes ☒ No
If Yes, Was Hole Retopped? ☐ Yes ☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite

For monitoring wells and monitoring well boreholes only
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Holeplug® Bentonite Chips (3/8")	Surface	11	3 bags	
In-situ Soils (2"ϕ split-spoon hole)	11	13		

(8) Comments: Cleaned w/ 10 gals water after pouring bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work: Environmental Drilling Services, Inc.

Signature of Person Doing Work: [signature] Date Signed: 3-9-99

Street or Route: 3671 Monroe Rd Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected ____ District/County ____
Reviewed/Entered ____ ☐ Complete ☐ Incomplete - Need ____
Follow-up Needed ____

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B
Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/~~Borehole~~ Location

County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 : T. 20 N; R. 17 ☒ E ☐ W

(If applicable) _____ Gov't Lot _____ Grid Number

Grid Location _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original ~~Well~~ Owner (If Known)

Present ~~Well~~ Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-8

WI Unique Well No.: _ _ _ _ _ _

Reason for Abandonment: Investigative Only

Date of Abandonment: 3-10-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On

(Date) 3-10-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify)

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 16 (From groundsurface)

Casing Diameter (in.) 6¼

Casing Depth (ft.) 14

Lower Drillhole Diameter (in.) 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) > 14

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials — For monitoring wells and monitoring well boreholes only
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Holeplug® Bentonite Chips (3/8")	Surface	14	3½ bags	
Insitu Soils (2" ϕ split-spoon hole)	14	16		

(8) Comments: Charged w/ 10 gals of water after pouring bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work
Environmental Drilling Services, Inc.

Signature of Person Doing Work: Eric Ricci — Date Signed: 3-10-99

Street or Route: 3671 Monroe Rd

Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Sealing Reported | Date Entered County

Reviewer, Inspector | ☐ Complete Well Report ☐ Satisfactory Sealing Work

Follow-up Needed

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/~~Borehole~~ Location: County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 : T. 20 N; R. 17 ☒ E ☐ W

(If applicable) _____ Gov't Lot _____ Grid Number

Grid Location _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Civil Town Name:

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original ~~Well~~ Owner (If Known):

Present ~~well~~ Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-7

WI Unique Well No.:

Reason for Abandonment: Investigative Only

Date of Abandonment: 3-10-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date): 3-10-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify)

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total ~~Well~~ Depth (ft.) 13 (From ground surface)

Casing Diameter (in.) 6 1/4

Casing Depth (ft.) 12

Lower Drillhole Diameter (in.) 6 1/4

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) >12

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials (For monitoring wells and monitoring well boreholes only)
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Hole plug® Bentonite Chips (3/8")	Surface	12	3 1/4 bags	
In situ Soils (2" ø shelby tube hole)	12	13		

(8) Comments: Charged w/ 10 gals of water after pouring bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work: Environmental Drilling Services, Inc.

Signature of Person Doing Work: [signature] Date Signed: 3-10-99

Street or Route: 3671 Monroe Rd Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected | District/County

Reviewer | ☐ Complete ☐ Incomplete ☐ Waiver ☐ Noncompliance ☐ Warning

Follow-up Needed | Date

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 ; T. 20 N; R. 17 ☒ E ☐ W

(If applicable) _____ Gov't Lot _____ Grid Number

Grid Location _____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name:

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original ~~Well~~ Owner (If Known):

~~Present Well~~ Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-6

WI Unique Well No.: _ _ _ _ _ _

Reason for Abandonment: Investigative Only

Date of Abandonment: 3-8-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On

(Date) 3-8-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify)

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total ~~Well~~ Depth (ft.) 9 (From groundsurface)

Casing Diameter (in.) 6¼

Casing Depth (ft.) 7

Lower Drillhole Diameter (in.) 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown

If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) 27

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material

☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials

For monitoring wells and monitoring well boreholes only

☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Hole plug® Bentonite Chips (3/8")	Surface	7	2 bags	
Insitu Soils (2" ϕ split-spoon hole)	7	9		

(8) Comments: Charged w/ 5 gals water after pouring bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work: Environmental Drilling Services, Inc.

Signature of Person Doing Work: Steven Krepline Jr. Date Signed: 3-8-99

Street or Route: 3671 Monroe Rd Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected | Date Filed/Entered

Reviewer | ☐ Complete ☐ Not Complete

Follow-up Needed

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/~~Borehole~~ Location

County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 : T. 20 N; R. 17 ☒ E ☐ W

(If applicable) _____ Gov't Lot _____ Grid Number

Grid Location _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original ~~Well~~ Owner (If Known)

Present ~~Well~~ Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-5

WI Unique Well No.: _ _ _ _ _ _ _

Reason For Abandonment: Investigative Only

Date of Abandonment: 3-10-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date): 3-10-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify) _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 12 (From groundsurface)
Casing Diameter (in.) 6¼
Casing Depth (ft.) 10

Lower Drillhole Diameter (in.) 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) >10

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite

For monitoring wells and monitoring well boreholes only
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Hole plug® Bentonite Chips (3/8")	Surface	10	2½ bags	
In situ Soils (2" ø split-spoon hole)	10	12		

(8) Comments: Charged w/ 7½ gals of water after pouring bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work: Environmental Drilling Services, Inc.

Signature of Person Doing Work: [signature] Date Signed: 3-10-99

Street or Route: 3671 Monroe Rd Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY
Date Received: Date Entered:
Reviewed by: ☐ Complete ☐ Incomplete
Follow-up Needed:

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 ; T. 20 N; R. 17 ☒ E ☐ W

(If applicable)

Gov't Lot _____ Grid Number _____

Grid Location

_____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original ~~Well~~ Owner (If Known)

~~Present Well~~ Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-4

WI Unique Well No.: _ _ _ _ _ _

Reason For Abandonment: Investigative Only

Date of Abandonment: 3-10-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On

(Date) 3-10-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify) _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 12 (From ground surface)

Casing Diameter (in.) 6¼

Casing Depth (ft.) 10

Lower Drillhole Diameter (in.) 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown

If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) >10

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material

☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials

For monitoring wells and monitoring well boreholes only

☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Lbs. Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Holeplug® Bentonite Chips (3/8")	Surface	10	2½ bags	
In situ Soils (2"ø split-spoon hole)	10	12		

(8) Comments: Chased w/ 7½ gals of water after pouring bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work: Environmental Drilling Services, Inc.

Signature of Person Doing Work: [signature] Date Signed: 3-10-99

Street or Route: 3671 Monroe Rd

Telephone Number: (920 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected | District/County

Reviewed/Inspected | ☐ Complete ☐ Incomplete Work

Follow-up Necessary

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 ; T. 20 N; R. 17 ☒ E ☐ W

(If applicable) Gov't Lot ____ Grid Number ____

Grid Location ____ ft. ☐ N. ☐ S., ____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original Well Owner (If Known)

Present Well Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-3A

WI Unique Well No.: _ _ _ _ _ _

Reason For Abandonment: Investigative Only

Date of Abandonment: 3-11-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date): 3-11-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify)

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 15 (From groundsurface)
Casing Diameter (in.) 6¼
Casing Depth (ft.) 13

Lower Drillhole Diameter (in.) 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? ____ Feet

(4) Depth to Water (Feet) >13

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials — For monitoring wells and monitoring well boreholes only
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Lbs. Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Hole Plug® Bentonite Chips (3/8")	Surface	13	3½ bags	
In situ Soils (2" ø split-spoon hole)	13	15		

(8) Comments: Chased w/ 10 gals of water after pouring bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work: Environmental Drilling Service, Inc

Signature of Person Doing Work: [signature] Date Signed: 3-11-99

Street or Route: 3671 Monroe Rd Telephone Number: (920 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY
Date Received
Date Filed/Copied
Reviewed/Inspected
☐ Complete ☐ Incomplete
☐ Noncompliance ☐ Waiver
Follow-up Needed

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location: County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 : T. 20 N. R. 17 ☒ E ☐ W

(If applicable) Gov't Lot ____ Grid Number ____

Grid Location ____ ft. ☐ N. ☐ S. ____ ft. ☐ E. ☐ W.

Civil Town Name:

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original Well Owner (If Known):

Present Well Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-3

WI Unique Well No.:

Reason For Abandonment: Investigative Only

Date of Abandonment: 3-11-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date): 3-11-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify)

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) (From ground surface): 9

Casing Diameter (in.): 6¼

Casing Depth (ft.): 7

Lower Drillhole Diameter (in.): 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown

If Yes, To What Depth? ____ Feet

(4) Depth to Water (Feet): >7

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials (For monitoring wells and monitoring well boreholes only)
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Holeplug® Bentonite Chips (3/8")	Surface	7	2 bags	
In situ Soils (2" ø split-spoon hole)	7	9		

(8) Comments: Charged w/ 5 gals of water after pouring bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work: Environmental Drilling Services, Inc.

Signature of Person Doing Work: [signature] Date Signed: 3-11-99

Street or Route: 3671 Monroe Rd Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(FED) FOR DNR OR COUNTY USE ONLY

Date Received: ____ District/County: ____

Reviewed by: ____ ☐ Complete ☐ Incomplete

Follow-up Needed: ____

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/~~Borehole~~ Location

County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 ; T. 20 N; R. 17 ☒ E ☐ W

(If applicable) _____ Gov't Lot _____ Grid Number

Grid Location _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original ~~Well~~ Owner (If Known)

Present ~~Well~~ Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-2

WI Unique Well No.: _ _ _ _ _ _ _ _

Reason For Abandonment: Investigative Only

Date of Abandonment: 3-11-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date): 3-11-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify) _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total ~~Well~~ Depth (ft.) 12 (From groundsurface)

Casing Diameter (in.) 6¼

Casing Depth (ft.) 10

Lower Drillhole Diameter (in.) 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) >10

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open Hole Pour

(6) Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite

For monitoring wells and monitoring well boreholes only
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Holeplug® Bentonite Chips (3/8")	Surface	10	2½ bags	
In situ Soils (2" ϕ split-spoon hole)	10	12		

(8) Comments: Chased w/ 7½ gals of H2O during bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work: Environmental Drilling Services, Inc.

Signature of Person Doing Work: [signature] Date Signed: 3-11-99

Street or Route: 3671 Monroe Rd Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Received _____ Distribution _____

Reviewer _____ ☐ Complete ☐ Incomplete Well Report

Follow-Up No. _____

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B Rev. 3-94

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

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location

County: Winnebago

__ 1/4 of SE 1/4 of Sec. 21 : T. 20 N; R. 17 ☒ E ☐ W

(If applicable) _____ Gov't Lot _____ Grid Number

Grid Location _____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name

Street Address of Well: Arrowhead Park Landfill

City, Village: Neenah, Wisconsin

(2) FACILITY NAME

Original ~~Well~~ Owner (If Known)

Present ~~Well~~ Owner: City of Neenah

Street or Route: 211 Walnut

City, State, Zip Code: Neenah, WI 54956

Facility Well No. and/or Name (If Applicable): SB99-1

WI Unique Well No.

Reason For Abandonment: Investigative Only

Date of Abandonment: 3-11-99

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date): 3-11-99

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☒ Yes ☐ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify) _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total ~~Well~~ Depth (ft.): 12 (From ground surface)
Casing Diameter (in.): 6¼
Casing Depth (ft.): 10

Lower Drillhole Diameter (in.): 6¼

Was Well Annular Space Grouted? ☐ Yes ☐ No ☐ Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet): > 10

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applicable
Screen Removed?	☐ Yes	☐ No	☒ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Soil Boring Only

Was Casing Cut Off Below Surface?	☐ Yes	☐ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) Open hole Pour

(6) Sealing Materials — For monitoring wells and monitoring well boreholes only
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☒ Chipped Bentonite
☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Hole plug® Bentonite Chips (3/8")	Surface	10	2½ bags	
In situ Soils (2" ø split-spoon hole)	10	12		

(8) Comments: Grouted w/ 7½ gals of water & Five Pounds bentonite into borehole

(9) Name of Person or Firm Doing Sealing Work: Environmental Drilling Services, Inc.

