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Plans and Specifications
Focused NAPL and Sediment Removal Action
Former Marinette MGP Site
City of Marinette, Marinette County, WI
Revision 1

September 7, 2012
NRT Project Number: 2098

NATURAL RESOURCE TECHNOLOGY

ENVIRONMENTAL CONSULTANTS

TABLE OF CONTENTS

Appendices

Drawings

END OF SECTION

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01001
SPECIFICATION DATA SHEET

SPECIFICATION TITLE: Focused NAPL and Sediment Removal Action
Former Marinette MGP Site
Wisconsin Public Service Corporation
City of Marinette, Marinette County, Wisconsin

REVISION NO.: 0

DATE: August 30, 2012

WISCONSIN PUBLIC SERVICE CORPORATION/
INTEGRYS BUSINESS SUPPORT, LLC

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NATURAL RESOURCE TECHNOLOGY, INC. (NRT)

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OVERVIEW OF WORK:

This sediment removal action will consist of mechanical dredging/excavation, sediment stabilization, transportation, and off-site disposal of non-aqueous phase liquid (NAPL) and polycyclic aromatic hydrocarbon (PAH) contaminated sediments (Appendix A) in and along the shoreline of the Menominee River. Coincident activities will consist of installation of a temporary sheet pile cofferdam around the dredging area, MGP contact water management, backfill of dredge areas, construction of a new sanitary and storm sewer outfall structure and sheet pile cutoff wall, and protection and/or restoration of existing site features.

END OF SECTION

SECTION 01010
SUMMARY OF WORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Definitions

B. Location of Project

C. Project Information

D. Work Covered by Contract Documents

E. Work by Company

F. Access to Site

G. Work Restrictions

H. Specification and Drawing Conventions

I. Safety Precautions and Programs

1.02 DEFINITIONS

A. Company: Wisconsin Public Service Corporation.

B. Owner: City of Marinette.

C. Engineer: Natural Resource Technology, Inc. (NRT).

D. Contractor: The Contractor performing the Work described herein.

E. Construction Quality Assurance (CQA) Engineer: NRT.

F. Contract Drawings: Set of construction drawings titled, “Focused NAPL and Sediment Removal Action, Former Marinette MGP Site, Wisconsin Public Service Corporation, Marinette, Wisconsin.”

G. Specifications: Technical specifications of which this is the first Section.

H. Work: All labor, supplies, and materials for completing remedy construction, as shown and specified.

I. Site: As shown on Contract Drawings.

1.03 LOCATION OF PROJECT

A. City of Marinette's Boom Landing Boat Launch; 480 Mann Street, Marinette, Wisconsin

1.04 PROJECT INFORMATION

A. Work of this Contract comprises dredging sediment contaminated with NAPL and PAHs. Items required to complete the Work generally include, but are not limited to: temporary sheet pile cofferdam installation and removal, dredging, sediment stabilization and transportation to the approved landfill for disposal, backfill placement, contact water management, odor control, storm water management, and site restoration.

The Company has established access to the City of Marinette's Boom Landing Boat Launch, located immediately adjacent to the largest dredge area, to serve as an upland support area for the removal action. Use of this property shall be in accordance with the associated access agreement (Appendix B).

Due to the presence and pervasive nature of wood debris in the sediment, dredging is anticipated to be accomplished by mechanical methods.

Sediment dredging and backfill activities shall be performed with the least amount of environmental impact as practicable. Sediments will likely become suspended during remedial work and will require one or more best management practices (BMP) to control sediment transport and protect aquatic habitat. The area adjacent to the boat launch, impacted with NAPL, requires installation of a temporary cofferdam as a BMP, as specified in Appendix C. The area adjacent to Nestegg Marine (adjacent property to the west) requires use of silt curtain.

Two sewer outfalls, a 30-inch diameter storm sewer and a 48-inch diameter sanitary effluent discharge pipe, discharge into the river in the dredge area just west of the boat landing. These sewer outfalls shall be bypassed around the area contained by the temporary cofferdam until the cofferdam is removed and a new outfall structure is constructed as part of this project. The new outfall structure includes a section of buried sheet pile cutoff wall extending to the boat ramp.

Existing shoreline structures in the dredge areas shall be protected during dredging. This shall be accomplished through deliberate sequencing of dredging within a specified distance from the structures (Appendix C).

Excavated contaminated materials shall be disposed off-site at Waste Management's Menonimee Landfill in Menominee, Michigan. Soil and sediment shall be dewatered and stabilized, as necessary, prior to being loaded into trucks and transported to the landfill. Dredging activities shall be sequenced and carefully monitored to contain sediment materials during dewatering, staging, and transport.

Contact water generated during dredging/dewatering activities shall be collected, treated and monitored in accordance with substantive Wisconsin Pollution Discharge Elimination System (WPDES) requirements prior to discharge into the Menominee River (Appendix D).

Following dredging, a 6-inch sand layer shall be placed over dredged as areas in

accordance with the requirements of the CQAPP (Appendix F). In addition, the dredge areas shall be partially backfilled (to support shorelines and shoreline structures). Sand and backfill shall be imported by the contractor.

Following backfill activities, a new outfall structure and sheet pile wall shall be constructed (Appendix E).

B. Project Schedule

Bid Document Issuance	Friday, August 31, 2012
Mandatory Pre-Bid Conference	Monday, September 10, 2012 (1:00 PM local time)
Bid Submittal	Monday, September 17, 2012 (4:00 PM local time)
Contract Award	Monday, September 24, 2012
Mobilization	Monday, October 1, 2012
Removal Action Substantially Completed (including removal of temporary sheet pile cofferdam)	December 31, 2012
Site Restoration Completed	Summer 2013

1.05 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of the Project is defined by the Contract Documents and consists of the following:

1. Mobilization and Demobilization: as specified in Contract Documents, including, but not limited to, the following activities:

a. Mobilization of all labor, equipment, materials, and other incidentals to and from the Site, including procurement of materials, and preparation of Contractor's Removal Action Work Plan described in the Contract Documents. Included are preparing and providing submittals, maintaining the quality of materials and workmanship, and implementing a site specific health and safety program. Also includes maintenance of site access roads where Contractor's work force or vehicles cause damage.

b. Demobilization of all Contractor construction and marine-support equipment, job trailers and temporary utilities, temporary erosion controls, trash, and miscellaneous construction materials from the site. Also included are cleaning/decontamination of Contractor equipment and removal from the site. Surplus construction materials shall be salvaged by Contractor, transported to the Company's designated location, or disposed of as construction debris, as directed by the Company.

2. Site Preparation: as specified in the Contract Documents, including but not limited to the following activities:

a. Furnish, install, inspect, and maintain temporary upland sediment and erosion controls, including tracking pad.

b. Provide job trailers and utilities.

c. Provide temporary chain-link fence as necessary to secure and delineate the Work area.

d. Construct and maintain an upland support area.

e. Implement measures to protect of utilities, structures, subsurface features, facilities, and environment.

f. Construction of an upland sediment stabilization area, if needed.

g. Construct and maintain a temporary decontamination area for personnel and construction equipment, as needed.

h. Temporary removal of boat docks in work area as necessary to facilitate work and related coordination of storage with owner(s) and reinstallation upon completion of work.

i. Removal of existing riprap materials along the shoreline, as necessary to facilitate work, and temporary stockpiling of these materials for later reuse during restoration activities.

3. Clearing and Grubbing: as specified in the Contract Documents.

4. Storm and Sanitary Sewer Bypass System: as specified in the Contract Documents, including, but not limited to, the following activities:

   a. Provide and operate a bypass system capable of transferring the peak discharge rate of flow (refer to drawings) from the two sewer outfalls to a discharge point located outside of the Temporary Cofferdam.

5. Temporary Cofferdam: as specified in the Contract Documents (Appendix C), including but not limited to the following activities:

   a. Pre-excavation of wood debris in the sediment within the cofferdam alignment as necessary to facilitate installation of the cofferdam.

      i. Includes removal from river and management/handling in roll-off boxes or other containers on shore provided by Company.

   b. Furnish, install, and maintain a temporary cofferdam during excavation/dredging of NAPL contaminated sediments, including navigational warnings (e.g., lights, signs and/or buoys).

   c. Remove and demobilize cofferdam when dredging and backfill is complete.

6. Contact Water Management: as specified in the Contract Documents, including but not limited to the following activities:

    a. Furnish, install, operate, and maintain a Contact Water Management System, including conveyance piping, storage tanks, treatment devices, etc. for treatment and discharge of contact water. Also included is removal of NAPL and sheen from MGP contact water.

    b. The Contact Water Management System will generally consist of, but is not limited to, the following:

        i. Mixing tank(s) with clarifier(s)

        ii. Mixed media sand filter(s)

        iii. Granular activated carbon filter(s)

        iv. Holding tank(s)

        v. Flow meter and sampling ports

    c. Provide continuous operation when necessary.

7. Mechanical Dredging: as specified in the Contract Documents, including but not limited to the following activities:

    a. Conduct pre-removal action bathymetric survey to establish baseline for quantifying dredge volumes for measurement and payment purposes, and submittal of related data to Engineer.

    b. For dredge areas outside cofferdam, provide, install, and maintain turbidity barrier(s) during excavation, dredging, and residual sand layer placement activities.

        i. Dredging equipment shall utilize a silt curtain with full-depth skirt that encompasses the dredge envelope.

    c. Provide oil boom for controlling releases of NAPL from dredging activities, and management/collection/conveyance of released NAPL.

    d. Dredge impacted sediment to the elevations specified on the Contract Drawings.

        i. Sequence dredging along shoreline structures as indicated in Appendix C.

        ii. A 6-inch over-dredge allowance is provided. Contractor will not be compensated for dredging beyond (deeper) than the over-dredge allowance, and associated disposal costs paid by Company will be deducted from Contractor invoices.

iii. Dredging will not be considered complete until at least 90% of the dredge area has achieved the elevations specified on the Contract Drawings.

iv. Engineer's post-dredge confirmation sampling results may require additional dredging beyond the elevations specified on the Contract Drawings.

e. Conduct progress surveys to adequately control the work within the construction limits.

f. Surveying the completed sediment dredge areas to verify completion and establish pay quantities.

8. Management of Debris: includes removal from river and management/handling in roll-off boxes or other containers on shore provided by Company.

9. Sediment Stabilization: as specified in the Contract Documents, including but not limited to the following activities:

a. Provide and apply sediment stabilization additive as necessary to meet the requirements of the disposal facility.

10. VOC and Odor Control: as specified in the Contract Documents, including but not limited to the following activities:

a. Provide and apply as necessary to control dust, odors, and VOC's from dredged materials.

b. Provide and operate portable outdoor misting systems to efficiently atomize odor neutralizer across the Work area and control dust and odor from dredged materials.

11. Loading and Transporting Stabilized Sediment to Landfill: as specified in the Contract Documents, including but not limited to the following activities:

a. Load and haul sediment to Waste Management's Menominee Landfill in Menominee, Michigan.

b. Provide locking tail gates for securing the loads during transport and automatic truck tarps.

c. Prevent tracking of materials off site. Monitor and clean streets regularly.

12. Residual Sand Layer (Min. 6" Thick): as specified in the Contract Documents, including but not limited to the following activities:

a. Provide and place sand in dredge areas following verification by Engineer that dredging has been completed (accomplished through sampling and demonstrated visually for NAPL dredging, or by laboratory analysis of samples for PAH dredging).

b. Quantities above the over-placement allowance (as measured by bulk quantity of material over area requiring sand layer, including over-placement allowance) will not be compensated.

13. Backfill: Provide and place clean backfill soil as necessary to achieve elevations indicated on Contract Drawings.

    a. Provide Reactive Core Mat as directed by the Engineer.

14. New Outfall Structure: as specified in the Contract Documents, including but not limited to the following activities:

    a. Provide and install a permanent sheet pile cutoff wall as shown on the Contract Drawings.

    b. Provide and construct concrete collars for outfall pipes.

    c. Provide and place granular fill around new structure.

    d. Provide and place riprap apron as shown on the Contract Drawings.

15. Site Restoration: as specified in the Contract Documents, including but not limited to the following activities:

    a. Replacement of salvaged riprap on shoreline and import and placement of supplemental riprap as needed.

    b. Removal and disposal of materials imported to site by Contractor for site preparation activities (e.g., earth fill, asphalt, liner materials, etc.). Transportation and landfill tipping fees for these materials are the responsibility of the Contractor and shall not be compensated under any other pay item.

    c. Removal and disposal of upland soils impacted by project, as determined by pre-construction and post-construction sampling and analytical testing performed and/or coordinated by Engineer. Transportation and landfill tipping fees for these materials are the responsibility of the Contractor and shall not be compensated under any other pay item. Contractor shall also be responsible for import and placement of topsoil to return impacted soil removal areas to pre-construction elevations.

    d. Topsoil, seed, and mulch areas disturbed during remediation.

    e. Replace any trees removed or damaged during remedial work.

    f. Replace any damaged signs, buildings, utilities, pavement, or any other site feature damaged during remediation.

    g. Restoration of public roads where Contractor's work force or vehicles cause damage.

16. Replacement of Asphalt Pavement: as specified in the Contract Documents, including but not limited to the following activities:

    a. Remove the full depth of existing asphalt pavement and transport to a recycling facility.

    b. Grade, supplement, and compact the underlying base course as needed.

    c. Furnish and place new asphalt pavement to the pre-construction line and grade.

B. It shall be the Contractor's responsibility to obtain complete information as to the field work involved in the removal action in order to submit a complete and comprehensive Bid. Under no circumstances shall the Contractor make any claims for any additional expenses incurred due to his failure to obtain a complete understanding of the detailed scope of work involved during the bid period, after award, or after the Work is in progress. The summary of work described above is an overall summary of work to be performed and is the responsibility of the Contractor. It does not supersede specific requirements of other Contract Documents.

C. Type of Contract

1. Project will be executed under a single prime contract.

1.06 WORK BY COMPANY

A. Work to be performed by the Company, or Company's designated representatives (e.g., Engineer), is as follows:

1. Construction observation and construction quality assurance (CQA) activities, observation of installation of the temporary sheet pile cofferdam ,turbidity monitoring, water treatment sampling and analyses to confirm effluent limitations for contact water treatment have been met, post-dredging/excavation sediment sampling and analyses to confirm cleanup goals have been achieved, observation of backfill activities, observation of construction of the new outfall structure, observation of site restoration activities, and observation of asphalt pavement replacement.

2. Optical survey of existing shoreline structures during dredging and backfill activities.

3. Air monitoring.

4. Public relations.

5. Identification of substantive permit requirements for the Work.

6. Direct payment of disposal facility tipping fees.

1.07 ACCESS TO SITE

A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Use of Site:

1. Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

2. The Contractor must satisfy himself by personal examination of the site as to all local conditions affecting the performance of this contract. The Contractor is deemed to accept such conditions as found to exist.

3. Confine operations to areas within Contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.

4. Coordinate use of premises under direction of Company.

5. Assume full responsibility for protection and safekeeping of materials and equipment under this Contract.

6. Protection and repair of existing facilities and utilities: Contractor shall perform operations carefully and in such a manner as to protect existing facilities and utilities. Obstructions not shown on the Drawings may exist and shall be exposed by Contractor without damage. Contractor shall be responsible for damages to existing facilities and utilities resulting from Contractor's operations and shall repair or replace damaged items to Company's and/or Owner's satisfaction.

C. Work on Properties Owned by Others:

1. Contractor shall be familiar with City's property boundaries and those of the adjacent properties in the Site where work is to be conducted.

2. Work on property owned by others will be in compliance with applicable access agreements, copies of any obtained access agreements will be supplied by Company. Agreements entered by Contractor shall be provided to the Company for information.

3. Storage of materials or equipment on property owned by others is not allowed unless as authorized by an access agreement.

4. Notify and receive advance approval of the Engineer of need to remove or disturb materials not addressed by these Contract Documents.

1.08 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work to the hours of 7 A.M. to 7 P.M. local time, Monday through Friday, except for emergencies or as approved by the Company in writing.

C. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other nuisances.

D. Smoking is not permitted within 25 feet of entrances, operable windows, or outdoor air intakes.

E. Controlled Substances: Use of tobacco products and other controlled substances within the work area is not permitted.

F. Employee Screening: Comply with Company's requirements regarding drug and background screening of Contractor personnel working on the Project site.

1.09 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

2. The term “provide” or “provided” shall mean, “furnish and install in place.”

B. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.

2. Abbreviations: Materials and products are identified by abbreviations.

3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

1.10 SAFETY PRECAUTIONS AND PROGRAMS

A. The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

B. The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to:

1. Employees on the Work and other persons who may be affected thereby

2. The Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Subcontractor or the Contractor's Subcontractors

3. Other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

C. The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

D. The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying Owners and users of adjacent sites and utilities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01040
PROJECT ADMINISTRATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Contractor Supervision and Subcontracted Work

B. Submittals

C. Project Meetings

D. Construction Schedule

E. Work Hours and Coordination

F. Reports

1.02 CONTRACTOR SUPERVISION AND SUBCONTRACTED WORK

A. Designate one superintendent or foreman to be on site continuously during working hours from start to finish of project. The designated superintendent/foreman shall be the primary contact with the Company and the Engineer and shall be responsible for all negotiated change orders. In the event of a proposed change in supervisory staff, the Company and Engineer shall be provided a minimum of two-weeks-notice prior to Contractor making the change. If Contractor changes superintendent or foreman designated for the project, Contractor shall make transition seamless to avoid lost work.

B. Use an adequate number of skilled workers who are thoroughly trained and experienced in necessary crafts and who are completely familiar with specified requirements and methods needed for performance of Work.

C. Use experienced professional personnel for that work which requires judgment, knowledge, and expertise of qualified professionals and who are familiar with all aspects of Work.

D. Contractor's superintendent/foreman shall maintain communication between subcontracted personnel and retained personnel, and shall be on site when subcontractors are on site performing work.

E. Contractor shall direct and supervise all Subcontractors.

1.03 SUBMITTALS

A. As required in accordance with this Section, Section 01330, and Table 1.

B. Contractor shall submit with Bid a proposed Construction Schedule prepared in accordance with Part 1.05A.

C. Contractor shall submit with Bid a Schedule of Values.

D. Contractor shall submit unit rates for construction personal and equipment to be used on site that may be used during the event of a contract modification.

1. Equipment brought on site, not originally intended to be used apart from the contract modification, needs to have prior approval by Engineer.

E. Contractor shall submit with Bid the names and roles of all Subcontractors who will be performing any work.

F. Contractor shall submit to Engineer as part of Removal Action Work Plan within 14 days following Notice to Proceed:

1. Name and phone number of the designated site superintendent/foreman.

2. An updated copy of the Construction Schedule submitted with Bid (Baseline Schedule).

G. Contractor shall submit one updated copy of Progress Schedule (Part 1.05B) to the Engineer at least weekly.

1. Failure to submit Baseline Schedule or subsequent Progress Schedules shall be considered cause for withholding any partial payments due or that may become due under Contract, in accordance with General Conditions.

H. Submit weekly report (Part 1.07A) to Engineer one work day prior to regularly scheduled progress meeting; the weekly report shall include, among other things, schedule updates in narrative form.

I. Submit the following reports to Engineer upon occurrence:

1. Accident Reports

2. Work Stoppage/Dispute Records

1.04 PROJECT MEETINGS

A. A pre-construction meeting will be conducted by the Company and the Engineer. Contractor shall schedule meeting and submit before the meeting all submittals required prior to the project start. Meeting shall be held at the site unless otherwise announced. At a minimum, the following personnel shall attend: Contractor, including designated site superintendent/foreman, Company, and Engineer. Purpose for meeting is:

1. Review work scope and schedule.

2. Review status of submittals required to be transmitted prior to project commencement.

3. Discuss Contractor's Removal Action Work Plan, construction sequencing and staging, and schedule.

4. Discuss project administration and lines of communication prior to start of work.

5. Schedule weekly progress meetings.

6. Discuss the coordination and scheduling of each major element of the project construction to include, but not be limited to:

    a. Contractor mobilization

    b. Site preparation, including establishment of erosion and sediment controls, clearing and grubbing, set up of contact water treatment system and sediment stabilization pad, if needed, and temporary bypass of sewer outfalls

    c. Installation of temporary sheet pile cofferdam

    d. Mechanical dredging, including stabilization and transportation of sediment to the specified off-site disposal facility, treatment of MGP contact water, QA surveys, and any required sequencing to protect existing shoreline structures

    e. Placement of residual sand layer and backfill over resulting dredge areas

    f. Construction of the new outfall structure and sheet pile cutoff wall

    g. Site restoration, including removal and replacement of asphalt pavement, and Contractor demobilization

B. The Company and the Engineer will conduct weekly progress meetings at the site unless otherwise announced for the purpose of coordinating and observing Work. All parties at the pre-construction meeting will agree upon the day of week and time for these meetings. Contractor, and requested subcontractors, shall be in attendance at weekly progress meetings. Company, Engineer, and other parties notified by the Company will also be in attendance.

C. Company and Engineer will conduct a substantial completion inspection meeting for the purpose of confirming that the Work is complete and consistent with the Contract Documents. Meeting will be scheduled when Contractor has submitted written certification to Company that the Contract Documents have been reviewed, Work has been inspected and that Work is Substantially Complete in accordance with Contract Documents and ready for Engineer's observation (Section 01770).

D. Company and Engineer will conduct a final completion inspection meeting for the purpose of confirming that the Work is complete and consistent with the Contract Documents. Meeting will be scheduled when Contractor has submitted written certification to Company that punch list items identified during and subsequent to the substantial completion inspection have been completed and are ready for Engineer's observation (Section 01770).

E. A principal member of Contractor's staff, authorized to make decisions on his behalf, shall represent Contractor at each meeting. Company and/or Engineer may direct certain

subcontractors to attend meetings as needed. Failure to attend a meeting does not relieve Contractor from acting on contents of meetings.

F. Engineer will record meeting minutes and distribute to all parties in attendance or affected by meeting discussion prior to the next meeting.

G. Special meetings may be called at discretion of the Company or Engineer for purpose of resolving problems or other purposes concerning Work. Attendance at special meetings is mandatory for Contractor, subcontractors, or other parties notified by Company or Engineer to attend.

1.05 CONSTRUCTION SCHEDULE

A. Contractor shall prepare a Construction Schedule that is time-scaled and shows work activities, including sequences of performance and interdependency. Each activity shall be labeled and include an estimated duration in working days. Construction Schedule shall comply with required contract completion date stated in Contract Documents and any work restrictions, including restrictions on days or hours of work. Baseline Schedule shall be reviewed at pre-construction meeting.

B. The Contractor shall update the Baseline Schedule weekly during construction to indicate actual progress in percent completion for each activity. This updated schedule is termed “Progress Schedule.” In addition to indicating actual progress, the Progress Schedule shall also indicate any changes in completion times or dates for any of activities shown on previous version, and include a brief written description of any revisions from the previous version, the effects of these revisions upon remaining Work and schedule, and corrective actions taken or proposed by Contractor.

C. Company and/or Engineer shall review the Contractor's Baseline and Progress Schedules. Comments made by Company and/or Engineer on Schedule, lack of such comments, acceptance, or rejection of Contractor's Schedule does not relieve Contractor from compliance with Contract Documents, nor create any responsibility or duty for scheduling owed from Company and/or Engineer to Contractor. This review, whether accompanied by comments, rejection, or neither, is only for general conformance with information provided in the Contract Documents.

D. Any contingency within Schedule (i.e., a difference in time between project's early completion and required completion dates and float in Schedule) will belong to Project and not any parties to Contract.

E. Contractor shall furnish material and labor at proper time and in sufficient quantities to correspond with actual job progress whether or not such actual progress is in conformance with Progress Schedules.

F. Should Contractor fail to adhere to the Baseline or Progress Schedules, Contractor shall promptly develop and implement measures to regain conformance with such schedules, at no additional cost to Company. Addition of equipment or construction forces, increase in working hours, or any other method, manner or procedure to return to Schedule shall not be considered justification for a request for additional compensation or treated as an acceleration order. If, in opinion of the Company, methods prove unsuccessful in

compensating for lost time, Company shall have right to pursue remedies, as described in Agreement and General Conditions of Contract Documents.

1.06 WORK HOURS AND COORDINATION

A. Contractor shall perform Work within a regular work week of twelve hours per day, Monday through Friday. Working hours will be 7:00 AM to 7:00 PM. If requested in advance, Saturday work and hours may be approved by the Company after Company consultation with the City of Marinette.

B. Work that causes elevated noise levels may only be performed during the hours of 7:00 AM to 7:00 PM, Monday through Friday.

C. Contractor shall keep the Company and Engineer informed, at reasonable time in advance or as required by Contract Documents, of times and places where work is to be done, so that any checking or oversight deemed necessary may be done with minimum inconvenience to the Company and Engineer.

1.07 REPORTS

A. Contractor shall prepare a progress report each week that shall include following:

1. A brief description of work completed that particular week, including quantities, volumes, and estimate of percentage of completion for each work item.

2. Erosion control inspection records.

3. A list of work anticipated and/or scheduled for the following week, including quantities and volumes.

4. A list and number of supervision and craft people on site by craft.

5. A review of conditions affecting execution of work, including encountered or anticipated problem areas, including schedule delays and causes, and proposed solutions to problems.

B. Contractor shall be required to prepare the following special reports as necessary:

1. Accident Reports immediately after accidents occur.

2. Work Stoppage/Dispute Records as they occur.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01230
ALTERNATES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.02 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the base bid amount if Company decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.

2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.03 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Execute accepted alternates under the same conditions as other work of the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 SCHEDULE OF ALTERNATES

A. As indicated on the Bid Form

END OF SECTION

SECTION 01250
CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.02 MINOR CHANGES IN THE WORK

A. Engineer will issue Field Order authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.03 PROPOSAL REQUESTS

A. Company-Initiated Proposal Requests: Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by Engineer are not instructions either to stop work in progress or to execute the proposed change.

2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

a. Include a list of quantities of products required or eliminated and contracted unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data (or other acceptable field measurements) to substantiate quantities.

b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

c. Include costs of labor and supervision directly attributable to the change.

d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

e. Quotation Form: Use forms acceptable to Engineer.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Engineer.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.

2. Include a list of quantities of products required or eliminated and contracted unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

4. Include costs of labor and supervision directly attributable to the change.

5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

6. Proposal Request Form: Use form acceptable to Engineer.

1.04 CHANGE ORDER PROCEDURES

A. On Company's approval of a Proposal Request, Company will issue a Change Order to the Contract.

1.05 WORK CHANGE DIRECTIVE

A. Work Change Directive: Engineer may issue a Work Change Directive. Work Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Work Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Work Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01270
MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Administrative and procedural requirements for measurement and payment.

B. Measurements and payment criteria applicable to portions of the Work performed under a unit price payment method.

C. Defect assessment and non-payment for rejected Work.

1.02 DEFINITIONS

A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.03 AUTHORITY

A. Measurement methods delineated in the individual specification sections are intended to complement the criteria of this section. In the event of conflict, the requirements of the individual specification section shall govern.

B. The Engineer will take measurements and compute quantities accordingly.

1. Contractor will assist Engineer by providing necessary equipment, workers, and survey personnel as required.

C. The Engineer will make measurements and determinations as necessary to classify the work within Pay Items and determine the quantities for pay purposes; such decisions will be final after 3 days if the Contractor does not submit a written notice as defined in the following paragraph.

1. If the Contractor differs with the Engineer's classification of the Pay Items or determination of quantities of the Pay Items, he must notify the Engineer in writing within 3 days of the time that the Contractor is informed of the Engineer's decision. Otherwise the Company will not consider any such difference as a claim for payment.

D. Company reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Company's expense, by an independent surveyor acceptable to Contractor.

E. Company reserves the right to alter the Contract Documents, modify incidental work as may be necessary, and increase or decrease quantities of work to be performed to accord with such changes, including deduction or cancellation of any one or more of the Pay Items. Changes in the work shall not be considered as a waiver of any conditions of the Contract nor invalidate any provisions thereof. When changes result in changes in quantities of Work to be performed, the Contractor will accept payment according to Contract Unit Prices that appear in the original Contract. For significant changes in the quantity for a particular item or total estimated cost of a particular item from the Contract Price as addressed under the General Conditions, a supplemental agreement between the Contractor and the Company may be negotiated and/or required.

1.04 UNIT QUANTITIES SPECIFIED

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

B. If the actual Work requires more or fewer quantities than those quantities indicated, provide the required quantities at the unit sum/prices contracted.

C. Quantities necessary to complete the work as shown on the Contract Drawings or as specified herein shall govern over those shown in the Proposal Form. The Contractor shall take no advantage of any apparent error or omission in the Contract Drawings or Technical Specifications, and the Engineer shall be permitted to make corrections and interpretations as may be deemed necessary for fulfillment of the intent of the Contract Documents.

1.05 MEASUREMENT OF QUANTITIES

A. Measurement Devices:

1. Weight Scales: Inspected, tested, and certified by governing state regulatory agency within the past year.

2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.

3. Metering Devices. Inspected, tested, and certified by governing state regulatory agency within the past year.

B. Measurement by Weight: Measured by certified scale with supporting documentation provided by scale operator.

C. Measurement by Volume: Measured by in-place cubic dimension using mean length, width, and height or thickness as determined by survey.

D. Measurement by Area: Measured by square dimension using mean length and width or radius as determined by survey.

E. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord as determined by survey.

F. Stipulated Sum/Price Measurement: Items measured by linear means as a completed item or unit of the Work.

1.06 PAYMENT

A. Payment for all Work done in compliance with the Contract Documents, inclusive of furnishing all manpower, equipment, materials, and performance of all operations relative to construction of this project. Work for which there is not a Pay Item will be considered incidental to the Contract and no additional compensation will be allowed.

B. Work shall not be considered complete until all testing has been satisfactorily completed and the item of work has demonstrated compliance with the Contract Documents.

C. Pay item numbers shown on the bid form are only provided in order to use them for pay application purposes. Utilize the descriptions on the bid form and within the Contract Documents to determine the work associated with each pay item.

1.07 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements.

B. If, in the opinion of the Company, it is not practical to remove and replace the Work, the Company will direct one of the following remedies:

1. The defective Work may remain, but the unit sum/price will be adjusted to a new sum/price at the discretion of the Company.

2. The defective Work will be partially repaired to the instructions of the Company, and the unit sum/price will be adjusted to a new sum/price at the discretion of the Company.

C. The authority of the Company to assess the defect and identify payment adjustment is final.

1.08 NON-PAYMENT FOR REJECTED OR UNUSED PRODUCTS

A. Payment will not be made for any of the following:

1. Products wasted or disposed of in a manner that is not acceptable.

2. Products determined as unacceptable before or after placement.

3. Products not completely unloaded from the transporting vehicle.

4. Products placed beyond the lines, levels, or tolerances of the required Work.

5. Products remaining on hand after completion of the Work and/or not used in completion of the Work.

6. Loading, hauling, and disposing of rejected Products.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01290
PAYMENT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.02 DEFINITION

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum into various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.03 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.

1. Correlate line items in the schedule of values with other required administrative forms and schedules, including the following:

a. Application for Payment forms with continuation sheets.

b. Submittal schedule.

c. Items required to be indicated as separate activities in Contractor's construction schedule.

2. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.

B. Format and Content: Use the Bid Form as a guide to establish line items for the schedule of values.

1. Identification: Include the following Project identification on the schedule of values:

a. Project name and location.

b. Contractor's name and address.

c. Date of submittal.

2. Arrange schedule of values consistent with format of EJCDC Document C-620.

3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Bid Form.

4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

6. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

7. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.

8. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.

9. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.04 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as approved by Engineer and paid by Company.

    1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Company and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

C. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Engineer will return incomplete applications without action.

    1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.

2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

D. Transmittal: Submit one (1) signed and notarized original copies of each Application for Payment to Engineer and Company by a method ensuring receipt. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

E. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.

2. When an application shows completion of an item, submit conditional final or full waivers.

3. Company reserves the right to designate which entities involved in the Work must submit waivers.

4. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Company.

F. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.

2. Schedule of values.

3. Contractor's construction schedule (preliminary if not final).

G. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.

2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Company acceptance of designated portions of the Work.

H. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.

2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.

3. Updated final statement, accounting for final changes to the Contract Sum.

4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."

5. AIA Document G706, "Contractor's Affidavit of Release of Liens."

6. AIA Document G707, "Consent of Surety to Final Payment."

7. Evidence that claims have been settled.

8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Company took possession of and assumed responsibility for corresponding elements of the Work.

9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01330
SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

1.02 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action.

B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements.

1.03 GENERAL REQUIRMENTS

A. Procedures and format for submittals required by the Contract Documents that may include but are not limited to:

1. Soil and/or material test data
2. Survey data
3. Product test data
4. Product specifications
5. Progress reports
6. Drawings
7. Manufacturers' instructions, certifications, guarantees and warranties
8. Management, staging, and sequencing plan
9. Schedules

B. Refer to Contract Documents for complete list of required submittals.

C. In addition to specific submittal requirements outlined above, each Contractor shall prepare and submit to the Company a Removal Action Work Plan to ensure that Contract Drawings and Contract Documents are followed efficiently and safely through each phase of the Work. Submittal of the Removal Action Work Plan is divided into two phases: Preliminary Work Plan and the Final Work Plan, discussed below.

D. A Preliminary Work Plan shall be submitted with the Bid that will outline conceptually required elements that are discussed in detail in the Contract Documents. Preliminary Work Plan Elements that are required to be submitted with the Bid are indicated in the Contract Documents and include but are not limited to the following:

1. List of proposed equipment for soil and sediment excavation, sediment dewatering and stabilization, placing residual sand layer and backfill, and contact water treatment system.

2. List of proposed equipment for installation, protection, and removal of cofferdam.

3. Contact water management plan, including water collection, handling, pumping into temporary holding tanks and treatment.