Signature of Person Doing Work: [signature] Date Signed: 3-11-99

Street or Route: 3671 Monroe Rd Telephone Number: (920) 337-9600

City, State, Zip Code: De Pere, WI 54115

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected | Date Filed/Entered
Keyboarded/Imaged | ☐ Complete ☐ Incomplete
Follow-up Needed | ☐ Non-Compliance

DNR/COUNTY

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION
Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-20*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/10/99*	*03/10/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*744.0 Feet MSL*	*6.25 inches*

Boring Location	Lat °	Local Grid Location (if applicable)
State Plane *801831 N, 2368938 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Long °	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	10	4/1'	2	Grasses at surface Fill, brown and reddish brown silty clay, trace of fine gravel, moist										
2/SS	0	0/1'	4	Light gray paper sludge										Top of sludge based on blow counts and drilling cuttings
3/ST	9													Shelby tube 99-20-3 t=1415
4/SS	10	0/1'	6											Sample 99-20-4 t=1419
5/ST	3		8											Shelby tube 99-20-5 t=1422
6/SS	12	2/1'	10											Shelby tube 99-20-7 t=1430
7/ST	4													Sample 99-20-8 t=1435 (sludge only)
8/SS	22	16/1'	12	Reddish brown clay, moist	CL			3.5						
			14	End of Boring at 13.0 feet Abandoned borehole with bentonite chips										
			16											
			18											
			20											
			22											

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

Signature	Firm
Richard Hart	ERM-North Central, Inc., Green Bay, WI

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

State of Wisconsin
Department of Natural Resources

Route To:
- ☐ Solid Waste
- ☐ Emergency Response
- ☐ Wastewater
- ☐ Superfund
- ☐ Haz. Waste
- ☐ Underground Tanks
- ☐ Water Resources
- ☐ Other:

SOIL BORING LOG INFORMATION
Form 4400-122 5-92

Facility/Project Name *Arrowhead Park Landfill - (ERM 99052)*			**License/Permit/Monitoring Number**	**Boring Number** *SB99-19*
Boring Drilled By (Firm name and name of crew chief) *EDS* *Brian Repinski*			**Date Drilling Started** *03/09/99*	**Date Drilling Completed** *03/09/99*	**Drilling Method** *Hollow-stem Auger*
DNR Facility Well No.	**WI Unique Well No.**	**Common Well Name**	**Final Static Water Level** *Feet MSL*	**Surface Elevation** *745.7 Feet MSL*	**Borehole Diameter** *6.25 inches*
Boring Location **State Plane** *801624 N, 2369100 E* *SE 1/4 of Section 21, T 20 N, R 17 E*			**Lat** ° **Long** °	**Local Grid Location (if applicable)** *Feet S* *Feet W*	
County *Winnebago*			**DNR County Code** *71*	**Civil Town/City/ or Village** *City of Neenah*	

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	6	2/1'	2	Grasses at surface Fill, reddish brown silty clay, moist										
2/SS	23	1/1'	4	Light gray paper sludge, fibrous										Sample 99-19-2 t=0855
3/ST	8													Shelby tube 99-19-3 t=0900
4/SS	14	1/1'	6											
5/ST	4		8											Shelby tube 99-19-5 t=0910
6/SS	24	0/1'												Sample 99-19-6 t=0915
7/SS	12	1/1'	10	Brown hemic peat, moist	Pt									
			12	End of Boring at 12.0 feet Abandoned borehole with bentonite chips										
			14											
			16											
			18											
			20											
			22											

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

Signature	Firm
	ERM-North Central, Inc., Green Bay, WI

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-18*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/08/99*	*03/08/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*745.3 Feet MSL*	*6.25 inches*

Boring Location	Lat °	Local Grid Location (If applicable)
State Plane *801420 N, 2369333 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Long °	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	18	3/1'	2	Grasses at surface Fill, reddish brown silty clay, moist										
2/SS	10	0/1'	4	Light gray paper sludge, fibrous										Sample 99-18-2 t=1625
3/ST	9													Shelby tube 99-18-3 t=1630
4/SS	24	0/1'	6											
5/ST	8		8											Shelby tube 99-18-5 t=1840
6/SS	23	0/1'												
7/ST	9		10											Sample 99-18-6 t=1845
8/SS	24	2/1'	12	Black organic silt, wet	OL									Shelby tube 99-18-7 t=1847
				Reddish brown silty clay, moist	CL			1.5						
			14	End of Boring at 13.0 feet Abandoned borehole with bentonite chips										
			16											
			18											
			20											
			22											

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

Signature	Firm
Brad Pan	ERM-North Central, Inc., Green Bay, WI

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State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION
Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-17*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/09/99*	*03/09/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*745.9 Feet MSL*	*6.25 inches*

Boring Location	Lat °	Local Grid Location (If applicable)
State Plane *801588 N, 2369265 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Long °	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	13	5/1'	2	Grasses at surface Fill, reddish brown silty clay, moist				2.25						
2/SS	12	2/1'	4											
3/SS	14	0/1'		Light gray paper sludge, fibrous										Sample 99-17-3 t=1015
ST	0		6											
4/ST	6													Shelby tube 99-17-4 t=1020
5/SS	24	0/1'	8											
6/SS	14	0/1'	10	Dark brown to black hemic peat, moist	Pt									Sample 99-17-5 t=1025
			12	End of Boring at 12.0 feet Abandoned borehole with bentonite chips										
			14											
			16											
			18											
			20											
			22											

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

Signature	Firm
Robert Pan	ERM-North Central, Inc., Green Bay, WI

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State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Superfund ☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-16A*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/10/99*	*03/10/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*746.0 Feet MSL*	*6.25 inches*

Boring Location	Lat °	Local Grid Location (If applicable)
State Plane *801890 N, 2369267 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Long °	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	9	6/1'	2	Grasses at surface Fill, reddish brown silty clay, moist				1.5						
2/SS	18	3/1'	4	Mixed light gray paper sludge and reddish brown silty clay, black fine gravelly clay layer at 3.7 to 4.0 feet										
3/SS	8	3/1'	6	Light gray paper sludge										
4/ST	2			Fill, brown silty clay										Pushed a rock into shelby tube
			8	End of Boring at 7.0 feet Abandoned borehole with bentonite chips Offset 3 feet southeast and drilled SB99-16										
			10											
			12											
			14											
			16											
			18											
			20											
			22											

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

Signature	Firm
Robert Fenn	ERM-North Central, Inc., Green Bay, WI

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State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Superfund
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-16*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/10/99*	*03/10/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*746.0 Feet MSL*	*6.25 inches*

Boring Location	Lat °	Local Grid Location (If applicable)
State Plane *801890 N, 2369267 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Long °	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	12	3/1'	2	Grasses at surface Fill, reddish brown silty clay, moist				1.75						
2/SS	8	18/1'	4	Mix of light gray paper sludge and reddish brown silty clay, black fine gravelly clay layer at 3.7 to 4.0 feet										
3/SS	13	4/1'	6	Light gray paper sludge with few to trace reddish brown silty clay, trace gravel										Sample 99-16-3 t=1330
4/SS	9	12/1'	8	Fill, dark brown to brown sandy silty clay, trace to few fine gravel, moist										
5/SS	18	7/1'	10	Fill, reddish brown and mixed reddish brown and dark brown silty clay, trace fine gravel, moist										
6/SS	5	6/1'	12	Fill, dark brown silty clay, trace fine gravel, moist										
			14	End of Boring at 12.0 feet Abandoned borehole with bentonite chips										
			16											
			18											
			20											
			22											

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

Signature	Firm
Robert Pierce	ERM-North Central, Inc., Green Bay, WI

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State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Superfund ☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-15*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/08/99*	*03/08/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*744.1 Feet MSL*	*6.25 inches*

Boring Location		Local Grid Location (If applicable)
State Plane *80131l N, 2369529 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Lat ° Long °	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	8	4/1'	2	Grasses at surface Fill, reddish brown silty clay, moist				1.5						
2/SS	18	2/1'	4	Gray paper sludge										Sample 99-15-2 t=1545
3/ST	7													Shelby tube 99-15-3 t=1552
4/SS	18	0	6											Sample 99-15-4 t=1550
5/ST	4		8											Shelby tube 99-15-5 t=1555
6/SS	22	1/1'	10	Dark brown to black hemic peat, wet	Pt									
			12	End of Boring at 10.0 feet Abandoned borehole with bentonite chips										
			14											
			16											
			18											
			20											
			22											

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Signature	Firm
Richard Pan	ERM-North Central, Inc., Green Bay, WI

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State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Superfund ☐ Other:

SOIL BORING LOG INFORMATION

Form 4400-122 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Arrowhead Park Landfill (ERM 99052)		*SB99-1*

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
EDS *Brian Repinski*	*03/11/99*	*03/11/99*	*Hollow-stem Auger*

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	*743.5 Feet MSL*	*6.25 inches*

Boring Location	Lat °	Local Grid Location (if applicable)
State Plane *801712 N, 2370751 E* *SE 1/4 of Section 21, T 20 N, R 17 E*	Long °	*Feet S* *Feet W*

County	DNR County Code	Civil Town/City/ or Village
Winnebago	*71*	*City of Neenah*

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1/SS	24	58/1"	2	Gravelly parking lot surface Fill, sandy gravel, moist										
2/SS	24	5/1"	4	Fill, silty clayey gravel over sandy fine gravel, moist Gray paper sludge, dense, black fine to medium sand layer at 2.9 to 3.1 feet										
3/SS	18	2/1"	6	Gray paper sludge										Sample 99-1-3 t=0900
4/ST	7													Shelby tube 99-1-4 t=0908
5/SS	24	2/1"	8											Sample 99-1-5 t=0908
6/ST	3		10											Shelby tube 99-1-6 t=0911 (sludge only)
7/SS	18	12/1"	12	Reddish brown silty clay, moist to wet	CL									
			14	End of Boring at 12.0 feet Abandoned borehole with bentonite chips										
			16											
			18											
			20											
			22											

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Signature *Richard Rom* Firm ERM-North Central, Inc., Green Bay, WI

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B1
B2
B3
B4
B5
746
745

Field Boring Log

SES Subsurface Exploration Services, LLC
2900 Lowell Drive
Green Bay, WI 54311
920.554.4228

Engineer _____ Surface Elevation _____ Water Level Observations

Technician _____ Boring Started 6-21- WL: _____ WS or WD

Driller JC Boring Completed 6- -11 WL: 4.7' BCR S ACR

Helper NP Station _____ WL: _____ AB _____ HR, AB

Rig/MFT/Model D-20 Offset o.L WL: _____ 24 hr AB

Job No.: 110611 **Boring No.:** B-5 **Client:** RJT Glatfelter Park Site **Weather:** 63° Rainy

140-lb Hammer Type: ☐ Safety ☐ Automatic

W.L. @ 6.6 Before installing casing

Sample No.	Depth or Elevation From	To	Sample Method	Penetration Record Split Spoon Blows 6"	6"	6"	6"	R Length Recovered (feet)	QP Penetrometer Test (tsf)	PID PID Detection	Strata Change	Sample Description
1	0	1.5	SS	4	9	8		1.3	3.25			BR/TR gray si cL w/TR Fi GR (Fill)
	0	2.5	PA									
2	2.5	4	SS	6	4	2		1.0	0.75			BR si cL w/Fi GR (moist) (Fill)
	2.5	5'	PA									
3	5'	6.5	SS	1	2	3		1.2	0.75			BR s cL w/TR Fi GR (moist) (Fill)
	5	7.5	PA									
4	7.5	9	SS	2	1	3		1.1	0.75			SAME (moist) (Fill)
	7.5	10'	PA									
5	10'	11.5	SS	1	2	1		1.0	2.0			BR s. cL w/TR Fi gr (wet)
	0	7.5	AU									install casing
	0	15	RB								wet	12'-13' noticed color change driving mud
6	15	17	SS	w	o	R	-2'	0				BR Si cL
	15	20'	RB									
7	20	21.5	SS	6	6	7		0.7	-			SAME w/ TR FiGR - unable to QP - disturbed sample
	20	25	RB									
8	25	26.5	SS	14	16	22		0.9	4.25	?		BR s. cL w/ TR FiGR (disturbed sample, pushed back)
	25	30	RB									GR wd @ 28.6'
9	30	31.5	SS	14	13	21		1.0	4.5+			BR s cL w/ FiGR

Abbreviations:
MC - Macro Core
LB - Large Bore
ST - Shelby Tube
DB - Diamond Bit
PA - Power Auger
HSA - Hollow Stem Auger
RB - Rock Bit
HA - Hand Auger
WS - While Sampling
WD - While Drilling
BCR - Before Casing Removal
ACR - After Casing Removal
AB - After Boring
AWO - After Wash Out

Drill Crew Checklist:
Topsoil Thickness _____
Fill Thickness 12'-13' Approx

Cave-In Level:
While Drilling & Sampling _____
After Boring Completion _____

Water Loss:
At _____ to _____
Percent Loss _____
At _____ to _____
Percent Loss _____

Boulders or Obstructions:
At _____ to _____
At _____ to _____

Artesian Pressure:
Depth _____
Height of Soil Rise in Casing _____
Piezometer: PVC or SS Diameter _____ in.
Screen Depth _____ ft to _____
Riser Pipe _____ ft to _____

Field Boring Log

Engineer _____ Surface Elevation _____ Water Level Observations

Technician _____ Boring Started _____ WL: _____ WS or WD

Driller JC Boring Completed 6-21- WL: 4.7' BCR 5' ACR

Helper NP Station _____ WL: _____ AB _____ HR, AB

Rig/MFT/Model D-120 Offset 2L WL: _____ 24 hr AB

SES Subsurface Exploration Services, LLC
2900 Lowell Drive
Green Bay, WI 54311
920.554.4228

pg 2 of 2

Job No.: 11061 **Boring No.:** B-5 **Client:** RVT / Glacier Park **Weather:** 62° Rain

Sample No.	Depth or Elevation From	Depth or Elevation To	Sample Method	Penetration Record Split Spoon Blows 6"	6"	6"	6"	R Length Recovered (feet)	QP Penetrometer Test (tsf)	PID PID Detection	Strata Change	140-lb Hammer Type: ☐ Safety ☐ Automatic — Sample Description
	30	35	RB									GR w/D 32.5-33'
10	35	36.5	SS	10	11	14		1.5	3.25			RR S - w/GI GR (pushed to recover)
												EOB

Abbreviations:
MC - Macro Core
LB - Large Bore
ST - Shelby Tube
DB - Diamond Bit
PA - Power Auger
HSA - Hollow Stem Auger
RB - Rock Bit
HA - Hand Auger
WS - While Sampling
WD - While Drilling
BCR - Before Casing Removal
ACR - After Casing Removal
AB - After Boring
AWO - After Wash Out

Drill Crew Checklist:
Topsoil Thickness _____
Fill Thickness 12' - 13' Mix

Cave-in Level:
While Drilling & Sampling _____
After Boring Completion _____

Water Loss:
At _____ to _____
Percent Loss _____
At _____ to _____
Percent Loss _____

Boulders or Obstructions:
At _____ to _____
At _____ to _____

Artesian Pressure:
Depth _____
Height of Soil Rise in Casing _____
Piezometer: PVC or SS
Diameter _____ in.
Screen Depth _____ ft to _____
Riser Pipe _____ ft to _____

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT
Form 3300-5 2/2000 Page 1 of 2

Notice: Please complete Form 3300-5 and return it to the appropriate DNR office and bureau. Completion of this report 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 this form 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 this form is not intended to be used for any other purpose. NOTE: See the instructions for more information.

Route to ☐ Drinking Water ☐ Watershed/Wastewater ☐ Waste Management ☐ Remediation/Redevelopment ☐ Other 110611

(1) GENERAL INFORMATION

WI Unique Well No	DNR Well ID No	County

Common Well Name _____ _____ Gov't Lot (if applicable)

Grid Location ___ 1/4 of ___ 1/4 of Sec. ___ ; T ___ N, R ___ ☐ E ☐ W

_____ ft ☐ N ☐ S, _____ ft ☐ E ☐ W

Local Grid Origin ☐ (estimated ☐) or Well Location ☐

Lat ___ ° ___ ' _____ " Long ___ ° ___ ' _____ " or

State Plane _____ ft N _____ ft E. S ☐ C ☐ N ☐ Zone

Reason For Abandonment	WI Unique Well No. of Replacement Well
Sample only	

(2) FACILITY /OWNER INFORMATION

Facility Name (RVT) Glatfelter Park site

Facility ID	License/Permit/Monitoring No.
B-5	

Street Address of Well

City, Village, or Town

Present Well Owner	Original Owner
Same	Same

Street Address or Route of Owner

City, State, Zip Code

(3) WELL/DRILLHOLE/BOREHOLE INFORMATION

Original Construction Date 6-21-11

☐ Monitoring Well
☐ Water Well
☑ Drillhole / Borehole

If a Well Construction Report is available, please attach.

Construction Type:
☑ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify) _____

Formation Type:
☑ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft) 36.5' (From ground surface)
Casing Diameter (in.) 4"
Casing Depth (ft.) 8'
Lower Drillhole Diameter (in.) 4"

Was Well Annular Space Grouted? ☐ Yes ☑ No ☐ Unknown
If Yes, To What Depth? _____ Feet
Depth to Water (Feet) 6.6'

(4) PUMP, LINER, SCREEN, CASING, & SEALING MATERIAL

Pump & Piping Removed?	☐ Yes	☐ No	☑ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☑ Not Applicable
Screen Removed?	☐ Yes	☐ No	☑ Not Applicable
Casing Left in Place?	☐ Yes	☑ No	
Was Casing Cut Off Below Surface?	☐ Yes	☑ No	
Did Sealing Material Rise to Surface?	☑ Yes	☐ No	
Did Material Settle After 24 Hours?	☐ Yes	☑ No	
If Yes, Was Hole Retopped?	☐ Yes	☑ No	

Required Method of Placing Sealing Material
☐ Conductor Pipe - Gravity ☐ Conductor Pipe - Pumped
☑ Screened & Poured ☐ Other (Explain)
(Bentonite Chips)

Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☑ Chipped Bentonite

For monitoring wells and monitoring well boreholes only
☐ Bentonite Chips
☐ Granular Bentonite
☐ Bentonite-Cement Grout
☐ Bentonite - Sand Slurry

(5) Sealing Material Used	From (Ft.)	To (Ft.)		Mix Ratio or Mud Weight
Hole plug	Surface	36.5	4 Bags	3/8 chip

(6) Comments _____

(7) Name of Person or Firm Doing Sealing Work SES [redacted] | Date of Abandonment 6-21-11

Signature of Person Doing Work | Date Signed 6-21-11

Street or Route [redacted] | Telephone Number [redacted]

City, State, Zip Code
Green Bay, Wisconsin 54311-8320

FOR DNR OR COUNTY USE ONLY

Date Received	Noted By

Comments

BCG 34930



LEGEND

- WELL LOCATION
- ABANDONED WELL LOCATION

N

0 100 200 400 600 Feet

MONITORING WELL LOCATIONS
GLATFELTER PARKSITE LANDFILL
NEENAH, WISCONSIN

DESIGNED BY	JWK	DATE	11-02-06
DRAWN BY	JWK	DATE	11-02-06
APPROVED BY	SJS	DATE	11-02-06
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REVISION	DESCRIPTION	DATE	BY

STS Consultants, Ltd
Consulting Engineers
1035 Kepler Drive
Green Bay, WI 54311
920.468.1978

STS PROJECT NUMBER	200606604
STS PROJECT FILE	
SCALE	1" = 200'
SHEET NUMBER	1

LITTLE LAKE
BUTTE DES MORTS
(TYPICAL WATER ELEV. 738.1)

ARROWHEAD PARK
LANDFILL

NEENAH SLOUGH

FOX RIVER
NEENAH CHANNEL

P.H. GLATFELTER

POWER CHANNEL

MAIN STREET

WISCONSIN AVENUE

HAUL ROAD (SLUDGE SOIL MIX)

STOCKPILE MINERGY

STOCKPILE

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802500N
802400N
802300N
802200N
802100N
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2371300E
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2371500E
2371600E
2371700E
2371800E

LEGEND

- —740— SURFACE CONTOUR
- —SAN— CITY SANITARY SEWER
- —STO— STORM SEWER
- PHGWW— P.H. GLATFELTER WASTEWATER SEWER
- STRUCTURE
- RAILROAD
- APPROXIMATE LIMITS OF DEPOSIT A
- -2.0- APPROXIMATE SEDIMENT THICKNESS (FEET)
- APPROXIMATE LIMITS OF SLUDGE IN LANDFILL
- 735.0 HISTORIC SURFACE ELEVATION (DRAWING 17-E 1146 F)
- 735.6 ELEVATION AT BORING PER SURVEY
- (734.9) ESTIMATED ELEVATION AT BORING PER SURVEY
- 739.5 QUESTIONABLE DATA POINT

N

BASE MAP PROVIDED BY CITY OF NEENAH, GIS DATA BASE. PHOTOGRAPH CONTROL, 1991 WITH CITY UPDATES THROUGH 1998. ERM MODIFICATIONS INCLUDED ADDITION OF CLARIFIER, SOIL STOCKPILE REMOVAL AND PROJECTION OF DEPOSIT A SEDIMENT (PER EWI 1992 FEASIBILITY STUDY).

REV. NO.	DESCRIPTION	DATE	REV. BY	CHK'D.	APP'D.
	REVISIONS				

ERM ENVIRONMENTAL RESOURCES MANAGEMENT

Arrowhead Park Landfill
Neenah, Wisconsin

DRAWN:	CHECKED:		DRAWING:
SCALE: 1"=100'	APPROVED:	Base Elevations	98276-10

LITTLE LAKE
BUTTE DES MORTS
(TYPICAL WATER ELEV. 738.1)

ARROWHEAD PARK
LANDFILL

NEENAH SLOUGH

FOX RIVER
NEENAH CHANNEL

SAN

STO

OHP

MINERGY

TREATMENT PLANT

PHGW

P.H. GLATFELTER

POWER CHANNEL

MAIN STREET

WISCONSIN AVENUE

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LEGEND

—740— SURFACE CONTOUR
741.0 ELEVATION AT BORING PER SURVEY
—SAN— CITY SANITARY SEWER
—STO— STORM SEWER
PHGWW— P.H. GLATFELTER WASTEWATER SEWER
STRUCTURE
RAILROAD
APPROXIMATE LIMITS OF DEPOSIT A
--2.0-- APPROXIMATE SEDIMENT THICKNESS (FEET)
APPROXIMATE LIMITS OF SLUDGE IN LANDFILL

BASE MAP PROVIDED BY CITY OF NEENAH, GIS DATA BASE. PHOTOGRAPH CONTROL, 1991 WITH CITY UPDATES THROUGH 1998. ERM MODIFICATIONS INCLUDED ADDITION OF CLARIFIER, SOIL STOCKPILE REMOVAL AND PROJECTION OF DEPOSIT A SEDIMENT (PER EWI 1992 FEASIBILITY STUDY).

REV. NO.	DESCRIPTION	DATE	REV. BY	CHK'D.	APPD.
	REVISIONS				

ENVIRONMENTAL RESOURCES MANAGEMENT
ERM

Arrowhead Park Landfill
Neenah, Wisconsin

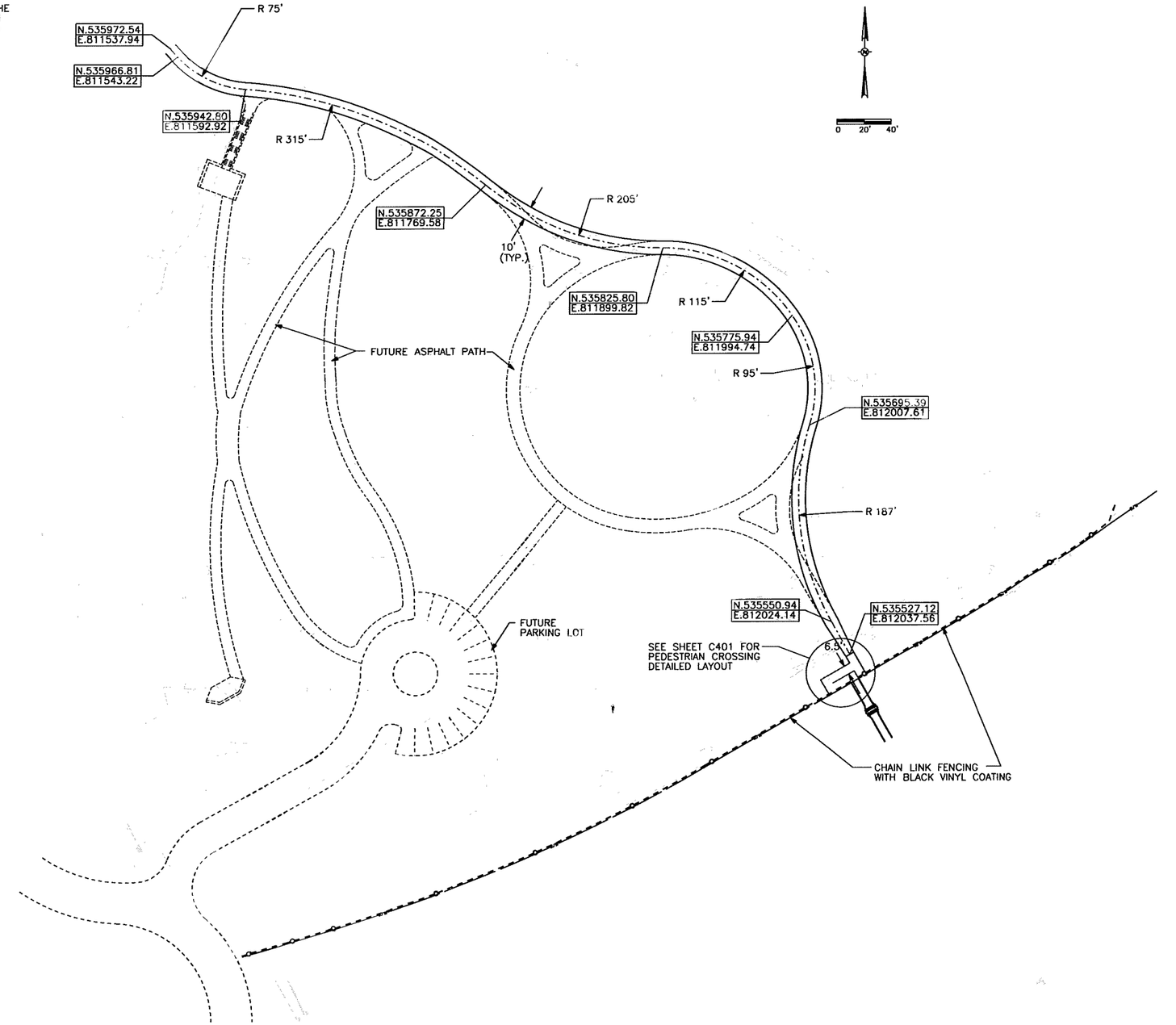
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APPENDIX D – DEVELOPMENT PLANS

- 2012 Park Site #1 Development Site Plan – C202
- 2012 Park Site #1 Development Grading Plan – C203
- 2012 Park Site #1 Screen Berm Typical Cross-Section
- 2008 Park Site #2 Master Plan
- Arrowhead Park - Boardwalk Landing Location/Detail

GENERAL NOTES

1. ALL DIMENSIONS SHOWN ARE TO DECIMAL FEET. GRAVEL PATH RADIUS DIMENSIONS ARE TO CENTERLINE, UNLESS SPECIFIED OTHERWISE. PRIOR TO START OF CONSTRUCTION, THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE.
2. ALL ADA ACCESSIBLE ROUTES SHALL COMPLY WITH PROVISIONS OF THE AMERICAN WITH DISABILITIES ACT STANDARDS FOR ACCESSIBLE DESIGN (ADAAG) INCLUDING CROSS-SLOPE, LONGITUDINAL SLOPE, WIDTH, AND OTHER REQUIREMENTS.