4. Dewatering pad configuration including proposed materials of construction. Also include a discussion on maintenance of function for the duration of its use.

5. Description of dredge sequencing near existing shoreline structures.

6. Description of equipment, means, and methods of constructing the new sanitary and storm sewer outfall structure and associated sheet pile cutoff wall.

7. Preliminary construction schedule, including anticipated production rates that comprise basis for project duration/schedule.

8. Elements of the removal action that are significantly different from the Contract Documents.

E. A Draft Construction Health and Safety Plan (HASP) shall be submitted within 14 calendar days of Notice of Award.

F. A Draft Construction Quality Control Plan (CQCP) shall be submitted within 14 calendar days of Notice of Award.

G. Following submittal and review of the Preliminary Work Plan by the Company and Engineer, a Final Work Plan shall be submitted within 14 calendar days of the Notice to Proceed. The Bidder should carefully review all Contract Documents to confirm submittal requirements.

1.04 SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or modifications to submittals noted by the Engineer and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.

2. Format: Arrange the following information in a tabular format:

    a. Project name and contract number

    b. Scheduled date for first submittal (or revision number)

    c. Specification Section number, title and submittal number

    d. Submittal category: action or informational

    e. Name of subcontractor

    f. Description of the Work covered

    g. Scheduled date for Engineer's final release or approval

    h. Sequential page numbers

1.05 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Engineer's Digital Data Files: Electronic copies of AutoCAD Drawings of the Contract Drawings will be provided by Engineer for Contractor's use in preparing submittals.

1. Engineer will furnish Contractor one (1) set of digital data drawing files of the Contract Drawings for use in preparing Drawings.

    a. Engineer makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.

    b. Digital Drawing Software Program: The Contract Drawings are available in AutoCAD Civil 3D 2012.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.

4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow five (5) days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.

2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.

3. Resubmittal Review: Allow five (5) days for review of each resubmittal.

D. Identification and Information:

1. Indicate name of firm or entity that prepared each submittal in title block.

2. Provide a space approximately 6 by 8 inches beside title block to record Contractor's review and approval markings and action taken by Engineer.

3. Include the following information for processing and recording action taken:

a. Project name

b. Date

c. Name of Engineer

d. Name of Contractor

e. Name of subcontractor

f. Name of supplier

g. Name of manufacturer

h. Submittal number or other unique identifier, including revision identifier

i. Number and title of appropriate Specification Section

j. Drawing number and detail references, as appropriate

k. Location(s) where product is to be installed, as appropriate

l. Other necessary identification

4. Include the following information as keywords in the electronic file metadata.

a. Project name.

b. Number and title of appropriate Specification Section.

E. Deviations: Identify deviations from the Contract Documents on submittals.

F. Additional Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

1. Submit one (1) copy of submittal to Engineer.

G. Transmittal: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer will return submittals received from sources other than Contractor.

1. Transmittal Form: Provide locations on form for the following information:

a. Project name

b. Date

c. Destination (To :)

d. Source (From :)

e. Names of subcontractor, manufacturer, and supplier

f. Category and type of submittal

g. Submittal purpose and description

h. Specification Section number and title

i. Indication of full or partial submittal

j. Drawing number and detail references, as appropriate

k. Transmittal number (numbered sequentially)

l. Submittal and transmittal distribution record

m. Remarks

n. Signature of transmitter

2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal

2. Note date and content of revision in label on title block and clearly indicate extent of revision

3. Resubmit submittals until they are marked with approval notation from Engineer action stamp

I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

J. Use for Construction: Use only final submittals that are marked with approval notation from Engineer action stamp, if applicable.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Submit electronic submittals via email as PDF electronic files.

a. Engineer will return annotated file.

2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

B. Provide all submittals and information as identified in Contract Documents to named individuals in the time frames as indicated in the Contractor prepared Schedule of Submittals. Payments may be withheld, in whole or in part, at discretion of the Company in the event that submittals are not made in times specified unless previously requested in writing by the Contractor (to Engineer) and approved in writing by Engineer or Company.

C. Transmit submittals by appropriate means to expedite review or submittal.

D. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.

2. Mark each copy of each submittal to show which products and options are applicable.

3. Include the following information, as applicable:

   a. Manufacturer's catalog cuts

   b. Manufacturer's product specifications

   c. Statement of compliance with specified referenced standards

   d. Testing by recognized testing agency

   e. Application of testing agency labels and seals

   f. Notation of coordination requirements

   g. Availability and delivery time information

4. Submit Product Data before or concurrent with Samples

E. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based upon Engineer's digital data drawing files is otherwise permitted.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

   a. Identification of products

   b. Schedules

   c. Compliance with specified standards

   d. Notation of coordination requirements

   e. Notation of dimensions established by field measurement

   f. Relationship and attachment to adjoining construction clearly indicated

   g. Seal and signature of professional engineer if specified

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches.

F. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form.

1. Name, address, and telephone number of entity performing subcontract or supplying products.

2. Number and title of related Specification Section(s) covered by subcontract.

3. Drawing number and detail references, as appropriate, covered by subcontract.

G. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of associated Engineer(s) and Company/Owner, and other information specified.

H. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

I. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

J. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

K. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

L. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

M. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

N. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

O. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

P. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

Q. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and

calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

3.02 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.03 ENGINEER'S ACTION

A. General: Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.

C. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.

D. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

SECTION 01400
QUALITY CONTROL AND QUALITY ASSURANCE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing, observation, and documentation services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities.

2. Specified tests, observations, documentation, and related actions do not limit Contractor's other quality assurance and quality control procedures that facilitate compliance with the Contract Document requirements.

3. Requirements for Contractor to provide quality-assurance and -control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.02 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, observation, documentation, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Engineer.

C. Preconstruction Testing: Tests and documentation performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

D. Product Testing: Tests and documentation that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

E. Source Quality-Control Testing: Tests and documentation that are performed at the source, i.e., plant, mill, factory, or shop.

F. Field Quality Control Testing: Tests and documentation that is performed on site for installation of the Work and for completed Work.

G. Testing Agency: An entity engaged to perform specific tests, documentation, or both. Testing laboratory shall mean the same as testing agency.

H. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade or trades.

I. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.03 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Engineer for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Engineer for a decision before proceeding.

1.04 SUBMITTALS

A. Contractor's Construction Quality-Control Plan (CQCP): For quality-control activities and responsibilities.

B. Contractor's Quality-Control Manager Qualifications: For supervisory personnel.

1.05 CONTRACTOR'S CONSTRUCTION QUALITY-CONTROL PLAN

A. Construction Quality-Control Plan: Submit draft Construction Quality-Control Plan (CQCP) to Engineer 14 days following the Notice of Award. Submit in format acceptable to Engineer. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule. Following review and comment by the Engineer and Company, the Contractor shall incorporate revisions and resubmit within 10 days for review and approval. The CQCP shall address all aspects

of the construction operations to include but not be limited to mobilization, site preparation, installation of the temporary sheet pile cofferdamsediment dredging and stabilization, debris management, residual sand layer and backfill placement, contact water management, on and off-site management of excavated materials, construction of the new outfall structure, and site restoration.

B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.

C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

D. Continuous Documentation of Workmanship: Describe process for continuous documentation during construction to identify and correct deficiencies in workmanship in addition to testing and documentation specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements.

E. Monitoring and Documentation: Maintain testing and documentation reports including log of approved and rejected results. Include work Engineer has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.06 REPORTS AND DOCUMENTS

A. Test and Documentation Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue

2. Project title and number

3. Name, address, and telephone number of testing agency

4. Dates and locations of samples and tests or documentations

5. Names of individuals making tests and documentations

6. Description of the Work and test and documentation method

7. Identification of product and Specification Section

8. Complete test or documentation data

9. Test and documentation results and an interpretation of test results

10. Record of temperature and weather conditions at time of sample taking

11. Comments or professional opinion on whether tested or documented Work complies with the Contract Document requirements

12. Name and signature of laboratory manager

13. Recommendations on retesting and additional documentation

B. Permits, Licenses, and Certificates: For Company's records, submit copies of permits, licenses, certifications, documentation reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.07 QUALITY ASSURANCE

A. Company and Engineer will arrange for construction oversight, as specified in the Construction Quality Assurance Project Plan (CQAPP) provided in Appendix F, to confirm that the construction activities and completed project complies with Contract Documents.

B. Company's documentation and testing activities will consist of following activities:

1. Engineer's daily observation and record of Contractor activities.

2. Verifying compliance with Contract Documents and project changes by the Engineer.

C. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

E. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

F. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

G. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar to those indicated for this Project in material, design, and extent.

H. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists

shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

I. Testing Agency Qualifications: An independent agency with the experience and capability to conduct testing and documenting indicated in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.

J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:

a. Provide test specimens representative of proposed products and construction.

b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.

2. Testing Agency Responsibilities: Submit a certified written report of each test, documentation, and similar quality-assurance service to Engineer with copy to Contractor. Interpret tests and documentations and state in each report whether tested and documented work complies with or deviates from the Contract Documents.

1.08 QUALITY CONTROL

A. Contractor Responsibilities: Tests and documentations not explicitly assigned to Company are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

a. Contractor shall not employ same entity engaged by Company, unless agreed to in writing by Company.

3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or documentation to be performed.

4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report of each quality-control service.

5. Testing and documentation requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

7. Perform work in strict accordance with Contract Documents. Coordinate, supervise and oversee subcontractors as needed to perform construction activities.

8. Perform measurements and testing as deemed necessary to satisfy requirements of Contract Documents related to off-site materials prior to delivery to site. Contractor is required to continue locating new material sources and testing the material until the material is approved by Engineer. Materials that do not meet specifications and are not approved by Engineer shall be removed from site at Contractors expense.

9. Cooperate with Engineer to furnish material sample, and provide assistance in on-site documentation and test activities.

B. Engineer’s Responsibilities.

1. Provide clarifications to Contract Documents, as well as any necessary design changes requested by the Company.

2. Sample upland surface soils for PAHs to document pre- and post-construction conditions.

3. Sample the bottom of NAPL and PAH dredge areas to document sediment quality left in place.

4. Sample the thickness of the residual sand layer, where required, for conformance with the Contract Documents.

5. Review Contractor’s submittals and advise Company on results of review of these items.

6. Provide manifests for disposal or transport of contaminated soil, and contact water, if necessary.

7. Communicate any pertinent issues with the Company and/or Contractor.

8. Monitor construction progress, and report to Company with respect to planned schedule.

9. Provide photo documentation and daily written reports documenting construction according to the Contract Documents.

10. Provide oversight of bathymetric survey when being completed by the contractor for submittal for payment.

11. Sample contact water treatment system when required according to obtained permit or substantive requirements.

C. Company's Responsibilities.

1. Perform Company's engineering review and monitor construction progress and progress payment approval.

2. Perform Company's administrative and managerial responsibilities. Company has authority to accept/reject materials and workmanship.

3. Communicate any pertinent issues with Contractor and/or Engineer. Maintain communication with USEPA.

4. Approve/reject Contactor's submittals and construction results.

D. Retesting: Regardless of whether original tests or documentations were Contractor's responsibility, provide quality-control services, including retesting and documentation, for construction that replaced Work that failed to comply with the Contract Documents.

E. Testing Agency Responsibilities: Cooperate with Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and documentations.

1. Notify Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.

3. Conduct and interpret tests and documentations and state in each report whether tested and documented work complies with or deviates from requirements.

4. Submit a certified written report, in duplicate, of each test, documentation, and similar quality-control service through Contractor.

5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.

6. Do not perform any duties of Contractor.

F. Associated Services: Cooperate with agencies performing required tests, documentations, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.

2. Incidental labor and facilities necessary to facilitate tests and documentations.

3. Adequate quantities of representative samples of materials that require testing and documentation. Assist agency in obtaining samples.

4. Facilities for storage and field curing of test samples.

5. Delivery of samples to testing agencies.

6. Preliminary design mix proposed for use for material mixes that require control by testing agency.

7. Security and protection for samples and for testing equipment at Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality assurance and quality control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and documentation.

1. Schedule times for tests, documentations, obtaining samples, and similar activities.

H. Schedule of Tests and Documentations: Contractor shall prepare a schedule of tests, documentations, and similar quality control services required by the Contract Documents as a component of the Contractor's CQCP. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.

1. Distribution: Distribute schedule to Owner, Engineer testing agencies, and each party involved in performance of portions of the Work where tests and documentation is required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 TEST AND DOCUMENTATION LOG

A. Prepare a record of tests and documentations. Include the following:

1. Date test or documentation was conducted.

2. Description of the Work tested.

3. Date test or documentation results were transmitted to Engineer.

4. Identification of testing agency conducting test or documentation.

B. Maintain log at Project site. Inform Engineer of operational changes and modifications as they occur. Provide access to test and documentation log for Engineer's reference during normal working hours.

END OF SECTION

SECTION 01410
PERMITS AND FEES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Applicable permits, approvals and associated fees required for completion of the Work.

2. Party responsible for obtaining the approvals and permits.

1.02 PROJECT REQUIREMENTS

A. Permits and Approvals:

1. Company and Engineer

a. Company and Engineer will complete waste profiling and approval for landfill disposal of dredged sediments and debris.

b. Engineer will identify substantive requirements of all WDNR and USACE permits that would normally be required for the Work.

2. Contractor

a. Contractor shall review City permitting requirements with the Engineer and Company prior to obtaining permits (Note: removal actions under USEPA and CERCLA authority are exempt from requirements to obtain state and local environmental permits normally necessary for such actions).

i. Contractor shall obtain any necessary City of Marinette permits, including, but not limited to, utility temporary use and connections (water and sanitary).

B. Fees:

1. Company

a. Company will pay for fees associated with all permits and approvals of their responsibility.

b. Company will pay for discharge fees for wastewater disposal to the water utility, if required.

c. Company will pay all fees for Agency inspections of construction activities.

d. Company will pay for all disposal facility tipping fees for excavated sediment, debris, and water treatment residuals.

2. Contractor

a. Contractor shall pay for fees associated with all permits and approvals of their responsibility.

b. Contractor shall pay for recycling of any demolition debris not in contact with contaminated sediment.

c. Contractor shall be responsible for all other fees, including, but not limited to:

i. Boat launch fees.

ii. Potable water connection and usage.

iii. Electric, gas, telephone/high speed internet access, and other needed or specified utilities.

C. Copies of permits and approvals obtained by the Company and Engineer will be made available to the Contractor.

D. Copies of permits obtained by the Contractor shall be provided to the Company and Engineer.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01500
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.02 REFERENCES

A. National Electrical Contractors Association (NECA) latest version of NECA 200, Recommended Practice for Installing and Maintaining Temporary Electric Power at Construction Sites (ANSI)

B. National Electrical Manufacturers Association (NEMA) latest standards for the design and manufacture of electrical equipment.

C. Underwriters Laboratories Inc. (UL) latest standards and test procedures for products, materials, components, assemblies, tools, and equipment.

D. National Fire Protection Association, NFPA 70: National Electric Code, latest edition.

E. National Fire Protection Association, NFPA 241: Standard for Safeguarding Construction, Alteration, and Demolition Operations, latest edition.

F. International Code Council/American Standards Institute ICC/ANSI A117.1, Accessible and Usable Buildings and Facilities, latest edition.

G. United States Access Board Americans with Disabilities Act and Architectural Barriers Act (ADA-ABA) Accessibility Guidelines for Buildings and Facilities, latest edition.

H. ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C, latest edition.

1.03 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Company, Engineer, testing agencies, and authorities having jurisdiction.

B. Sanitary Services:

1. Provide sanitary facilities on site conforming to state and local health and sanitation regulations in sufficient number for use by all entities for construction operations.

2. Provide facilities at time of mobilization and maintain in sanitary condition at all times.

C. Water Service:

1. Contractor shall provide with the bid documents anticipated water requirements for Work to be completed on the Site.

2. Provide and pay for suitable quality water service as needed to maintain specified conditions for construction operations. Connect to existing water source. Provide separate metering and pay for cost of water used. Contractor shall protect water service from freezing during cold weather conditions.

3. Contractor shall provide potable water, containers, and ice for Contractor's employees as needed.

D. Electric Power Service:

1. The Contractor shall provide electrical requirements along with their bid documents. If needed to support their operations, contractor shall establish electrical service and meter at the site for their use, and the use of the Company and/or Engineer as needed (Company and Engineer do not anticipate needing access to anything with larger voltage than 120V single phase service).

2. OSHA regulations require that employers shall use either ground fault circuit interrupters or an assured equipment grounding conductor program in addition to any other regulations for equipment grounding conductors.

E. Gas Service:

1. Contactor shall provide natural gas requirements along with the bid documents, if required.

2. Contractor shall provide, connect, and disconnect required gas lines to equipment.

F. Telephone and Internet Service:

1. Contractor shall provide, maintain, and pay for local land-line telephone service to Site with sufficient line capacity for both Contractor and Company/Engineer from project start to completion.

2. Cellular phone is required for the on-site superintendent or foreman.

3. Contractor shall provide, maintain, and pay for high-speed internet service to the Site with sufficient capacity for both Contractor and Company/Engineer operations from project start to completion.

1.04 INFORMATIONAL SUBMITTALS

A. Site Preparation Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.05 USE OF SITE FACILITIES

A. Contractor shall consult with the Company and Engineer regarding locations for offices, trailers, material storage, access roads, and areas within the Work area for use by Contractor.

B. Confine equipment, storage of materials, and operations of work persons to designated and Company approved areas. Do not bring materials onto Site until reasonably required for progress of work.

C. Contractor or subcontractors may not use areas outside of the designated work areas at the Site for any purpose unless explicitly approved by the Company in writing.

D. Store, place, and handle material and equipment to protect from any damage. Contractor shall move materials sheds, or equipment, as necessary or when required for continuing construction at Contractor's expense.

E. Company assumes no responsibility for project material or equipment stored on site or off site. Contractor assumes full responsibility for damage due to storing of materials.

F. Contractor is responsible to schedule work, storage of materials, etc., to minimize interference with construction activities.

G. Contractor, prior to start of work, shall inspect Site with Company and Engineer to determine existing conditions in conjunction with preconstruction meeting.

H. Contractor is responsible for all snow removal necessary for duration of project.

1.06 SECURITY

A. Contractor shall furnish and install temporary chain link fencing for security at the site as indicated in the Contract Drawings. Security will not be provided by Company for Contractor's property.

B. Contractor is responsible for loss or injury to persons or property where his work is involved, and shall provide security and take precautionary measures as deemed necessary to protect Contractor's and Company's interests.

1.07 PARKING

A. Parking areas at the Site will be designated by Company.

B. Parking areas for Contractor's personal vehicles shall be in the designated area on site. No Contractor work trucks or equipment shall be parked or temporarily staged on public streets or rights-of-way unless pre-approved by the Company and City.

1.08 ARCHAEOLOGICAL OR HISTORIC RELICS

A. Native American relics, or items with an apparent archaeological or historical value discovered during construction, shall not be touched, moved, or otherwise disturbed.

B. Report presence of these items to Engineer and Company immediately upon discovery.

1.09 FIELD OFFICES AND STRUCTURES FOR OVERSIGHT PERSONNEL

A. Contractor shall provide office space on site for Company, Engineer, and Regulatory Agency personnel.

1. Office space shall contain a minimum of 2 separate offices with locking doors plus a meeting space of sufficient size to conduct weekly progress meetings.

2. Office and meeting space shall have adequate lighting and functional heating and air conditioning facilities.

3. Contractor shall provide electrical power.

4. Contractor shall provide and pay for telephone and high-speed internet access.

5. Office space shall be sufficiently furnished by Contractor with the necessary amount of tables, desks, and chairs to facilitate use by Company, Engineer, and Regulatory Agency personnel.

6. Contractor shall post a map-clearly depicting route to nearest hospital as well as emergency numbers next to exit door.

7. Contractor shall provide fire extinguishers as required by law.

B. Contractor shall provide necessary temporary sheds or other storage facilities to accommodate Contractor’s supply and storage needs.

1.10 CONSTRUCTION NOISE

A. The Contractor shall take all necessary precautions to minimize construction noise for the Site. All equipment shall be fitted with suitable noise reduction devices such as mufflers, inlet and exhaust silencers and engine covers that shall be maintained in good working order.

B. The Company will decide on the adequacy of provision and maintenance of noise reduction equipment. When so instructed, in writing by the Company, the Contractor shall immediately withdraw any item of plant or equipment from service and carry out all necessary additions, replacements, or repairs to the noise reduction equipment to the satisfaction of the Company.

C. The contractor shall comply with City of Marinette construction noise restrictions.

1.11 BARRIERS AND PROTECTION OF INSTALLED WORK

A. Protect installed work and provide special protection as stated in Technical Specifications.

B. Construction traffic shall be prohibited on completed and/or landscaped areas.

C. Provide barriers to prevent unauthorized entry to construction and staging areas as necessary. Protect existing facilities and adjacent properties from damage during construction operations.

1.12 ODOR CONTROLS

A. The Engineer shall monitor site conditions related to odor generation and VOC air emissions on a daily basis and direct Contractor to take actions as necessary to address observed deficient practices or conditions deleterious to construction and/or public.

B. For vapor phase VOC and odor control, a commercial vapor phase suppressant and application equipment shall be provided and applied, as directed by Engineer in accordance with the Construction Quality Assurance Project Plan in Appendix H, during sediment/soil stabilization and loading into trucks to minimize odors or to reduce vapor phase emissions. Suppressant shall be applied as directed by manufacturer's instructions; application equipment is considered incidental to the cost of the product. Contractor shall provide MSDS sheet.

1.13 FUEL STORAGE AND HANDLING

A. Store fuel according to local, state and federal laws.

B. At no time, shall overtopping fuel tank or spillage to ground surface be allowed.

1.14 PROTECTION OF ENVIRONMENT

A. Contractor shall take measures to prevent pollution due to removal action operations and handling of contaminated materials, including, but not limited to, provision of spill and contact water containment. Areas of the site that are not paved will be sampled prior to and following completion of the removal action by the Engineer, and impacted soils, as demonstrated by the sampling results as described in the CQAPP (Appendix F), shall be removed from the site and transported to the landfill for disposal at the sole expense of the Contractor, including landfill tipping fees.

B. Minimize air pollution by use of properly operating combustion emission control devices on construction vehicles and equipment. Encourage shutdown of motorized equipment not in use.

C. Trash burning is not permitted on site.

D. All areas for handling and storage of fuels, oils and other potentially hazardous liquids shall have spill containment or release prevention measures. Maintenance of equipment on site shall be with prior approval of the Engineer.

E. All waste materials shall be recycled, hauled to a licensed solid waste landfill, or otherwise disposed of in an environmentally sound manner and in compliance with all applicable local, state, and federal rules as approved by the Engineer and Company

F. All hazardous waste shall be stored, handled, and disposed of in compliance with applicable local, state, and federal rules.

G. Other measures shall be taken, as necessary, to maintain work Site in an environmentally sound matter.

H. All spills or leaks of fuels, oil, or other reportable liquids resulting from handling or equipment malfunctions shall be reported immediately to Company and/or Engineer. Affected soils shall be properly removed from limits of construction and disposed in accordance with applicable local, state and federal rules as approved by the Company and Engineer. A copy of manifests, if necessary, shall be provided to Company/Engineer within 5 working days of disposal. Waste Generator Manifests shall not state Company as Generator. Company reserves right to order leaking equipment removed from Site.

1.15 PUBLIC ROAD REQUIREMENTS

A. The Contractor shall conduct his operations on the Site in a manner that shall minimize interference with the normal operation of adjoining public roads and parks and shall implement all specified and other appropriate measures to ensure the safety of all users of the adjoining public roads and parks.

B. During periods of heavy truck or equipment traffic near public roadways, the Contractor shall provide sufficient flag persons to direct construction equipment and safeguard vehicular traffic. At the close of each workday, the Contractor shall leave the Site in a safe condition.

C. At no time during construction shall any waste be permitted to leave the Site without being fully contained and covered unless expressly approved by the Company. All trucks shall be covered and covers shall be securely fastened without gaps and shall be approved by the Company. In the event of uncontained waste materials migrating outside of the upland support area, through tracking, spillage, or any other means, the Contractor shall be responsible for immediate clean-up, and all direct and indirect costs associated with the cleanup. In all cases, the Contractor shall be responsible for maintaining clean public roadways adjacent to the sites.

1.16 ADDITIONAL REQUIREMENTS

A. Company has first right of refusal for any items with an apparent historical or monetary value present or discovered during construction or items that can be salvaged and reused elsewhere (i.e., trees, planters, benches, signs). Notify Company of items at least 5 days prior to removal.

B. No firearms or explosives are allowed on site.

C. Possession and/or use of intoxicating beverages and nonprescription drugs are prohibited at all times. Persons caught in possession or under the influence of drugs or alcohol will be immediately dismissed and removed from the Site.

D. Tobacco use will be allowed in designated areas only.

E. No horseplay is permitted on the Site.

F. Visitors or personnel not employed by the Contractor or his approved Subcontractors shall not be permitted on site without prior approval by the Company.

G. Company and Engineer reserve the right to require that any of the Contractor's personnel be excluded from work at the site at any time.

1.17 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

C. Accessible Temporary Egress: Comply with applicable provisions in the United States Access Board ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.18 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Company's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

3.02 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility Company, Company, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction. Protect water service from freezing during cold weather condition.

D. Electric Power Service: Coordinate with the electric power service provider to install temporary electric power service for the project. Maintain equipment in a condition acceptable to Company.

E. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

F. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel.

1. At each telephone, post a list of important telephone numbers.

a. Police and fire departments.

b. Ambulance service.

c. Contractor's home office.

d. Engineers' office.

e. Company’s office.

f. Principal subcontractors' field and home offices.

2. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

3.03 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E136. Comply with NFPA 241.

2. Maintain support facilities until after Substantial Completion inspection. Remove after Substantial Completion.

B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas as indicated and within construction limits indicated on Drawings.

1. Provide dust-control treatment that is nonpolluting and does not cause tracking. Reapply treatment as required to minimize dust.

C. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary

roads and paved areas, within construction limits indicated, as necessary for construction operations.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.

D. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.

2. Maintain access for fire-fighting equipment and access to fire hydrants.

E. Parking: Provide, per the Company's approval, temporary parking areas for construction personnel.

F. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.

2. Remove snow and ice as required to minimize accumulations.

G. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.

1. Identification Signs: Provide Project identification signs as requested by Company and Engineer.

2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.

a. Provide temporary, directional signs for construction personnel and visitors.

3. Maintain and touchup signs so they are legible at all times.

H. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.

I. Lifts and Hoists: Provide facilities necessary for hoisting materials.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.04 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

B. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways.

C. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

D. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

END OF SECTION

SECTION 01550
MOBILIZATION, DEMOBILIZATION, AND DECONTAMINATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Description of Work.

1.02 DESCTIPTION OF WORK

A. Mobilization consists of the Work and operations necessary for the movement of personnel, equipment, supplies and incidentals to the project Site including work and operations which must be performed or for which costs must be incurred before beginning Work on the various items on the project site. Includes all labor, equipment and materials necessary to fulfill the requirements of all Division 1 Specifications. Demobilization shall include all Work and operations to vacate the Site, including movement of personnel, equipment, supplies and incidentals from the Site.

B. Decontamination of personnel clothing, equipment and disposition of decontamination wastes is an integral part of the overall Health and Safety Program. The selection of protective clothing, respirators, and equipment to prevent human contact and the spread of contaminants shall be addressed in the Contractor's Health and Safety Plan. Decontamination consists of physically removing contaminants or changing their chemical nature to innocuous substances. This item consists of all Work and operations necessary for the Contractor to safely enter and exit the Site and perform the Work contained in these Contract Documents.

C. Contactor shall submit a written plan for decontamination to the Engineer as part of the Work Plan for approval prior to proceeding with decontamination activities.

1. Detergents used to decontaminate equipment must be pre-approved by the Engineer

1.03 SUBMITTALS

A. Provide Company and Engineer written notice of construction start date at least 10 working days prior to beginning site activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 DECONTAMINATION OPERATIONS

A. Trucks and heavy equipment with noticeable surface contamination or soil shall be decontaminated prior to leaving the site and may include other vehicles not belonging to the Contractor.

B. Decontamination shall first be conducted by scraping, brushing, or other mechanical means to the extent practical to remove soil and contaminants from equipment. Soil and debris removed during the decontamination operations shall be managed on-site and treated or transported to the landfill, as directed by the Engineer.

C. Contractor shall provide high-pressure low-volume washing equipment with steam capabilities for the purpose of decontamination, unless approved otherwise by the Engineer. Equipment may also be used for decontamination of debris and structures encountered during excavation.

D. Decontamination liquids shall be contained at all times and shall be pumped and/or transported to the furnished holding tanks for treatment.

END OF SECTION

SECTION 01700
EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.

2. Field engineering and surveying.

3. Installation of the Work.

4. Progress cleaning.

5. Starting and adjusting.

6. Protection of installed construction.

7. Correction of the Work.

1.02 REFERENCES

A. National Fire Protection Association, NFPA 241: Standard for Safeguarding Construction, Alteration, and Demolition Operations, latest edition.

1.03 CONTRACTOR'S RESPONSIBLITIES

A. Upon commencement of construction work, become familiar with the location of existing reference benchmarks, control points, and other necessary reference construction points. Maintain their accuracy and prevent disturbance or destruction. Contractor is responsible for re-establishing control points and benchmarks if such items are destroyed at no cost to Company.

B. Establish and verify grades, lines, levels, locations and dimensions as shown on Drawings and report any errors or inconsistencies to Engineer before commencing Work.

C. Layout own work and be responsible for all surveys, lines elevations and measurements of structures and other Work executed under Contract. Exercise proper preparation to verify figures on Drawings within construction limits before laying out work. Any error resulting from failure to exercise such precautions or work done without being properly located may be removed at Company's direction and corrected or replaced at Contractor's expense.

1.04 INFORMATIONAL SUBMITTALS

A. Qualification Data: For registered land surveyor and/or professional engineer.

B. Certificates: Submit certificate signed by registered land surveyor or professional engineer certifying that location and elevation of improvements comply with requirements.

1.05 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing surveying services of the kind indicated.

1.06 SURVEY DATA FOR CONSTRUCTION DOCUMENTATION

A. Documentation Surveys: To be supplied to Engineer within two (2) working days following completion of survey for a particular surface or set of features.

B. Survey data shall be supplied to Engineer in the following formats:

1. Topographic map (PDF and electronic compatible for import into AutoCAD Civil 3D 2011).

2. Tabular (description, northing, easting, elevation).

C. Contractor will be notified by Engineer of areas to be adjusted or will be given written approval of surveyed area within two working days of receiving survey data.

D. Contractor shall obtain written approval from Engineer for each surveyed area prior to placement of any overlying materials.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.

2. Before construction, survey entire project site to document vegetation (i.e., trees, bushes, etc.), monitoring well vaults and well pipe elevations, playground equipment, and other physical site features.

3. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Acceptance of conditions: Examine substrates, area, and conditions, with installer or applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with Work indicates acceptance of conditions.

3.02 PREPARATION

A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately upon discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a Request for Information to Engineer. Indicate a detailed description of the problem encountered along with any recommendations for remedying the problem, including their relationship to the Contract Documents.

3.03 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Engineer. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Engineer before proceeding.

2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

B. Benchmarks: Establish and maintain a minimum of two (2) permanent benchmarks on Project Site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.

3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

C. Documentation Survey: On completion of major site improvements, and other work requiring field-engineering services, prepare a survey showing dimensions, locations, angles, and elevations of construction and Site Work for submittal to Engineer for review.

1. All survey data shall be under the seal of a Wisconsin Registered Land Surveyor or Professional Engineer.

3.04 CONSTRUCTION LAYOUT AND DOCUMENTATION

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Engineer promptly.

B. General: Engage a qualified surveyor to lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points for construction and elsewhere as needed to locate each element of Project. Contractor is responsible for re-establishing control points and benchmarks if such items are destroyed at no cost to the Company.

2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions. Report any errors or inconsistencies to Engineer before commencing work.

3. Exercise proper preparation to verify figures on Contract Drawings within construction limits before laying out work. Any error resulting from failure to exercise such precautions or work done without being properly located may be removed at Company’s direction and corrected or replaced at Contractor’s expense.

4. Inform installers of lines and levels to which they must comply.

5. Check the location alignment and elevation of every major element as the Work progresses.

6. Notify Engineer when deviations from required lines and levels exceed allowable tolerances.

7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

8. Bathymetric surveys for pay quantity purposes shall be performed by trained and experienced personnel under supervision by the Contractor.

9. Rework grades at own expense if grades are altered by weather conditions before or after survey work or before final restoration is completed.

10. Verify own work with respect to required grades prior to documentation surveys. Areas deficient will be corrected and resurveyed at Contractor's expense.

C. Site Improvements: Locate and lay out site improvements, including structures, pavements, backfill, riprap, and riprap aprons.

D. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Engineer.

3.05 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produces harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

3.06 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80°F .

3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.

2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

F. Waste Disposal: Do not bury or burn waste materials on site. Do not wash waste materials down sewers or into waterways.

G. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

H. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

I. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.07 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

3.08 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

SECTION 01770
CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.

2. Final completion procedures.

3. Warranties.

4. Final cleaning.

1.02 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete at time of request for inspection.

1. Prepare a list of items in conjunction with the Engineer to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.

2. Advise Company of pending insurance changeover requirements.

3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.

4. Prepare and submit Project Record Documents, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.

5. Submit test/adjust/balance records.

6. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

2. Results of completed inspection will form the basis of requirements for final completion.

1.03 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment using the EJCDC Form C-620.

2. Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.04 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Prepare list of incomplete items in conjunction with the Engineer. Include name and identification of each area of the construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction

1. Organize list of areas in sequential order.

2. Organize by major construction elementsand categories.

3. Include the following information at the top of each page:

a. Project name.

b. Date.

c. Name of Engineer.

d. Name of Contractor.

e. Page number.