LEGEND

- - - - - -	– GRADING LIMITS
———	– GRAVEL PATH
R	– RADIUS
N.535972.54 E.811537.94	– NORTHING – EASTING

GRÄEF

1150 Springhurst Drive,
Suite 201
Green Bay, WI 54304-5950
920 / 592 9440
920 / 592 9445 fax

www.graef-usa.com

CONSULTANTS:

PROJECT TITLE:

HERB AND DOLLY SMITH
AND PARK SITE #1
PARK DEVELOPMENT

ISSUE:

PROJECT INFORMATION:

PROJECT NUMBER:	2011-2003.01
DATE:	03/16/12
DRAWN BY:	KAH
CHECKED BY:	
APPROVED BY:	PJS
SCALE:	1"=40'

SHEET TITLE:

PARK SITE #1
SITE PLAN

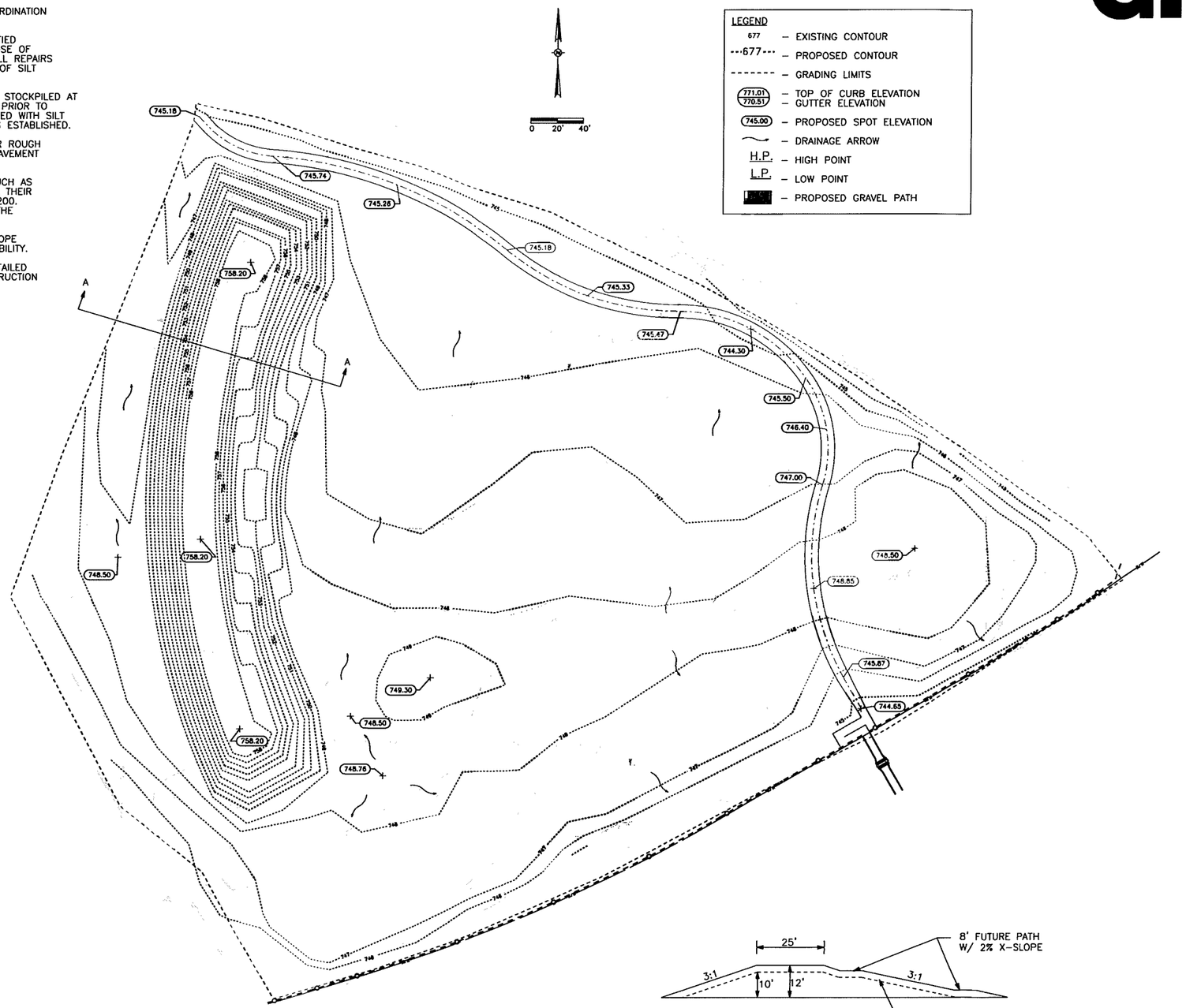
SHEET NUMBER:

C202

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GENERAL NOTES

1. REFERENCE EROSION CONTROL PLAN AND SITE PLAN FOR COORDINATION OF WORK ON THIS SHEET.
2. FOLLOWING CONSTRUCTION AND THE ESTABLISHMENT OF SPECIFIED GROUND COVERS, THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SEDIMENT CONTROL DEVICES. THE CONTRACTOR SHALL MAKE ALL REPAIRS OF LAWNS AND LANDSCAPED AREAS FOLLOWING THE REMOVAL OF SILT FENCES AND STAKES.
3. ALL EXCESS MATERIAL SHALL BE REMOVED FROM THE SITE OR STOCKPILED AT LOCATIONS APPROVED BY THE CONSTRUCTION REPRESENTATIVE PRIOR TO PLACEMENT OF ANY MATERIAL. STOCKPILES SHALL BE ENCLOSED WITH SILT FENCE UNTIL TEMPORARY OR PERMANENT VEGETATIVE COVER IS ESTABLISHED.
4. THIS PLAN SHOWS NEW CONTOURS AND FINISHED GRADES. FOR ROUGH GRADES OF ALL PAVEMENT AREAS, SUBTRACT THICKNESS OF PAVEMENT AND BASE COURSE SPECIFIED.
5. WHEN SPOT ELEVATIONS SHOWN REFER TO CRITICAL POINTS SUCH AS PAVEMENT ANGLE POINTS AND CURVE–TANGENT INTERSECTIONS, THEIR LOCATION WILL CORRESPOND WITH COORDINATES SHOWN ON C200. VERIFY SPOT ELEVATION AND COORDINATE RELATIONSHIP WITH THE CONSTRUCTION REPRESENTATIVE.
6. FOR INTERPRETIVE PATH, MAINTAIN MAXIMUM LONGITUDINAL SLOPE OF 5% AND MAXIMUM CROSS–SLOPE OF 2% PER ADA ACCESSIBILITY.
7. REFER TO SECTION 00 81 00 – SPECIAL CONDITIONS FOR DETAILED INFORMATION ON GRADING ACTIVITIES RELATED TO BERM CONSTRUCTION AND USE OF STOCKPILED AND OTHER MATERIAL.



SECTION A–A

BERM TYPICAL SECTION

GRAEF

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CONSULTANTS:

PROJECT TITLE:

HERB AND DOLLY SMITH
AND PARK SITE #1
PARK DEVELOPMENT

ISSUE:

PROJECT INFORMATION:

PROJECT NUMBER:	2011-2003.01
DATE:	03/16/12
DRAWN BY:	KAH
CHECKED BY:	
APPROVED BY:	PJS
SCALE:	1"=40'

SHEET TITLE:

PARK SITE #1
SITE GRADING AND PAVING PLAN

SHEET NUMBER:

C203

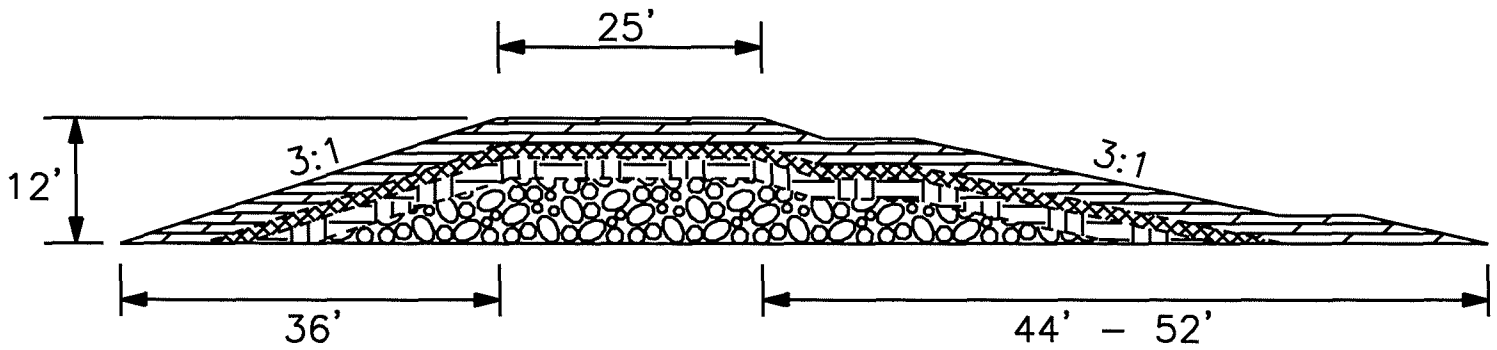
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2' PERMANENT CLAY CAP
W/6" TOPSOIL

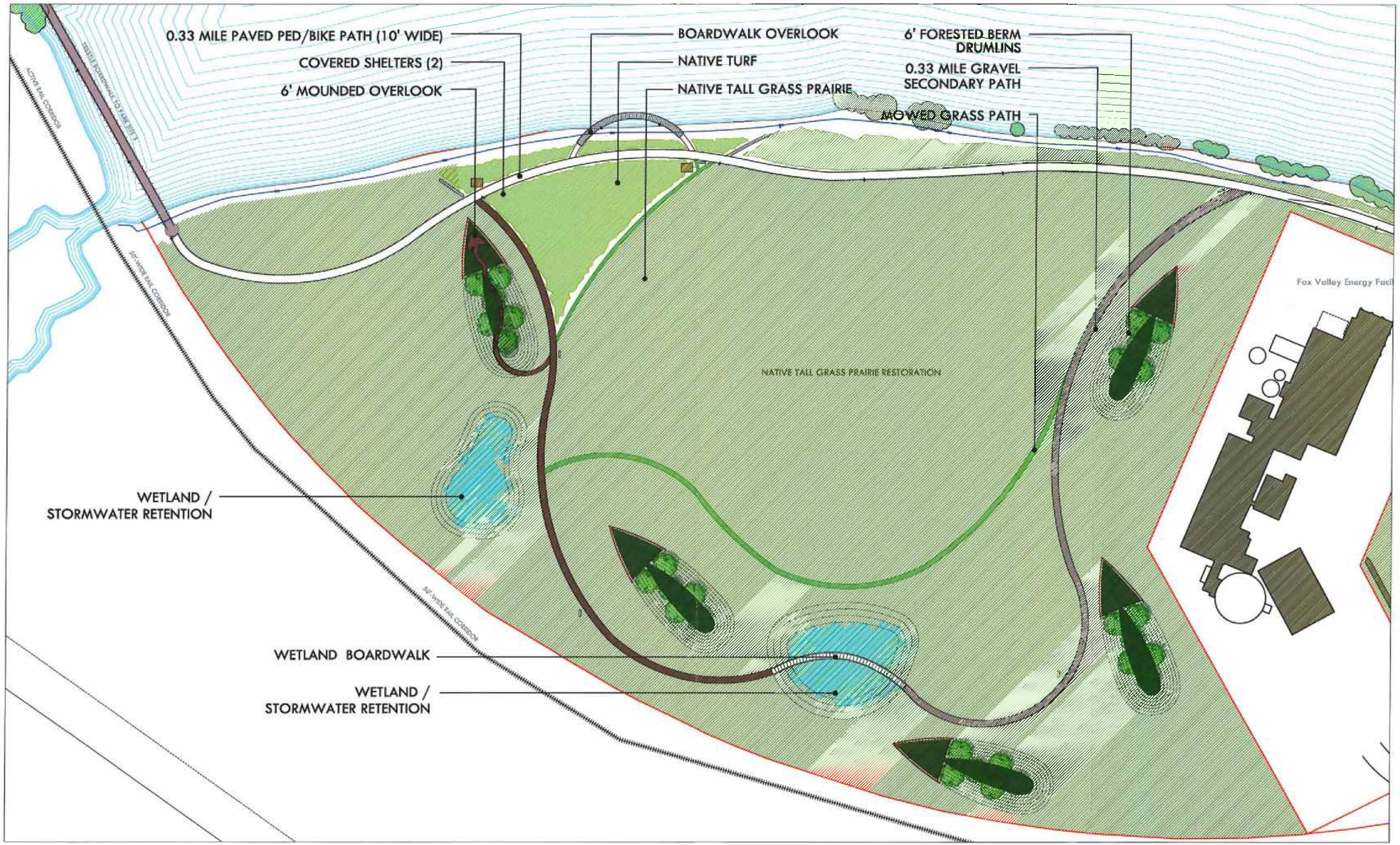
FUTURE PLEXUS DC2 BDLG SPOIL
1.25 FT THICK – ASH MATERIAL

2' INTERIM CLAY CAP
W/6" TOPSOIL (TOPSOIL TO REMOVED PRIOR TO PLACEMENT OF PLEXUS MATERIAL)

ASH MATERIAL CURRENTLY IN BERM FOOTPRINT
FROM AFFINITY PROJECT. MINOR AMT OF MASONRY WITH LEAD
BASED PAINT FROM GATEWAY PLAZA PARK PROJECT.