1.05 RECORD DOCUMENTS

A. Produce and maintain on site, one set of the following record documents of all items or work; record actual revisions of all items of work:

1. Contract Drawings.

2. Technical Specifications.

3. Change orders and other modifications to contact.

4. Submittals.

5. Other documents, including: Work Plan, Construction Quality Control Plan (CQCP), Health and Safety Plan (HASP), and Storm Water Pollution Prevention Plan (SWPPP).

6. A copy of approvals of work performed.

7. Store record documents separate from documents used for construction.

B. Record information concurrent with construction progress including changes made by addenda and modifications.

C. Maintain a Daily Field Log documenting work times, personnel on site, equipment used and other essential information of the operation's progress.

1.06 WARRANTIES

A. Submittal Time: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

d. Remove tools, construction equipment, machinery, and surplus material from Project site.

END OF SECTION

SECTION 01900
SITE HEALTH AND SAFETY

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. General Health and Safety Issues

2. Disclosure – Chemical Characteristics

3. Public Safety

4. Accident Reports

5. Fire Protection and Emergencies

6. Working in Proximity to Overhead Transmission Lines

1.02 REFERENCES

A. US Department of Labor Occupational Safety and Health Administration (OSHA) latest standards.

1.03 GENERAL HEALTH AND SAFETY ISSUES

A. Contractor is responsible for implementation and enforcement of health and safety requirements and shall take necessary precautions and provide protection for the following:

1. Personnel working on or visiting project Site, irrespective of employer.

2. Work and materials or equipment to be incorporated in Work area on- or off-site.

3. Other property at or adjacent to project Site.

4. Public exposed to job-related operations or potential release of toxic or hazardous materials.

B. Contractor shall prepare a Project specific Construction Health and Safety Plan (HASP). The HASP will be reviewed by the Engineer and Company. Submit a signed copy to Engineer 7 days after Notice of Award. Prepare HASP in accordance with applicable OSHA guidance. HASP shall address all major elements of the Contractor Work. The Contractor's HASP does not supersede or in any way relieve the Contractor of obligations under any applicable OSHA regulations including 29 CFR 1910: Occupational Safety and Health Standards and 29 CFR 1926: Health and Safety Regulations for Construction. At minimum, the Contractor HASP shall include the following:

1. Site description
2. Project activities and coordination with other Subcontractors
3. Hazards evaluation
4. Heavy equipment operation
5. On-site safety responsibilities
6. Work zones
7. Personnel training
8. Atmospheric (Work Zone) monitoring
9. Personal protection, clothing, and equipment
10. Emergency procedures
11. Spill control and countermeasures
12. Name of person who will be responsible in the event of an emergency incident
13. Plan for initial site safety orientation and training for all Contractor and subcontractor personnel
14. Listing of on-site health and safety equipment, supplies, and locations
15. Maps clearly depicting routes to closest emergency medical facilities and hospitals
16. Provisions for mitigating the potential for exposure to the community.

C. Spill control and countermeasures shall include the following:

1. Contingencies for potential spills or discharges
2. Means, methods, and facilities to manage and prevent loss of contaminated soil, groundwater, and surface water to the environment
3. Descriptions of proposed personnel and equipment for conducting decontamination of personnel, equipment, and materials
4. Notification requirements to regulatory agencies in accordance with applicable Federal Clean Water Act and WDNR requirements
5. Emergency notification protocols and procedures to the Company and the Engineer

D. Contractor shall be and remain liable for compliance by employees, agents, and subcontractors with Contractor's HASP and procedures for Site and shall not hold

Company and/or Engineer accountable to any claims, damages, suits, losses, and expenses in any way arising from noncompliance with HASP. It is Contractor's responsibility to enforce all necessary safety rules.

E. Engineer and Company may adopt Contractors HASP for on-site Company and Engineer personnel. Regardless, Contractor shall be responsible for its own health and safety at all times.

F. Notify Engineer of any chemical products to be used by Contractor while on site. Furnish Material Safety Data Sheets (MSDS) for chemical products, to Engineer before any such chemicals are brought on site throughout duration of project. Comply with standards set in 29 CFR 1910.120 in providing such notifications and MSDS.

G. Provide all necessary safety equipment needed to perform required Work. Provide and properly utilize adequate ventilation and personal protective equipment, including respirators as required by and in accordance with OSHA regulations.

H. Train personnel in use, limitations, and proper fit of all necessary safety equipment. General Site workers expected to be in contact with contaminated sediment or water shall have received 40-hour Hazardous Waste Operations and Emergency Response training in accordance with 29 CFR 1910.120.

I. Hard hats, eye protection, and traffic vests are required, as necessary, in all construction areas.

J. Conform to OSHA Safety and Health Regulations for construction.

1.04 DISCLOSURE – CHEMICAL CHARACTERISTICS

A. Refer to Appendix A for details of the chemical conditions anticipated at the Site. This appendix provides information about the identity, location, quantity, nature or characteristics of environmental impairment at and near the work Site. Company assumes no responsibility or liability for accuracy or completeness of such documents or information, and all such documents and information will remain property of the Company.

B. Sediment and Soil in the River: The sediment and soil in the River consists of poorly graded sand with silt (SP-SM), poorly graded sand (SP), and silty sand (SM). Non-Aqueous Phase Liquid (NAPL) and Polycyclic aromatic hydrocarbons (PAHs) are present in the sediment targeted for removal.

1.05 PUBLIC SAFETY

A. Protect finished and unfinished work against any damage, loss, or injury during performance of and up to completion day of work.

B. Provide adequate protection around all openings wherever required to safeguard work or public.

C. Protect all openings and surface obstructions with fencing, barricades, signs, and warning devices in accordance with local, state and federal requirements.

D. No smoking or eating will be allowed within Site boundaries except in locations agreed upon by Company and Engineer.

1.06 ACCIDENT REPORTS

A. If a death, serious injury, or damage occurs, the Contractor shall report the accident immediately by telephone to the local authorities, Company, and Engineer.

B. Report in writing to the Company all accidents occurring in connection with the Work, giving full details, names and statements of witnesses.

C. The summaries shall address the date/time of accident, agency/establishment named and location, and consequences, description of operation and the accident, causal factors, applicable standards and their effectiveness, and corrective/preventive actions.

1.07 FIRE PROTECTION AND EMERGENCIES

A. Contactor shall execute all Work in a fire-safe manner. Furnish and maintain a suitable type and amount of portable fire extinguishers on-site and in each piece of equipment as applicable.

B. Abide by Company's emergency notification and operating practices for emergency situations. Practices will be discussed at the preconstruction meeting.

1.08 WORKING IN PROXIMITY TO OVERHEAD TRANSMISSION LINES

A. Contractor shall conform, when, performed in proximity to energized electrical conductors, to the provisions and requirements, with any amendments hereto, of OSHA Safety and Health Regulations for Construction, in particular, but not limited to subpart 1926.550 and local and State electrical code and any amendments thereto.

B. Contactor shall not stockpile below the transmission lines.

C. No transmission line outage will be allowed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

DIVISION 02 – SITE WORK

SECTION 02050
SITE PREPARATION

PART 1 - GENERAL

1.01 SUMMARY

A. Site preparation shall be performed in accordance with the Contract Documents and this section by the Contractor and includes the following:

1. Dust Control
2. Temporary Work Area Fence
3. Temporary Access Road and Contractor Parking
4. Protection of Utilities and Structures
5. Clearing and Grubbing
6. Decontamination Area
7. Sediment Stabilization Area
8. Temporary Sheet Pile Cofferdam
9. Snow and Ice Management
10. Staging and Stockpile Areas

1.02 REFERENCES

A. Wisconsin Department of Transportation (WisDOT), Standard Specifications for Highway and Structure Construction, current edition.

B. Wisconsin Administrative Code (Wis. Adm. Code)

C. ASTM International

D. Geosynthetics Research Institute (GRI)

1.03 DEFINITIONS

A. Structures and Surface Features: Existing structures and surface features including sheet pile dock walls, boat launch ramps, shoreline features, buildings, signs, posts, utility poles, monitoring wells and piezometers, bridges, fences, trees, shrubs, landscaped surface features, and other miscellaneous items.

B. Utilities: Existing gas mains, water mains, electric lines, storm sewers and conduits, telephone and other communication lines and conduits, sewer pipe, cable television, other utilities, and appurtenances.

C. Clearing and Grubbing: cutting, removal and disposal of trees, roots, brush, stumps, windfalls, logs, and other vegetation.

D. Debris: rubble, wreckage, ruins, litter and discarded garbage/refuse/trash, scattered remains of something destroyed, logs, and other miscellaneous items.

1.04 SUBMITTALS

A. Provide Company and Engineer written notice of construction start date at least ten working days prior to beginning site activities.

B. Contractor shall submit information that demonstrates the Contractor's means and methods for site preparation. This information shall be submitted as part of the Preliminary and Final Work Plans. The information shall include provisions for compliance with these specifications, including proposed fugitive dust and noise mitigation measures, engineering controls, equipment/application details, and the following:

1. Mobilization, deployment, and staging plan for all equipment.

2. Site security measures (boat launch will be closed during construction).

    a. Temporary fencing layout, identifying location and size of gates, existing pavement and roads, access to fire hydrants and hose connections, and other site specific conditions.

3. Overall site layout plan including all equipment, haul roads, job trailers, worker parking, equipment laydown area, support zones, stabilization pad layout, sheet piling storage area, MGP-contact water treatment area, river access area, sediment offload area, and bulk storage areas.

4. Means, methods, and sequencing for installation, maintenance, and removal of temporary sheet pile cofferdam, including ice mitigation measures.

5. Dewatering Pad design, including proposed materials, manufacturer's installation and repair manual, and detailed cross-section drawings describing configuration of geosynthetic and soil layers.

6. Ability to conduct operations and maintain Site at all times to minimize creation and dispersion of dust and mud.

    a. Equipment necessary to control dust generation resulting from wind effects on open stockpiles, and from Contractor's vehicle and equipment traffic, at all times.

    b. The Engineer will monitor site conditions related to dust and mud generation on daily basis and direct Contractor to take actions as

necessary to address observed deficient practices or conditions deleterious to construction and/or public.

7. Indicate how public right-of-ways and streets will be cleaned as needed on a daily basis with commercial street sweepers.

8. Temporary measures and controls for protection of subsurface features, if necessary.

9. Number of construction workers and the major pieces of equipment to be used for each element of Work.

10. Other site preparation measures anticipated to execute Work in an efficient and safe manner.

11. Detailed schedule and sequence of Work.

C. Engineer will take photographs or videotape of the site prior to commencement of Work to document existing conditions of adjoining construction and site improvements. Documentation shall include truck routes, fence, buildings, sidewalks, fish cleaning station, landscaping, ground surface of the equipment laydown, material management areas, and other elements that might be affected by the Work.

D. Engineer will collect and chemically analyze surface samples in areas of the work site in accordance with the requirements of the CQAPP (Appendix F) before Contractor mobilization and just prior to 2012 demobilization to document that Contractor work practices did not affect the work areas.

PART 2 - PRODUCTS

2.01 MISCELLANEOUS MATERIALS

A. Riprap: As specified in Section 02300.

B. Three (3) inch clear stone consisting of 3 to 6 inch diameter clear or washed stone. All material shall be retained on the 3 inch sieve.

2.02 TEMPORARY CHAIN LINK FENCE

A. Unless otherwise indicated, type of temporary chain link fencing shall be Contractor's option. Following types are acceptable:

1. New materials or previously used salvaged chain link fencing in good condition.

2. Posts: Galvanized steel pipe of diameter to provide rigidity. Post shall be suitable for setting in concrete footings, driving into ground, anchoring with base plates, or inserting in precast concrete blocks.

3. Fabric: Woven galvanized steel wire mesh. Provide in continuous lengths to be wire-tied to fence posts or prefabricated into modular pipe-framed fence panels.

B. Entrance gates shall be installed in the fence in locations shown on the Contract Drawings, and shall be secured and locked during non-working hours.

1. Fabricate of same material as used for fencing.

2. Vehicle gates:

a. Minimum width: 20 feet to allow access for emergency vehicles.

b. Capable of manual operation by one person.

C. The fence shall be a minimum height of 6 feet.

D. Fence shall be constructed with adequate stands, bracing/support, post diameter and spacing to resist damage due to winds while in use on the site.

2.03 PLASTIC MESH FENCING

A. Where indicated on Drawings or as required to provide visual warning and control, provide plastic mesh fencing supported by steel posts driven into ground or set in precast concrete blocks.

B. Height: 36 inches minimum.

C. Color: Safety orange

PART 3 - EXECUTION

3.01 PREPARATION

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site preparation operations.

B. Utility Locator Service: Notify “Diggers Hotline” (1-800-242-8511) or 811 to locate underground utilities at least three business days before beginning any Site work.

C. Do not commence Work until temporary erosion and sedimentation control and tree-protection measures are in place.

D. Locate staging areas for construction equipment and for loading and hauling debris.

E. Contractor shall provide RTK-GPS or total station survey support for Engineer’s pre-construction soil sampling and provide resulting survey data within 24-hours. Survey information shall be provided in AutoCAD and point file formats.

3.02 DUST CONTROL

A. Control dust by application of water to affected areas, such that surfaces are moistened to prevent dust from becoming a nuisance to public, neighbors, and concurrent performance of other work at Site. Contractor shall prevent dusting 24 hours per day from project commencement to substantial completion of the Work.

3.03 PROTECTION OF UTILITIES AND STRUCTURES

A. Preserve and protect benchmarks, existing building, and site improvements to remain. If damaged during construction, notify Engineer and Company immediately. If determined by Engineer that the building or site improvement integrity is compromised, Contractor shall repair damage at Contractor's expense under observation of Engineer.

B. Protect, support, and maintain existing utilities (i.e., conduits, wires, pipes) that are to remain in place during work. If uncharted utilities are encountered during excavation, stop work in a safe condition, and notify Engineer. Locate existing underground utilities by hand excavation, as necessary.

C. Interrupting Existing Utilities: Do not interrupt utilities unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Engineer not less than two days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without Engineer's written permission.

3.04 TEMPORARY SEWER OUTFALL BYPASS

A. Provide and operate a bypass system capable of transferring the peak discharge rate of flow from the two sewer outfalls (refer to drawings) to a discharge point located outside of the Temporary Cofferdam.

3.05 TEMPORARY WORK AREA FENCE

A. Contractor shall install and maintain a temporary work area perimeter chain link fence in areas shown on the Contract Drawings.

B. Installation of temporary fencing shall not deter or hinder access to existing and new hose connections and fire hydrants.

1. Maintain 3 feet diameter clear space around fire hydrants.

2. Where fire hydrant or hose connection is blocked by fencing, provide access gate.

C. Access: Provide gates for personnel, delivery of materials, and access by emergency vehicles.

D. Chain link posts:

1. Space at 10 feet maximum.

2. Drive posts, set in holes and backfill, or anchor in precast concrete blocks.

3. For soft and unstable ground conditions, cast concrete plug around post.

4. Posts over pavement: Use steel post plates or precast concrete blocks.

5. Gate posts: Use bracing or concrete footings to provide rigidity for accommodating size of gate.

E. Fabric: Securely attach to posts.

F. Gates: Install with required hardware.

G. Plastic mesh fencing: Space steel support posts to ensure mesh remains vertical and at proper height. Securely tie mesh to posts.

H. Maintain fencing in good condition. If damaged, immediately repair.

I. Remove temporary fencing upon completion of Work or when no longer required for security or control. Backfill holes and compact. Holes in pavement shall be surfaced to match existing paving. Repair damage caused by installation of temporary fencing.

3.06 CONTRACTOR PARKING

A. Contractor shall establish temporary parking area for contractor vehicles in the locations specified on the Contract Drawings or in Contractor's approved Removal Action Work Plan.

1. All Contractor vehicles and equipment shall be parked in Work Area. No parking will be allowed on public streets adjacent to the site.

B. Haul routes shall be maintained for truck traffic throughout the duration of dredging activities. Contractor shall receive approval from Engineer and Company prior to construction or placement of haul routes. The haul routes shall be cleared of debris and sediment on a regular basis to prevent tracking of soils onto public roads.

C. A sediment tracking pad shall be constructed in accordance with Section 02111 "Erosion and Sediment Control" at the point where truck traffic exits the Work Area.

1. Tracking pads shall be constructed with 3 inch clear stone atop a minimum 16 ounce per square yard nonwoven geotextile fabric. The pad must be at least 18-inches thick and shall be maintained for the duration of the work.

D. "Truck Entrance" signs shall be placed along the adjoining public street near the temporary access road so that they are visible to traffic and pedestrians on the adjoining public street.

E. Contractor shall maintain temporary access road(s) and parking area as necessary during construction.

F. The transportation routes including public roads and site entrance shall be maintained throughout the duration of the project. Clean public right-of-ways, streets, and entrance on-site as needed with commercial street sweepers.

G. Control mud and tracking of mud on-site access roads and public roads along haul routes. Provide stone surfaces at entrances and exists to prevent tracking.

3.07 CLEARING AND GRUBBING

A. Areas designated for clearing and grubbing shall be field verified with the Engineer.

B. Clear and grub areas as designated on Drawings. Clear areas of shrubs, trees, stumps, vegetation, rubbish, and other perishable or objectionable matter. Grind or remove stumps.

C. Do not trim trees and root systems unless located within construction limits shown on Plans. Within construction limits, cut interfering tree roots and branches 1 inch or greater in diameter perpendicular to direction of growth.

D. Dispose of materials removed by clearing and grubbing in accordance with applicable local, state and federal regulations. Burning of material on site is not allowed.

3.08 DOCK REMOVAL

A. Coordinate with the City of Marinette for removal of the boat docks at Boom Landing. Docks shall be stored in the upland support area and protected from damage throughout the duration of the project.

B. Coordinate with Nestegg Marine for removal of boat docks, if needed for performance of the Work. Docks shall be stored in a location designated by the Marina.

3.09 TEMPORARY DECONTAMINATION AREA

A. Contractor shall provide high-pressure, low-volume washing equipment with steam capabilities for the purpose of decontamination.

B. Temporary decontamination area shall be lined to prevent contact of underlying soils with contaminated sediment, and to facilitate control and capture of water utilized for decontamination.

C. Water utilized for decontamination shall be collected and treated in accordance with Section 02241 “Contact Water Management”.

1. Contractor shall provide closed conveyance for this water to the Contact Water Treatment System.

2. Conveyance in open/earthen ditches will not be allowed.

3.10 SEDIMENT STABILIZATION AREA

A. Suggested location for the sediment stabilization area is shown on the Contract Drawings, and is to be used for stabilizing excavated sediment and, if necessary, for decontamination of contaminated debris, piping, and earthwork equipment.

1. Contractor may locate sediment stabilization area in another area of the site if reflected in Work Plan submitted by Contractor and approved by Engineer, or as otherwise pre-authorized by Engineer in writing.

B. The sediment stabilization area shall be constructed over the existing paved surface.

1. Where the Contractor proposes to install geosynthetics in contact with the pavement, the area shall be broom swept to remove any stones that may damage the geomembrane to the satisfaction of the Engineer.

C. A geomembrane liner shall be used in the construction of the sediment stabilization area. Provide puncture protection, such as a cushion geotextile, on each side of the geomembrane (upper and lower).

D. If practicable, geomembrane liner shall be continuous. If not a continuous section, the geomembrane liner shall be seamed in accordance with the Manufacturer's recommendations by trained technicians.

1. Prior to seaming, the seam area shall be clean and free of moisture, dust, dirt, debris of any kind, and foreign material.

2. Field seams shall be nondestructively tested in accordance with the manufacturer's recommendations.

E. Repair geosynthetics in accordance with manufacturer's recommendations. All repairs shall be made by trained technicians.

F. Contractor shall designate a truck decontamination area with truck ramps for access within the area.

3.11 TEMPORARY SHEET PILE COFFERDAM

A. Contractor shall install temporary sheet pile cofferdam in accordance with the requirements of Appendix C.

B. Contractor shall provide and install temporary navigational aids in the River when the sheet pile cofferdam is installed, including lights, signs and/or buoys to alert boat traffic of the presence of the cofferdam.

1. Temporary navigational aids with lights shall be lit from sunset to sunrise.

2. Company or Engineer will notify appropriate entities regarding Contractor's installation and maintenance of said navigational aids, including, but not limited to, the City of Marinette, U.S. Coast Guard, and Wisconsin Department of Natural Resources.

3. Contractor shall bear responsibility for any damages resulting from neglect to provide and/or maintain temporary navigational aids.

3.12 SNOW AND ICE MANAGEMENT (AS NEEDED)

A. Non- Contact Snow: As necessary, throughout the course of the Work, snow shall be plowed and removed to maintain access to the site and to and from the Work areas. As required to maintain access, accumulated snow shall be moved to an on-site location approved by the Company.

B. Contact Snow: Accumulated snow in excavation areas and in contact with contaminated materials shall be removed, if required, and transported to the sediment stabilization pad.

3.13 STAGING AND STOCKPILE AREAS

A. Contractor shall establish a staging and stockpile area in a location agreed upon by Company.

B. Stockpiles of non-contaminated soil shall not exceed 12 feet in height, unless approved otherwise by the Engineer, and shall be surrounded with a minimum 9-inch high berm at the perimeter or as necessary to contain runoff.

C. Inactive stockpiles shall be covered with plastic, and the cover anchored and inspected periodically for breaches.

END OF SECTION

SECTION 02111
EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Erosion and sediment control measures necessary to prevent runoff, tracking, or loss of soil materials by water or mechanical action from areas at the site, both upland and in-river.

B. Management of clean (non-contact) surface water within construction limits including protection of any catch basins within the construction limits and construction of surface water diversion berms.

1.02 REFERENCES

A. State of Wisconsin Storm Water Construction and Post-Construction Technical Standards (WDNR Technical Standards).

B. State of Wisconsin, Department of Transportation (WisDOT), Standard Specifications for Highway and Structure Construction (SSHSC), current edition.

C. US Federal Water Pollution Control Act (Clean Water Act)

1.03 QUALITY ASSURANCE

A. All Work shall be in accordance with applicable manufacturer's instructions and local, state, and federal codes, regulations, laws, and ordinances.

B. Contractor shall comply with applicable requirements of Section 404 of Clean Water Act and Navigable Waters Protection.

1.04 SUBMITTALS

A. Submit with and as part of the Removal Action Work Plan an Erosion Control and Surface Water Management Plan including, but not limited to, locations of temporary surface water diversion berms and temporary culverts. Measures shall be taken to minimize surface water intrusion into exposed areas where possible.

B. Contractor shall document condition of erosion control measures during inspections and provide Engineer with copies of erosion control inspection and maintenance records with weekly progress reports.

1.05 PERFORMANCE REQUIREMENTS

A. Contractor shall follow Contract Documents and referenced best management practices for upland areas.

B. In-river turbidity downstream of in-river dredge areas shall not exceed 70 NTU above baseline turbidity measurements.

1. Engineer shall establish baseline turbidity value and measure turbidity downstream of erosion and sediment control features.

2. Engineer will inform Contractor of turbidity readings.

3. When turbidity measurements exceed the allowable maximum levels, Contractor shall immediately adjust operations or improve erosion and sediment control features as necessary to achieve acceptable water quality.

PART 2 - PRODUCTS

2.01 MATERIALS (AS NEEDED)

A. Silt Fence: Comply with WDNR Technical Standard 1056 and Contract Documents.

B. Tracking Pad: Comply with WDNR Technical Standard 1057 and Contract Documents.

C. Inlet Protection: Storm Sentinel Catch Basin Insert, Part #1340, or approved equal.

D. Floating Turbidity Barriers: Comply with WDNR Technical Standard 1069 and Contract Documents.

E. Silt Curtain: Comply with WDNR Technical Standard 1070 and Contract Documents.

F. Temporary Cofferdam: Refer to Contract Documents and Appendix C.

PART 3 - EXECUTION

3.01 GENERAL

A. The erosion and sediment control measures shown on the plans represent a minimum requirement. The Contractor is responsible for determining whether additional erosion and sediment control measures are needed to minimize soil erosion and prevent the migration of sediment from the Work Area for the protection of adjacent properties and water bodies.

B. In dredging areas outside of the cofferdam, utilize a silt curtain that encompasses the dredge envelope. The silt curtain shall have a full-depth skirt of permeable sediment curtain capable of being mechanically raised and lowered.

C. Silt fence, surface water trench, and other erosion control measures shall be established prior to exposing any erodible material. Site grading and drainage operations are to be conducted in a manner to prevent or lessen soil erosion of construction-site work area.

D. Contractor shall establish and maintain erosion control features until site is stabilized from erosion without the use of temporary controls and accepted by Company.

E. Contractor shall undertake erosion control and surface water management measures as required in the Contract Documents including but not limited to:

1. Intercept and divert surface drainage away from the sediment stabilization pad by the use of dikes, curbwalls, ditches, or other means.

2. Install surface drainage systems so that they do not cause erosion on or offsite.

3. Install and maintain silt fence as needed.

4. Provide and maintain tracking pad and roads for access to site and management areas as needed.

5. Protect adjacent storm sewer inlets as needed.

6. Cover stockpiles with plastic and secure to prevent wind erosion. Contractor shall maintain stockpiles throughout the duration of project.

7. Install and maintain silt curtains as necessary.

F. The following general practices shall be used where applicable:

1. Minimize disturbed areas and sequence work to minimize exposure time.

2. Use temporary vegetation, mulch, or other cover to protect areas during construction. Utilize dikes, brush, straw bales, or silt fence to trap sediment.

3. Reduce volume and velocity of water crossing disturbed areas by utilizing diversion dams, straw bales, berms, or other facilities.

4. Remove and replace erosion control measures to accommodate the sequencing and progression of work.

G. The Company and the Engineer have authority to limit surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow, and placement operations. Contractor shall provide immediate temporary or permanent erosion control measures when directed. Contractor shall incorporate all permanent erosion control features into project at earliest practicable time to minimize need for temporary controls.

3.02 ADDITIONAL CONTROL MEASURES

A. Contractor shall provide measures daily to prevent tracking of sediment from site onto public or private roadways, parking lots, and paved areas.

B. Soil loss control measures, in addition to those outlined in these documents and deemed necessary by Company or Engineer shall be implemented immediately.

C. Additional control measures required by regulatory agencies as a result of improper maintenance or installation of the specified control measures will be the responsibility of the Contractor.

3.03 MAINTENANCE

A. Contractor shall inspect erosion control measures within 24 hours of the end of each rainfall event of 0.5 inches or more, or daily during periods of prolonged rainfall, and

weekly during periods without rainfall. Contractor shall immediately repair or replace damaged, failed or inadequate erosion control measures. Contractor shall document condition of erosion control measures during such inspections and provide Company with copies of inspection records.

1. Contractor shall continue inspections following demobilization until final site stabilization and acceptance by the Engineer.

B. Sediment deposits should be removed after each storm event.

C. Contractor shall inspect planned entrances and adjacent public streets daily when traffic is occurring and remove tracked and eroded soils daily or as deemed necessary by Company with a commercial street sweeper.

D. Contractor to maintain erosion control measures through completion of the site work and remove materials as directed by Engineer.

END OF SECTION

SECTION 02241
CONTACT WATER MANAGEMENT

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Control, handling, and storage of groundwater, surface water, and pore water derived from excavation, dredging, and stabilization of sediments at the site and from stockpile areas.

B. Treatment of contact water using Contractor provided mobile treatment system.

C. Treatment of contact water as necessary to meet the Substantive Requirements of a Wisconsin Pollution Discharge Elimination System (WPDES) Permit. A project-specific WPDES Permit is pending from the Wisconsin Department of Natural Resources (WDNR) as of the date these specifications were released. Therefore, an example WPDES Permit is provided in Appendix D which was obtained from another project from WDNR and is expected to be similar for this project.

1. Certain requirements in the permit may be modified or eliminated for the project, which is anticipated to be received before Contractor selection and Contract Award. No substantive changes are anticipated which would cause a material change in the scope or related Bid pricing.

D. Management, transportation, and disposal of water treatment residuals (e.g., settled solids in tanks, filter media).

1.02 REFERENCES

A. WPDES Discharge Permit (Appendix D)

1.03 PERFORMANCE REQUIREMENTS

A. Provide method of control, handling, and storage of contact water from dredging and sediment stabilization activities by whatever means necessary and in conformance with the Contract Documents to obtain satisfactory working conditions and maintain progress of Work.

B. Provide a temporary water treatment system of sufficient flow capacity, which shall include, at minimum, the following process steps: an influent tank for solids settling/clarification, multi-media filtration, and granulated active carbon filtration. The system shall also include an effluent tank, and may include bag filters and other treatment processes as necessary to treat water to meet Project requirements

1. Water treatment additives may be utilized to meet effluent limits. Contractor shall identify and provide information on all proposed additives and dosage in the Contact Water Management Plan.

2. System shall include an effluent flow meter and sample taps between each treatment step and after the final treatment step. An additional sample tap shall be provided on the effluent line for the Engineer to install a flow proportional sampling device provided by Engineer; Contractor shall provide electric power.

3. System shall include a real-time, continuous-recording turbidity meter (NTU) on the effluent line and will be readily available for Engineer to observe and document readings.

4. The system may operate continuously or in batch mode, as determined by the Contractor.

C. Perform storage and gravity settling using a frac tank of adequate volume. Multiple tanks may be required. Provide pipe connection to River for discharge of treated water outside of temporary sheet pile cofferdam. Contractor shall provide measures necessary for operation in freezing temperatures.

D. Contractor shall provide an operator to maintain and operate the Contractor-provided mobile water treatment system throughout the duration of the Contractor's operations as necessary to meet the WPDES discharge permit.

E. If coal tar or lighter phase residual oils are present in the sediment contact water/treatment system influent, the Contractor shall contain and remove the residuals using oil booms and sorbent pads to the extent practical prior to conveyance to the water treatment system. Alternatively, Contractor may install an oil-water separator. These response measures are incidental to the scope of this work item.

F. Provide adequate backup systems to accomplish control of water and to prevent removal, loosening, or softening of in-situ materials.

G. Exercise reasonable means for diverting run-on water away from material management and stockpile areas to minimize contact water volumes.

1.04 SUBMITTALS

A. Submit with as part of the Preliminary and Final Removal Action Work Plans a description of proposed Contact Water Management Plan, including, but not limited to:

1. Methods, equipment, and power supply.

2. Planned location on site for set up and operation of water treatment system.

3. Construction details of typical dewatering sumps and conveyance facilities, if necessary.

4. Description of secondary containment measures.

5. Methods of controlling fines and meeting the substantive requirements of the WPDES Permit.

6. Schedule of installation and operation.

B. If changes occur prior to construction, submittal shall be revised no later than five (5) days prior to start of construction or installation of water control systems.

C. At the end of each day of operation, submit with Daily Dredge Report (Section 02325, Item 1.02.D) the quantity of treated water discharged, and effluent line turbidity (NTU) readings to Engineer as a CSV, XLS, or other electronic format approved by Engineer.

1.05 WORK BY OTHERS

A. Company will obtain the Substantive Requirements of a WPDES discharge permit.

B. Engineer will perform compliance monitoring.

C. Company will pay for transportation and disposal of residuals and spent treatment media.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Pumping, conveyance, and temporary sump equipment and materials are to be selected by Contractor to accomplish Work of this Section.

2.02 PUMPING EQUIPMENT

A. Equipment shall be operated and maintained in an efficient manner to meet the substantive requirements of the WPDES permit.

B. The Contractor shall have on hand, at all times, sufficient pumping equipment and machinery in good working condition for emergencies and shall have available, at all times, competent workmen for the operation of the pumping equipment.

PART 3 - EXECUTION

3.01 SURFACE DRAINAGE

A. Remove surface drainage systems when no longer needed.

B. Prevent any and all discharge of untreated site runoff.

3.02 EQUIPMENT INSTALLATION AND INITIAL TESTING

A. Provide secondary containment for water treatment system.

B. Install water treatment system and facilities in general conformance with Contractor’s approved Removal Action Work Plan.

C. Test all equipment, piping, and fittings for leaks prior to operation. Repair all leaks discovered during inspection prior to operation.

D. Perform initial operation of water treatment system in accordance with agency requirements to demonstrate compliance, including temporary holding of treated effluent until satisfactory sample results are achieved.

3.03 CONTACT WATER CONVEYANCE

A. Provide closed conveyances for contact water (piping or hoses). Conveyance in open troughs or ditches will not be allowed.

B. Inspect contact water conveyances for leaks daily when in operation. Immediately repair leaks when discovered and clean up impacted areas as appropriate.

C. Discharge to and from storage tanks shall be done in a manner that minimizes resuspension of solids.

3.04 WATER TREATMENT SYSTEM OPERATION

A. Contractor shall provide adequate equipment and manpower to operate the water treatment system throughout the duration of the project. Contractor shall be responsible for change-out of filters. All costs associated with the operation and maintenance are the responsibility of the Contractor.

B. If batch operation is planned, Contractor shall give Engineer notice at least 24 hours before initiating operation so Engineer can prepare for necessary sample collection and QA monitoring.

C. Upon completion of the Work, Contractor shall demobilize and decontaminate contact water treatment system, equipment, and materials. Disposal of any decontamination wash waters shall be properly handled and disposed in accordance with all applicable laws, regulations, rules, and standards.

3.05 MANAGEMENT OF WATER TREATMENT RESIDUALS

A. Contaminated filter media or other waste products shall be stored and managed in accordance with all applicable laws, regulations, rules, and standards.

1. Spent sorbent pads shall be disposed with stabilized sediment.

2. Sand filter media shall be disposed with stabilized sediment.

3. Granular activated carbon shall be regenerated.

3.06 DISCHARGE OF TREATED WATER

A. The exact location of discharge point shall be determined in the field by the Contractor and approved by the Engineer and Company, but shall be located outside of the temporary sheet pile cofferdam. The discharge point shall be determined based on WPDES discharge permit requirements.