PARK SITE #1 BERM TYPICAL SECTION



PDI PLANNING AND DESIGN INSTITUTE, INC.
241 N. BROADWAY · MILWAUKEE WI 53202 · 414 271 2545

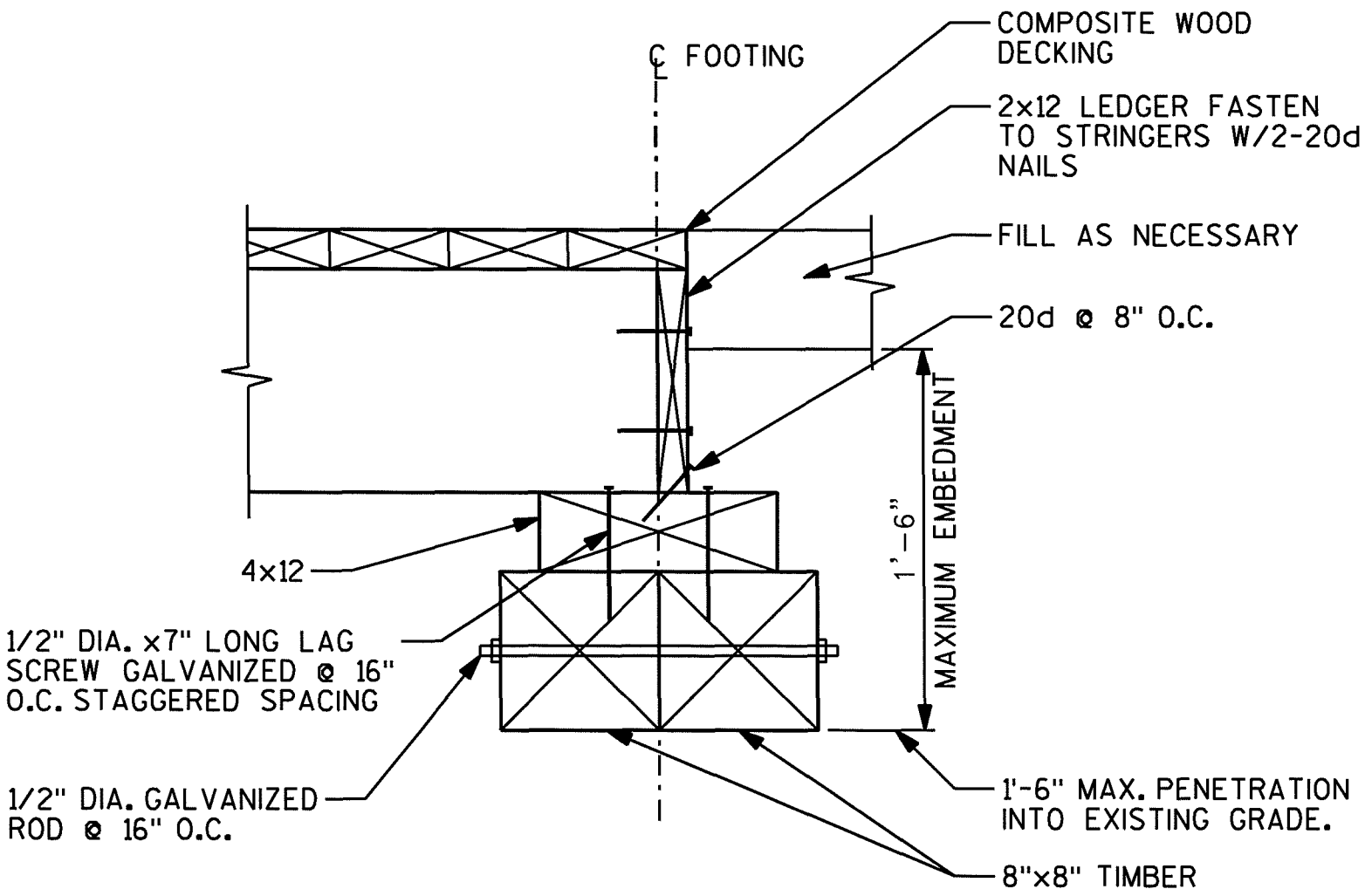
GRAEF ANHALT SCHLOEMER

PARK SITE 2

• Little Lake Butte des Morts Properties •

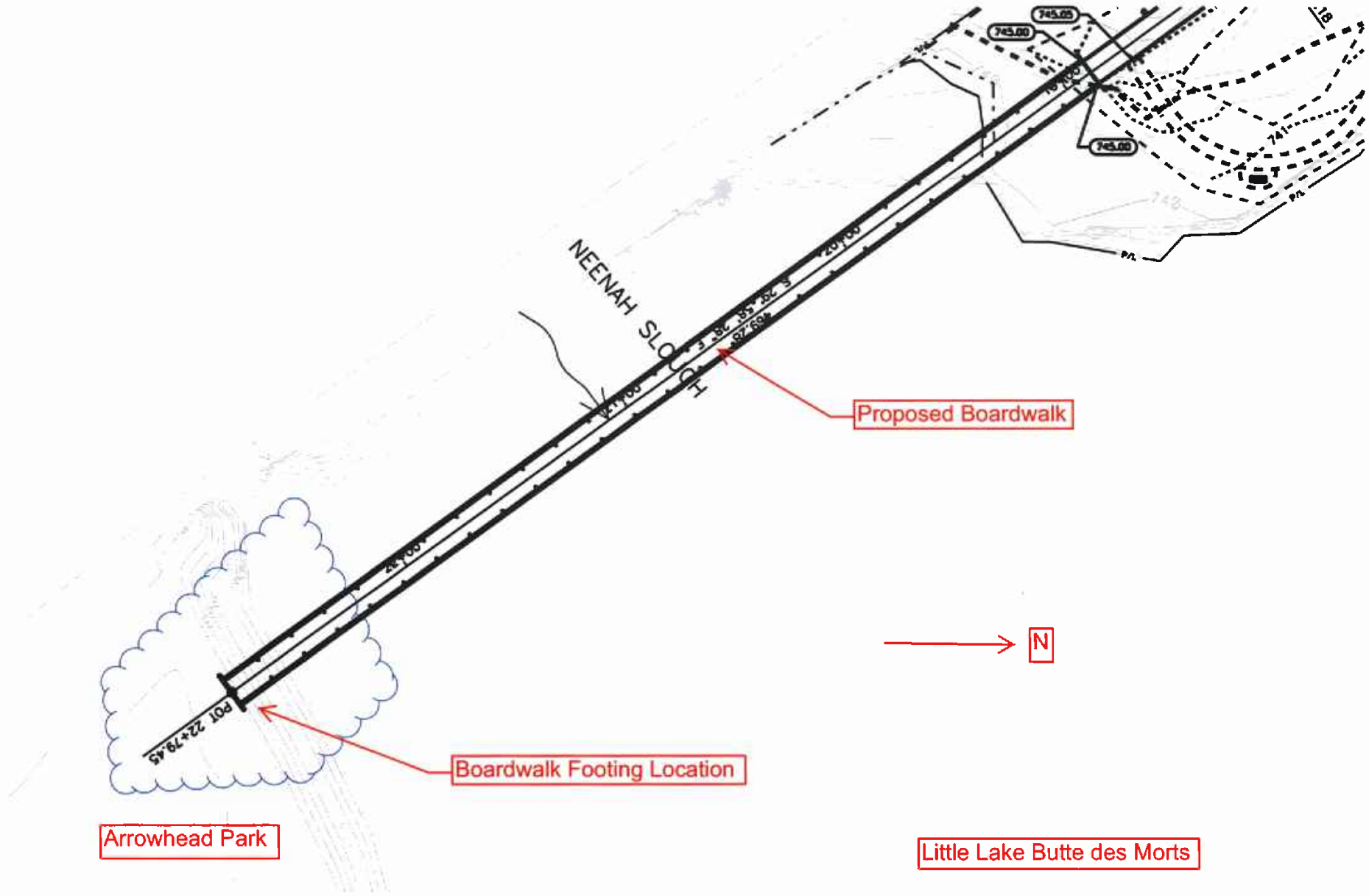
0ft. 50 100

DECEMBER 2008



FOOTING DETAIL - STA. 22+79.45

ARROWHEAD PARK LANDING


NEENAH SLOUGH
Proposed Boardwalk
Boardwalk Footing Location
Arrowhead Park
Little Lake Butte des Morts
N

APPENDIX E – SITE VISIT PHOTO LOG

City of Neenah Park Site #1 and Park Site #2 Site Visit Photo Locations

March 1, 2012



→ Photo Orientation

1 Photo Index

City of Neenah Park Site #1 and Park Site #2 Site Visit Photos

March 1, 2012



1: Well Nest PS-33 and excavation for a stormwater pond. Looking east near southwest entrance to Park Site #1.



2: Park Site #1 looking west-southwest from east end of the landfill. Aggregate stockpile is in the foreground.

City of Neenah Park Site #1 and Park Site #2 Site Visit Photos

March 1, 2012



3: Park Site #1 looking west-northwest from east end of the landfill. Aggregate stockpile is in the foreground, outline of previous clarifier location and Fox Valley Energy Center in the background.



4: Park Site #1 looking southeast at new development.



5: Existing berm along east side of Fox Valley Energy Center, looking south.



6: Southwest entrance to Park Site #1 looking north.

City of Neenah Park Site #1 and Park Site #2 Site Visit Photos

March 1, 2012



7: Looking north from Park Site #1. Monitoring well PS-15 shown in center of the photo.



8: Submerged storm sewer outlet near the north east corner of the Fox Valley Energy Center parcel.



9: Top of bulkhead dike looking west from the area north of the Fox Valley Energy Center.



10: Looking south from the bulkhead dike along the west side of the Fox River Valley Energy Center.

City of Neenah Park Site #1 and Park Site #2 Site Visit Photos

March 1, 2012



11: Looking northwest from the landfill. The photo shows a small open water area caused by snow melt collected in a shallow depression.



12: Small area of thin vegetation located approximately 200 feet west of the Fox River Energy. Surface included aggregate and gravel.

City of Neenah Park Site #1 and Park Site #2 Site Visit Photos

March 1, 2012



13: Looking southwest from south-central area of the landfill.



14: Looking south from south-central area of the landfill.



15: Looking north from the central area of the landfill.



16: Looking west-northwest from the central portion of the landfill.

City of Neenah Park Site #1 and Park Site #2 Site Visit Photos

March 1, 2012



17: Looking east from the western portion of the landfill. The Fox Valley Energy Center is in the background.



18: Looking east along the riprap slope of the bulkhead dike.



19: Looking west at the outlet of the Neenah Slough. The area in the foreground is the proposed location of the Park Site #2 landing.



20: Looking easterly along the railroad embankment at the west end of the landfill.

Appendix B

Conceptual Master Plan for Arrowhead Park



January 2017

Neenah
WISCONSIN

ARROWHEAD PARK CONCEPTUAL MASTER PLAN

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- Project Goals 5
- Guiding Principles 6

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- Accessibility 10

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Acknowledgements

Mayor and Neenah City Council
Dean Kaufert, Mayor
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Cari Lendrum
William Pollnow
Marge Bates
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Christopher Kunz
Todd Stevenson
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City of Neenah Staff

Michael Kading, Director, Parks and Recreation Department
Chris Haese, Director, Community Development Department

Future Neenah, Inc.