B. Contractor shall install and maintain conveyance from water treatment system to discharge point. Erosion protection shall be provided at discharge point if discharged back into the River.

END OF SECTION

SECTION 02325
MECHANICAL DREDGING AND BACKFILL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Mechanical dredging.

B. Stabilization, transportation, and disposal of dredged sediments.

C. Backfill of dredged areas (e.g., 6-inch thick post-dredge residual sand layer, as well as backfill along shorelines and structures, where needed).

1.02 SUBMITTALS

A. In accordance with Section 01330.

B. Mechanical Dredging Plan:

1. Contractor shall submit as part of the Preliminary and Final Work Plans a Mechanical Dredging Plan that includes, but is not limited to:

a. All planned dredging equipment (e.g., mechanical backhoe or crane size/capacity and manufacturer; mechanical bucket type and capacity; number and size of barges and scows; etc.).

b. Means and methods for sediment stabilization, including planned location of stabilization activities, additives to be used (product, product source, and mix percentage), and stabilization production rate.

i. Contractor is prohibited from applying super-absorbent polymer to minimize the generation of contact water from dredged sediments.

c. Location within Work Area for river access to facilitate mobilization and demobilization of equipment, as well as for unloading of excavated sediments and loading of backfill materials.

d. Dredging process steps, including means and methods of removing sediment and co-mingled wood debris from the Menominee River and transfer to the sediment stabilization area and/or trucks that will transport stabilized sediment to the designated disposal facility, including locations within Work Area where trucks will be staged for loading of stabilized sediment.

e. Sequence of dredging operations, particularly in areas near existing shoreline structures where careful sequencing is required to maintain the stability of the structure (see Appendix C).

f. Measures to contain dredged sediments and related residuals in the water column, protect uncontaminated areas, and decontaminate equipment following completion of dredging operations.

g. Anticipated dredging production rates.

h. Anticipated sediment stabilization production rates.

i. Anticipated truck loading production rate, and number and type of trucks to be used.

j. Procedures for removal and management of debris and wood pilings encountered in dredge areas.

k. Methods for achieving specified dredging depth and tolerance.

l. Method of Contractor QC and QA bathymetry surveys.

m. Means and methods for placing residual sand layer, including equipment to be used, sand to be used (product, product source, gradation, and chemical analysis), and placement rate, including measures to demonstrate compliance with specified thickness tolerances.

n. Means, methods, and equipment utilized to backfill dredged areas, where needed along shoreline structures, including measures to demonstrate compliance with specified tolerances for backfill depth and/or elevation.

o. Number of Contractor personnel including equipment operators, their specific roles and responsibilities, and qualifications to perform the work. Provide resumes of key staff.

p. Anticipated schedule for operations, including daily working hours and number of days to be worked per week.

q. Other information as needed to fully explain dredging and sediment stabilization means and methods, including those activities that will be self-performed and those that will be subcontracted.

2. Re-submittals or addenda shall be made during course of construction if Work Plan is modified.

C. Submit prior to start of construction the name and location of all sources that will be used to obtain the materials specified in this Section.

1. Submit for documentation, certificates and/or test results for one sample of each material obtained from off-site sources indicating compliance with Specifications prior to start of construction. Engineer may take random samples of the material upon delivery or placement to verify compliance with the Specifications.

D. Daily Dredging Reports:

1. Contractor shall submit reports summarizing daily dredging operations to the Engineer no later than 11:00 a.m. on the following work day.

2. Daily Dredging Report shall contain:

    a. Day and date of report;

    b. Project name;

    c. Weather conditions;

    d. Location/area of dredging (i.e., a figure);

    e. Crew size and hours worked;

    f. Approximate volume and character of materials dredged (including debris), particularly any changes in sediment characteristics and/or debris encountered;

    g. Quality control depth soundings taken;

    h. Quality control turbidity measurements and observations associated with the contact water treatment system, along with daily discharge volume;

    i. Accidents, spills, and mishaps, etc. and actions taken in response to these incidents;

    j. Names of any visitors to the site; and

    k. Name of individual making report.

E. Weekly Reports

1. In addition to the Daily Dredging Reports, Contractor shall also submit weekly reports summarizing weekly progress, productivity, and monitoring data in accordance with Section 01040.

2. Construction drawings shall be utilized to reflect progress.

3. Transportation/disposal manifests and weight/truck tickets associated with stabilized sediment transported to the off-site disposal facility during the previous week shall be included.

4. Load tickets or other documentation shall be provided for materials imported to the site for the removal action (e.g., sediment stabilization additive, backfill, riprap, etc.).

F. Surveys

1. Submit to the Engineer a listing of benchmarks and/or control points established at the site by Contractor, which National Geodetic Survey (NGS) monument(s) they are referenced to, and their horizontal and vertical positions.

2. Submit preconstruction QA bathymetric survey to Engineer for information.

3. Submit for Engineer verification final surveys of completed Work with quantity calculations for the following Work items:

   a. Mechanical Dredging

   b. Shoreline backfill

   c. Sand layer

4. Survey submittals shall include electronic files in a format compatible with AutoCAD 2012.

1.03 PERSONNEL REQUIREMENTS

A. Provide competent personnel to perform the work. Personnel shall be trained and have prior experience using all of the equipment, meeting environmental requirements, and achieving dredging tolerance limits.

1.04 MARINE REQUIREMENTS

A. Contractor shall provide or make arrangements for all marine equipment and facilities, including staging areas, docks, and transportation of equipment, material, and personnel to and from offshore operations.

B. Contractor shall provide marine equipment that complies with all regulatory and safety requirements.

C. Company or Engineer will notify City of Marinette, U.S. Coast Guard, U.S. Army Corps of Engineers, Wisconsin Department of Natural Resources and other necessary agencies when offshore operations are to commence. Contractor shall comply with all applicable marine rules and requirements.

D. All offshore operations shall comply with all applicable laws, rules, and customs, including those regarding lights, day signals, markers, etc. Offshore equipment shall comply with the requirements of the U.S. Coast Guard and U.S. Army Corps of Engineers.

1.05 QUALITY CONTROL (QC) AND QUALITY ASSURANCE (QA)

A. Comply with conditions and substantive requirements of all applicable permits, and permit equivalency.

B. Dredging and Backfilling equipment shall be equipped with real-time kinematic global positioning system (RTK GPS) equipment that continuously measures and records the

horizontal and vertical position of the bucket in accordance with the following tolerance requirements:

1. Horizontal Tolerance: 3.0 ft.

2. Vertical Tolerance: 0.2 ft.

3. Horizontal and vertical positions/elevations shall be referenced to National Geodetic Survey (NGS) monuments with a classification of 3rd Order, Class 1 or higher.

    a. Site control points shall be established from NGS monuments and be accurate within 0.05 ft horizontally and 0.1 ft vertically as determined by GPS equipment using static observations or by kinematic techniques.

        i. Horizontal positions shall be referenced to the Marinette County Coordinate System (US feet).

        ii. Elevations shall be referenced to the North American Vertical Datum of 1988.

        iii. Site control points shall be clear of obstacles that may cause GPS multi-path problems or radio signal interference such as fences, buildings, and radio masts to the extent possible.

        iv. A permanent monument shall be set on at least one site control point.

        v. One of the site control points shall be BM-SG as indicated on the Contract Drawings.

4. Contractor shall demonstrate compliance with specified tolerance intervals once per day or as directed by Engineer, by calibration with a site benchmark or control point.

C. Contractor QC Bathymetric Surveys:

1. Perform at minimum weekly QC bathymetric surveys to track progress in achieving target elevations.

D. Contractor QA Bathymetric Surveys:

1. Perform and provide a pre-dredging bathymetric survey(s) to be used to establish a baseline from which to quantify work.

2. Perform post-dredging bathymetric survey(s) that will serve as the basis for establishing pay quantities.

3. Bathymetric surveys shall be performed in accordance with US Army Corps of Engineers Engineering Manual No. 1110-2-1003 (Engineering and Design – Hydrographic Surveying).

4. Single or multi-beam surveys may be used, with surveying transects located between 10 and 25 feet apart. If there are portions of the project area that are not accessible for the marine survey equipment to access (i.e., water is too shallow), bathymetric measurements may be collected using conventional survey methods (e.g., a survey rod).

5. If it is determined that the post-dredge QA bathymetric survey has not achieved the target design elevation in 90% or more of the work area, additional dredging will be performed to reach the target elevation. If additional dredging is performed, the post-dredge QA survey will be performed again.

    a. The 90% criterion will not apply to dredge areas documented to contain "high subgrade," if any. "High subgrade" is defined as uncontaminated sediment, or firm native stratum (e.g., clay till, bedrock) underlying contaminated sediment. Engineer and Contractor shall work together to develop a mutually acceptable standard operating procedure for documenting high subgrades if/when encountered.

6. Multiple QA surveys may be performed as work progresses to identify/demonstrate progress and establish related pay quantities to facilitate monthly invoicing. If progress surveys overlap, pay quantity calculations shall clearly identify how surveys were utilized to calculate pay quantity to facilitate verification by Engineer.

7. Engineer may observe QA surveys, and Contractor shall provide 24 hours notice prior to performing QA surveys.

E. Sediment Confirmation Sampling:

1. Following confirmation of the 90% elevation criterion, provide access for Engineer (including Engineer's boat) to collect sediment post-dredge confirmation samples for analysis of residual contaminant concentrations. Refer to CQAPP (Appendix F).

F. Turbidity Measurements:

1. Engineer will monitor turbidity outside of the temporary sheet pile cofferdam (upstream and downstream) and periodically monitor turbidity inside of the cofferdam. Turbidity observations and results will be made available to Contractor. Refer to CQAPP (Appendix F).

G. Backfill Tolerance:

1. Tolerance on backfill (including residual sand layer) is minus 0.1 foot and plus 0.25 foot.

1.06 PERFORMANCE REQUIREMENTS

A. Area within temporary cofferdam may not be dewatered to facilitate dry excavation due to stability concerns associated with the cofferdam. Refer to Appendix C for further information.

B. Contractor may pump water from within, or pump water into, the cofferdam to facilitate work, but at no time may the difference in water level inside and outside the cofferdam exceed 1 ft to maintain cofferdam stability.

C. Contractor may not moor equipment to the cofferdam or place loading other than that caused by the river and sediment/soil.

D. Existing bathymetry (top of sediment) as of the date of survey and dredge target elevations are shown on the Contract Drawings. Estimated dredge quantities based on these surfaces are shown on the Bid Form. These are estimates only, and payment will be made for actual quantities based on project pre- and post-dredge QA bathymetric surveys. Contractor's QA survey data (point files) shall be provided to Engineer. Engineer will independently generate surfaces and volume take-offs using Contractor data as a check on Contractor's calculations. Engineer's results will be used as the basis for Contractor pay requests, unless Engineer accepts Contractor's results.

1. Contractor is allowed up to 0.5 feet of dredge overcut beyond the target elevations.

    a. This overdredge allowance will be converted to an allowable overdredge volume over an agreed upon dredge management unit (DMU) equivalent to no more than one week's dredging production rather than point measurements of thickness/depth/elevation.

2. Overdredging greater than 0.5 feet below target elevations, based on QA bathymetry surveys, will not be compensated. Further, landfill disposal fees paid by the Company for volumes corresponding to dredging below the 0.5-foot overdredge allowance will be deducted from Contractor's payment.

E. Dredging of sediments/ will be considered complete when sediments have been removed to target elevations (or a maximum of 6 inches below target elevation), QA bathymetry surveys have been performed to document removal to target elevations over at least 90% of the subject area or DMU, post-dredge confirmation samples have been collected and analyzed for comparison to target concentrations, and the Engineer approves the Contractor to proceed with backfilling or sand layer placement, if needed.

1. Dredging of NAPL-containing sediment will be determined complete based on visual observation of dredged sediment for the absence of NAPL (refer to CQAPP in Appendix F). If NAPL appears to extend deeper than target depths/elevations, Engineer in consultation with Regulatory Agencies may direct Contractor to investigate lateral and vertical extent with mechanical excavator, and/or to continue excavation. Engineer will consider stability of cofferdam and existing shoreline structures when determining whether to continue excavation deeper.

F. Contractor shall immediately notify Engineer if native soil is encountered above the design dredge depths/elevations while dredging (i.e., high subgrade condition). Engineer will investigate and possibly raise target dredge elevations accordingly.

G. If turbidity (as measured by Engineer) downstream of dredge area outside cofferdam which is enclosed by silt curtain, or downstream of dredge area enclosed by cofferdam exceeds 70 NTU higher than the turbidity upstream (as measured by the Engineer), Contractor will be required to modify operations. These response actions are considered incidental to the dredging work.

H. There is no turbidity performance standard inside the cofferdam during dredging and backfilling operations. However, **subject to Regulatory Agency approval**, the 70 NTU performance standard must be met before the cofferdam can be removed after dredging and backfilling are completed (i.e., turbidity inside the cofferdam must be 70 NTU or less than turbidity outside/downstream of the cofferdam before removing the cofferdam).

1. Contractor shall employ best management practices and conduct dredging operations in a manner to minimize turbidity in the Work Area and recontamination of dredged areas.

1.07 PROJECT CONDITIONS

A. Refer to Appendix A for logs of sediment cores and borings showing subsurface conditions in the dredge area. It also contains chemical analytical data summaries characterizing contamination.

B. A significant amount of wood debris was present during poling and core sampling. Contractor should be prepared to remove and manage debris in the sediment during dredging, and consider the effect of debris on dredge production rates in establishing its bid. Company will provide roll-off boxes in the upland support area to manage debris, including transportation to and disposal at Waste Management's Menominee Landfill.

PART 2 - PRODUCTS

2.01 BACKFILL

A. Sand: provide sand meeting the requirements of Concrete Fine Aggregate in Section 501.2.5.3 of the Wisconsin Department of Transportation's (WisDOT's) Standard Specifications for Highway and Structure Construction or equivalent material approved by Engineer.

B. Gravel: provide gravel meeting the requirements of No. 2 Concrete Coarse Aggregate in Section 501.2.5.4 of the Wisconsin Department of Transportation's (WisDOT's) Standard Specifications for Highway and Structure Construction or equivalent material approved by Engineer.

C. General Fill: provide soil meeting ASTM D2487 soil classification groups GW, GP, GM, SW, and SP or a combination of these group symbols; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, chemical contamination, and other deleterious matter.

D. Contractor shall provide Engineer a representative sample of backfill materials two weeks prior to delivery to site along with documentation demonstrating compliance with the material specifications referenced above. Engineer may submit the sample for independent testing.

2.02 REACTIVE CORE MAT

A. Provide CETCO Reactive Core Mat (RCM) with organoclay, or equivalent product approved by Engineer. Place cushion geotextile between Mat and overlying rip rap as shown on Contract Drawings.

PART 3 - EXECUTION

3.01 PREPARATION

A. Provide facilities as necessary to protect structures from damage during the dredging operations.

B. Provide controls necessary to limit the re-suspension of sediments within the cofferdam if turbidity measurements outside of the cofferdam reach unacceptable levels.

C. Environmental Protection:

1. Wherever possible, use biodegradable hydraulic oil.

2. Provide necessary facilities to comply with Federal, State and local requirements concerning air, noise and water pollution.

3. Protect against discharge of any oils, fuels, bitumens, garbage, trash, sewage, or other materials which may be harmful to fish, wildlife, or vegetation into the waters of the River. Should the Contractor spill, dump, lose, throw off the dredge or sink any material, plant, machinery or appliance, which in the opinion of the Engineer or Company, may be dangerous to the environment or hazardous to navigation, the Contractor shall promptly recover or correct any fuel or oil leaks in equipment at Contractor expense.

D. Provide oil boom around direct dredging/excavation area and secondary containment oil boom along the inside face of the cofferdam. Contractor shall remove oil/sheen as encountered during dredging with sorbent pads.

3.02 CONSTRUCTION REQUIREMENTS

A. Trucks shall be staged within the work area shown on the Contract Drawings and as indicated in the Contractor's Work Plan to be approved by the Engineer. Temporary staging of trucks on City of Marinette streets is not allowed.

B. Perform work in a manner so that the structural integrity existing shoreline structures is not compromised during dredging activities.

C. Water elevation inside cofferdam shall be maintained in accordance with the requirements of the design contained in Appendix C. Refer to Section 02241 for water treatment/discharge requirements.

D. Dredged sediment must be adequately dewatered and/or stabilized prior to transportation for disposal per disposal requirements. Contractor shall provide truck bed liners, tarps, and/or absorbent material, as needed.

E. Dredged sediments and debris may only be stockpiled within the upland portion of the Work Area following construction of a containment system consisting of a bottom liner and perimeter dikes, as approved by Engineer. Refer to Section 02100 – Site Preparation for requirements related to an upland sediment stabilization area.

F. Operations Sequence Requirements:

1. Dredging operations shall be sequenced to avoid disturbing a large volume of sediment at a time.

2. After Engineer approval, place backfill in a timely fashion in areas as shown on Contract Drawings, or as needed based on results of post-dredge confirmation sampling.

3.03 DREDGING EQUIPMENT

A. The dredging must be performed by wet excavation with a dredge equipped with an environmental bucket or other approved bucket. Means and methods shall be provided to move dredged sediments to upland stabilization area or on-water barge for stabilization as approved by Engineer.

B. Dredging equipment utilized outside of the temporary cofferdam shall have a silt curtain that encompasses the dredge envelope. The silt curtain will have a full-depth skirt.

C. Utilize equipment necessary to provide specified residual sand cover including, but not limited to:

1. Direct placement with a mechanical clamshell bucket.

2. Spreading with hydraulic pipeline and baffle box or plate.

3. Washing off deck of barge with high powered jet.

3.04 DREDGING

A. Dredging Limits and Target Depth:

1. The dredge area limits and approximate thicknesses are shown on Contract Drawings.

2. Preserve stable side slopes and avoid leaving residual sediment above the target elevations in any areas where dredging has been performed.

3. If it is determined that the post-dredge QA bathymetric survey has not achieved the target design elevation in 90% or more of the work area, additional dredging will be performed to reach the target elevation. Areas of documented high subgrade approved by Engineer will be excluded from the 90% criterion.

B. Dredging Operations:

1. Maintain access for boat traffic through navigable waterways at all times.

2. When working at night, Contractor shall provide and maintain adequate lighting from sunset to sunrise to allow for safe and proper observation and control of dredging operations.

3. Do not disturb sediments outside the dredge area.

4. Immediately stop dredging and notify the Engineer in the event that something is encountered which is unanticipated or outside the scope of this specification.

a. If NAPL material extends beyond the planned excavation areas along and under the shoreline, and if additional excavation may cause instability of adjacent features on shore, Contractor shall notify the Engineer of these conditions.

i. If approved by Engineer, Contractor shall install Reactive Core Mat as a contingency response action to cover the shoreline containing residual NAPL, and the Reactive Core Mat shall be anchored near the top of slope and extend to the bottom of excavation. The Reactive Core Mat shall be installed in accordance with the manufacturer's instructions prior to backfilling the sediment and shoreline excavations.

b. Contractor shall immediately notify Engineer if native soil is encountered above the design dredge depths/elevations while dredging (i.e., high subgrade condition). Engineer will investigate and possibly raise target dredge elevations accordingly.

5. The Engineer will be present on site during dredging activities.

6. Blasting will not be permitted.

7. Unless otherwise directed, dredge in a manner that prevents sloughing of contaminated sediments into dredged areas.

8. Control dredge speed and operations to minimize the re-suspension of sediment into the water column and to minimize the settling out of re-suspended solids in areas previously dredged.

9. Overlap dredge cuts to avoid leaving ridges or windrows of contaminated sediments between adjacent cuts.

10. Establish final side slopes to an angle of repose that assures stability and to avoid subsequent sloughing of residual material.

C. Confirmation Sampling and Testing:

1. After QA bathymetric surveys verify target elevations have been attained within the stated tolerances, post-dredge confirmation sampling and testing of residual sediments will be performed by the Engineer. Refer to Engineer's Construction Quality Assurance Project Plan (CQAPP) in Appendix F.

3.05 MANAGEMENT AND DISPOSAL OF DREDGED SEDIMENT

A. Contractor shall load dredged sediment into appropriate and licensed trucks provided by Contractor, and transport sediment to Waste Management's Menominee Landfill located in Menominee, Michigan. Company will directly pay all Waste Management disposal costs.

B. Dredged sediment must be stabilized before loading into trucks so that it contains no free liquids (i.e., passes paint filter testing, SW846 Method 9095A). Further, stabilized sediment must be "workable" and meet the following physical criteria before acceptance at the landfill:

1. Cohesive and/or fine-grained sediment must have at least 1,600 PSF unconfined compressive strength or 800 PSF shear strength.

2. Non-cohesive and/or coarse-grained sediment must have at least 25 degrees friction angle as determined by direct shear testing (ASTM D3080).

C. Engineer will collect samples of stabilized sediment, and perform QA paint filter testing and geotechnical testing to verify sediment meets the criteria listed above. Refer to CQAPP in Appendix F.

3.06 SEDIMENT STABILIZATION

A. Contractor shall provide means and methods to stabilize dredged/excavated sediment to meet disposal requirements. Contractor will determine appropriate stabilization measures. Stabilization methods may be passive (e.g., gravity dewatering in a stockpile) or active (e.g., blending with solidification additives such as Portland cement, Calciment, or lime; use of "super absorbent polymer" will not be allowed). Dust shall be controlled if additives are used. Sediment stabilization in upland areas shall be lined to prevent contact of sediment with underlying soils, and to control and capture sediment contact water for treatment (Section 02241). Sediment stabilization, if performed in contractor work barge or scow, must be done in a controlled manner to prevent releases to the river.

3.07 TRANSPORTING DREDGED MATERIAL FOR DISPOSAL

A. Contractor shall demonstrate that stabilized sediments meet disposal requirements prior to loading for transportation. Engineer will perform independent sampling and testing for confirmatory purposes.

B. Upon demonstration that the stabilized sediment meets disposal requirements, Contractor shall load and transport sediment to the designated disposal facility. Contractor shall provide truck bed liners, tarps, and/or absorbent material, as needed.

3.08 BACKFILL

A. Engineer will perform post-dredge verification sampling to determine compliance with removal action objectives (refer to CQAPP in Appendix F).

B. Following Engineer's confirmation sampling and testing related to dredging, and following notification from Engineer to proceed to backfilling, Contractor shall backfill with general fill along shorelines and structures as indicated on the Contract Drawings, and/or with sand away from shorelines and structures based on residual sediment concentrations.

1. Refer to CQAPP (Appendix F) for basis for determining need for 6-inch sand layer.

2. Shoreline areas shall be backfilled with General Fill to within 1 foot of design elevations indicated on the Contract Drawings. Contractor shall compact General Fill by reasonable means and methods considering site conditions, to maximize shoreline stability and to minimize settling/consolidation.

3.09 CLEANUP

A. Upon completion of the Work, pressure-wash all equipment that has handled or made contact with contaminated sediments, including, but not limited to the, excavation bucket, material barge, stabilization equipment, sheet pile associated with temporary cofferdam, Engineer's sampling boat's and turbidity equipment, and upland stabilization area. Wash water shall be appropriately handled and disposed in accordance with Section 02241, and material residue (solids) shall be disposed with the stabilized sediments.

1. Contractor to provide information regarding planned detergent or cleaning agents including, but not limited to, MSDS sheets, for Engineer's approval.

B. Also, all marine equipment removed from the river shall be cleaned in accordance with WDNR requirements before leaving the site to prevent the spread of viral hemorrhagic septicemia (VHS) and invasive species.

C. Contact the Engineer for inspection and approval of intermediate and final clean-up of equipment and work areas.

END OF SECTION

SECTION 02510
ASPHALTIC CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

A. If needed, construct asphaltic concrete paving to asphalt areas damaged during construction activities, as directed by Engineer.

1.02 REFERENCES

A. City of Marinette Code of Ordinances, current edition.

B. State of Wisconsin Department of Transportation (WisDOT), Standard Specifications for Highway and Structure Construction, current edition.

1.03 SUBMITTALS

A. Identify the asphalt paving subcontractor to be used for the project.

1.04 QUALITY ASSURANCE

A. Paving Contractor's Qualifications:

1. The work of this section shall be performed by a qualified (sub)contractor specializing in asphaltic concrete paving.

B. Perform Work in accordance with WisDOT Section 460 – Hot Mix Asphalt Pavement.

C. Conform to WisDOT Section 450 – General Requirements for Asphaltic Pavements.

D. Obtain material from same source throughout.

PART 2 - PRODUCTS

2.01 ASPHALT PAVING MIX

A. Use dry material to avoid foaming. Mix uniformly.

B. Aggregate Base Course: WisDOT Section 305 - Dense Graded Base; ¾ - inch gradation: crushed stone shall be used.

C. Binder Course: WisDOT Section 460.2.2.3 – Lower Layer, Nominal Size ½-inch (12.5 mm).

D. Surface Course: WisDOT Section 460.2.2.3 – Upper Layer, Nominal Size ½-inch (12.5 mm).

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that compacted subgrade and granular base is dry and ready to support paving and imposed loads.

B. Correct irregularities in subgrade by scarifying, reshaping and re-compacting. If there is a delay between subgrade preparation and placing the base course, the subgrade shall be recompacted.

C. Verify grades and elevations of base are correct.

3.02 BASE COURSE FOR STREETS AND PARKING AREAS

A. The materials used and the method of construction shall be in compliance with the specifications approved by the State Highway Commission of the State of Wisconsin.

B. Base course consisting of crushed stone of gravel, compacted using a vibratory roller to a minimum thickness of six (6) inches, or to match the thickness of surrounding base course.

C. Place aggregate in maximum 4-inch thick layers and roller compact.

D. Aggregate surface shall not rut or displace significantly under the weight of the equipment. Soft or unstable areas that cannot be improved by additional compaction shall be undercut, replaced with suitable material, and recompacted.

E. If material is deficient in moisture content, add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.

F. Use of portable mechanical tamping equipment shall only occur in areas inaccessible to roller compaction equipment.

3.03 PREPARATION – TACK COAT

A. Apply tack coat in accordance with WisDOT Section 455.2.5 – Tack Coat.

3.04 PLACING ASHPHALT PAVEMENT – DOUBLE COURSE

A. Place binder course to a nominal compacted thickness of 2.0 inches, or to a thickness to match surrounding binder course.

B. Place surface course within 24 hours of placing and compacting binder course.

C. Apply tack coat immediately before placing surface course and in accordance with WisDOT standards.

D. Place surface course to a nominal compacted thickness of 1.75 inches, or to a thickness to match surrounding surface course.

E. Compact pavement by rolling to specified requirements of Section 450, WisDOT. Do not displace or extrude pavement from position. Hand compaction shall occur only in areas inaccessible to rolling equipment.

F. Perform rolling while the mixture is still hot with consecutive passes to achieve even and smooth finish, without roller marks.

G. Do not place asphalt when ambient air or base surface temperature is less than 40°F, or surface is wet or frozen.

H. Do not permit heavy equipment, including rollers, to stand on finished surface before it has completely cooled or set.

3.05 TOLERANCES

A. Slope: Provide a uniformly sloped surface to promote drainage.

B. Scheduled Compacted Thickness: Within 0.25 inch.

C. Variation from Design Elevation: Within 0.5 inch.

3.06 PATCHING

A. Remove and replace defective areas.

1. Cut out and fill with fresh hot-asphalt concrete; cold patching is not allowed.

2. Compact by rolling to surface smoothness.

3. Remove deficient areas for full depth of course.

4. Cut sides perpendicular and parallel to direction of traffic with edges vertical.

5. Apply tack coat to exposed surfaces before placing new asphalt concrete mixture.

3.07 FIELD QUALITY CONTROL AND PROTECTION

A. Provide field inspection and grade measurements as required to verify placement, grades and elevation.

B. Immediately after placement, protect pavement from mechanical injury for two (2) days or until surface temperature is less than 140°F.

END OF SECTION

SECTION 02930
SEEDING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Preparation of subsoil

B. Placing salvaged and imported topsoil

C. Seeding

D. Herbicides/pesticides

E. Mulching/Erosion Control Mat

F. Fertilizing

G. Maintenance

1.02 REFERENCES

A. State of Wisconsin, Department of Transportation (WisDOT), Standard Specifications for Highway and Structure Construction, current edition.

B. Federal Seed Act. Importation of seed and screening under the federal seed act. Animal and plant health inspection service. U.S. Department of Agriculture. Code of Federal Regulations 7 CFR 361.

1.03 WORK INCLUDES

A. Furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary for seeding all disturbed areas within the Work Area, as specified herein, and as shown on Contract Drawings.

1.04 DEFINITIONS

A. Weeds: Vegetative species, other than specified species, established in given area.

1.05 QUALITY ASSURANCE

A. Seed

1. Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging and location of packaging. Containers or packages shall be new and unopened.

2. Seed shall not be used one year later than the test date appearing on the label.

B. Fertilizer

1. Each container shall be plainly marked with the analysis of the contents showing the minimum percentages of total nitrogen, available phosphorous, and soluble potash. Containers or packages shall be new and unopened.

C. Seeding Contractor's Qualifications:

1. The work of this section shall be performed by a qualified Contractor specializing in seeding and maintenance procedures for native species.

2. The Seeding Contractor shall have a minimum of three years of experience in seeding and maintaining similar projects.

1.06 REGULATORY REQUIREMENTS

A. Comply with applicable regulations for fertilizer and herbicide composition and application. Include evidence of compliance from applicable agencies having jurisdiction over herbicide/pesticide application and copies of applicator's current license.

B. Provide certificate of compliance from authority having jurisdiction indicating approval of seed mixture.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Grass seed shall be provided in supplier's sealed water-tight/rodent proof containers labeled in accordance with Federal Seed Act. Seed in damaged containers is not acceptable.

B. Contractor shall store and protect products. Deliver materials at time of application; do not store on site.

C. Contractor shall deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.08 SUBMITTALS

A. Product Data: Submit data for seed mix, fertilizer, mulch, and other accessories at least five (5) working days prior to use.

1. Topsoil: Provide data on imported topsoil. Imported topsoil shall be tested as specified to verify compliance with specified requirements. The testing results shall include recommended fertilizer application rates.

2. Seed: Provide data on seed mixture showing name of seed supply Company and percentage of seed mix.

3. Fertilizer: Provide data on fertilizer showing type, manufacturer, and composition.

4. Herbicides/pesticides: Provide data on herbicides/pesticides.

5. Mulch: Provide data on mulch including supplier and assurance that mulch is free of weed seeds.

6. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.09 WARRANTY

1.10 Contractor shall warranty growth for a period of 1 year following planting.

PART 2 - PRODUCTS

2.01 SEED MIXTURE

A. Seed shall comply with the requirements of Section 630 of the WisDOT Standard Specifications for Highway and Structure Construction.

B. WisDOT Seed Mix No. 40: proportion by weight as below.

Species	**Percent Germination**	**Percent Mixture**
Kentucky Bluegrass	85	35
Red Fescue	85	20
Hard Fescue	85	20
Improved Fine Perennial Ryegrass	85	25
Total		**100**

2.02 SOIL MATERIALS

A. New or imported topsoil shall meet the requirements of Paragraph 625.2 (1) of the WisDOT Standard Specifications for Highway and Structure Construction; free of objectionable debris such as sod, stones, roots and twigs.

B. Salvaged topsoil shall meet the requirements of Paragraph 625.2 of the applicable WisDOT Standard Specifications; free of objectionable debris such as sod, stones, roots and twigs.

2.03 MULCHES (Slopes less than 3%)

A. Straw

1. Provide stalks from oats, wheat, rye, barley or rice that are free of weeds, mold, or other objectionable material.

2. Straw shall be in an air-dry condition and suitable for placing with commercial mulch blowing equipment.

B. Cellulose Fiber

1. Provide cellulose fiber for use with hydraulic application of grass seed and fertilizer consisting of specially prepared wood cellulose fiber, processed to contain no growth or germination-inhibiting factors, and dyed an appropriate color to facilitate visual metering of application of materials. Provide wood cellulose fiber containing not more than 12 percent moisture on an air-dry weight basis, plus or minus 3 percent at time of manufacture, with a pH range from 3.5 to 5.0. Provide wood cellulose fiber manufactured so that:

   a. After addition and agitation in slurry tanks with fertilizers, grass seeds, water and other approved additives, the fibers in the material will become uniformly suspended to form a homogeneous slurry.

   b. When hydraulically sprayed on the ground, the materials will form a cover impregnated uniformly with grass seed.

   c. The cover will allow the absorption of moisture and allow rainfall or applied water to percolate to the underlying soil.

2.04 EROSION CONTROL MATTING (Slopes greater than 7%)

A. Provide a product that exhibits the following properties: 100 Percent degradable composition (photo-degradable, bio-degradable) sufficient to stabilize 4H:1V (maximum) slopes, such as North American Green S150 or similar.

B. Erosion control mat (ECM) shall conform to the requirements of the WisDOT Product Acceptability List (PAL) for Erosion Control Revegetative Mat (ECRM).

C. Anchoring devices shall be biodegradable. Anchoring devices shall substantially degrade within 3 to 6 months during warm soil conditions. Steel wire pins or staples shall not be allowed.

D. Netting shall be bonded sufficiently to the parent material for the life of the product.

2.05 ACCESSORIES

A. Water: Clean, fresh and free of substances or matter capable of inhibiting vigorous growth of grass.

B. Fertilizer: Granular, slow release type meeting the following requirements, or other as approved by Engineer:

1.	Nitrogen	20%
2.	Phosphoric Acid	0%
3.	Potash	3%

PART 3 - EXECUTION

3.01 SEEDING

A. Prepared seedbed areas shall be inspected and approved by Engineer and/or Company prior to seeding. Failure to comply may result in rejection of seeding work.

B. Apply seed at rate of 2 pounds per 1000 square feet, evenly.

C. Do not seed areas in excess of that which can be mulched on same day.

D. Planting Seasons: Spring, April 1st through June 1st; Fall, August 15th through October 1st. Seeding outside the specified time periods requires written approval from Engineer.

E. Do not sow immediately following rain, when ground is too dry, or when winds are over 12 mph.

F. Roll seeded area with roller not exceeding 150 lbs/linear foot.

G. Immediately following seeding and compacting, apply mulch to thickness of 1/8 inch. Maintain clear of shrubs and trees. All straw mulch material is to be machine crimped into topsoil.

H. Apply water with fine spray immediately after each area has been mulched. Saturate soil to depth of four (4) inches.

I. Seeding shall comply with the requirements of Section 630 of the WisDOT Standard Specifications for Highway and Structure Construction.

J. Seed may be sown by either Method A or Method B as defined in Section 630.3.3 of the WisDOT Standard Specifications.

1. Preferred equipment for Method A shall be a multi-packer type seeder.

2. Light rolling or compacting will be required after seeding by Method A if it is not accomplished by the seeding equipment.

3.02 FERTILIZING

A. Apply fertilizer at a rate recommended by manufacturer.

B. Do not apply fertilizer at same time or with same machine used to apply seed.

C. Mix fertilizer thoroughly into upper two (2) inches of topsoil.

D. Comply with the requirements of Section 629 of the WisDOT Standard Specifications for Highway and Structure Construction.

3.03 MULCH (Slopes less than 3%)

A. Mulch seeded areas where erosion mat will not be placed (areas with less than 3% slope). Mulch must be free of weeds. Hand spread or power blow mulch to uniformly cover

seeded surface. Seat mulch into subgrade using crimp-mulching technique. Use construction methods specified in Section 627 of the WisDOT Standard Specifications for Highway and Structure Construction.

3.04 EROSION CONTROL MAT (Slopes greater than 3%)

A. The application area shall be inspected prior to the installation of the erosion control mat (ECM) to verify it is properly graded, compacted and generally free of ruts and projecting stones or clods. The surface shall be seeded prior to the placement of the ECM as specified in this section.

B. The Contractor shall place the ECM as recommended by the manufacturer. The ECM shall be laid on the prepared base in the direction of flow without wrinkles, folds and minimal void spaces between the ECM and the ground surface. Successive sheets of ECM shall be overlapped a minimum of 12 inches, with the upstream sheet overlapping the downstream. Longitudinal overlaps must be a minimum of four (4) inches along the overlap length. Anchoring shall include the use of trenches and fasteners that are biodegradable.

C. The ECM shall be inspected and approved by the Engineer after installation. Damaged sections shall be repaired immediately with a patch of the same material of sufficient size to permit attaching to or anchoring through the parent blanket beyond the damaged area at the Contractors cost.

3.05 ESTABLISHMENT

A. Establishment Period shall be one year.

B. Acceptable Establishment: At the end of the establishment period the grass shall be healthy, uniform in density and color, and substantially free of weeds with uniform coverage of at least 70 percent of a representative one square yard plot and bare spots not exceeding 6 inches by 6 inches.

C. Re-seed areas that fail to grow within Establishment Period.

D. Repair washouts or gullies that occur during Establishment Period.

E. Protect all seeded areas with temporary warning signs, fences, etc. to prevent trampling and/or damage during Establishment Period.

3.06 FINAL ACCEPTANCE

A. Payment for seeding will be based on the Acceptable Establishment. If Acceptable Establishment is not produced within the Establishment Period, Company or Engineer reserves right to perform seeding and cost of this work will be deducted from the Contract.

END OF SECTION

SECTION 02940
SITE RESTORATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Construction of the new sanitary and storm sewer outfall structure and associated sheet pile cutoff wall.

2. Removal of Temporary Sheet Pile Cofferdam.

3. General Site Restoration.

4. Final Erosion Controls and Final Cleanup.

1.02 REFERENCES

A. State of Wisconsin, Department of Transportation, (WisDOT) Standard Specifications for Highway and Structure Construction (SSHSC), current edition.

B. Specifications for New Outfall Structure and Sheet Pile Wall, Ayres Associates, Inc. (Appendix E)

PART 2 - PRODUCTS

2.01 RIPRAP

A. Furnish durable field or quarry stone that is sound, hard, dense, resistant to the action of air and water, and free of seams, cracks, or other structural defects. Use stone pieces with a length and width no more than twice the thickness. Do not place material without the engineer's approval of the stone quality, size, and shape.

B. The Engineer will determine the average dimension of stone pieces by averaging measurements of thickness, width, and length. Furnish stones conforming to the size requirements for the specified riprap.

C. Size requirements are expressed as the percent of the gross in-place riprap volume occupied by stones within average dimension size. Conform to the following gradation requirements:

ROCK SIZE (inches)	PERCENT PASSING (by weight)
18	70 – 100
14	50 – 70
10	35 – 50
3	2 – 10

D. The contractor may substitute waste concrete slabs for stone. Furnish sound concrete, free of protruding reinforcement, and conforming to the size requirements specified for stone.

PART 3 - EXECUTION

3.01 NEW OUTFALL STRUCTURE AND SHEET PILE CUTOFF WALL

A. Contractor shall construct new sanitary and storm sewer outfall structure and associated sheet pile cutoff wall in accordance with the requirements of Appendix E.

3.02 REMOVAL OF TEMPORARY SHEET PILE COFFERDAM

A. Contractor shall remove and properly dispose of all temporary oil boom within the temporary sheet pile cofferdam.

B. Water quality within the temporary sheet pile cofferdam shall meet the Substantive Requirements of WPDES Permit before cofferdam is removed. Engineer shall verify compliance with this requirement through water quality testing and notify Contractor accordingly. Treatment of water within the cofferdam in accordance with Section 02241 - MGP Contact Water Management may be necessary prior to removing the cofferdam.

3.03 GENERAL SITE RESTORATION

A. Remove, transport to, and dispose of soils impacted by contractor operations at the approved waste disposal facility, as identified by the Engineer through pre-construction and post-construction sampling and chemical analytical testing. Backfill removal areas to preconstruction elevations with topsoil. Costs for these activities are solely the responsibility of the Contractor.

B. Restore parking lot, landscaping, fencing, roads, and utilities that are disturbed during the performance of the Work to preconstruction condition, as necessary and as directed by Engineer.

C. Place riprap along shore where riprap was disturbed for soil and sediment excavation activities. Supplement with new riprap as necessary.

D. Install riprap aprons at pipe outfalls, as shown on the Contract Documents.

E. Contractor shall remove and dispose of the tracking pad(s), upland sediment stabilization area, decontamination area, and other soil or gravel material used during construction activities. These materials shall be transported to the approved waste disposal facility. Costs for these activities are solely the responsibility of the Contractor.

F. Transport impacted materials to the landfill as special waste.

G. Contractor shall remove and transport dewatering pad liner components, and other project wastes (e.g., silt fence, turbidity curtain, etc.), as necessary to an approved waste disposal facility as construction debris.

H. Comply with all provisions of Access Agreement between Company and the City of Marinette (Appendix B).

3.04 FINAL EROSION CONTROLS AND FINAL CLEANUP

A. Streets or drives adjacent to the site shall be swept and/or high pressure washed to remove any residuals, dust, or debris.

B. Trash, rubbish, or other debris shall be removed and transported off site for disposal.

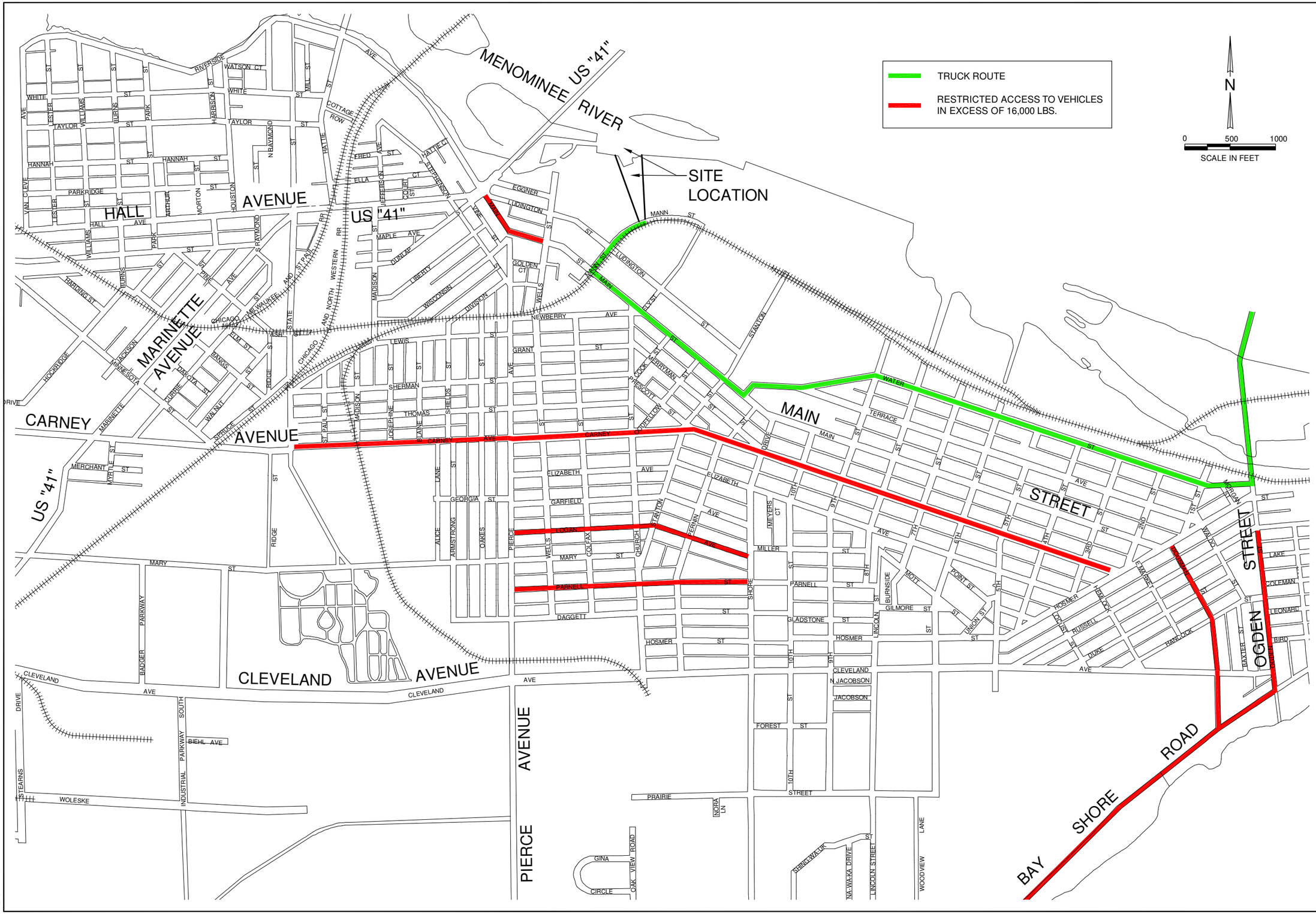
C. Contractor shall remove inlet protection from storm sewer catch basins following soil stabilization as approved by the Engineer.

D. Contractor shall correct, at no expense to the Company, any damage to buildings, telephone or other cables, overhead and underground utilities or their structures as a result of his construction, whether or not the item is shown on the Contract Drawings.

E. All Contractor equipment and materials shall be removed from the site.

END OF SECTION

FIGURE



DRAWN BY:	NWD	DATE: 08/29/12
CHECKED BY:	EJT	DATE: 08/29/12
APPROVED BY:	EJT	DATE: 08/30/12
DRAWING NO:	2098-BID_CON-B01	
REFERENCE:	SEE INFO BLOCK	

TRUCK ROUTE

-

FOCUSED NAPL AND SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
2098/BID_CON

FIGURE NO.
1

Aug 30, 2012 12:32pm PLOTTED BY: ndraskovich SAVED BY: ndraskovich
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TABLES

Table 1 - List of Project Submittals
Focused NAPL and Sediment Removal Action
Former Marinette MGP Site

No.	Submittal	Time Frame	Specification	
			Section	Part
Required Submittals				
1.	Proposed Construction Schedule	With Bid	01040	1.03B
2.	Schedule of Values	With Bid	01040 01290	1.03C 1.03
3.	List of Subcontractors	With Bid	01040	1.03E
4.	List of Key Personnel	With Bid	01310	1.04A
5.	Preliminary Work Plan	With Bid	01330	1.03D
	Site Preparation Plan		01500 02050	1.04A 1.04B
	Contact Water Management Plan		02241	1.04A
	Mechanical Dredging/Excavation Plan		02300	1.03A
6.	Draft Construction Health and Safety Plan (HASP)	Within 14 days of the Notice of Award	01330 01900	1.03E 1.03B
7.	Draft Construction Quality Control Plan (CQCP)	Within 14 days of the Notice of Award	01330 01400	1.03F 1.05
8.	Final Work Plan	Within 14 days of Notice to Proceed		
	Baseline Schedule	Provide Updated Schedule as Weekly Progress Meetings	01040 01310	1.03F 1.05C.5
	Superintendent Contact Information		01040	1.03F
	Submittal Schedule		01330	1.04A
	Contractor's Quality-Control Manager Qualifications		01400	1.04A
	Site Preparation Plan		01500 02050	1.04A 1.04B
	Erosion Control and Surface Water Management Plan		01500 02111	1.04B 1.04A
	Decontamination Plan		01550	1.02C
	Construction Health & Safety Plan (HASP)		01900	1.03B
	Dewatering Pad Configuration		02050	1.04B
	Contact Water Management Plan		02241	1.04A
	Mechanical Dredging/Excavation Plan		02300	1.03A
9.	Submittal Schedule	Within 10 Days of Notice of Award	1330	1.03E

Table 1 - List of Project Submittals
Focused NAPL and Sediment Removal Action
Former Marinette MGP Site

No.	Submittal	Time Frame	Specification	
			Section	Part
10.	Construction Start Date	5 Working days prior to beginning site activities	01150 02050	1.03A 1.04A
11.	Material Source Qualification Information	Prior to start of construction	02300	1.03C
12.	List of Site Benchmarks / Control Points	As Established	02300	1.03F
13.	Preconstruction Bathymetry	When Available	02300	1.03F
14.	Daily Dredging Reports	no later than 11:00 am on the following work day	02300	1.03D
15.	Progress Schedules	Monthly	01040	1.03G
16.	Weekly Progress Reports	1 work day prior to weekly progress meetings	01040 01310 02300	1.03H 1.06A 1.03E
	Transportation/Disposal Manifests and Weight/Truck Tickets		02300	1.03G
	Erosion Control Inspection Reports		02111	1.04B
17.	Progress Bathymetric Surveys	Weekly (minimum)	02300	1.02F
18.	Survey Certificate (RLS or PE)	With Submittal of Survey Data	01700 02300	1.04B 1.03F
19.	Asphalt Paving Subcontractor Name	Prior to Paving Work	02510	1.03A
20.	Borrow Source Material Certificates and/or Test Results	Prior to Delivery to Site	02300	1.03C
21.	Geotextile Pre-Installation Submittals	Prior to Deployment	02415	1.04A
22.	Geotextile Installation Submittals	As Installation Proceeds	02415	1.04B
23.	Geomembrane Manufacturer & Installation Information	At Least 15 Days Prior to Delivery	02590	1.04A.1
24.	Geosynthetics Field Crew and Equipment Submittals	At Least 15 Days Prior to Installation	02590	1.04A.2
25.	Geosynthetics Installation Progress Submittals	Daily, During Installation	02590	1.04A.3
26.	Geosynthetics Post-Installation Submittals	Within 5 Days After Installation	02590	1.04A.4
27.	Seeding Product Data	5 working days prior to use	02930	1.08
28.	Notice of Substantial Completion	Upon Occurrence	01770	1.02
29.	Notice of Final Completion	Upon Occurrence	01770	1.03

Table 1 - List of Project Submittals
Focused NAPL and Sediment Removal Action
Former Marinette MGP Site

No.	Submittal	Time Frame	Specification	
			Section	Part
30.	Punch List	At Time of Substantial Completion	01770	1.04
31.	Record Documents	At Time of Final Completion	01770	1.05
As Needed Submittals				
32.	Accident Reports	Immediately following accident	01040	1.03I
33.	Work Stoppage/Dispute Records	Upon Occurrence	01040	1.03I
34.	Proposals for Purchase of Products	Upon Request	01210	1.03A
35.	Invoices or Delivery Slips	Upon Request	01210	1.03B
36.	Time Sheets and Other Documentation Showing Labor and Other Costs	Upon Request	01210	1.03C
37.	Qualification Data for Registered Land Surveyor or Professional Engineer	Upon Request	01700	1.04A

Table 2 - Observed Bedrock Elevations
Focused NAPL and Sediment Removal Action
Former Marinette MGP Site

Bedrock Elevation Information				
Location	Ground Surface/Sediment Elevation (ft)[(1)]	Depth to Bedrock/Refusal	Bedrock/ Refusal Elevation	Observations at Refusal
SB-4	582.60	15.00	567.6	15-19' Bedrock, No Recovery, Grinding Noise, No Cuttings
SB-5	582.60	19.00	563.6	Grinding Noise Indicated Bedrock
SB-6	582.60	19.00	563.6	Grinding Noise Indicated Bedrock
SB-7	582.60	19.00	563.6	Grinding Noise Indicated Bedrock
SB-8	582.60	19.00	563.6	Grinding Noise Indicated Bedrock
T07N-NATIVE	572.86	12.50	560.4	Freshly Broken Bedrock Gravel in Tip of Spit Spoon Sampler
T03HH-NATIVE	569.99	8.50	561.5	Refusal of Drill Bit, Bedrock Fragments Adhering to Drill Bit
T02A-NATIVE	572.04	8.80	563.2	Gravel Sized Bedrock Fragments in Split Spoon
T04N-NATIVE	575.38	10.60	564.8	Bedrock Fragments in Split Spoon Sampler
T04N-NATIVE1	575.49	11.20	564.3	Refusal of Drill Bit on Bedrock
T05N-NATIVE	570.93	6.70	564.2	Freshly Broken Bedrock Gravel in Tip of Spit Spoon Sampler
T06HH1-NATIVE	569.65	6.50	563.1	Refusal of Drill Bit, Drill Bit Bouncing on Hard Material
T06HH1-NATIVE1	568.56	4.50	564.1	Freshly Broken Bedrock Gravel in Tip of Spit Spoon Sampler
T02A8-NATIVE	572.07	10.00	562.1	Refusal of Drill Bit
T04B-NATIVE	574.96	12.30	562.7	Refusal of Drill Bit
Maximum Bedrock/Refusal Elevation			**564.8**	
Minimum Bedrock/Refusal Elevation			**560.4**	

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Notes:

1) Elevations for soil borings SB-4, -5, -6, -7, and -8 were estimated based on the ground surface elevation of the nearest groundwater monitoring well MW-01.

2) Elevations for soil borings SB-4, -5, -6, -7, and -8 were not included in the calculation for maximum and minimum Bedrock/Refusal Elevation.

APPENDIX A

SEDIMENT INFORMATION

APPENDIX A1

SEDIMENT QUALITY ANALYTICAL DATA TABLES

Table 1. Sediment Analytical Results - BTEX (µg/kg)
Former Wisconsin Public Service Marinette Manufactured Gas Plant Site
USEPA WIN000509952 / BRRTS # 02 38 000047

Location	Depth (feet)	Sample Date	Benzene	Ethylbenzene	Toluene	Xylene, o	Xylenes, m + p
AMB1	0-0.5	04/10/12	< 25	< 25	< 25	< 25	< 50
AMB1	0.5-1.5	04/10/12	< 25	< 25	< 25	< 25	< 50
AMB1	1.5-1.9	04/10/12	< 25	< 25	< 25	< 25	< 50
T01A	0-0.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T01A	0.5-1.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T01A	1.5-2.5	04/05/12	< 25	< 25	60.7	< 25	< 50
T01A	2.5-3.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T01A	3.5-4.5	04/05/12	< 25	< 25	50.6	< 25	< 50
T01A	4.5-5	04/05/12	< 25	< 25	128	< 25	< 50
T01A1	0-0.5	04/10/12	< 25	< 25	53.5	< 25	< 50
T01A1	0.5-1.5	04/10/12	< 25	< 25	127	< 25	< 50
T01A1	1.5-2.5	04/10/12	< 25	< 25	< 25	< 25	< 50
T01A1	2.5-3.3	04/10/12	< 25	< 25	65	< 25	< 50
T01A2	0-0.7	04/12/12	< 25	< 25	< 25	< 25	< 50
T01A3	0-0.8	04/13/12	< 25	< 25	< 25	< 25	< 50
T01B	0-0.5	04/04/12	< 25	< 25	< 25	< 25	< 50
T02A	0-0.5	04/05/12	< 19.5	< 19.5	< 19.5	< 19.5	< 38.9
T02A	0.5-1.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T02A	1.5-2.5	04/05/12	< 25	< 25	97.7	< 25	< 50
T02A	2.5-3.5	04/05/12	< 25	< 25	126	< 25	< 50
T02A	3.5-4.5	04/05/12	< 25	< 25	74.5	< 25	< 50
T02A	4.5-5.2	04/05/12	< 25	< 25	90.5	< 25	< 50
T02A1	0-0.5	04/06/12	< 25	< 25	< 25	< 25	< 50
T02A1	0.5-1.5	04/06/12	< 25	< 25	50.5	< 25	< 50
T02A1	1.5-2.5	04/06/12	< 25	< 25	93.4	< 25	< 50
T02A1	2.5-3.5	04/06/12	< 25	< 25	194	< 25	< 50
T02A2	0-0.5	04/09/12	< 25	< 25	< 25	< 25	< 50
T02A2	0.5-1.7	04/09/12	< 25	< 25	< 25	< 25	< 50
T02A2R	0-0.5	04/19/12	< 25	< 25	< 25	< 25	< 50
T02A2R	0.5-1.5	04/19/12	< 25	< 25	< 25	< 25	< 50
T02A3	0-0.5	04/10/12	< 25	< 25	< 25	< 25	< 50
T02A3	0.5-1.5	04/10/12	< 25	< 25	139	< 25	< 50
T02A3	1.5-2.1	04/10/12	< 25	< 25	< 25	< 25	< 50
T02A4	0-0.5	04/10/12	< 25	< 25	< 25	< 25	< 50
T02A4	0.5-1.8	04/10/12	< 25	< 25	98.9	< 25	< 50
T02A5	0-0.5	04/11/12	< 25	< 25	< 25	< 25	< 50
T02A5	0.5-1.5	04/11/12	< 25	< 25	< 25	< 25	< 50
T02A5	1.5-2.3	04/11/12	< 25	< 25	61.2	< 25	< 50
T02A6	0-0.5	04/11/12	< 25	< 25	< 25	< 25	< 50
T02A6	0.5-1.5	04/11/12	< 25	< 25	< 25	< 25	< 50
T02A6	1.5-2.6	04/11/12	< 25	< 25	< 25	< 25	< 50
T02A7	0-0.5	04/12/12	< 25	< 25	< 25	< 25	< 50
T02A7	0.5-1.5	04/12/12	< 25	< 25	< 25	< 25	< 50
T02A7	1.5-2.5	04/12/12	< 25	< 25	52	< 25	< 50
T02A7	2.5-3.1	04/12/12	< 25	< 25	< 25	< 25	< 50
T02A8-NATIVE	2-4	04/17/12	< 25	< 25	< 25	< 25	< 50
T02A8-NATIVE	4-6	04/17/12	< 25	< 25	< 25	< 25	< 50
T02A8-NATIVE	6-8	04/17/12	< 25	< 25	< 25	< 25	< 50

Table 1. Sediment Analytical Results - BTEX (µg/kg)
Former Wisconsin Public Service Marinette Manufactured Gas Plant Site
USEPA WIN000509952 / BRRTS # 02 38 000047

Location	Depth (feet)	Sample Date	Benzene	Ethylbenzene	Toluene	Xylene, o	Xylenes, m + p
T02A8-NATIVE	8-10	04/17/12	< 25	< 25	< 25	< 25	< 50
T02A-NATIVE	2-4	04/19/12	< 25	< 25	< 25	< 25	< 50
T02A-NATIVE	6-8	04/19/12	< 25	< 25	159	< 25	< 50
T02A-NATIVE	8-8.8	04/19/12	< 25	< 25	< 25	< 25	< 50
T02B	0-0.5	04/04/12	< 25	< 25	< 25	< 25	< 50
T02C	0-0.5	04/04/12	< 25	< 25	< 25	< 25	< 50
T02C	0.5-1	04/04/12	< 25	< 25	< 25	< 25	< 50
T03A	0-0.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T03A	0.5-1.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T03A	1.5-2.5	04/05/12	< 25	< 25	74.3	< 25	< 50
T03A	2.5-3.5	04/05/12	< 25	< 25	110	< 25	< 50
T03A	3.5-4	04/05/12	1660	91.7	85.2	168	653
T03A1	0-0.5	04/06/12	< 25	< 25	< 25	< 25	< 50
T03A1	0.5-1.5	04/06/12	< 25	< 25	54.8	< 25	< 50
T03A1	1.5-2	04/06/12	< 25	< 25	71	< 25	< 50
T03A2	0-0.5	04/06/12	< 14.7	< 14.7	< 14.7	< 14.7	< 29.4
T03A3	0-0.5	04/11/12	< 25	< 25	< 25	< 25	< 50
T03A3	0.5-1.5	04/11/12	< 25	< 25	< 25	< 25	< 50
T03A3	1.5-2.5	04/11/12	< 25	< 25	< 25	< 25	< 50
T03A3	2.5-3.5	04/11/12	106	< 25	88.7	255	129
T03A3	3.5-4.5	04/11/12	1200	1170	< 100	1680	2910
T03A3	4.5-4.9	04/11/12	< 1000	4240	< 1000	< 1000	< 2000
T03B	0-0.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T03B	0.5-1.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T03B	1.5-2	04/05/12	< 25	< 25	< 25	< 25	< 50
T03B2	0-0.5	04/10/12	< 25	< 25	< 25	< 25	< 50
T03B2	0.5-1.6	04/10/12	< 25	< 25	< 25	< 25	< 50
T03B3	0-0.5	04/12/12	< 25.3	< 25.3	< 25.3	< 25.3	< 50.5
T03B3	0.5-1.8	04/12/12	< 25	< 25	< 25	< 25	< 50
T03C	0-0.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T03E	0-0.7	04/04/12	< 25	< 25	52.6	< 25	< 50
T03ER	0-0.8	04/19/12	< 25	< 25	< 25	< 25	< 50
T03HH	0-0.5	04/03/12	< 25	< 25	< 25	< 25	< 50
T03HH	0.5-1.5	04/03/12	166	< 25	< 25	< 25	< 50
T03HH	1.5-2.5	04/03/12	3150	< 25	63.8	657	534
T03HH	2.5-3.5	04/03/12	4640	730	214	1690	2650
T03HH-NATIVE	2-2.5	04/19/12	918	< 25	75.2	118	< 50
T03HH-NATIVE	2.5-4.5	04/19/12	3860	2790	< 500	2000	4260
T04A	0-0.5	04/04/12	2340	109	191	1230	2160
T04A	0.5-1.7	04/04/12	4190	7850	< 250	3760	7980
T04A1	0-0.5	04/11/12	< 25	< 25	< 25	< 25	< 50
T04A1	0.5-1.1	04/11/12	< 25	< 25	< 25	< 25	< 50
T04B	0-0.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T04B	0.5-1.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T04B	1.5-2.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T04B	2.5-3.1	04/05/12	< 25	< 25	< 25	< 25	< 50
T04B1	0-0.5	04/12/12	< 25	< 25	< 25	< 25	< 50
T04B1	0.5-1.7	04/12/12	< 25	< 25	< 25	< 25	< 50

Table 1. Sediment Analytical Results - BTEX (µg/kg)
Former Wisconsin Public Service Marinette Manufactured Gas Plant Site
USEPA WIN000509952 / BRRTS # 02 38 000047

Location	Depth (feet)	Sample Date	Benzene	Ethylbenzene	Toluene	Xylene, o	Xylenes, m + p
T04B-NATIVE	0-0.5	04/17/12	< 25	< 25	< 25	< 25	< 50
T04B-NATIVE	0.5-1.5	04/17/12	< 25	< 25	< 25	< 25	< 50
T04B-NATIVE	1.5-2.5	04/17/12	< 25	< 25	< 25	< 25	< 50
T04B-NATIVE	2.3-3.5	04/17/12	< 25	< 25	< 25	< 25	< 50
T04B-NATIVE	3.5-5.5	04/17/12	< 25	< 25	< 25	< 25	< 50
T04B-NATIVE	5.5-7.5	04/17/12	< 25	< 25	< 25	< 25	< 50
T04B-NATIVE	7.5-9.5	04/17/12	< 25	< 25	< 25	< 25	< 50
T04B-NATIVE	9.5-11.5	04/17/12	< 25	< 25	< 25	< 25	< 50
T04B-NATIVE	11.5-13.5	04/17/12	< 25	< 25	< 25	< 25	< 50
T04C	0-0.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T04C	0.5-0.8	04/05/12	< 25	< 25	< 25	< 25	< 50
T04D	0-0.5	04/10/12	< 25	< 25	54.9	< 25	< 50
T04D	0.5-1.7	04/10/12	< 25	< 25	123	< 25	< 50
T04HH	0-0.5	04/04/12	18000	69100	< 3120	18000	34600
T04HH	0.5-1.5	04/04/12	< 12500	98300	< 12500	26300	50000
T04HH	4.5-5.5	04/04/12	62.1	367	86.3	380	451
T04N	0-0.5	04/04/12	763	60.2	59.2	91.8	197
T04N	0.5-1.5	04/04/12	2740	13300	< 1000	3920	7460
T04N	1.5-2.5	04/04/12	< 2500	29000	< 2500	8900	16700
T04N	2.5-3.5	04/04/12	< 2500	24600	< 2500	6410	14300
T04N	3.5-4.5	04/04/12	< 1250	5680	< 1250	2060	3340
T04N	4.5-5.2	04/04/12	66.9	72.5	72.8	115	< 50
T04N-NATIVE	4-5	04/19/12	7960	51900	< 2500	13000	26200
T04N-NATIVE	5-6	04/19/12	< 1250	5930	< 1250	< 1250	< 2500
T04N-NATIVE1	10-10.5	04/19/12	< 5000	29300	< 5000	8990	18300
T04N-NATIVE1	105-11.2	04/19/12	< 25	163	< 25	51.5	103
T04NR	0-0.5	04/19/12	407	205	68.1	230	222
T04NR	0.5-1	04/19/12	< 2500	32200	< 2500	8690	18100
T04SW3	0-0.5	04/04/12	193	< 50	< 50	907	< 100
T04SW3	0.5-1.5	04/04/12	< 500	3640	< 500	2190	< 1000
T04SW3	3.5-4.5	04/04/12	< 25	< 25	< 25	< 25	< 50
T04SW3	4.5-5.7	04/04/12	< 25	< 25	76.8	< 25	< 50
T04SW3R	0-0.5	04/19/12	< 312	1010	< 312	902	< 625
T04SW3R	0.5-1.4	04/19/12	< 500	1840	< 500	948	< 1000
T04SW4	0-0.5	04/04/12	< 25	< 25	< 25	< 25	< 50
T04SW4	0.5-1.5	04/04/12	< 25	< 25	< 25	< 25	< 50
T04SW4	1.5-2.5	04/04/12	< 25	< 25	< 25	< 25	< 50
T05A	0-0.8	04/05/12	< 25	< 25	< 25	< 25	< 50
T05A1	0-0.5	04/09/12	< 25	< 25	< 25	< 25	< 50
T05A1	0.5-1.5	04/09/12	< 25	< 25	< 25	< 25	< 50
T05A1	1.5-2.1	04/09/12	< 25	< 25	< 25	< 25	< 50
T05A2	0-0.5	04/09/12	< 25	< 25	< 25	< 25	< 50
T05A2	0.5-1.4	04/09/12	< 25	< 25	< 25	< 25	< 50
T05A3	0-0.5	04/13/12	< 25	< 25	< 25	< 25	< 50
T05D	0-0.5	04/10/12	< 25	< 25	< 25	< 25	< 50
T05D	0.5-1.5	04/10/12	< 25	< 25	77.2	< 25	< 50
T05D	1.5-2.5	04/10/12	< 25	< 25	< 25	< 25	< 50
T05HH1	0-0.5	04/04/12	< 203	1130	339	517	1160

Table 1. Sediment Analytical Results - BTEX (µg/kg)
Former Wisconsin Public Service Marinette Manufactured Gas Plant Site
USEPA WIN000509952 / BRRTS # 02 38 000047