Amy Barker, Executive Director

Consultant Team: Short Elliott Hendrickson Inc (SEH) in association with Engberg Anderson

Section 1: Executive Summary

Located at the southern end of Little Lake Butte des Morts, Arrowhead Park sits atop a 27-acre former landfill. The Arrowhead Park Conceptual Master Plan establishes a long-term vision for transforming the current site into a major destination (Figure 1).

The vision is to create a major destination with multiple recreational, educational, and visitor experiences serving a range of guests. The park will be a treasured local asset, well connected to the surrounding neighborhoods and providing unique, enriching experiences for all of Neenah's residents. As a destination attraction it will bring additional visitors to Neenah, positively impacting local businesses.

As the City and its partners work collaboratively to implement the Master Plan, decisions will be guided by the following set of guiding principles:

- Create a Great, Engaging Destination
- Build a High Quality, Enduring Park
- Embrace the Water
- Provide a Place Promoting Healthy Living
- Embrace the Natural Environment
- Leverage the Park to Encourage Investment
- Make the Park Accessible to All

The Arrowhead Park Conceptual Master Plan establishes a collection of outdoor rooms which will provide a wide range of uses and activities. Key programmatic elements of the final design include a boat works building and pier situated near the shoreline of the park, which will provide skills training, equipment rentals, and concessions.

A larger, centrally located multi-use community building is intended to provide space for a variety of larger events and programs, which may include a museum, concessions, wedding space, educational programs, or other uses. A narrow, two-lane parkway will provide access to the western edge of the park, where a long sinuous boardwalk provides fishing access and wildlife watching.

The western portion of the park includes several outdoor rooms to accommodate activities such as sledding, hiking, biking, kite flying, informal outdoor sporting events, and environmental education.

The eastern portion or the park closer to downtown provides social gathering areas which will accommodate events such as outdoor picnics, concerts, movies, and recreational event staging. It also includes a kayak pier, bicycle amenities, and an arbor/shade structure for visitors to relax under.

Figure 1 Arrowhead Park Conceptual Master Plan

Section 2: Vision, Goals, & Guiding Principles

Vision

Arrowhead Park, located at the southern end of Little Lake Butte des Morts, sits atop a 27-acre former landfill. Ever since Nathan Bergstrom proposed to the City of Neenah in 1950 that a park be developed on land created by filling in the south end of Little Lake Butte Des Morts with paper mill waste, it has been recognized as a unique location deserving of a great park. Throughout the planning process residents, downtown business owners, and elected officials emphasized the desire to create a special park providing a rich variety of experiences to visitors, including recreational and educational opportunities.

The Arrowhead Park Conceptual Master Plan (The Plan) establishes a long-term vision for transforming the current site into a major destination with multiple educational and recreational opportunities.

The Plan takes into consideration several prior studies and reflects significant public input gathered throughout the planning period from September 2016 through January 2017 including:

- Lobby & On-Line Survey
- Bergstrom-Mahler Museum
- City Staff
- Parks and Recreation Commission
- Leadership Group
- Common Council
- Business Leaders
- Public Workshop

See Appendix 'Summary of Prior Planning Efforts and Citizen Comments and Public Input' for more detail regarding the park planning process.

Project Goals

The Plan is guided by the goals established in the 2008 Little Lake Butte des Morts Park Properties Master Plan:

Goal 1: Recreational Uses and Programming. Recreational opportunities which emphasize non-motorized and non-programmed forms of recreation that are generally "passive" in nature.

Goal 2: Path Access and Connectivity. Pedestrian and bicycle connectivity between parks, public facilities, and local destinations is established through improved access, trail development, and year-round trail maintenance.

Goal 3: Dynamic and Interactive Park Amenities. The parks include "signature" features that are dynamic in their appeal and entice repeat visitation.

Goal 4: Design Standards. The standards of park and recreational facility design achieve a high level of aesthetic and functional quality.

Goal 5: Natural Environment. Ecological values and natural processes are established, enhanced, and protected through environmental restoration efforts.

Goal 6: Sustainability. Park sites are designed and managed as sustainable public venues.

Goal 7: Safe Facilities. Park sites are perceived as safe environments.

Goal 8: Park Maintenance. Maintenance of facilities, natural resources, and trail system that do not require significant long-term costs, yet are supported through appropriate levels of staffing and funding.

Goal 9: Funding. Economic sustainability and stability of parks is afforded through efficient use of financial resources.

The park is intended to be a treasured local asset, well connected to the surrounding neighborhoods and providing unique, enriching experiences for all of Neenah's residents. As a destination attraction it will also bring additional visitors to Neenah, helping support local businesses and organizations. Finally, the park will serve as a demonstration site for restoring ecological processes, creating wildlife habitat, and innovatively treating storm water. As the City and its partners work collaboratively to implement the Master Plan over time, decisions should be informed by the following guiding principles, which were developed as part of the current plan.

Guiding Principles

Create a Great, Engaging Destination

Neenah is a community with a variety of exceptional destinations and important community gathering places. Arrowhead Park should become another great gathering place, both for residents and visitors. It should be a unique destination which draws people from across the region. It should foster interaction while creating a special connection to the waterways that define the Neenah community.



Build a High Quality, Enduring Park

Residents, business leaders, and elected officials want Arrowhead Park built to a high standard. Historic downtown Neenah is a landmark among the Fox Cities, known for its well preserved buildings and vibrant commercial district. The Park should reinforce this positive image of Neenah, while reflecting the community's highest aspirations for itself. The City also has a proud history of innovation, and Arrowhead Park should embrace this history while also looking to the future.



Embrace the Water

The park should bring people down to the water, let them touch the river and get wet. It should embrace the water visually, providing opportunities for multiple vantage points from different elevations. There should be many fishing, boating, and nature observation opportunities which take advantage of the site's location adjacent Little Lake Butte Des Morts.



Promote Healthy Living

With the Loop the Lake Trail project, Neenah will become a hub for biking, walking, and exploring the waterfront. Arrowhead Park should provide additional opportunities for visitors to stay physically and spiritually healthy. A variety of outdoor rooms should provide multiple opportunities for visitors to both relax and enjoy nature, as well as recreate.



Embrace the Natural Environment

The park should be designed in such a manner that it contributes to both the rediscovery and restoration of the site including both terrestrial and aquatic habitat. Opportunities for ecological restoration should be addressed from the interior of the site across the shore land and out into the lake. The park should be designed and built to a very high environmental standard, serving as a demonstration for how to restore the natural environment.



Leverage the Park to Encourage Investment

The park should be a catalytic project which stimulates a variety of investments throughout downtown Neenah and the surrounding neighborhoods. A mix of new educational, hospitality, commercial, residential, and office uses are envisioned in and adjacent the site, strengthening the surrounding neighborhoods and extending downtown Neenah to the water's edge.



Make the Park Accessible to All

The park should be well connected and designed in such a way that it is accessible to people of all abilities. Bike and pedestrian amenities, safe access points, wayfinding, and parking should combine to make the park highly accessible to and from downtown, the surrounding neighborhoods, and the rest of the Fox Cities.



Section 3: Master Plan

Design Program

Through the design process, committee input, and public engagement process a well-defined program was developed for Arrowhead Park. The Plan includes the following programmatic elements:

1. **Provide Vehicular Access & Additional Parking**
    - Create new parking spaces (Approximately 100 more)
    - Narrow carriage road providing access to west end of park

2. **Enhance Bike & Pedestrian Circulation**
    - New multi-use trails (Approximately ½ mile)
    - Recreational trail bridge and overlook parallel to Main Street

3. **Connect Site to Downtown and Residential Fabric**
    - Multi-use trails connecting to adjacent neighborhoods
    - Pedestrian bridge access to new development bordering park

4. **Maximize Shoreline Access**
    - Floating boardwalk and fishing pier (Approximately 500 feet)
    - Two paddle craft piers
    - Paddle craft and kayak livery
    - Water access stepping stones

5. **Create Visual Connections**
    - Terraced viewing area
    - Sledding hill

6. **Create Small and Large Gathering Areas**
    - Multiple outdoor rooms with flexibility to accommodate a range of uses

7. **Create Destination Structures**
    - Boat Works building (Approximately 3,500 Square Feet)
    - Multi-Use Community building (Approximately 45,000 Square Feet)

8. **Cluster Structures to Minimize Impact**
    - Multi-use Community building located on Minergy building footprint

9. **Leverage the Park Investment**
    - Pedestrian bridges to new development opportunities
    - Realigned Mill View Drive

10. **Buffer the Rail Road**
    - Tree plantings and carriage road

In addition to developing a design program for Arrowhead Park, the consultant team was asked to identify potential strategies to incorporate green infrastructure, sustainable design, and accessibility principles into the park concept. An overview of these topics is provided below. As the Master Plan is implemented in phases, these design options should be further investigated to determine their viability.

Green Infrastructure & Sustainable Design

The green infrastructure and sustainable design opportunity framework identifies several opportunities at Arrowhead Park and adjacent Little Lake Butte Des Morts including:

- Shoreline buffers
- Vegetated bio-swales
- Improved water circulation
- Storm water collection and treatment
- LEED certified buildings

The ecological opportunities framework identifies opportunities for:

- Near shore habitat enhancements
- Shoreline buffers
- Aquatic habitat enhancements
- Terrestrial and avian habitat improvements
- Native vegetation plantings

Additional opportunities to incorporate sustainable design into the park include:

- Energy efficient lighting
- Environmental education
- Use of recycled and regionally sourced materials
- Solar energy
- Wind energy, possibly along the proposed perimeter road
- Compact development
- Brownfield remediation
- Community gardens



Figure 2 Green Infrastructure and Sustainable Design Opportunities Framework



Figure 3 Ecological Opportunities Framework

Demonstrating a variety of sustainable design techniques at Arrowhead Park to showcase innovative solutions can help repair the damage of past harmful industrial practices while telling the "story" of the site including on-going terrestrial and aquatic habitat restoration efforts.

If there is continued interest in utilizing Arrowhead Park as a showcase for sustainable design, the LEED Neighborhood Development[1], SITES Sustainable Sites program[2], and ENVISION[3] rating system each provide guidance on relevant strategies, as well certification programs designed to differentiate innovative approaches to building construction, landscape design, and infrastructure development.

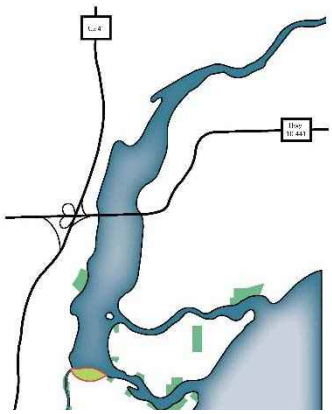


Figure 4 Arrowhead Park provides opportunities to strengthen green connections throughout the broader community

Accessibility

In addition to green infrastructure and sustainable design, accessibility was identified as a priority concern during the planning process. The Master Plan proposes several additional access points, including multi-purpose trails, a widened Mill View Drive, and overhead crossings connecting to future development south of the railroad tracks along Main Street. With completion of an additional trail bridge as part of the Loop the Little Lake Project, Arrowhead Park will become much more accessible to both residents of Doty Island and to visitors utilizing a unique trail system within the region.

In addition to new linkages to and from Arrowhead Park, this Master Plan envisions that the City will continue making its parks and waterfront areas accessible to people of all abilities as discussed in the 2015 Comprehensive Outdoor Recreation Plan. Recent accomplishments include a wheelchair lift at the Recreation Park Pool, an accessible kayak launch at Shattuck Park, and an accessible shoreline and piers at Doty, Herb & Dolly, Island, Kimberly Point, Recreation, Riverside and Shattuck Parks.

The Master Plan identifies several opportunities to enhance accessibility for all types of users including but not limited to:

- An accessible kayak launch
- New bike trail connections to adjacent neighborhoods
- Wheel chair accessible trail connections
- Accessible shoreline areas and piers
- ADA compliant buildings, play structures, and other public spaces constructed with public funding

[1] LEED for Neighborhood Development is a program of the U.S. Green Building Council, intended to promote the adoption of voluntary measures to enhance neighborhood scale sustainability.
[2] The SITES Rating System is intended for use by persons engaged in sustainable land design and development. Persons may use the material contained in the SITES v2 Rating System for the purpose of applying guidelines and performance benchmarks for sustainable land design and development.
[3] ENVISION is a sustainable infrastructure rating tool developed by the Institute for Sustainable Infrastructure.

Section 4: Arrowhead Park Master Plan

Figure 5 Arrowhead Park Conceptual Master Plan

Detailed Zonal Enlargements and Descriptions of Use

The park's key design features and uses are described on the following page. They are organized and referenced by Zones (1 through 7) as shown in the figure below. The drawings and precedent images which follow represent conceptual ideas only. As the development process moves forward, preliminary and final designs will establish what ultimately is built on the site and where.



Legend

1. Public Terrace
2A. Long Pier
2B. Paddle Craft Pier
3. Paddle Craft & Kayak Livery
4. Boardwalk/Fishing Pier
5. Neighborhood Recreational Trail
6. Recreational Trail Bridge & Overlook
7. Pedestrian Bridge Access
8. Community Building/Eating & Dining
9. Drop Off Zone
10. Terraced Viewing Area
11. Water Access Stepping Stones
12. Shade Structure
13. Programmable Community Gathering Area
14. Tree Canopy Areas
15. Boat Works Building
16. Sledding Hill
17. Gathering/Picnic Areas/Open Space
18. Neenah Historical Society
19. Gateway Plaza
20. Redevelopment Opportunities
21. Playground
22. Aesthetic Enhancements
23. Trailhead Kiosk
24. Park Entrance

Parking Areas A-D = 150 Total Spaces

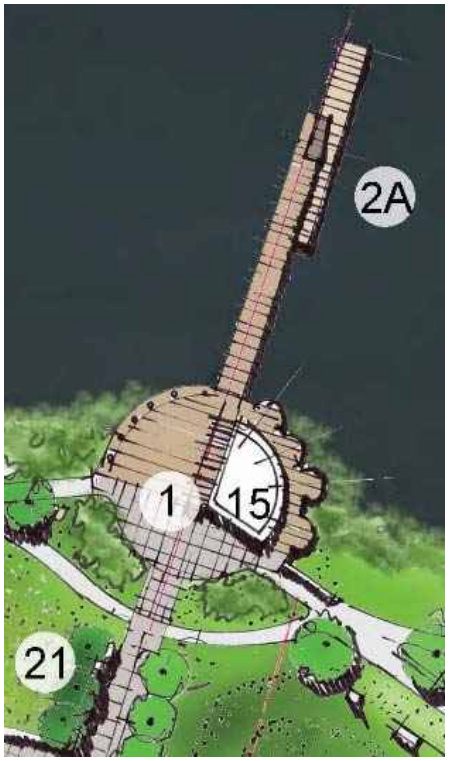
Figure 6 Zone enlargements overview diagram

Zone 1

Zone 1 is centrally located and is intended to serve as a primary destination along the park's shoreline. The area south of the shoreline development connects with the greater park, including the proposed multi-use community building. The area provides views of the lake and integrates the Loop the Lake Trail to promote regional access to these amenities. Suggested improvements include:

- A Boat Works building providing boat and equipment rentals to the public; educational and recreational classes; small concessions; bathrooms and changing area; storage space (15)
- A wood decked terrace (brown) and paved plaza (grey) providing outdoor seating and dining (1)
- A long combination fixed and floating pier, provides public recreational access for paddle craft sports, bird watching, and fishing (2A)
- A natural playground with views of the lake, located between the proposed multi-use building and boat works building (21)











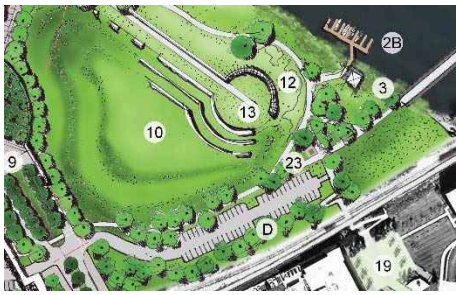




Zone 2



Zone 2 is an important gateway to the park for visitors arriving from Doty Island. It also provides a connection to downtown Neenah via an existing pedestrianized railroad crossing and Gateway Plaza. The circular shape maintains design continuity from the 2008 Master Plan and its primary function is to serve as a public gathering space. Key elements include:

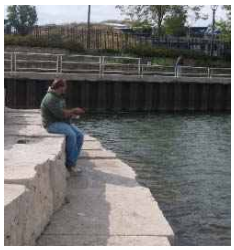


- Programmable community gathering area and natural ampitheater flexible enough to accommodate a variety of users and evolve to meet user demand over time (13)
- Shaded arbor to accommodate picnicking, relaxing, reading, as well as gatherings such as birthdays, corporate luncheons, and other group functions (12)
- An elongated lawn and long block seating walls provide a commanding view of the lake
- An accessible, six finger paddle craft pier (2B) and paddle craft and kayak livery providing seasonal boat storage for easy access to the lake (3)
- A trailhead area, including informational kiosk, wayfinding signage, bike racks, and bike fix it station (23)
- Existing parking provides spaces for both office and park users (D)











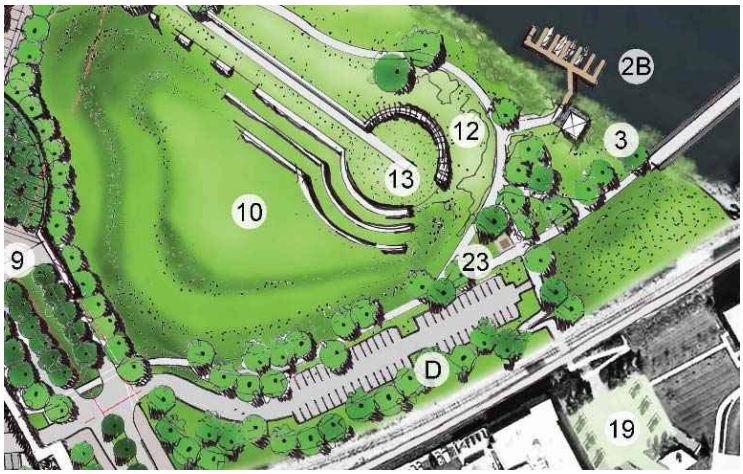




Zone 2 continued….

Zone 2 also provides a raised mound that will provide topographic relief to the flat site, sloping from higher ground nearer the railroad track to lower ground nearer the lake. Bands may set up in the lawn, while spectators use the hill to view concerts and performances. Design elements include:

- A terraced viewing area allows visitors to gain a height advantage over the lawn with views down to the lake and toward the Community Building (10)
- Large open lawn areas serve multiple uses, including as an entertainment venue, recreational event staging area, and outdoor weddings venue.















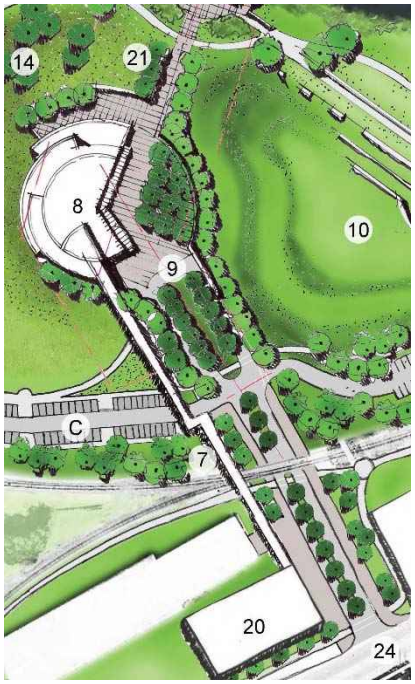


Zone 3

Zone 3 contains some of the largest physical features on the site. The primary intended use is a proposed Multi-Use Community Building, set within a public plaza. Key components include:

- A conceptual multi-use Community Building housing several different uses is located on the existing slab in order to minimize site disturbance. Slab boundaries are delinated with a faint, dashed red line on the plan. The building's entrance is oriented toward a large plaza (8)
- The conceptual building incorporates multiples uses, such as a museum, educational facilities, artist studio spaces, classrooms, meeting space, public gathering areas, and rentable venues. Food service and a rooftop viewing area contribute to Arrowhead Park's appeal as a unique destination for visitors
- Loading dock facility and service access at the southwest corner of the building
- Vehicle turn around and drop off with loading areas and emergency services access as well as 10 parallel parking spaces (9)
- 60 parking stalls on the proposed carriage road (C)
- Pedestrian bridge access to new development (20) located to south outside park boundary (7)
- A re-aligned park entrance from the intersection of Mill View Drive and Main Street (24)













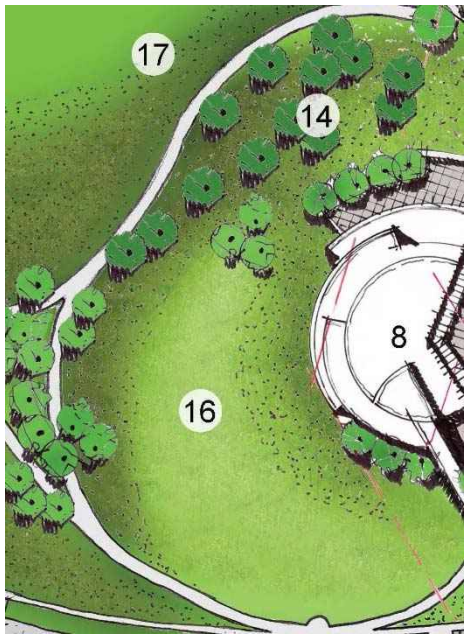


Zone 4

Zone 4 includes a large mound or earth form created to provide topographical sculpture to the site. Improvements include:

- A sledding hill, which would slope toward the new parking area (16)
- Native prairie focuses sledding activity and provides visual appeal from the new community building
- Tree canopy areas with berms less than 3 feet in height creating 4-5 foot rootball zones (14)
- A mix of both turf grass and native vegetation plantings















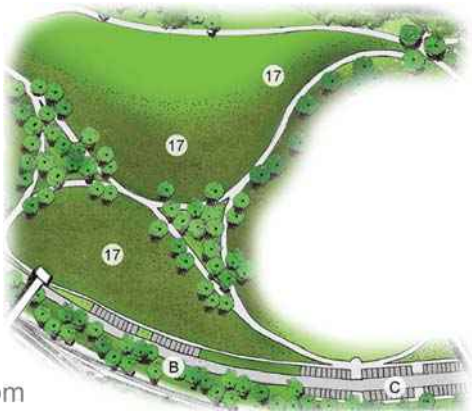
Zone 5



Zone 5 incorporates earth mounds and native plantings. Large and smaller spaces within this area can be used for a variety of activities. For example, this area could be used as an educational platform for local school children and clubs to learn about pollinators, small mammal habitat, and native prairies.

Design features include:

- Larger spaces for picnicking, sun bathing, hacky sack, kite flying, star gazing. Lighter green areas closer to the lake include turf grass, while areas closer to the railroad tracks include larger expanses of native vegetation (17)
- Space for winter activities such as snowshoeing, XC-skiing (17)
- A network of multi-use trails (17)
- Two triangular outdoor rooms, which could accommodate a small labyrinth or outdoor maze
- An elevated pedestrian walkway connecting to new development outside the park from south of the railroad tracks
- A carriage road with two 10-foot traffic lanes extending from Millview Drive to the western end of the park
- 20 parking stalls along the northern side of the carriage road (B); and 60 parking stalls along the carriage road adjacent the railroad tracks, with proximity to the sledding hill and multi-use Community Building (C)
- Lighting along the carriage road and perimeter trail system









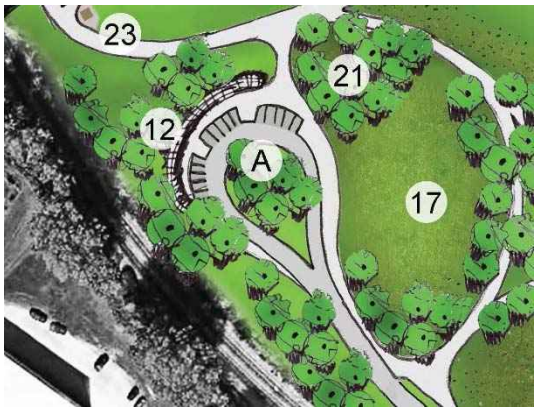



Zone 6



Zone 6 is located at the end of the proposed internal carriage road, and serves as a gateway into the park for visitors arriving from Herb and Dolly Smith Park. A key priority for Zone 6 is providing public access to the water. The site is adjacent the confluence of the Neenah Slough and Little Lake Butte Des Morts, a prime fishing area. Proposed features include:

- Vehicular and multi-modal access to fishing, nature observation, picnicking areas
- 15 parking spaces along the perimeter of the carriage road, incorporating low impact design features and views of the small playground and water (A)
- Picnicking and smaller gathering areas, including native plantings (17)
- A small playground (21)
- A shade structure which matches the Zone 1 arbor in character and materials (12)
- A trailhead kiosk and wayfinding signage serving as a gateway into the park from Herby and Dolly Smith Park (23)









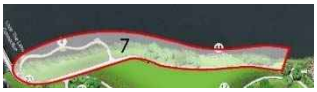








Zone 7





Zone 7 includes the entire shoreline area within the park outside Zone 1. Proposed enhancements include:

- A 500 foot long, floating sinuous boardwalk with multiple fishing piers and observation areas at the western edge of the park adjacent the Neenah slough. The boardwalk would create aquatic habitat creating environmental education and interpretation opportunities between it and the shoreline (4)
- A paddle craft and kayak livery (3)
- Multiple bird watching opportunities and seating areas along the length of the shoreline
- Water access stepping stones providing opportunities for touching the water, fishing, nature observation, and relaxation (11)
- Paddle craft pier near the eastern edge of the park – also shown in Zone 2 (2)
- Shoreline and aquatic restoration opportunities include native plantings, fish habitat improvements, bird nesting areas, and wetland restoration
- A trailhead kiosk and wayfinding signage serving as a gateway into the park from Herby and Dolly Smith Park.