Location	Depth (feet)	Sample Date	Benzene	Ethylbenzene	Toluene	Xylene, o	Xylenes, m + p
T05HH1	0.5-1.3	04/04/12	< 5000	8890	< 5000	< 5000	< 10000
T05HH3	0-0.5	04/09/12	71.5	378	75.7	155	249
T05N	0-0.5	04/03/12	< 25	< 25	< 25	< 25	< 50
T05N	0.5-1.5	04/03/12	< 25	< 25	< 25	< 25	< 50
T05N	1.5-2.5	04/03/12	< 625	< 625	< 625	< 625	< 1250
T05N2	0-0.5	04/06/12	< 25	< 25	< 25	< 25	< 50
T05N2	0.5-1.5	04/06/12	< 25	< 25	< 25	< 25	< 50
T05N2	1.5-2.2	04/06/12	< 25	< 25	< 25	< 25	< 50
T05N-NATIVE	0-2	04/18/12	< 25	< 25	< 25	< 25	< 50
T05N-NATIVE	2-4	04/18/12	< 25	< 25	299	< 25	< 50
T05N-NATIVE	6-6.7	04/18/12	< 25	< 25	< 25	< 25	< 50
T06A	0-0.5	04/04/12	< 25	< 25	< 25	< 25	< 50
T06A	0.5-1.5	04/04/12	< 25	< 25	< 25	< 25	< 50
T06A	1.5-2.5	04/04/12	< 25	< 25	< 25	< 25	< 50
T06A	2.5-3.2	04/04/12	< 25	< 25	< 25	< 25	< 50
T06A1	0-0.5	04/10/12	< 25	< 25	< 25	< 25	< 50
T06A1	0.5-1.7	04/10/12	< 25	< 25	< 25	< 25	< 50
T06A2	0-0.5	04/10/12	< 25	< 25	< 25	< 25	< 50
T06B3	0-0.5	04/03/12	< 25	< 25	< 25	< 25	< 50
T06C3	0-0.5	04/03/12	< 25	< 25	< 25	< 25	< 50
T06D	0-0.5	04/06/12	< 25	< 25	< 25	< 25	< 50
T06D	0.5-1.5	04/06/12	< 25	< 25	< 25	< 25	< 50
T06D	1.5-2.5	04/06/12	< 25	< 25	< 25	< 25	< 50
T06HH1	0-0.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T06HH1	0.5-1	04/05/12	< 25	< 25	< 25	< 25	< 50
T06HH1-NATIVE	0-0.5	04/18/12	< 25	< 25	< 25	< 25	< 50
T06HH1-NATIVE	0.5-2.5	04/18/12	< 25	< 25	< 25	98.8	< 50
T06HH1-NATIVE1	3.5-4.5	04/18/12	< 62.5	< 62.5	< 62.5	< 62.5	< 125
T06N1	0-0.5	04/03/12	< 25	< 25	< 25	< 25	< 50
T06N1	0.5-1.3	04/03/12	< 25	< 25	< 25	< 25	< 50
T06N1-NATIVE	1.5-2.5	04/17/12	< 25	< 25	< 25	< 25	< 50
T06N1-NATIVE	2.5-3.5	04/17/12	< 25	< 25	< 25	< 25	< 50
T06N1-NATIVE	3.5-4.5	04/17/12	< 25	< 25	< 25	< 25	< 50
T06N1-NATIVE	5.5-7.5	04/17/12	< 25	< 25	< 25	< 25	< 50
T06N1-NATIVE	7.5-9.5	04/17/12	< 25	< 25	< 25	< 25	< 50
T06N1-NATIVE	9.5-11.5	04/17/12	< 25	< 25	< 25	< 25	< 50
T06N1-NATIVE	11.5-13	04/17/12	< 25	< 25	< 25	< 25	< 50
T06N2	0-0.5	04/11/12	< 25	< 25	< 25	< 25	< 50
T06N2	0.5-1.5	04/11/12	< 25	< 25	< 25	< 25	< 50
T06N2	1.5-2.8	04/11/12	< 25	< 25	< 25	< 25	< 50
T07A1	0-0.5	04/06/12	< 25	< 25	< 25	< 25	< 50
T07A1	0.5-1.5	04/06/12	< 25	< 25	< 25	< 25	< 50
T07A1	1.5-2	04/06/12	< 25	< 25	< 25	< 25	< 50
T07A2	0-0.5	04/11/12	< 25	< 25	< 25	< 25	< 50
T07B	0-0.5	04/02/12	< 21.6	< 21.6	< 21.6	< 21.6	< 43.3
T07B6	0-0.8	04/11/12	< 25	< 25	< 25	< 25	< 50
T07C	0-0.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T07D	0-0.5	04/06/12	< 25	< 25	< 25	< 25	< 50

Table 1. Sediment Analytical Results - BTEX (µg/kg)
Former Wisconsin Public Service Marinette Manufactured Gas Plant Site
USEPA WIN000509952 / BRRTS # 02 38 000047

Location	Depth (feet)	Sample Date	Benzene	Ethylbenzene	Toluene	Xylene, o	Xylenes, m + p
T07N	0-0.5	04/06/12	< 25	< 25	< 25	< 25	< 50
T07N	0.5-1.5	04/06/12	< 25	< 25	< 25	< 25	< 50
T07N	1.5-2.5	04/06/12	< 25	< 25	< 25	< 25	< 50
T07N-NATIVE	0-2	04/16/12	< 25	< 25	< 25	< 25	< 50
T07N-NATIVE	2-3.5	04/16/12	< 25	< 25	< 25	< 25	< 50
T07N-NATIVE	3.5-5.5	04/16/12	< 25	< 25	< 25	< 25	< 50
T07N-NATIVE	5.5-7.5	04/16/12	< 25	< 25	< 25	< 25	< 50
T07N-NATIVE	7.5-9.5	04/16/12	< 25	< 25	< 25	< 25	< 50
T07N-NATIVE	9.5-11.5	04/16/12	< 25	< 25	< 25	< 25	< 50
T07N-NATIVE	11.5-12.5	04/16/12	< 25	< 25	< 25	< 25	< 50
T08A2	0-0.5	04/02/12	< 25	< 25	< 25	< 25	< 50
T08A3	0-0.5	04/10/12	< 25	< 25	< 25	< 25	< 50
T08A3	0.5-1.5	04/10/12	< 25	< 25	< 25	< 25	< 50
T08A3	1.5-2.5	04/10/12	< 25	< 25	< 25	< 25	< 50
T08A3	2.5-3.2	04/10/12	< 25	< 25	< 25	< 25	< 50
T08A4	0-0.5	04/11/12	< 25	< 25	< 25	< 25	< 50
T08A5	0-0.5	04/11/12	< 25	< 25	< 25	< 25	< 50
T08A5	0.5-1.8	04/11/12	< 25	< 25	< 25	< 25	< 50
T08B3	0-0.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T08B3	0.5-1.7	04/05/12	< 25	< 25	< 25	< 25	< 50
T08B4	0-0.5	04/13/12	< 25	< 25	< 25	< 25	< 50
T08C	0-0.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T08HH	0-0.5	04/06/12	< 25	< 25	< 25	< 25	< 50
T08HH	0.5-1.8	04/06/12	< 25	< 25	< 25	< 25	< 50
T09A2	0-0.5	04/06/12	< 25	< 25	< 25	< 25	< 50
T09A3	0-0.5	04/06/12	< 25	< 25	< 25	< 25	< 50
T09A3	0.5-1.5	04/06/12	< 25	< 25	< 25	< 25	< 50
T09A3	1.5-2.7	04/06/12	< 16.6	< 16.6	< 16.6	< 16.6	< 33.3
T09A6	0-0.5	04/11/12	< 25	< 25	< 25	< 25	< 50
T09A6	0.5-1.5	04/11/12	< 25	< 25	< 25	< 25	< 50
T09A6	1.5-2.3	04/11/12	< 25	< 25	< 25	< 25	< 50
T09A7	0-0.5	04/13/12	< 25	< 25	< 25	< 25	< 50
T09A7	0.5-1.2	04/13/12	< 25	< 25	< 25	< 25	< 50
T09C	0-0.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T09C	0.5-1.5	04/05/12	< 25	< 25	< 25	< 25	< 50
T09C	1.5-1.9	04/05/12	< 25	< 25	< 25	< 25	< 50

[O:EPK 7/12, C:JTB 7/12]

Notes:

BTEX - Benzene, Toluene, Ethylbenzene, and total Xylenes
µg/kg - micrograms per kilogram
< - parameter not detected above detection limit indicated

Table 2. Sediment Analytical Results - Metals (µg/kg) and Cyanide (mg/kg)
Former Wisconsin Public Service Marinette Manufactured Gas Plant Site
USEPA WIN000509952 / BRRTS # 02 38 000047

Location	Depth (feet)	Sample Date	Aluminum, Total	Antimony, Total	Copper, Total	Iron, Total	Manganese, Total	Nickel, Total	Silver, Total	Vanadium, Total	Zinc, Total	Cyanide, Total
AMB1	0-0.5	04/10/12	2910000	< 220	10800	8840000	194000	5400	< 28	16400	44400	na
AMB1	0.5-1.5	04/10/12	3050000	< 170	8100	7890000	118000	7200	54	17000	32300	na
AMB1	1.5-1.9	04/10/12	2520000	< 190	6100	6240000	78600	4300	< 24	17000	24200	na
T01A	0-0.5	04/05/12	2680000	< 220	57600	8410000	222000	5600	96	14300	50200	na
T01A	0.5-1.5	04/05/12	4540000	430	41300	11100000	266000	15700	120	18900	82800	na
T01A	1.5-2.5	04/05/12	4410000	590	37600	9470000	200000	9100	240	17800	108000	na
T01A	2.5-3.5	04/05/12	4660000	1500	31300	10500000	204000	9200	180	19600	111000	na
T01A	3.5-4.5	04/05/12	5690000	1200	44700	11700000	222000	9800	300	21900	132000	na
T01A	4.5-5	04/05/12	5120000	410	21500	10100000	223000	8200	89	21100	49900	na
T01A1	0-0.5	04/10/12	4420000	350	62200	10700000	301000	14300	110	18200	81400	na
T01A1	0.5-1.5	04/10/12	4470000	290	29700	9900000	236000	8300	95	19900	85500	na
T01A1	1.5-2.5	04/10/12	4550000	280	42400	9740000	189000	10400	210	18900	96100	na
T01A1	2.5-3.3	04/10/12	6610000	1300	58400	12300000	202000	10700	830	25900	146000	na
T01A2	0-0.7	04/12/12	4120000	420	20500	10300000	173000	6500	49	16300	65600	na
T01A3	0-0.8	04/13/12	3950000	360	16300	10400000	257000	6600	170	19400	28500	na
T01B	0-0.5	04/04/12	4420000	< 190	5100	12100000	301000	7100	< 24	22000	31700	< 0.62
T02A	0-0.5	04/05/12	4630000	8300	26300	11400000	345000	9000	190	18000	93300	na
T02A	0.5-1.5	04/05/12	4250000	1400	24100	10100000	278000	8400	180	17700	92200	na
T02A	1.5-2.5	04/05/12	5170000	1500	419000	11700000	266000	11500	560	19700	135000	na
T02A	2.5-3.5	04/05/12	5460000	690	46500	11400000	226000	11800	400	21000	131000	na
T02A	3.5-4.5	04/05/12	4170000	420	28500	9290000	164000	8800	190	17100	81100	na
T02A	4.5-5.2	04/05/12	3720000	250	36200	8930000	167000	5900	120	17600	36700	na
T02A1	0-0.5	04/06/12	5190000	430	29600	12000000	362000	9900	440	19400	90700	na
T02A1	0.5-1.5	04/06/12	5640000	370	67000	12000000	291000	15000	610	22500	115000	na
T02A1	1.5-2.5	04/06/12	4720000	2200	30700	10000000	202000	8600	210	18300	79100	na
T02A1	2.5-3.5	04/06/12	5000000	2000	36100	10700000	167000	7800	97	21300	66300	na
T02A2	0-0.5	04/09/12	4430000	860	28200	9690000	192000	8300	300	18000	82300	na
T02A2	0.5-1.7	04/09/12	3130000	980	13600	7090000	101000	7600	240	15700	43000	na
T02A2R	0-0.5	04/19/12	2630000	< 170	39300	7340000	172000	5800	52	11000	41300	na
T02A2R	0.5-1.5	04/19/12	2700000	< 200	71300	6840000	86300	6500	150	13100	54400	na
T02A3	0-0.5	04/10/12	2860000	240	146000	8450000	176000	6100	130	12400	46600	na
T02A3	0.5-1.5	04/10/12	3440000	320	86100	8030000	145000	8400	190	17100	76700	na
T02A3	1.5-2.1	04/10/12	3560000	1200	41300	8490000	126000	7400	92	19400	77600	na
T02A4	0-0.5	04/10/12	1970000	< 190	18500	6730000	109000	4500	44	12300	33300	na
T02A4	0.5-1.8	04/10/12	3140000	330	18100	7990000	114000	7000	69	16200	64400	na
T02A5	0-0.5	04/11/12	2500000	< 180	71400	8320000	190000	5500	43	11300	29100	na
T02A5	0.5-1.5	04/11/12	2410000	< 220	16600	7820000	126000	5900	110	11800	59100	na
T02A5	1.5-2.3	04/11/12	4910000	7300	42400	10600000	139000	11400	400	16200	118000	na
T02A6	0-0.5	04/11/12	4020000	470	15000	13400000	393000	7200	110	17400	72700	na
T02A6	0.5-1.5	04/11/12	4610000	< 250	22700	12100000	308000	13000	270	18800	103000	na
T02A6	1.5-2.6	04/11/12	4140000	630	46000	9850000	192000	14300	250	16800	86000	na
T02A7	0-0.5	04/12/12	2310000	< 190	5800	6940000	148000	7400	33	13300	33500	na
T02A7	0.5-1.5	04/12/12	2460000	360	152000	6780000	128000	5200	92	11700	39000	na
T02A7	1.5-2.5	04/12/12	3890000	1100	27600	10300000	133000	9600	390	19200	102000	na

Table 2. Sediment Analytical Results - Metals (µg/kg) and Cyanide (mg/kg)
Former Wisconsin Public Service Marinette Manufactured Gas Plant Site
USEPA WIN000509952 / BRRTS # 02 38 000047

Location	Depth (feet)	Sample Date	Aluminum, Total	Antimony, Total	Copper, Total	Iron, Total	Manganese, Total	Nickel, Total	Silver, Total	Vanadium, Total	Zinc, Total	Cyanide, Total
T02A7	2.5-3.1	04/12/12	3060000	480	20200	7360000	84600	5500	40	15100	53600	na
T02A8-NATIVE	8-10	04/17/12	7930000	< 160	13100	13500000	294000	11300	< 20	30200	19000	na
T02A-NATIVE	2-4	04/19/12	3240000	440	46500	8250000	160000	7900	80	14000	58800	na
T02A-NATIVE	8-8.8	04/19/12	3520000	< 160	6100	8440000	233000	5900	< 20	16000	19200	na
T02B	0-0.5	04/04/12	2400000	< 190	21500	7060000	183000	4400	52	11600	16700	< 0.6
T02C	0-0.5	04/04/12	5110000	< 160	7500	13100000	656000	6500	< 20	19100	11500	na
T02C	0.5-1	04/04/12	4760000	< 160	7000	10600000	387000	6200	< 20	16900	11300	na
T03A	0-0.5	04/05/12	4590000	< 260	27300	13400000	466000	8600	590	21100	103000	0.096
T03A	0.5-1.5	04/05/12	6670000	2400	101000	17400000	579000	17000	2800	25100	289000	na
T03A	1.5-2.5	04/05/12	9270000	770	102000	19400000	481000	22200	3900	35600	304000	na
T03A	2.5-3.5	04/05/12	5590000	790	60300	11600000	197000	11300	2300	22000	288000	na
T03A	3.5-4	04/05/12	8440000	1900	111000	17000000	244000	16800	3400	48900	407000	na
T03A1	0-0.5	04/06/12	3000000	< 220	8800	8210000	234000	5400	52	13500	39400	na
T03A1	0.5-1.5	04/06/12	4080000	< 220	26000	8350000	188000	9600	460	14700	84100	na
T03A1	1.5-2	04/06/12	5720000	< 290	36800	11000000	208000	13000	390	22000	112000	na
T03A2	0-0.5	04/06/12	2950000	8000	9100	7740000	179000	4600	< 24	10500	25400	na
T03A3	0-0.5	04/11/12	4460000	390	16900	13600000	436000	8200	640	19900	78800	na
T03A3	0.5-1.5	04/11/12	3500000	280	19200	11000000	327000	6600	490	15900	65600	na
T03A3	1.5-2.5	04/11/12	5890000	560	69300	18800000	545000	14800	2700	25000	229000	na
T03A3	2.5-3.5	04/11/12	7820000	1400	136000	28700000	734000	24400	8200	32200	564000	na
T03A3	3.5-4.5	04/11/12	7680000	1100	119000	17100000	374000	24400	7300	29500	374000	na
T03A3	4.5-4.9	04/11/12	7380000	700	82300	16500000	314000	18900	4100	29500	277000	na
T03B	0-0.5	04/05/12	3560000	680	27500	10400000	181000	10600	57	17100	79600	na
T03B	0.5-1.5	04/05/12	2280000	1100	8200	6130000	90900	4700	89	13700	32100	na
T03B	1.5-2	04/05/12	3530000	740	27200	8240000	86600	7200	< 37	15600	127000	na
T03B2	0-0.5	04/10/12	3030000	< 210	49600	7560000	154000	13800	< 27	14700	41300	na
T03B2	0.5-1.6	04/10/12	2470000	400	40200	6380000	96500	4900	< 30	11900	48300	na
T03B3	0-0.5	04/12/12	3200000	< 240	11300	7410000	137000	5700	44	12000	43600	na
T03B3	0.5-1.8	04/12/12	3000000	560	21800	7500000	98800	6700	73	16200	56500	na
T03C	0-0.5	04/05/12	3000000	< 160	16000	8480000	127000	6100	< 20	21300	22100	na
T03E	0-0.7	04/04/12	1670000	250	7300	6600000	284000	3500	70	7800	24600	na
T03ER	0-0.8	04/19/12	4830000	< 190	8200	14100000	380000	12300	< 24	24900	29000	na
T03HH	0-0.5	04/03/12	6210000	440	41600	18200000	576000	12700	1600	25900	135000	< 1.2
T03HH	0.5-1.5	04/03/12	6180000	460	69300	17500000	516000	23300	2900	24900	235000	na
T03HH	1.5-2.5	04/03/12	7530000	1300	140000	22200000	617000	23100	7600	31400	528000	2.8
T03HH	2.5-3.5	04/03/12	7920000	1000	112000	16100000	390000	18800	6400	29800	322000	0.45
T03HH-NATIVE	2.5-4.5	04/19/12	6850000	990	91300	15700000	446000	16100	4000	26900	302000	na
T04A	0-0.5	04/04/12	13900000	1500	134000	15100000	357000	21000	7800	22800	449000	7.3
T04A	0.5-1.7	04/04/12	8420000	2100	203000	22000000	511000	26200	13300	35800	639000	na
T04A1	0-0.5	04/11/12	4760000	550	5000	11600000	212000	8300	270	18400	40300	na
T04A1	0.5-1.1	04/11/12	2030000	< 160	2000	5590000	81200	4100	< 20	8200	27000	na
T04B	0-0.5	04/05/12	2830000	< 200	6100	7410000	203000	5200	< 25	11900	40000	na
T04B	0.5-1.5	04/05/12	2960000	880	15900	7120000	173000	5400	99	12300	40700	na
T04B	1.5-2.5	04/05/12	4930000	2700	26100	9930000	214000	10200	100	17100	40900	na

Table 2. Sediment Analytical Results - Metals (µg/kg) and Cyanide (mg/kg)
Former Wisconsin Public Service Marinette Manufactured Gas Plant Site
USEPA WIN000509952 / BRRTS # 02 38 000047

Location	Depth (feet)	Sample Date	Aluminum, Total	Antimony, Total	Copper, Total	Iron, Total	Manganese, Total	Nickel, Total	Silver, Total	Vanadium, Total	Zinc, Total	Cyanide, Total
T04B	2.5-3.1	04/05/12	5270000	< 170	9600	9970000	284000	8100	< 21	18400	13700	na
T04B1	0-0.5	04/12/12	2760000	< 180	5800	7630000	203000	5200	< 23	13000	29800	na
T04B1	0.5-1.7	04/12/12	2310000	410	44500	6550000	77100	4800	< 27	13400	137000	na
T04B-NATIVE	0-0.5	04/17/12	2970000	< 200	6500	7540000	182000	5400	< 25	13200	29800	na
T04B-NATIVE	0.5-1.5	04/17/12	3810000	< 200	10100	8030000	171000	5800	36	16700	40300	na
T04B-NATIVE	1.5-2.5	04/17/12	3160000	< 160	3900	8920000	689000	5900	< 20	13700	17800	na
T04B-NATIVE	2.3-3.5	04/17/12	4600000	< 170	7500	10900000	605000	6800	30	17500	10300	na
T04B-NATIVE	3.5-5.5	04/17/12	5120000	< 160	8700	9260000	306000	7300	< 20	19300	12100	na
T04B-NATIVE	5.5-7.5	04/17/12	5050000	< 170	8800	9290000	280000	7600	< 22	19600	12500	na
T04B-NATIVE	7.5-9.5	04/17/12	8400000	< 180	13100	12100000	285000	11900	23	25700	19100	na
T04B-NATIVE	9.5-11.5	04/17/12	9120000	< 180	14900	13500000	315000	13700	23	28500	21200	na
T04B-NATIVE	11.5-13.5	04/17/12	5030000	< 160	10800	9060000	298000	7500	< 20	19200	12700	na
T04C	0-0.5	04/05/12	2750000	< 150	3700	8170000	186000	4600	< 19	13400	17100	na
T04C	0.5-0.8	04/05/12	3180000	< 160	8500	7820000	117000	5200	< 20	14800	22600	na
T04D	0-0.5	04/10/12	3680000	490	16200	8350000	190000	6400	< 35	19700	24400	na
T04D	0.5-1.7	04/10/12	3880000	300	27200	8150000	168000	6200	< 32	18300	30300	na
T04HH	0-0.5	04/04/12	3300000	950	74400	15300000	271000	21600	4400	21800	314000	na
T04HH	0.5-1.5	04/04/12	3260000	620	93000	9810000	182000	8800	4500	14800	365000	na
T04HH	4.5-5.5	04/04/12	7900000	690	33400	17400000	399000	11700	200	30900	82200	na
T04N	0-0.5	04/04/12	2170000	400	67800	10900000	321000	5200	1900	10700	112000	na
T04N	0.5-1.5	04/04/12	3090000	580	48000	9870000	242000	9400	2300	15800	172000	na
T04N	1.5-2.5	04/04/12	3850000	1000	36400	11200000	237000	11200	4200	18300	163000	na
T04N	2.5-3.5	04/04/12	3260000	1200	66400	10800000	232000	10100	4200	15900	286000	na
T04N	3.5-4.5	04/04/12	2120000	1200	37100	7040000	172000	7500	3200	10200	107000	na
T04N	4.5-5.2	04/04/12	6650000	830	36500	15900000	341000	10700	570	25700	94100	na
T04N-NATIVE1	10-10.5	04/19/12	3860000	< 200	14700	9330000	215000	6400	730	16100	63400	na
T04N-NATIVE1	105-11.2	04/19/12	4010000	< 170	8900	9390000	257000	6300	84	16700	16500	na
T04NR	0-0.5	04/19/12	2200000	< 290	49300	10800000	321000	5200	1400	8900	90900	na
T04NR	0.5-1	04/19/12	3800000	770	64200	11900000	226000	10100	4600	17000	361000	na
T04SW3	0-0.5	04/04/12	na	na	na	na	na	na	na	na	na	1.1
T04SW3R	0-0.5	04/19/12	4860000	2500	65700	13400000	265000	10600	4400	20800	370000	na
T04SW3R	0.5-1.4	04/19/12	4540000	1800	56500	12000000	259000	8500	2000	18200	215000	na
T04SW4	0-0.5	04/04/12	3770000	< 320	11000	11900000	339000	7200	60	18300	56000	na
T04SW4	0.5-1.5	04/04/12	2560000	< 210	7000	6310000	120000	4100	< 27	13300	30000	na
T04SW4	1.5-2.5	04/04/12	2640000	< 270	7700	5910000	86800	4400	< 33	14300	26900	na
T05A	0-0.8	04/05/12	2190000	< 190	2400	5250000	112000	3300	< 23	9700	17300	na
T05A1	0-0.5	04/09/12	3730000	< 170	8100	10500000	299000	6200	< 21	20200	29400	na
T05A1	0.5-1.5	04/09/12	9660000	< 170	13900	14500000	398000	12800	< 21	28100	21700	na
T05A1	1.5-2.1	04/09/12	6910000	< 170	11000	11900000	307000	8900	< 21	23000	15400	na
T05A2	0-0.5	04/09/12	4110000	< 180	5800	10100000	221000	7300	< 23	19900	25500	na
T05A2	0.5-1.4	04/09/12	2230000	< 180	2400	7290000	151000	3300	< 22	11200	15600	na
T05A3	0-0.5	04/13/12	3260000	810	9900	9350000	263000	5800	42	17400	33800	na
T05D	0-0.5	04/10/12	3290000	800	12500	7870000	244000	6100	380	15100	30300	na
T05D	0.5-1.5	04/10/12	4930000	700	16300	12500000	394000	8700	150	21400	45700	na

Table 2. Sediment Analytical Results - Metals (µg/kg) and Cyanide (mg/kg)
Former Wisconsin Public Service Marinette Manufactured Gas Plant Site
USEPA WIN000509952 / BRRTS # 02 38 000047

Location	Depth (feet)	Sample Date	Aluminum, Total	Antimony, Total	Copper, Total	Iron, Total	Manganese, Total	Nickel, Total	Silver, Total	Vanadium, Total	Zinc, Total	Cyanide, Total
T05D	1.5-2.5	04/10/12	6060000	540	19400	15000000	377000	10300	100	24000	67300	na
T05HH1	0-0.5	04/04/12	3700000	720	63300	10600000	264000	13100	3400	17900	227000	0.94
T05HH1	0.5-1.3	04/04/12	2920000	1100	38000	8670000	200000	8100	2100	13600	154000	na
T05HH3	0-0.5	04/09/12	3820000	< 220	22200	11000000	361000	6800	610	15800	79700	na
T05N	0-0.5	04/03/12	3830000	240	21400	10900000	301000	10700	760	18200	86700	na
T05N	0.5-1.5	04/03/12	6210000	470	55600	13100000	253000	13900	2300	23300	217000	< 0.34
T05N	1.5-2.5	04/03/12	4190000	500	33800	10400000	132000	8700	1400	23400	141000	na
T05N2	0-0.5	04/06/12	3940000	< 300	14700	9450000	265000	6900	220	15500	66900	na
T05N2	0.5-1.5	04/06/12	2880000	< 200	11000	6340000	129000	6100	200	11500	52300	0.085
T05N2	1.5-2.2	04/06/12	3040000	220	13400	6950000	96500	5800	250	12600	48700	na
T05N-NATIVE	6-6.7	04/18/12	4030000	< 160	6300	9010000	226000	6400	30	17300	14900	na
T06A	0-0.5	04/04/12	3640000	1200	20100	10600000	322000	8300	360	15400	70000	na
T06A	0.5-1.5	04/04/12	2810000	< 200	15500	7540000	164000	10400	240	12800	63300	< 0.64
T06A	1.5-2.5	04/04/12	5150000	600	63800	10700000	192000	14600	2700	21000	243000	na
T06A	2.5-3.2	04/04/12	3520000	560	34900	7850000	133000	8100	920	14700	109000	na
T06A1	0-0.5	04/10/12	3670000	< 230	10000	8930000	180000	6400	< 29	19600	30100	na
T06A1	0.5-1.7	04/10/12	5640000	270	29700	10900000	191000	9400	600	20700	96400	na
T06B3	0-0.5	04/03/12	2450000	< 200	4700	8490000	216000	4100	< 25	17900	23300	na
T06C3	0-0.5	04/03/12	2400000	< 170	5100	10800000	149000	5800	< 21	28300	19700	na
T06D	0-0.5	04/06/12	4650000	< 290	11600	10400000	308000	7100	< 37	16900	48100	na
T06D	0.5-1.5	04/06/12	3790000	< 220	8300	9460000	245000	6200	< 27	14100	37100	na
T06D	1.5-2.5	04/06/12	5060000	< 220	17000	11900000	343000	8500	< 28	18600	54600	na
T06HH1	0-0.5	04/05/12	9540000	< 630	62900	32700000	433000	23500	760	41100	195000	na
T06HH1	0.5-1	04/05/12	3170000	< 190	63300	9880000	122000	6800	180	16600	456000	na
T06N1	0-0.5	04/03/12	2290000	240	2000	7130000	133000	4500	130	10800	15000	na
T06N1	0.5-1.3	04/03/12	2780000	< 160	2400	8510000	213000	5200	< 20	15200	19200	na
T06N1-NATIVE	1.5-2.5	04/17/12	2720000	710	4000	9170000	177000	5400	< 23	16000	26000	na
T06N1-NATIVE	3.5-4.5	04/17/12	7320000	< 170	11100	13400000	395000	10100	52	24000	21900	na
T06N1-NATIVE	5.5-7.5	04/17/12	9450000	< 150	13700	15000000	325000	12800	21	30900	22600	na
T06N1-NATIVE	7.5-9.5	04/17/12	13000000	< 160	17600	18300000	381000	16800	25	34700	28800	na
T06N1-NATIVE	9.5-11.5	04/17/12	5690000	< 150	10300	11600000	240000	8500	< 18	30000	21700	na
T06N1-NATIVE	11.5-13	04/17/12	2890000	< 160	6200	7670000	216000	5100	< 20	16500	16400	na
T06N2	0-0.5	04/11/12	3930000	< 280	8900	11000000	484000	6200	42	17500	40100	na
T06N2	0.5-1.5	04/11/12	5470000	< 320	19200	11500000	300000	9300	69	21500	67100	na
T06N2	1.5-2.8	04/11/12	7390000	< 160	10800	14000000	422000	10300	27	23400	27100	na
T07A1	0-0.5	04/06/12	3380000	< 230	11600	8540000	159000	5600	440	12600	51000	< 0.75
T07A1	0.5-1.5	04/06/12	6990000	320	59000	14300000	288000	11700	530	26100	109000	na
T07A1	1.5-2	04/06/12	7100000	430	39400	15300000	269000	11200	390	26100	110000	0.11
T07A2	0-0.5	04/11/12	3000000	< 210	16000	8390000	159000	6200	170	14500	49000	na
T07B	0-0.5	04/02/12	6250000	< 320	21100	12900000	332000	10900	94	24100	77200	< 0.88
T07B6	0-0.8	04/11/12	4460000	< 160	8300	10100000	257000	8700	26	17100	18500	na
T07C	0-0.5	04/05/12	2750000	< 150	8900	9920000	149000	6400	< 19	15700	18100	na
T07D	0-0.5	04/06/12	2990000	< 190	2900	8250000	214000	4800	< 24	15900	33500	na
T07N	0-0.5	04/06/12	2850000	< 210	5300	8330000	202000	4600	28	13800	31900	na

Table 2. Sediment Analytical Results - Metals (µg/kg) and Cyanide (mg/kg)
Former Wisconsin Public Service Marinette Manufactured Gas Plant Site
USEPA WIN000509952 / BRRTS # 02 38 000047

Location	Depth (feet)	Sample Date	Aluminum, Total	Antimony, Total	Copper, Total	Iron, Total	Manganese, Total	Nickel, Total	Silver, Total	Vanadium, Total	Zinc, Total	Cyanide, Total
T07N	0.5-1.5	04/06/12	2860000	< 180	4900	7650000	175000	4900	33	15800	24000	< 0.59
T07N	1.5-2.5	04/06/12	5240000	< 160	7700	9570000	315000	7000	< 21	16600	14600	na
T07N-NATIVE	0-2	04/16/12	6690000	< 150	10500	12600000	394000	10000	61	23800	17700	na
T07N-NATIVE	2-3.5	04/16/12	7480000	< 150	11800	11700000	342000	10800	24	23600	17000	na
T07N-NATIVE	3.5-5.5	04/16/12	3920000	< 160	6100	7340000	209000	5400	< 21	14900	< 9300	na
T07N-NATIVE	5.5-7.5	04/16/12	4760000	< 160	7500	8140000	232000	6500	< 21	16400	10200	na
T07N-NATIVE	7.5-9.5	04/16/12	7690000	< 180	13100	12100000	307000	11100	< 22	25400	17700	na
T07N-NATIVE	9.5-11.5	04/16/12	8370000	< 160	13300	12400000	300000	12000	21	25800	18900	na
T07N-NATIVE	11.5-12.5	04/16/12	3030000	< 170	9900	6220000	142000	4800	< 22	14000	< 9900	na
T08A2	0-0.5	04/02/12	3410000	< 220	24500	10100000	202000	5600	270	14700	47600	na
T08A3	0-0.5	04/10/12	8620000	< 180	13200	14600000	392000	12500	48	25700	26300	na
T08A3	0.5-1.5	04/10/12	8500000	< 170	13300	14500000	328000	12600	46	24900	23900	na
T08A3	1.5-2.5	04/10/12	8290000	< 190	12300	14600000	266000	11700	32	26300	23900	na
T08A3	2.5-3.2	04/10/12	5860000	< 150	9700	11300000	208000	8400	43	19900	20300	na
T08A4	0-0.5	04/11/12	3210000	< 290	11400	10500000	218000	5400	54	13500	43400	na
T08A5	0-0.5	04/11/12	10500000	< 170	15000	16100000	348000	15200	35	29000	24100	na
T08A5	0.5-1.8	04/11/12	9340000	240	14200	14800000	320000	12700	100	26900	23800	na
T08B3	0-0.5	04/05/12	2560000	< 180	5400	7190000	134000	4900	< 23	14500	26800	na
T08B3	0.5-1.7	04/05/12	5860000	< 340	21100	14800000	252000	9900	< 43	26900	65000	na
T08B4	0-0.5	04/13/12	3600000	< 200	9300	11400000	216000	7800	27	24800	38300	na
T08C	0-0.5	04/05/12	15600000	< 290	118000	15400000	321000	5400	69	34800	56400	na
T08HH	0-0.5	04/06/12	5080000	< 180	6200	14700000	277000	10500	< 23	19400	27500	na
T08HH	0.5-1.8	04/06/12	3190000	< 150	4200	11900000	194000	7200	< 19	15000	19200	na
T09A2	0-0.5	04/06/12	3530000	< 200	6200	8810000	293000	5700	< 25	14700	33200	na
T09A3	0-0.5	04/06/12	7360000	< 160	10300	12200000	389000	9600	< 20	21400	16500	na
T09A3	0.5-1.5	04/06/12	6650000	< 160	9700	11100000	294000	8800	< 20	20000	15000	na
T09A3	1.5-2.7	04/06/12	6500000	< 150	11500	10800000	267000	8700	< 19	23000	14800	na
T09A6	0-0.5	04/11/12	9090000	< 190	14000	15800000	407000	13500	47	26200	26300	na
T09A6	0.5-1.5	04/11/12	8730000	< 170	13800	14800000	309000	12600	40	26100	24600	na
T09A6	1.5-2.3	04/11/12	5550000	< 170	14400	10300000	157000	8700	29	17700	17200	na
T09A7	0-0.5	04/13/12	5150000	< 260	13500	13300000	614000	8900	110	19500	57900	na
T09A7	0.5-1.2	04/13/12	4570000	< 260	11600	11500000	465000	8200	100	19500	90600	na
T09C	0-0.5	04/05/12	6360000	< 180	9200	14400000	582000	8800	< 23	22900	19600	na
T09C	0.5-1.5	04/05/12	6170000	< 170	8900	10500000	271000	8900	76	19300	13400	na
T09C	1.5-1.9	04/05/12	6300000	< 170	9500	10300000	259000	8500	< 21	19100	12700	na

[O:EPK 7/12, C:JTB 7/12]

Notes:
µg/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
< - parameter not detected above detection limit indicated
na - parameter not analyzed in the sample

Table 3. Sediment Analytical Results - PAHs (µg/kg) & TOC (mg/kg)
Former Wisconsin Public Service Marinette Manufactured Gas Plant Site
USEPA WIN000509952 / BRRTS # 02 38 000047

Location	Depth (feet)	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene (PAH)	Phenanthrene	Pyrene	PAH 13, Total (1/2 Non Detect Value)	Carbon, Total Organic (mg/kg)
AMB1	0-0.5	04/10/12	< 20.8	< 23.6	70.1	223	236	222	151	213	282	49.1	562	< 36.9	138	< 25.9	241	443	2545.7	13800
AMB1	0.5-1.5	04/10/12	< 17.7	< 20	48.9	137	145	106	80.2	134	162	< 34.2	239	< 31.2	74.8	< 22	120	206	1343.35	10800
AMB1	1.5-1.9	04/10/12	26	21.5	63.6	110	102	81.6	54.3	86.4	117	< 34.9	252	< 31.9	53.2	33.9	220	216	1345.95	6220
T01A	0-0.5	04/05/12	64.7	54.2	213	466	442	291	213	346	510	88.5	893	< 74.8	189	< 52.7	350	936	4629.65	47600
T01A	0.5-1.5	04/05/12	112	161	320	625	636	613	381	359	710	97.9	1230	81.1	255	233	634	1190	6904.1	46700
T01A	1.5-2.5	04/05/12	867	144	887	601	654	655	376	312	698	103	1660	508	243	1140	2430	1610	12166	96100
T01A	2.5-3.5	04/05/12	2700	569	3300	3840	3760	2510	2070	3170	3970	654	7150	1780	1960	1120	9000	6970	49839	68500
T01A	3.5-4.5	04/05/12	2240	1820	4550	7380	6290	6030	3380	5470	8560	1330	15400	1700	3410	1050	9980	11800	82270	82900
T01A	4.5-5	04/05/12	114	28.4	69.9	122	78.6	96.7	60.3	67.9	129	< 45.4	237	< 41.4	27.8	133	234	242	1573.2	72100
T01A1	0-0.5	04/10/12	27.8	30.1	71.9	262	322	341	254	173	357	64.9	590	< 44.1	173	49	187	493	2925.85	36300
T01A1	0.5-1.5	04/10/12	443	1700	8050	11400	12000	11700	6640	5610	11600	1540	27300	779	5360	1140	14700	21200	127622	27100
T01A1	1.5-2.5	04/10/12	114	81.8	351	862	910	942	571	589	991	153	2040	111	446	166	921	1620	9698.8	23500
T01A1	2.5-3.3	04/10/12	78.9	129	230	574	652	814	415	316	742	103	1430	100	310	344	763	1230	7402.9	58200
T-01A-1	0-0.5	11/15/11	184	136	300	559	609	432	372	485	586	129	1100	122	331	191	837	994	6535	na
T-01A-1	0.5-1.25	11/15/11	755	165	567	744	767	515	484	766	858	163	1820	343	414	792	2190	1760	12042	na
T01A2	0-0.7	04/12/12	< 28.2	< 31.9	48.2	137	138	118	89.9	133	175	< 54.5	334	< 49.8	80.6	< 35.1	117	279	1551.7	31200
T01A3	0-0.8	04/13/12	< 3	7.5	11.9	67.3	59.9	43.3	28.8	54.8	60.9	11.3	86.2	< 5.4	29.6	3.9	13.7	105	518.6	5590
T01B	0-0.5	04/04/12	< 18.1	< 20.5	< 30	< 18.3	21.5	35.8	< 17	< 23.9	45.3	< 35.1	77.7	< 32	< 18.3	< 22.5	35.1	56.6	354.65	16200
T02A	0-0.5	04/05/12	40.5	61.5	144	327	344	425	252	250	430	61.1	882	< 50.8	188	80.1	303	649	3961.5	39100
T02A	0.5-1.5	04/05/12	37.6	35.6	87.8	164	133	183	107	79.1	180	< 54.5	332	< 49.8	79.2	128	183	274	1842	48700
T02A	1.5-2.5	04/05/12	140	111	254	512	523	554	364	264	561	88.8	795	122	216	289	610	754	5489	65600
T02A	2.5-3.5	04/05/12	184	83.1	365	553	507	630	322	300	638	75.4	1290	167	223	189	1080	1030	7016.1	69400
T02A	3.5-4.5	04/05/12	206	154	512	818	860	1390	504	1130	983	143	2150	298	411	283	1950	1520	12254	45700
T02A	4.5-5.2	04/05/12	26.2	61.8	94.8	219	213	244	165	156	289	< 44.9	525	41.2	116	183	310	502	2865	37000
T02A1	0-0.5	04/06/12	43.5	65.3	103	215	250	312	176	126	255	45.7	567	47.5	136	92.9	230	362	2669.2	59600
T02A1	0.5-1.5	04/06/12	36.8	17.8	39.4	69	81.3	95.4	59.6	42.8	79	15.1	161	38.3	44.4	34.5	123	105	923.3	60400
T02A1	1.5-2.5	04/06/12	108	64.4	159	290	313	389	204	125	335	59.8	684	90.1	153	182	574	459	3772.5	60600
T02A1	2.5-3.5	04/06/12	284	101	176	505	495	616	333	266	667	86.1	1240	71.7	260	290	565	1020	6296.7	158000
T-02A-1	0-0.5	11/15/11	26.3	50.8	81.5	251	298	301	234	260	320	76.5	626	34.4	206	67	286	521	3123	na
T-02A-1	0.5-0.9	11/15/11	66.2	111	227	409	444	328	287	362	424	95.2	930	78.2	251	101	712	803	4995.4	na
T02A2	0-0.5	04/09/12	< 25.3	< 28.7	47.4	177	193	255	157	126	223	< 49	472	< 44.8	109	< 31.5	154	350	2062.55	24600
T02A2	0.5-1.7	04/09/12	29.7	< 22.3	47.9	91.2	95	115	76.4	64.1	113	< 38.1	186	39.3	53	120	133	154	1199.35	11700
T02A2R	0-0.5	04/19/12	< 18.8	< 21.3	< 31.2	138	129	128	69.5	126	143	< 36.5	280	< 33.3	63.1	< 23.5	70.1	229	1307.15	na
T02A2R	0.5-1.5	04/19/12	< 21.4	< 24.2	< 35.4	69.3	50.9	27.3	24.2	49.4	64.6	< 41.4	88	< 37.8	< 21.6	< 26.6	75.4	109	606.6	na
T02A3	0-0.5	04/10/12	< 22.4	< 25.4	42.5	132	131	157	114	98.8	184	< 43.4	368	< 39.7	90.8	< 27.9	113	268	1552	12800
T02A3	0.5-1.5	04/10/12	< 21.4	< 24.3	37.4	76.5	67.4	78.1	57.5	51.5	88.2	< 41.5	132	< 37.9	39.8	< 26.7	107	139	832.25	13400
T02A3	1.5-2.1	04/10/12	46.3	< 31.2	58.1	94.6	68.6	73.1	54.1	45.8	102	< 53.3	120	< 48.7	31.6	63.9	205	147	1064.35	27400
T02A4	0-0.5	04/10/12	201	110	1950	2010	1780	1790	1010	1130	1870	293	5710	591	761	< 47.5	4940	4080	26185.75	11700
T02A4	0.5-1.8	04/10/12	147	48.5	93.7	120	95.6	114	100	50.4	140	< 54.3	536	< 49.6	63.3	158	503	264	2295	52700

Table 3. Sediment Analytical Results - PAHs (µg/kg) & TOC (mg/kg)
Former Wisconsin Public Service Marinette Manufactured Gas Plant Site
USEPA WIN000509952 / BRRTS # 02 38 000047

Location	Depth (feet)	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene (PAH)	Phenanthrene	Pyrene	PAH 13, Total (1/2 Non Detect Value)	Carbon, Total Organic (mg/kg)
T02A5	0-0.5	04/11/12	91	< 22.3	152	199	230	286	179	139	329	41.3	877	106	143	168	753	643	3984.15	17600
T02A5	0.5-1.5	04/11/12	< 23.3	< 26.4	81	204	172	213	120	108	230	< 45.1	457	< 41.2	90	274	182	330	2296.45	27500
T02A5	1.5-2.3	04/11/12	< 4.4	< 5	< 7.3	8.4	6.9	9.1	7.1	< 5.8	8.4	< 8.6	53.5	< 7.8	5.2	5.8	9.5	13.1	129.85	65600
T02A6	0-0.5	04/11/12	69.3	89	161	375	365	280	204	325	409	66.9	778	49.5	197	< 32.6	414	659	3990.1	27100
T02A6	0.5-1.5	04/11/12	< 25.9	58.9	282	666	658	702	411	299	728	96.8	1290	< 45.8	275	52.6	422	1110	6304.35	34500
T02A6	1.5-2.6	04/11/12	< 25.1	< 28.4	< 41.5	60.9	49.3	38.8	35.9	48.8	63.8	< 48.6	123	< 44.4	30.2	98.7	97.4	108	758.4	28900
T02A7	0-0.5	04/12/12	< 20.3	< 22.9	< 33.5	123	135	115	82.7	132	155	< 39.2	270	< 35.8	78.8	< 25.2	93.1	212	1303.95	13400
T02A7	0.5-1.5	04/12/12	< 19.8	< 22.4	101	266	273	208	144	210	275	44.4	471	< 35	139	< 24.6	201	403	2458.9	11600
T02A7	1.5-2.5	04/12/12	< 24.5	< 27.7	60.6	110	88.7	111	58.4	51.1	138	< 47.3	322	< 43.3	47.5	58.3	175	232	1394.45	27300
T02A7	2.5-3.1	04/12/12	40.5	41.3	87.9	116	120	142	85.7	65.6	172	< 47.3	326	< 43.2	67.1	87.1	251	237	1708	30200
T02A8-NATIVE	0-2	04/17/12	< 20.1	< 22.7	< 33.2	144	159	128	109	149	158	39.8	272	< 35.5	99.9	< 25	69.9	191	1339.15	na
T02A8-NATIVE	2-4	04/17/12	124	43.4	509	718	610	543	372	535	733	108	2010	215	262	55.9	1740	1290	9126.3	na
T02A8-NATIVE	4-6	04/17/12	51.9	< 34.4	91	133	112	78.3	141	105	128	< 58.8	440	< 53.7	53.5	< 37.8	218	3030	4450.15	na
T02A8-NATIVE	6-8	04/17/12	42.2	46.5	157	339	326	244	189	307	362	48.1	789	< 41.5	142	< 29.2	436	573	3657.05	na
T02A8-NATIVE	8-10	04/17/12	< 2.9	< 3.3	< 4.8	< 2.9	< 3.4	< 3.5	< 2.7	< 3.8	< 3.7	< 5.6	< 10.2	< 5.1	< 2.9	< 3.6	< 4.5	< 3.7	27.7	46300
T02A-NATIVE	0-2	04/19/12	< 27.4	< 31.1	< 45.4	52.5	59.8	55.6	31.2	57.5	59.1	< 53.1	< 97.6	< 48.5	30.6	< 34.1	< 42.9	90.9	538.9	na
T02A-NATIVE	2-4	04/19/12	< 30.6	38.7	91.4	227	196	180	115	141	255	< 59.2	358	< 54.1	95.6	< 38.1	246	355	2149.5	na
T02A-NATIVE	6-8	04/19/12	44.4	< 49.8	89.9	135	130	99.8	159	107	156	< 85	340	< 77.7	50.6	110	374	324	1948.95	na
T02A-NATIVE	8-8.8	04/19/12	< 15.8	< 17.9	< 26.2	< 16	< 18.4	< 19.5	< 14.9	< 20.9	< 20.4	< 30.6	< 56.2	< 28	< 16	< 19.7	< 24.7	< 20.6	143.2	na
T02B	0-0.5	04/04/12	< 18.4	< 20.9	< 30.5	< 18.6	< 21.5	< 22.7	< 17.3	< 24.4	< 23.8	< 35.7	< 65.6	< 32.6	< 18.6	< 23	< 28.8	< 24	166.95	6210
T02C	0-0.5	04/04/12	< 16.3	< 18.5	< 27	< 16.5	< 19	< 20	< 15.3	< 21.5	< 21	< 31.5	< 58	< 28.8	< 16.5	< 20.3	< 25.5	< 21.2	147.55	41600
T02C	0.5-1	04/04/12	< 16.2	< 18.3	< 26.8	29.5	< 18.8	< 19.9	< 15.2	< 21.4	< 20.9	< 31.3	< 57.5	< 28.6	< 16.3	< 20.1	< 25.3	< 21.1	167.8	40100
T03A	0-0.5	04/05/12	70	< 30.8	69.1	65.4	105	163	85.7	65	168	< 52.6	285	54.1	64	40.6	148	236	1469.2	41200
T03A	0.5-1.5	04/05/12	143	102	227	181	270	265	162	173	236	< 54.1	431	101	118	88.2	476	388	3081.2	56100
T03A	1.5-2.5	04/05/12	129	66	141	193	162	186	97.6	122	250	< 72.6	456	120	75.9	82.4	521	391	2819.4	90300
T03A	2.5-3.5	04/05/12	129	< 32	173	129	93.3	107	56.7	70.2	156	< 54.6	303	83.8	< 28.5	129	447	340	2176.3	66100
T03A	3.5-4	04/05/12	1300	91.2	343	359	456	397	292	250	449	81.1	594	318	170	4330	929	684	10500.2	96900
T03A1	0-0.5	04/06/12	< 22.8	29.4	87	267	301	269	206	297	359	69.1	716	< 40.4	183	< 28.4	290	568	3229.2	20900
T03A1	0.5-1.5	04/06/12	32.8	45.3	91	209	215	163	146	204	245	< 44.1	470	40.7	123	40.7	238	419	2413.5	41500
T03A1	1.5-2	04/06/12	55.6	32.8	98.4	156	134	100	90.8	137	175	< 55.5	367	< 50.8	74.7	83.9	400	339	2104.1	64600
T03A2	0-0.5	04/06/12	< 19.5	< 22.1	< 32.3	24.3	27.4	30	23.9	28.5	37.9	< 37.7	72.8	< 34.5	< 19.7	< 24.3	< 30.5	57.3	388.45	6700
T03A3	0-0.5	04/11/12	31.7	< 33.3	120	302	361	435	291	262	489	72.3	971	< 52	217	55.5	408	720	4197.85	31400
T03A3	0.5-1.5	04/11/12	< 24.2	< 27.4	< 40	72.5	73.2	116	72.6	55.3	131	< 46.8	212	< 42.7	50.3	< 30.1	70.6	163	975.8	27500
T03A3	1.5-2.5	04/11/12	54.9	71.3	146	271	277	316	180	130	349	< 50.1	633	46.8	141	58.3	329	572	3254.3	47400
T03A3	2.5-3.5	04/11/12	478	364	1010	1020	1060	731	555	756	1080	173	1920	478	510	370	2420	2040	13727	89000
T03A3	3.5-4.5	04/11/12	312	< 165	340	333	256	202	176	218	403	< 282	736	< 258	< 147	21300	1200	707	26218.5	92900
T03A3	4.5-4.9	04/11/12	213000	58800	185000	183000	168000	119000	88600	126000	164000	26300	429000	144000	86100	1010000	559000	350000	3708800	102000

Table 3. Sediment Analytical Results - PAHs (µg/kg) & TOC (mg/kg)
Former Wisconsin Public Service Marinette Manufactured Gas Plant Site
USEPA WIN000509952 / BRRTS # 02 38 000047

Location	Depth (feet)	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene (PAH)	Phenanthrene	Pyrene	PAH 13, Total (1/2 Non Detect Value)	Carbon, Total Organic (mg/kg)
T03B	0-0.5	04/05/12	93	281	370	1240	1660	1770	1290	1270	1600	295	2850	113	1010	410	1270	2520	15447	57300
T03B	0.5-1.5	04/05/12	31.1	29.6	86.2	144	151	167	101	105	178	< 41.9	290	< 38.3	78	28.7	191	282	1702.75	47600
T03B	1.5-2	04/05/12	99.1	89.3	207	321	283	287	178	193	349	< 59.1	676	< 54.1	132	208	528	507	3774.45	83800
T03B2	0-0.5	04/10/12	< 23.3	< 26.4	< 38.5	90.6	78.2	94.3	67.8	43.9	113	< 45	148	< 41.2	41.6	< 29	60.5	166	873.7	7010
T03B2	0.5-1.6	04/10/12	146	< 28.1	109	263	233	235	169	144	295	< 48	554	< 43.8	125	< 30.9	201	437	2668.4	11600
T03B3	0-0.5	04/12/12	29.4	46.1	209	464	418	313	216	374	485	80.9	1030	58.5	214	< 31.4	642	803	4887.7	29700
T03B3	0.5-1.8	04/12/12	247	< 33.7	94.5	227	214	166	139	184	219	58.1	358	< 52.7	124	51.4	220	335	2359.1	29800
T03C	0-0.5	04/05/12	< 17	< 19.2	< 28.1	30.2	23.2	21.7	19.3	< 22.4	34.2	< 32.9	< 60.4	< 30	< 17.2	< 21.1	< 26.6	50.2	271.9	22800
T03E	0-0.7	04/04/12	208000	41400	164000	109000	108000	103000	63100	64600	114000	14300	301000	136000	44700	596000	464000	259000	2668000	230000
T03ER	0-0.8	04/19/12	< 18	< 20.4	< 29.8	< 18.2	< 21	< 22.2	< 16.9	< 23.8	< 23.2	< 34.9	< 64.1	< 31.9	< 18.2	< 22.4	< 28.2	< 23.5	173.35	17000
T03HH	0-0.5	04/03/12	117	117	208	434	464	557	410	276	543	91.5	998	77.4	286	266	426	846	5329.4	59000
T03HH	0.5-1.5	04/03/12	174	184	397	561	646	659	444	325	656	109	1240	121	301	226	700	1110	6999	63500
T03HH	1.5-2.5	04/03/12	1160	724	2590	3050	3270	2640	1910	1760	3380	594	6260	1030	1410	1780	5840	5370	38854	93600
T03HH	2.5-3.5	04/03/12	1130	1890	1230	3410	4320	4340	3470	2100	4020	< 827	4680	< 756	2320	72100	3150	4300	107048	76300
T03HH-NATIVE	2-2.5	04/19/12	4740	6640	15000	19400	19300	16500	10800	13000	18100	2910	42400	4250	10200	5340	34000	33600	232270	na
T03HH-NATIVE	2.5-4.5	04/19/12	87200	53500	167000	60800	55100	44900	28900	38400	57200	7370	156000	78700	25900	550000	264000	127000	1739800	267000
T04A	0-0.5	04/04/12	6470	4470	12600	15100	15800	14500	9570	7150	15700	2420	30900	4110	7220	10200	21900	27700	186600	99600
T04A	0.5-1.7	04/04/12	20400	6440	19900	18700	19800	18500	13500	11200	20800	3120	43500	10100	9060	207000	44100	38500	478940	120000
T04A1	0-0.5	04/11/12	< 30.3	< 34.3	< 50.1	115	114	145	88.4	86.6	169	< 58.6	342	< 53.5	74.3	< 37.7	158	268	1500.55	3790
T04A1	0.5-1.1	04/11/12	< 16.9	< 19.2	< 28	< 17.1	< 19.7	< 20.8	< 15.9	< 22.4	< 21.8	< 32.8	< 60.2	< 29.9	< 17.1	< 21.1	< 26.5	< 22	162.8	< 1000
T04B	0-0.5	04/05/12	< 41.7	< 47.2	< 69	283	391	374	273	331	376	86.2	543	< 73.8	239	< 51.9	161	427	3027.8	28600
T04B	0.5-1.5	04/05/12	< 22.9	< 25.9	39.8	72.7	61.1	104	62.9	51.4	115	< 44.3	187	< 40.5	46.2	< 28.5	101	152	942.9	51800
T04B	1.5-2.5	04/05/12	< 23.9	< 27	40.1	107	90	102	65.1	71.2	136	< 46.2	199	< 42.2	50.2	52.6	101	171	1116.45	48900
T04B	2.5-3.1	04/05/12	< 17	< 19.3	< 28.1	< 17.2	< 19.8	< 20.9	< 16	< 22.5	< 21.9	< 32.9	< 60.5	< 30.1	< 17.2	< 21.2	< 26.6	< 22.1	163.6	44500
T04B1	0-0.5	04/12/12	< 20.4	< 23.1	< 33.7	52.9	41.6	59.1	34	32	63.9	< 39.4	123	< 36	23.8	< 25.3	69.3	97.5	608.55	13200
T04B1	0.5-1.7	04/12/12	670	< 25	94	129	100	96.4	61.1	69	111	< 42.7	304	< 39.1	51	80.2	235	221	2141.65	26400
T04B-NATIVE	0-0.5	04/17/12	< 21.2	< 24	< 35.1	82.4	89.8	78.8	68.3	86.3	93.3	< 41.1	153	< 37.5	46	< 26.4	61.1	126	829.6	37700
T04B-NATIVE	0.5-1.5	04/17/12	< 20.8	24.1	63.5	161	173	135	81	144	170	< 40.3	252	< 36.8	76.2	38.4	171	244	1624	115000
T04B-NATIVE	1.5-2.5	04/17/12	< 2.9	< 3.3	< 4.8	< 2.9	< 3.4	< 3.5	< 2.7	< 3.8	< 3.7	< 5.6	< 10.3	< 5.1	< 2.9	< 3.6	< 4.5	< 3.8	27.8	3090
T04B-NATIVE	2.3-3.5	04/17/12	< 2.7	< 3.1	< 4.5	< 2.8	< 3.2	< 3.4	< 2.6	< 3.6	< 3.5	< 5.3	< 9.7	< 4.8	< 2.8	< 3.4	< 4.3	< 3.6	26.3	49100
T04B-NATIVE	3.5-5.5	04/17/12	< 2.8	< 3.1	< 4.6	< 2.8	< 3.2	< 3.4	< 2.6	< 3.7	< 3.6	< 5.4	< 9.9	< 4.9	< 2.8	< 3.4	< 4.3	< 3.6	26.65	52600
T04B-NATIVE	5.5-7.5	04/17/12	< 2.8	< 3.2	< 4.6	< 2.8	< 3.2	< 3.4	< 2.6	< 3.7	< 3.6	< 5.4	< 9.9	< 4.9	< 2.8	< 3.5	< 4.3	< 3.6	26.75	56200
T04B-NATIVE	7.5-9.5	04/17/12	< 2.9	< 3.3	< 4.8	< 2.9	< 3.3	< 3.5	< 2.7	< 3.8	< 3.7	< 5.6	< 10.2	< 5.1	< 2.9	< 3.6	< 4.5	< 3.7	27.65	57200
T04B-NATIVE	9.5-11.5	04/17/12	< 2.9	< 3.3	< 4.9	< 3	< 3.4	< 3.6	< 2.8	< 3.9	< 3.8	< 5.7	< 10.4	< 5.2	< 3	< 3.7	< 4.6	< 3.8	28.25	55200
T04B-NATIVE	11.5-13.5	04/17/12	< 2.7	< 3	< 4.4	< 2.7	< 3.1	< 3.3	< 2.5	< 3.5	< 3.4	< 5.2	< 9.5	< 4.7	< 2.7	< 3.3	< 4.2	< 3.5	25.65	33400
T04C	0-0.5	04/05/12	< 16.6	< 18.8	< 27.4	< 16.7	< 19.3	< 20.4	< 15.6	< 21.9	< 21.4	< 32.1	< 58.9	< 29.3	< 16.7	< 20.6	< 25.9	23.1	171.7	2420
T04C	0.5-0.8	04/05/12	35	< 18	< 26.3	41.3	31.8	26.7	17.7	27.6	39.2	< 30.7	64.1	< 28.1	16.2	< 19.8	< 24.8	53.3	377.5	4650
T04D	0-0.5	04/10/12	< 26.9	149	107	516	523	475	320	284	593	82.8	812	< 47.6	212	< 33.5	174	769	4456	11400
T04D	0.5-1.7	04/10/12	< 26.1	< 29.5	< 43.1	61.5	40.1	43.8	31.1	< 34.4	55.1	< 50.5	< 92.7	< 46.1	45.5	85.3	71.6	91.4	584.75	48000

Table 3. Sediment Analytical Results - PAHs (µg/kg) & TOC (mg/kg)
Former Wisconsin Public Service Marinette Manufactured Gas Plant Site
USEPA WIN000509952 / BRRTS # 02 38 000047

Location	Depth (feet)	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene (PAH)	Phenanthrene	Pyrene	PAH 13, Total (1/2 Non Detect Value)	Carbon, Total Organic (mg/kg)
T04HH	0-0.5	04/04/12	266000	45200	174000	117000	107000	104000	61300	66200	128000	< 16800	285000	132000	45400	1470000	442000	251000	3587400	129000
T04HH	0.5-1.5	04/04/12	590000	63900	382000	188000	139000	164000	96700	75800	199000	< 35100	493000	304000	65000	2510000	894000	432000	6434700	98400
T04HH	4.5-5.5	04/04/12	883	< 125	244	< 111	< 128	152	< 104	< 146	193	< 213	412	< 195	< 111	19500	610	355	22701.5	85700
T04N	0-0.5	04/04/12	152000	37300	207000	147000	143000	116000	88600	86300	153000	21100	404000	118000	63100	43400	534000	356000	2497000	31400
T04N	0.5-1.5	04/04/12	86800	20900	96200	66300	69000	61700	38000	35000	69800	9800	162000	48900	30100	249000	206000	133000	1304600	19800
T04N	1.5-2.5	04/04/12	142000	18200	108000	50800	45200	42500	28000	28600	60500	< 9300	137000	72900	19800	621000	224000	120000	1670700	56700
T04N	2.5-3.5	04/04/12	219000	21200	143000	70000	58900	60600	34600	38100	93100	< 16600	215000	105000	26500	860000	347000	209000	2439900	51700
T04N	3.5-4.5	04/04/12	136000	19700	98000	53800	47300	49100	32600	29800	64200	7190	153000	69700	21900	445000	235000	126000	1526600	19700
T04N	4.5-5.2	04/04/12	26000	3170	18900	9740	9150	8020	5260	5760	10800	< 1170	27700	12200	3610	72500	44100	22500	270540	80100
T04N-NATIVE	4-5	04/19/12	430000	32500	243000	146000	118000	78500	58700	84300	136000	18200	297000	198000	52400	1400000	622000	301000	4086300	na
T04N-NATIVE	5-6	04/19/12	2180	220	1150	832	700	371	253	633	727	84.4	1880	1030	242	4680	3560	1760	19723	na
T04N-NATIVE	10-10.6	04/19/12	717	70.2	395	280	227	124	85.1	200	234	29.2	613	328	79.3	1540	1160	585	6473.2	na
T04N-NATIVE1	10-10.5	04/19/12	158000	17300	91700	64100	58300	43300	28900	39300	59000	8960	147000	75200	26600	452000	271000	129000	1605200	47600
T04N-NATIVE1	10.5-11.2	04/19/12	159	< 18.5	61	40.8	32.4	< 20	< 15.3	24.2	36.1	< 31.5	84.5	52.8	< 16.5	561	169	87.1	1327.15	43200
T04NR	0-0.5	04/19/12	135000	41000	199000	119000	110000	85200	54600	76900	114000	16800	281000	96300	51400	115000	405000	240000	2017400	na
T04NR	0.5-1	04/19/12	196000	29000	141000	93100	81400	58500	41000	56800	83300	13000	219000	101000	38200	734000	375000	189000	2357100	144000
T04SW3	0-0.5	04/04/12	39400	6750	28300	17000	17600	15000	11700	10400	20000	3370	42400	18800	8100	80000	70200	41200	407050	101000
T04SW3	0.5-1.5	04/04/12	51500	3940	28600	20200	17200	16300	9910	7660	21900	2560	40900	20000	6140	131000	70000	44900	474100	114000
T04SW3	3.5-4.5	04/04/12	338	61.5	239	235	246	293	171	152	351	< 40.1	731	132	119	685	669	633	4765.5	21800
T04SW3	4.5-5.7	04/04/12	39.5	103	130	370	392	537	237	436	484	55.3	859	< 45	166	208	280	727	4588	43200
T04SW3R	0-0.5	04/19/12	28700	7020	25300	27300	27000	15100	15000	22200	25000	4570	59000	13800	13400	44600	65400	47600	408020	162000
T04SW3R	0.5-1.4	04/19/12	31500	2550	19900	12100	10600	5650	5840	8720	12100	2010	25300	14200	4980	75500	55900	23200	297220	90200
T04SW4	0-0.5	04/04/12	284	363	1190	3470	3910	3570	2220	2380	3590	578	6290	203	1840	292	1250	5190	31982	41100
T04SW4	0.5-1.5	04/04/12	142	< 25.8	79.3	147	170	189	119	114	195	< 44.2	292	43.7	89.1	166	151	259	1960.9	58400
T04SW4	1.5-2.5	04/04/12	58.8	< 29.7	< 43.4	< 26.5	< 30.5	< 32.2	27.7	< 34.6	36.9	103	< 93.2	< 46.4	119	90.5	< 41	53.7	382.05	67800
T05A	0-0.8	04/05/12	< 19.2	< 21.8	< 31.9	< 19.4	< 22.4	< 23.7	< 18.1	< 25.4	< 24.8	< 37.2	< 68.4	< 34	< 19.4	< 24	< 30.1	< 25.1	150.9	2530
T05A1	0-0.5	04/09/12	< 18.8	23.4	56.4	208	197	156	108	169	236	42.3	365	< 33.2	101	26.1	163	310	1935.9	13900
T05A1	0.5-1.5	04/09/12	< 17.8	< 20.2	< 29.5	< 18	< 20.8	< 21.9	< 16.8	< 23.6	< 23	< 34.5	< 63.4	< 31.6	< 18	< 22.2	< 27.9	< 23.2	139.85	47100
T05A1	1.5-2.1	04/09/12	< 17.1	< 19.4	< 28.3	< 17.3	< 19.9	< 21	< 16.1	< 22.6	< 22.1	< 33.1	< 60.8	< 30.3	< 17.3	< 21.3	< 26.7	< 22.3	134.15	44400
T05A2	0-0.5	04/09/12	< 3	< 3.4	8.1	32.3	36.5	44.1	32	27.1	42.6	8.1	76.4	< 5.4	22.2	< 3.8	27	58.3	360.2	4650
T05A2	0.5-1.4	04/09/12	< 2.8	< 3.2	< 4.7	< 2.8	< 3.3	< 3.5	< 2.6	< 3.7	< 3.6	< 5.4	< 10	< 5	< 2.8	< 3.5	< 4.4	< 3.7	22.1	3330
T05A3	0-0.5	04/13/12	5.3	12.2	20.3	58	60.1	49.9	40	57.7	67.3	14.6	110	6.7	36.5	6.1	47.5	92.4	593.5	13300
T05D	0-0.5	04/10/12	< 28.2	< 32	< 46.7	< 28.5	< 32.9	< 34.7	< 26.5	< 37.3	< 36.4	< 54.6	< 100	< 49.9	< 28.5	85.1	< 44.1	< 36.7	288.8	64100
T05D	0.5-1.5	04/10/12	< 43	< 48.7	< 71.1	< 43.4	< 50	< 52.8	< 40.4	< 56.7	< 55.4	< 83.2	< 153	< 76	< 43.4	153	< 67.2	< 55.9	463.1	112000
T05D	1.5-2.5	04/10/12	32	139	87	203	189	177	127	99.1	221	< 58.4	498	< 53.4	74	599	258	480	3008.8	105000
T05HH1	0-0.5	04/04/12	61300	9540	43300	26100	24900	26000	15800	12500	28600	3230	76700	38200	11300	210000	123000	63300	743440	108000
T05HH1	0.5-1.3	04/04/12	256000	43300	247000	117000	119000	104000	58200	65500	128000	14000	358000	164000	43000	748000	563000	289000	3201800	75500
T05HH3	0-0.5	04/09/12	8460	2860	11800	12700	12400	12200	8040	5440	13100	1990	29900	5100	6040	20600	28900	24800	188260	35400

Table 3. Sediment Analytical Results - PAHs (µg/kg) & TOC (mg/kg)
Former Wisconsin Public Service Marinette Manufactured Gas Plant Site
USEPA WIN000509952 / BRRTS # 02 38 000047