Peripheral Areas

Peripheral areas located outside Arrowhead Park not included in the zone descriptions include the following:

1. Two new trail connections to the neighborhood south of the park. The proposed trails extend underneath the Main Street Bridge and provide access to the park and downtown. They incorporate a trail bridge and side paths extending into the park alongside Millview Drive (5, 6)
2. A recreational trail bridge and overlook (6)
3. Re-aligned Millview Drive, providing a stronger visual and physical connection between the park and downtown Neenah (19)
4. Four proposed redevelopment sites located along Main Street (20), two of which include pedestrian bridge access (7) directly into the park over the railroad tracks
5. Aesthetic enhancements within the railyard directly south of the park (22)



Section 5: Opinion of Probable Construction Cost

Overall Cost

The table below summarizes overall estimated costs for development of the park by major investment area. Figures do not include any improvements outside the park boundary except for Millview Drive. The approximate total project cost is $25 million. A detailed breakdown of costs by project phase is providided in the Appendix 'Preliminary Engineer's Opinion of Probable Construction Cost.'

Operational and Maintenance Impacts

In addition to the capital improvements it is important to be cognizant of the long-term financial requirements to operate and maintain the completed park to a satisfactory level.

Using figures from the 2013 Parks and Recreation National Database Report published by the National Recreation and Park Association, the estimated annual operation and maintenance cost for Arrowhead Park is $172,287.[4]

[4] Based on published figure of $6,381 per acre annual management and maintenance cost.

Section 6: Implementation Strategy

Phasing

In today's fiscal environment, successful project implementation is less straightforward than in the past. Most communities can't afford to make large capital investments without carefully aligning those investments with a multitude of funding sources and project partners. The proposed phasing strategy for developing Arrowhead Park reflects this reality. The strategy identifies four phases, including their estimated costs, major funding sources, anticipated timing, and partnership opportunities. These areas, which are depicted in the figure below, include the following major components:

PHASE 1A **Public Access, Fishing, and Shoreline Enhancements ($3.6M)**

A. Shoreline and aquatic habitat development and restoration
B. 500' long floating boardwalk; pull-up or pile supported
C. 2 terraced limestone water access points
D. 250' long solid paddle craft pier; with gangway and floating pier extension
E. 6-finger floating paddle craft pier; anchored with gangway
F. Canoe and kayak livery
G. Pile supported terrace deck connecting to pier
H. 3,500 Square Feet Boat Works Building.

PHASE 1B **Infrastructure and Circulation ($2M)**

A. Community gathering area landscaping and overhead structure (arbor or pergola)
B. Main entrance and drop off zone
C. Railroad crossing reconstruction
D. Carriage road (Bituminous) and parking
E. 6,000' paved and aggregate multi-use trails
F. Carriage road and path lighting

PHASE 2 **Interior Parkland ($2M)**

A. Wayfinding and interpretive signage
B. 2 natural playgrounds
C. 20 acres grass and natural areas
D. 150 canopy trees
E. 600' of seat wall

PHASE 3 **Destination Buildings ($17.5M)**

A. 45,000 Square Feet Multi-Use Community Building



Figure 7 Phasing Diagram for Arrowhead Park

As funding and project partners are identified, detailed design will allow the City to accurately budget for and schedule future park improvements. The table on the following page provides a general framework for near term investments, and can be used to help establish Capital Improvement Plans for Arrowhead Park. The investment framework should be considered a placeholder to be updated as additional planning and design work is completed, and as specific partnership opportunities are developed.

Partnership and Funding Opportunities

The following matrix identifies potential funding and partnerships as they relate to specific investments by phase.

Table 1 Investment Framework

Improvement Area	Costs	Major Funding	Timing
PHASE 1A Public Access, Fishing, and Shoreline Enhancements			
Fishing pier/boardwalk and aquatic habitat improvements	$1M	Natural Resource Damage Assessment (NRDA) Wisconsin Department of Natural Resources (WDNR) City of Neenah (City)	2017-2018: Planning, grant applications 2019-2020: Construction
Little Lake Butte Des Morts Lake Management Plan	$10,000-$20,000	WDNR City	2017: Grant application 2018: Plan Development
Paddle Craft Pier (East)	$100,000-$200,000	WDNR, RBF City	2018: Design 2019: Construction
Boat Works Building	$1M	Private Partners/Non-Profits City	2017: Develop partnership strategies 2018-2019: Fundraising 2020: Construction
PHASE 1B Infrastructure and Circulation			
Utilities including sewer, water, lighting, power	$1M	City	See timing for trail development and destination buildings
Carriage road and parking	$300,000	City	2017: Planning 2018: Design 2019: Construction
PHASE 2 Interior Parkland			
Community Gathering Area, Shade Structure	$100,000-$200,000	City Alice Jean Memorial Fund (If applicable)	2017: Design 2018: Construction
Multi-use trails	$300,000-$400,000	WDNR Wisconsin Department of Transportation (WisDOT) City	2017: Grant writing 2018-2019: Design & Construction
Trail Amenities including wayfinding, service mapping	$100,000	On-going funding through Loop the Lake Project City Private Businesses	2017: Fundraising 2018: Design and construction
Signage, site furniture, playgrounds, natural areas	$1M-$1.5M	Existing WDNR Grant Dollars City	2017-2018: Planning, grant applications 2019: Construction
PHASE 3 Destination Buildings			
Community Building	$11M +	Private Partners/Non-Profits City	2017: Develop partnership strategies 2018-2020: Fundraising 2021: Construction

Partnership Strategies

Partnerships have been critical to the success of many projects in Neenah, including but not limited to recent efforts brought forward under the umbrella of Navigate Neenah-Menasha. Building off of the success of the Loop the Lake initiative, this Plan recommends three major partnership opportunities be pursued in order to accelerate development of Arrowhead Park. The first is the park itself, including but not limited to trails, playground areas, pedestrian furnishings, fishing, and boating access to the water. The second major partnership opportunity is the Multi-Use Community Building. The third is the Boat Works building. This Plan recommends a three step approach for identifying and developing partnerships.

Step 1: Compile background information into a succinct document

The City should compile relevant background documentation into a single document, available as a PDF to facilitate sharing among potential partners. The document should include items such as the existing known environmental constraints on the site, the Arrowhead Park Conceptual Master Plan, and the WDNR's comments on the draft Arrowhead Park Conceptual Master Plan.

Step 2: Develop a task force to explore partnership opportunities

The City should establish a small task force of City staff, elected officials, and public partners to explore partnership opportunities. A preliminary list of potential partner organizations incudes:

- A Friends of Arrowhead Park Group
- Future Neenah
- Bergstrom-Mahler Museum
- Local Boating Groups
- Neenah Joint School District
- Other Educational Organizations
- Fox Cities Greenways Inc
- Sierra Club, Wisconsin John Muir Chapter
- Fox Cities Convention and Visitors Bureau
- University of Wisconsin System
- Wisconsin Department of Natural Resources
- US Fish and Wildlife Service

A communications plan should be developed to inform staff, elected officials, and the broader public of the partnership strategy and how it will be implemented.

Step 3: Partnership development

The groundwork for partnership opportunities should be laid in 2017, with a goal of having specific partnership opportunities defined by the end of the year.

The figure on the following page lists major relevant grant funding opportunities for developing Arrowhead Park. The Appendix 'Summary of Grant Funding Opportunities' provides more detail for each program, including agency, program description, match requirements, funding cycle, and contact information.

	Program Name	Agency/Organization
1	Community Development Investment Grant (CDIG)	Wisconsin Economic Development Corporation
2	Natural Resource Damage Assessment (NRDA) Program	Settlement funding from Fox River contamination
3	Transportation Alternatives Program (TAP) Funding	WisDOT
4	Sports Fishing Restoration (SFR)	WDNR (Federal Dollars)
5	Recreational Boating Facilities (RBF)	WDNR (State Dollars)
6	WDNR Knowles-Nelson Stewardship Program AALP	WDNR
7	WDNR Knowles-Nelson Stewardship Program UGS	WDNR
8	WDNR Knowles-Nelson Stewardship Program URGP	WDNR
9	WDNR Knowles-Nelson Stewardship Program LAWCON	WDNR
10	Congestion Mitigation and Air Quality Improvement Program. (CMAQ).	WisDOT
11	Urban Nonpoint Source and Storm Water Management Grant Program (UNPS & SW)	WDNR
12	Joint Effort Marketing (JEM) Grant Program	Wisconsin Department of Tourism
13	Kodak American Greenways	Eastman Kodak Company & National Geographic
14	Boating Infrastructure Grant	WDNR
15	Migratory Bird Conservancy	National Fish and Wildlife Foundation
16	Municipal Flood Control	Wisconsin Department of Natural Resources
17	North American Wetlands Conservation Act	U.S. Fish & Wildlife Service
18	NFWF General Matching Grants Program	National Fish and Wildlife Foundation
19	Recreational Trails Aids (RTA) Program	WDNR
20	American Hiking Society – National Trails Fund	Privately supported, national grants program
21	People for Bikes Community Grant Program	Funding for projects that leverage federal funding,
22	Fox Cities Greenways	Non-Profit dedicated to fostering preservation and
23	Trail Grants	Fox Cities Convention and Visitors Bureau
24	Environmental Grants	Community Foundation of the Greater Fox Valley
25	WE Energies Foundation	WE Energies
26	Aquatic Invasive Species (AIS) Control Grant	WDNR
27	Lake/River Planning and Protection Grants	WDNR

Figure 8 Summary of Grant Funding Opportunities

Regulatory and Permitting Considerations

In 1951 the State Legislature granted the City of Neenah, through legislative act, permission to fill in the bed of Little Lake Butte des Morts for a "public purpose." Despite the passage of time and subsequent filling of the land, the 1951 Wisconsin Act 52 continues to apply. The filled lakebed must therefore be used for a "public purpose" and the Wisconsin DNR is obligated to review future plans for Arrowhead Park to verify that the use meets the following criteria:

- A public body must control use of any buildings on site;
- All areas and building(s) must be devoted to public purposes and must be open to the public;
- The reduction in the area of the lake resulting from construction of the building must be very small;
- No public use of the lake can either be destroyed or greatly impaired by construction of the building;
- The loss of the public's ability to use the area of the building for "traditional" public rights in navigable waters (the rights to navigate, fish, swim, etc…) must be substantially outweighed by the benefits tht would accrue to the public using the buiding.

For additional discussion of the public trust doctrine see Appendices 'Environmental Challenges and Opportunities' and 'WDNR Comments on Draft Conceptual Master Plan.'

In addition to meeting the regulatory requirements of the public trust doctrine, permitting requirements will be determined as the City decides to implement specific construction projects. Key issues and environmental impacts include but are not limited to landfill impacts, stormwater management, sustainable design features, water quality, and grading.

As a former landfill, future development on Arrowhead Park may also require building exemptions. The DNR's Remediation and Redevelopment and Waste and Materials Management programs have jointly developed a process and guidance for development on historic fill sites, which is available on their website.

Let's Get Started!

The importance of any successful initiative is to identify early demonstration projects which through their implementation create momentum and lead to successful long-term completion of the vision. The following action items will maintain the initiative and should be promoted as a priority in 2017:

1. **Establish an overall Implementation Team, representing a mix of public, private, and non-profit partners with a strong interest in seeing Arrowhead Park come to fruition.**

2. **Prioritize and budget for capital improvement activities in 2018 and beyond.**

3. **Identify and meet with potential partners to identify areas of mutual interest and benefit.**

4. **Continue to meeet with the WDNR and other funding and regulatory staff to discuss the Plan**. Early discussions will help the City avoid unforeseen requirements and strategically align its resources to maximize its potential use of outside funding for plan implementation..See Appendices for WDNR comments on the draft conceptual master plan.



Appendices

Planning Process

Summary of Prior Planning Efforts

Citizen Comments and Public Input

Documentation of Meeting Summaries

Programming Ideas Summary

Conceptual Alternatives (3)

WDNR Comments on Draft Conceptual Master Plan

Site Analysis

Environmental Challenges and Opportunities

Existing and Future Land Use Diagrams

Connectivity Diagrams

Circulation Diagrams

Opportunities and Challenges Diagram

Summary of Grant Funding Opportunities

Preliminary Engineer's Opinion of Probable Construction Cost

Appendix C

Photographs



Photo 1 Arrowhead Park Paved Trail Entrance



Photo 2 Arrowhead Park Millview Road Entrance



Photo 3 Arrowhead Park Paved Trail



Photo 4: Arrowhead Park Parking Lot



Photo 5 Arrowhead Park Vegetation



Photo 6 Arrowhead Park Vegetation



Photo 7 Arrowhead Park West Depression Area



Photo 8 Arrowhead Park West Rail Area



Photo 9 Arrowhead Park Filling Activities



Photo 10 Arrowhead Park Fill Pile



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Sustainable buildings, sound infrastructure, safe transportation systems, clean water, renewable energy and a balanced environment. Building a Better World for All of Us communicates a companywide commitment to act in the best interests of our clients and the world around us.

We're confident in our ability to balance these requirements.

SEH