Location	Depth (feet)	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene (PAH)	Phenanthrene	Pyrene	PAH 13, Total (1/2 Non Detect Value)	Carbon, Total Organic (mg/kg)
T05N	0-0.5	04/03/12	371	579	1110	2260	2410	2010	1640	1530	2370	406	4970	361	1340	354	2520	4000	24845	39100
T05N	0.5-1.5	04/03/12	5430	592	4490	3690	3550	3400	2080	2000	3870	622	9550	3070	1680	2690	11800	7110	61242	55700
T05N	1.5-2.5	04/03/12	82700	11900	59500	36500	34700	34800	21000	16600	38300	4440	118000	47200	15300	167000	178000	88600	913800	78500
T05N2	0-0.5	04/06/12	665	212	384	965	1080	807	699	977	1150	233	1980	161	638	246	965	1740	11332	39000
T05N2	0.5-1.5	04/06/12	769	587	1400	2710	2650	1700	1340	2010	2740	544	3700	394	1220	259	2720	4010	25649	27100
T05N2	1.5-2.2	04/06/12	1640	1720	4300	6890	6210	3850	3190	5120	6880	1090	13500	1410	2950	1020	10400	12800	75740	47300
T05N-NATIVE	0-2	04/18/12	177	168	312	581	705	429	359	707	650	107	1070	125	331	108	790	953	6775	na
T05N-NATIVE	2-4	04/18/12	351	219	416	515	605	445	316	457	550	85.8	1080	271	266	469	1190	1020	7588	na
T05N-NATIVE	6-6.7	04/18/12	361	< 19	< 27.7	< 16.9	< 19.5	< 20.6	< 15.7	< 22.1	< 21.6	< 32.4	< 59.6	75.6	< 16.9	32.8	< 26.2	< 21.8	554	na
T06A	0-0.5	04/04/12	553	500	973	1840	1840	1200	1040	1510	1800	333	3030	344	948	296	2080	2940	18906	27900
T06A	0.5-1.5	04/04/12	736	922	1940	3370	3650	2550	2160	2560	3150	698	6080	559	1880	283	3340	5170	34310	12700
T06A	1.5-2.5	04/04/12	2430	327	1150	1100	1080	704	595	893	1090	191	2440	1120	552	311	3410	2090	18145	50100
T06A	2.5-3.2	04/04/12	3390	1700	6020	6960	7210	6640	4410	3830	7040	998	16800	2540	3190	812	14800	13700	91442	24600
T06A1	0-0.5	04/10/12	195	64.6	355	468	442	382	276	214	529	91.7	765	134	166	< 30.5	725	888	5176.85	8650
T06A1	0.5-1.7	04/10/12	22600	4220	35700	32500	29500	25000	17900	13600	32800	4920	59200	17700	10700	6070	80200	60700	437640	66200
T06A2	0-0.5	04/10/12	241	< 30.3	< 44.3	100	87.5	130	91.1	71.9	127	< 51.8	231	< 47.3	67.1	< 33.3	62.4	170	1298.4	na
T06B3	0-0.5	04/03/12	57.2	< 23.1	< 33.8	< 20.7	< 23.8	< 25.1	< 19.2	< 27	< 26.4	< 39.6	< 72.7	< 36.2	< 20.7	< 25.4	< 32	< 26.6	243.6	8110
T06C3	0-0.5	04/03/12	< 2.9	< 3.3	< 4.8	< 2.9	< 3.4	< 3.6	< 2.7	< 3.8	< 3.7	< 5.6	< 10.3	< 5.1	< 2.9	< 3.6	< 4.5	< 3.8	26.4	19600
T06D	0-0.5	04/06/12	383	715	2140	3350	3180	1890	1610	2460	3300	641	4650	557	1470	513	3700	5040	31878	47800
T06D	0.5-1.5	04/06/12	< 3.9	< 4.4	< 6.4	< 3.9	6	8.2	12.4	5.5	11.5	< 7.5	< 13.8	< 6.8	7.1	< 4.8	7.5	11.5	70.25	44000
T06D	1.5-2.5	04/06/12	849	502	1770	2720	2650	1690	1270	2000	2640	457	3990	832	1080	303	4410	4300	28656	34200
T06HH1	0-0.5	04/05/12	2750	2110	4320	7460	7620	5030	4150	6120	7410	1240	13800	1750	3880	1100	11200	13000	83670	41300
T06HH1	0.5-1	04/05/12	1130	1780	3680	5790	5250	3290	2740	4440	5490	813	12700	1270	2600	512	8690	10900	64922	54700
T06HH1-NATIVE	0-0.5	04/18/12	8670	1090	3690	4250	4170	3180	2090	2960	4230	648	8820	4510	1960	935	12300	7400	66205	na
T06HH1-NATIVE	0.5-2.5	04/18/12	130000	17000	126000	73900	67100	50500	36100	49300	69800	9010	209000	84800	34300	24900	350000	170000	1422300	na
T06HH1-NATIVE1	3.5-4.5	04/18/12	23600	2660	17700	10700	9630	5470	5400	8720	8510	1640	31900	13400	5050	58500	50900	21500	263190	na
T06N1	0-0.5	04/03/12	< 16.5	< 18.7	36	80.3	60.3	65.7	40.1	37.3	94.8	< 32	106	< 29.3	22.4	< 20.6	62.4	110	695.35	4250
T06N1	0.5-1.3	04/03/12	< 16.6	< 18.8	34.1	63.3	42.2	50	27.2	31.4	71.8	< 32.1	130	< 29.3	19.1	< 20.6	61.9	107	634.35	6340
T06N1-NATIVE	0-1.5	04/17/12	< 2.7	< 3.1	< 4.5	4.8	4.6	< 3.3	5.1	4.8	5.2	< 5.3	13.8	< 4.8	< 2.7	< 3.4	9.2	11	64.3	na
T06N1-NATIVE	1.5-2.5	04/17/12	< 2.8	< 3.2	< 4.7	< 2.9	< 3.3	< 3.5	< 2.7	< 3.8	< 3.7	< 5.5	< 10.1	< 5	< 2.9	< 3.5	< 4.4	< 3.7	27.3	55600
T06N1-NATIVE	2.5-3.5	04/17/12	< 2.8	< 3.2	< 4.7	< 2.9	< 3.3	< 3.5	< 2.7	< 3.7	< 3.7	< 5.5	< 10.1	< 5	< 2.9	< 3.5	< 4.4	< 3.7	27.25	na
T06N1-NATIVE	3.5-4.5	04/17/12	< 2.8	< 3.2	< 4.6	< 2.8	< 3.2	< 3.4	< 2.6	< 3.7	< 3.6	< 5.4	< 9.9	< 4.9	< 2.8	< 3.5	< 4.4	< 3.6	26.8	53800
T06N1-NATIVE	4.5-5.5	04/17/12	< 2.9	< 3.3	< 4.8	< 2.9	< 3.4	< 3.6	< 2.7	< 3.8	< 3.7	< 5.6	< 10.3	< 5.1	< 2.9	< 3.6	< 4.5	< 3.8	27.85	na
T06N1-NATIVE	5.5-7.5	04/17/12	< 2.7	< 3	< 4.4	< 2.7	< 3.1	< 3.3	< 2.5	< 3.5	< 3.5	< 5.2	< 9.5	< 4.7	< 2.7	< 3.3	< 4.2	< 3.5	25.7	31100
T06N1-NATIVE	7.5-9.5	04/17/12	< 2.6	< 2.9	< 4.3	< 2.6	< 3	< 3.2	< 2.4	< 3.4	< 3.3	< 5	< 9.2	< 4.6	< 2.6	< 3.2	< 4	< 3.4	24.85	35900
T06N1-NATIVE	9.5-11.5	04/17/12	< 2.5	< 2.9	< 4.2	< 2.6	< 2.9	< 3.1	< 2.4	< 3.3	< 3.3	< 4.9	< 9	< 4.5	< 2.6	< 3.1	< 3.9	< 3.3	24.3	na
T06N1-NATIVE	11.5-13	04/17/12	< 2.7	< 3	< 4.4	< 2.7	< 3.1	< 3.3	< 2.5	< 3.5	< 3.4	< 5.1	< 9.4	< 4.7	< 2.7	< 3.3	< 4.2	< 3.5	25.6	31900

Table 3. Sediment Analytical Results - PAHs (µg/kg) & TOC (mg/kg)
Former Wisconsin Public Service Marinette Manufactured Gas Plant Site
USEPA WIN000509952 / BRRTS # 02 38 000047

Location	Depth (feet)	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene (PAH)	Phenanthrene	Pyrene	PAH 13, Total (1/2 Non Detect Value)	Carbon, Total Organic (mg/kg)
T06N2	0-0.5	04/11/12	48.7	< 34.4	65.5	80.3	67.2	63.4	45.8	56.1	91.1	< 58.8	197	< 53.8	38.4	155	242	173	1283.4	26300
T06N2	0.5-1.5	04/11/12	< 33.4	< 37.8	< 55.2	87.4	62.2	85.8	40.7	< 44.1	97.8	< 64.6	196	< 59	37.3	< 41.6	121	152	937.75	51900
T06N2	1.5-2.8	04/11/12	< 17.2	< 19.5	< 28.5	< 17.4	< 20.1	< 21.2	< 16.2	< 22.8	< 22.2	< 33.4	< 61.3	< 30.5	< 17.4	< 21.5	< 27	< 22.5	165.85	33600
T07A1	0-0.5	04/06/12	14200	6250	22300	27500	24800	17100	13500	19500	26400	3810	56100	9750	12100	4060	56300	50200	334460	38100
T07A1	0.5-1.5	04/06/12	12300	4910	15800	19000	17400	11800	8920	13600	18000	2790	42600	7590	8700	7570	36000	36400	242970	70800
T07A1	1.5-2	04/06/12	6220	1360	9260	4860	4650	2930	2440	3790	4890	792	10700	3650	2320	5080	13900	9650	80940	73700
T07A2	0-0.5	04/11/12	6180	2460	9880	11800	12700	11000	8250	6610	11600	2130	21800	5400	5660	1060	24200	21700	146390	29200
T07B	0-0.5	04/02/12	41.7	39.1	72.7	130	107	124	76.2	58.5	123	< 62.6	190	< 57.2	52.8	62	140	143	1259.6	23600
T07B6	0-0.8	04/11/12	< 16.7	< 18.9	< 27.6	< 16.9	< 19.4	< 20.5	< 15.7	< 22	< 21.5	< 32.3	< 59.3	< 29.5	< 16.9	< 20.8	< 26.1	< 21.7	160.45	25200
T07C	0-0.5	04/05/12	249	< 17.7	< 25.9	< 15.8	< 18.2	< 19.3	< 14.7	< 20.7	< 20.2	< 30.3	< 55.7	< 27.7	< 15.8	< 19.5	< 24.5	23.4	405	na
T07D	0-0.5	04/06/12	< 18.8	< 21.3	< 31.1	< 19	< 21.9	< 23.1	< 17.7	< 24.9	< 24.3	< 36.4	< 66.9	< 33.3	< 19	< 23.4	< 29.4	34.4	203.1	6160
T07N	0-0.5	04/06/12	502	384	1770	2460	2260	1520	1100	1610	2590	491	3650	623	972	304	3790	4460	25923	12600
T07N	0.5-1.5	04/06/12	272	335	747	1890	2000	1240	1100	1470	2030	400	2470	279	895	132	1520	2960	17345	33800
T07N	1.5-2.5	04/06/12	< 16	< 18.1	< 26.5	< 16.2	< 18.6	< 19.7	< 15	< 21.2	< 20.7	< 31	< 57	< 28.3	< 16.2	< 19.9	< 25	< 20.9	144.75	37700
T07N-NATIVE	0-2	04/16/12	21.3	54.5	127	457	420	262	182	291	473	78.6	463	27.5	146	19.6	192	612	3419.9	51700
T07N-NATIVE	2-3.5	04/16/12	< 2.7	< 3.1	< 4.5	< 2.7	< 3.1	< 3.3	< 2.5	< 3.6	< 3.5	< 5.2	< 9.6	< 4.8	< 2.7	< 3.4	< 4.2	< 3.5	26	50300
T07N-NATIVE	3.5-5.5	04/16/12	< 2.7	< 3.1	< 4.5	< 2.7	< 3.1	< 3.3	< 2.5	< 3.6	< 3.5	< 5.2	< 9.6	< 4.8	< 2.7	< 3.4	< 4.2	< 3.5	26	45200
T07N-NATIVE	5.5-7.5	04/16/12	< 2.7	< 3.1	< 4.5	< 2.7	< 3.2	< 3.3	< 2.6	< 3.6	< 3.5	< 5.3	< 9.7	< 4.8	< 2.7	< 3.4	< 4.2	< 3.5	26.1	46800
T07N-NATIVE	7.5-9.5	04/16/12	< 2.9	< 3.3	< 4.8	< 2.9	< 3.3	< 3.5	< 2.7	< 3.8	< 3.7	< 5.6	< 10.2	< 5.1	< 2.9	8.3	< 4.5	< 3.7	34.15	58500
T07N-NATIVE	9.5-11.5	04/16/12	7.2	< 3.3	< 4.8	< 2.9	< 3.4	< 3.6	< 2.7	< 3.8	< 3.7	< 5.6	< 10.3	< 5.1	< 2.9	24.1	< 4.5	< 3.8	55.9	35600
T07N-NATIVE	11.5-12.5	04/16/12	11.7	< 3.1	< 4.6	< 2.8	< 3.2	< 3.4	< 2.6	< 3.6	< 3.6	< 5.3	< 9.8	< 4.9	< 2.8	17.3	< 4.3	< 3.6	52.45	24800
T08A2	0-0.5	04/02/12	2350	1770	12200	15100	14400	13700	8400	8770	16400	1770	34400	2060	6330	1100	18100	29200	169550	38400
T08A3	0-0.5	04/10/12	< 18	< 20.3	< 29.7	< 18.2	< 20.9	< 22.1	< 16.9	< 23.7	< 23.2	< 34.8	< 63.9	< 31.8	< 18.2	< 22.4	< 28.1	< 23.4	172.85	49100
T08A3	0.5-1.5	04/10/12	< 17.1	< 19.4	< 28.3	< 17.3	< 19.9	< 21.1	< 16.1	< 22.6	< 22.1	< 33.1	< 60.9	< 30.3	< 17.3	< 21.3	< 26.8	< 22.3	164.7	47000
T08A3	1.5-2.5	04/10/12	< 17.8	< 20.2	< 29.4	< 18	< 20.7	< 21.9	< 16.7	< 23.5	< 23	< 34.4	< 63.3	< 31.5	< 18	< 22.2	< 27.8	< 23.2	171.25	26800
T08A3	2.5-3.2	04/10/12	< 16.1	< 18.2	< 26.6	< 16.2	< 18.7	< 19.8	< 15.1	< 21.2	< 20.7	< 31.1	< 57.1	< 28.4	< 16.2	< 20	< 25.1	< 20.9	154.5	22800
T08A4	0-0.5	04/11/12	580	< 31.1	< 45.5	47	< 32	39.3	29.1	< 36.3	50.4	< 53.2	< 97.7	< 48.6	< 27.8	< 34.2	48.8	70.9	999.1	38900
T08A5	0-0.5	04/11/12	< 18.7	< 21.2	< 31	< 18.9	< 21.8	< 23.1	< 17.6	< 24.8	< 24.2	< 36.3	< 66.6	< 33.2	< 18.9	< 23.3	< 29.3	< 24.4	180.25	45200
T08A5	0.5-1.8	04/11/12	< 17.8	< 20.1	< 29.4	< 18	< 20.7	< 21.9	< 16.7	< 23.5	< 23	< 34.4	< 63.3	< 31.5	< 18	< 22.1	< 27.8	< 23.2	171.15	47700
T08B3	0-0.5	04/05/12	77.5	24.7	49.4	116	100	130	82.3	87.2	136	< 35.6	246	< 32.6	67.4	< 22.9	92.2	211	1297.75	21700
T08B3	0.5-1.7	04/05/12	377	< 42.4	129	172	128	165	104	101	218	< 72.5	425	70.4	90.4	72.8	284	371	2534.4	66400
T08B4	0-0.5	04/13/12	4.5	11.6	24.8	62.8	47.1	38.9	24.5	39.2	60.2	9.3	104	6.9	24.2	4.8	67.7	91.4	563.9	8650
T08C	0-0.5	04/05/12	< 28.5	< 32.2	< 47.1	< 28.8	< 33.1	< 35	< 26.7	< 37.6	< 36.7	< 55.1	< 101	< 50.3	< 28.8	< 35.4	< 44.5	< 37.1	273.65	na
T08HH	0-0.5	04/06/12	25.2	74.6	316	523	535	502	337	292	487	89.8	1210	35.8	277	73.9	570	859	5503.5	9480
T08HH	0.5-1.8	04/06/12	< 2.7	< 3	< 4.4	< 2.7	< 3.1	< 3.3	< 2.5	< 3.5	< 3.5	< 5.2	< 9.5	< 4.7	< 2.7	< 3.3	< 4.2	< 3.5	25.7	33000
T09A2	0-0.5	04/06/12	45.4	40.4	113	219	192	135	90.6	163	227	< 41.5	432	< 37.9	88.2	78.2	268	371	2302.95	15000

Table 3. Sediment Analytical Results - PAHs (µg/kg) & TOC (mg/kg)
Former Wisconsin Public Service Marinette Manufactured Gas Plant Site
USEPA WIN000509952 / BRRTS # 02 38 000047

Location	Depth (feet)	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene (PAH)	Phenanthrene	Pyrene	PAH 13, Total (1/2 Non Detect Value)	Carbon, Total Organic (mg/kg)
T09A3	0-0.5	04/06/12	< 17.4	< 19.7	< 28.8	19.7	< 20.2	30.4	< 16.3	< 22.9	49.2	< 33.6	< 61.8	< 30.7	< 17.6	< 21.6	< 27.2	55.3	279.75	46100
T09A3	0.5-1.5	04/06/12	< 16.4	< 18.6	< 27.2	< 16.6	< 19.1	< 20.2	< 15.4	< 21.7	< 21.2	< 31.8	< 58.4	< 29	< 16.6	< 20.4	< 25.7	< 21.4	157.95	43600
T09A3	1.5-2.7	04/06/12	< 16.3	< 18.5	< 27	< 16.5	< 19	< 20.1	< 15.3	< 21.6	< 21.1	< 31.6	< 58.1	< 28.9	< 16.5	< 20.3	< 25.5	< 21.3	157.1	43200
T09A6	0-0.5	04/11/12	< 17.8	< 20.1	< 29.4	< 18	< 20.7	< 21.9	< 16.7	< 23.5	< 22.9	< 34.4	< 63.2	< 31.4	< 18	< 22.1	< 27.8	< 23.1	170.95	50700
T09A6	0.5-1.5	04/11/12	< 17.4	< 19.7	< 28.9	< 17.6	< 20.3	< 21.4	< 16.4	< 23	< 22.5	< 33.7	< 62	< 30.8	< 17.6	< 21.7	< 27.3	< 22.7	167.65	42300
T09A6	1.5-2.3	04/11/12	< 15.7	< 17.8	< 26	< 15.9	< 18.3	< 19.3	< 14.8	< 20.8	< 20.3	< 30.4	< 55.9	< 27.8	< 15.9	< 19.6	< 24.6	< 20.5	151.25	11000
T09A7	0-0.5	04/13/12	19.9	37.9	74.5	195	189	144	103	146	200	35.3	299	18.4	99	36.9	150	300	1810.6	33000
T09A7	0.5-1.2	04/13/12	30.9	36.5	88.1	190	157	95.2	80.3	119	165	31.1	260	24.2	73.5	28	196	270	1659.9	32100
T09C	0-0.5	04/05/12	5.3	< 3.7	14.4	23.4	22.1	21.4	14.6	15.8	24	< 6.2	52	< 5.7	10.1	10.3	33.8	39.5	266.7	39900
T09C	0.5-1.5	04/05/12	< 2.7	< 3.1	< 4.5	< 2.7	< 3.2	< 3.3	< 2.5	< 3.6	< 3.5	< 5.2	< 9.6	< 4.8	< 2.7	< 3.4	< 4.2	< 3.5	26.05	42800
T09C	1.5-1.9	04/05/12	< 2.7	< 3.1	< 4.5	< 2.7	< 3.1	< 3.3	< 2.5	< 3.6	< 3.5	< 5.2	< 9.6	< 4.8	< 2.7	< 3.4	< 4.2	4.4	28.65	42500
T1B	0-0.5	11/15/11	< 2.9	7.1	7.4	45.1	47	46.1	39.1	55.3	50	11.6	59.9	< 5.1	35.8	< 3.6	18.4	52	394.1	na
T1B	0.5-1	11/15/11	< 2.9	< 3.3	7.5	26.9	25.1	19.4	15.9	24.3	27.7	5.9	50.6	< 5.1	14.1	< 3.6	22.6	43.3	254.85	na
T1C-2	0-0.25	11/15/11	< 2.8	< 3.1	< 4.6	< 2.8	< 3.2	< 3.4	< 2.6	< 3.7	< 3.6	< 5.4	< 9.9	< 4.9	< 2.8	< 3.5	< 4.3	< 3.6	26.7	na
T2B	0-0.5	11/15/11	4.4	12.4	23.9	57.2	55.7	47.1	35.1	53.5	77.1	11.6	103	8.2	30.5	3.9	56	93	595.4	na
T2C	0-0.5	11/15/11	10.9	9.9	49.1	114	120	97.7	82.2	94.5	114	25.1	215	20.2	64.3	11.4	147	194	1197.7	na

[O:EPK 7/12, C:JTB 7/12]

Notes:

PAH - Polycyclic aromatic hydrocarbons
TOC - Total organic carbon
µg/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
PAH 13, Total (1/2 Non Detect Value) - sum of the concentrations of the following compounds: Acenapthene, Acenapthylene, Anthracene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Chrysene, Fluoranthene, Fluorene, Naphthalene (PAH), Phenanthrene, Pyrene. If any of these individual compounds were not detected in a sample, half of the detection limit for those particular compounds was added to the sum of the concentrations of the individual compounds detected.
< - parameter not detected above detection limit indicated
na - sample not submitted to laboratory due to low sample volume

APPENDIX A2

LOGS FOR SEDIMENT SAMPLING POINTS

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		Amb1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/10/2012	4/10/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	568.8 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994416.742 Feet ☐ S 450765.435 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	33 22.8		0.5 1.0 1.5	0 - 0.3' **SILT:** to **FILL:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, soft, poorly graded, homogeneous, some wood debris and organic silt, wet, faint sulfur-like odor. 0.3 - 1.9' **POORLY-GRADED SAND:** SP, very dark grayish brown (10YR 3/2), poorly graded, mostly subrounded to rounded sand [few fine, few medium, trace coarse], homogeneous, mostly very fine sand. 1.2' -1.5' feldspar lithics and wood debris. 1.9' End of Boring.	ML SP			0.4 0.4						Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature
Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 7/12/2012
Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T01A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/5/2012	4/5/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	572.7 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location
4994383.804 Feet ☐ S ☒ N 450786.706 Feet ☐ W ☒ E

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	66 60.0		0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0	0 - 0.4' **SILT:** to **POORLY-GRADED SAND:** ML, very dark brown (10YR 2/2), soft, poorly graded, some sand [mostly fine], homogeneous, wet, faint sulfur-like odor, little wood debris. 0.4 - 0.9' **POORLY-GRADED SAND:** to **SILT:** SP, very dark gray (10YR 3/1), 40% very dark brown (10YR 2/2) mottling, slow dilatency, low toughness, nonplastic, very soft, poorly graded, mostly sand [mostly fine], some silt, homogeneous, wet, few roots and wood debris, faint sulfur-like odor. 0.9 - 2.4' **POORLY-GRADED SAND:** SP, pale brown (10YR 6/3), 40% very dark brown (10YR 2/2) mottling, poorly graded, mostly sand [mostly fine, little medium, trace coarse], trace gravel [mostly medium], little silt, homogeneous, moist. 2' 0.5" nodule of silt 10YR 6/3 Pale Brown. 2.4 - 4.4' **SILT:** to **POORLY-GRADED SAND:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, low plasticity, soft, poorly graded, mostly sand [mostly fine], homogeneous, moist, trace wood debris, sulfur-like odor. 2.5' -2.7' 10YR 2/1 Black organic silt, little fine sand, organic-like odor. 4.4 - 5' **WELL-GRADED SAND:** to **FILL:** SW, very dark brown (10YR 2/2), soft, well graded, mostly sand [some fine, mostly medium, trace coarse], few silt, homogeneous, moist. 5' End of Boring.	ML SP SP ML SW			0 0 0 0 0.1 0 0 0 0 0						Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature

Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 7/12/2012
Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T01A1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/10/2012	4/10/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	567.7 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994401.311 Feet ☐ S 450786.5833 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	45 39.6		0.5 1.0 1.5 2.0 2.5 3.0	0 - 1.9' **SILT:** to **POORLY-GRADED SAND:** ML, black (10YR 2/1), slow dilatency, low toughness, nonplastic, very soft, poorly graded, some sand [some fine], homogeneous, wet, starting at 0.5' sand content increases with depth. 0.5' Little wood debris. 1.4' 10YR 2/2 Very dark brown, increased woody debris and organic silt. 1.9 - 3.3' **POORLY-GRADED SAND:** to **SILT WITH SAND:** SP, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, soft, poorly graded, mostly sand [mostly fine], some silt, homogeneous, mostly very fine sand, little organic silt. Silt and organic silt decreasing with depth. Sand content increasing with depth. 3.3' End of Boring.	ML SP			0 0 0 0 0 0 0						

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

Signature	Firm	
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T01A2

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/12/2012	4/12/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	570.7 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994394.846 Feet ☐ S 450799.4532 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	24 8.4		0.5	0 - 0.7' **SILT:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, poorly graded, little sand [mostly fine], homogeneous, wet, few root debris and organics, sand content increasing with depth. wood chip at bottom. 0.7' End of Boring.	ML			0 0						Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T01A3

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/13/2012	4/13/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	565.9 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994440.578 Feet ☐ S 450803.2774 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	18 9.6		0.5	0 - 0.6' **WELL-GRADED SAND:** SW, very dark grayish brown (10YR 3/2), rapid dilatency, low toughness, nonplastic, well graded, mostly subrounded sand [mostly fine, some medium, little coarse], trace subrounded gravel [trace fine], trace silt, wet, gravel size (0.25" to 0.5"), little wood debris (0.25" to 0.75"). 0.6 - 0.8' **WELL-GRADED SAND:** to **SILT:** SW, very dark grayish brown (10YR 3/2), rapid dilatency, low toughness, nonplastic, well graded, mostly subrounded sand [mostly fine, some medium, some coarse], some silt, moist to wet, little wood debris. 0.8' End of Boring.	SW SW			1 0 0						Additional Sample collected in 0-0.5' sampling interval with a push core. PID reading measured from pushcore sample.

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

Signature	Firm	
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T01B

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/4/2012	4/4/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	566.3 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994456.991 Feet ☐ S 450785.4855 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	12 6		0.5	0 - 0.5' **WELL-GRADED SAND:** SW, very dark grayish brown (10 YR 3/2), well graded, mostly rounded sand [mostly fine, little medium, few coarse], homogeneous, wet, few rounded grave, trace wood debris. 0.5' End of Boring.	SW			0 0						Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature

Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 7/12/2012
Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T01C

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/10/2012	4/10/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	572.7 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N 4994525.67 Feet ☐ S ☒ E 4994525.67 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS 1	0.5 1.2			0 - 0.1' **WELL-GRADED GRAVEL:** GW, very dark brown (10YR 2/2), well graded, mostly subangular gravel [mostly fine, little coarse], homogeneous, moist. 0.1' End of Boring.	GW			0						Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T02A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/5/2012	4/5/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	573.2 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994379.612 Feet ☐ S 450818.5883 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	66 62.4		0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0	0 - 3.6' **SILT:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, very soft, trace sand [trace fine], homogeneous, trace root and wood debris, organic silt, very fine sand. 1.1' -3.6' some fine sand. 2.8' 30% sand, increasing sand content with depth. 3.6 - 4.7' **POORLY-GRADED SAND:** SP, very dark gray (10YR 3/1), 40% very dark grayish brown (10YR 2/2) mottling, trace silt, homogeneous, little wood debris. 4.7 - 5.2' **POORLY-GRADED SAND:** SP, very dark grayish brown (10YR 3/2), homogeneous, few wood debris. 5.2' End of Boring.	ML SP SP			0 0 0 0 0 0 0 0 0 0						Additional Sample collected in 0-0.5' sampling interval with a push core.

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

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23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T02A1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/6/2012	4/6/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	572.4 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994378.297 Feet ☐ S 450830.9966 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	46.8 42		0.5 1.0 1.5 2.0 2.5 3.0 3.5	0 - 2' **SILT:** to **ORGANIC SILT:** ML, very dark gray (10YR 3/1), 45% black (10YR 2/1) mottling, slow dilatency, low toughness, nonplastic, very soft, poorly graded, little sand [mostly fine], homogeneous, wet, some organic silt, trace wood pieces, very fine sand, faint petroleum-like odor, increasing sand content with depth. 2 - 3.5' **SILT:** to **FILL:** ML, very dark grayish brown (10YR 3/2), 20% black (10YR 2/1) mottling, slow dilatency, low toughness, nonplastic, very soft, poorly graded, some sand [mostly fine], homogeneous, moist, some wood debris (length of wood pieces 0.6"-0.8"), very fine sand,increasing wood size and content with depth. 3' 60% gravel, 25% wood and increasing with depth. 3.5' End of Boring.	ML ML			0 0.2 0.2 0 0 0 0 0						Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature	Firm	
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T02A2

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/9/2012	4/9/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	571.9 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994389.909 Feet ☐ S 450831.7759 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	28.8 20.4		0.5 1.0 1.5	0 - 0.6' **SILT:** to **ORGANIC SILT:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, very soft, poorly graded, few sand [mostly fine], homogeneous, wet, some organic silt, few root debris, fine sand increasing with depth, MGP-like odor. 0.6 - 1.7' **POORLY-GRADED SAND:** SP, very dark brown (10YR 2/2), 30% black (10YR 2/1) mottling, poorly graded, mostly rounded sand [mostly fine, some medium, trace coarse], trace silt, homogeneous. 1.7' End of Boring.	ML SP			0.8 0.6 0 0 0						Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature
Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 7/12/2012
Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T02A2R

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/9/2012	4/9/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	571.9 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994391.04 Feet ☐ S 450832.4317 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	30 18		0.5 1.0 1.5	0 - 0.3' **SILT:** ML, very dark brown (10YR 2/2), 15% black (10YR 2/1) mottling, slow dilatency, low toughness, nonplastic, soft, poorly graded, little sand [mostly fine], homogeneous, moist, trace organics, few root debris and wood chips, very fine sand, faint sulfur-like odor, at 0.3' well graded sands mostly medium.	ML									
				0.3 - 0.8' **POORLY-GRADED SAND:** SP, very dark brown (10YR 2/2), 15% black (10YR 2/1) mottling, poorly graded, mostly sand [mostly fine], little silt, homogeneous, moist, few wood debris and chips, trace organics, fine sand increases and grades to medium sand with depth.	SP									
				0.8 - 1.5' **SILT:** to **ORGANIC SILT:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, poorly graded, little sand [mostly fine], homogeneous, moist, some organic silt, few wood debris and chips, very fine sand, faint sulfur-like odor.	ML									
				1.5' End of Boring.										

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T02A3

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/10/2012	4/10/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	569.6 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994401.138 Feet ☐ S 450818.1137 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	42 25.2		0.5 1.0 1.5 2.0	0 - 0.2' **SILT:** ML, black (10YR 2/1), rapid dilatency, very soft, poorly graded, little sand [mostly fine], homogeneous, wet, some wood debris. 0.2 - 1.1' **POORLY-GRADED SAND:** SP, very dark gray (10YR 3/1), very soft, poorly graded, mostly sand [mostly fine], trace silt, homogeneous, moist to wet, very fine sand. the top 2" some silt. 1.1 - 1.5' **SILT:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, low plasticity, soft, poorly graded, trace sand [mostly fine], homogeneous, moist, little organic silt and wood debris, very fine sand, faint sulfur-like odor, wood debris increases with depth. 1.5 - 2.1' **POORLY-GRADED SAND:** to **FILL:** SP, very dark grayish brown (10YR 3/2), soft, poorly graded, mostly sand [mostly fine], some silt, homogeneous, some wood debris, very fine sand. 2.1' End of Boring.	ML SP ML SP			0 0.2 0 0						Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature
Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 7/12/2012
Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Page 1 of 1

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T02A4

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/10/2012	4/10/2012	vibratory

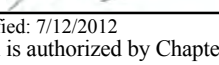
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	568.6 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994414.62 Feet ☐ S 450832.0161 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	42 21.6		0.5 1.0 1.5	0 - 0.55' **POORLY-GRADED SAND:** to **SILT:** SP, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, poorly graded, mostly subrounded sand [mostly fine, trace coarse], some silt, homogeneous, trace wood debris. 0.55 - 1.8' **FILL:** (FILL), mostly wood debris, little to some poorly graded sand very dark brown (10YR 2/2) subrounded, trace rounded gravel subrounded, faint sulfur-like odor. 1.8' End of Boring.	SP (FILL)			0 0 0 0						Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Page 1 of 1

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T02A5

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/11/2012	4/11/2012	vibratory

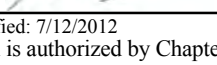
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	567.8 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994426.895 Feet ☐ S 450816.4129 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	36 27.6		0.5 1.0 1.5 2.0	0 - 1.4' **POORLY-GRADED SAND:** to **FILL:** SP, black (10YR 2/1), poorly graded, mostly subrounded sand [mostly fine, trace coarse], little silt, homogeneous, wet, some wood debris (0.25" to 3"), sulfur-like odor.	SP			0.1 0.1 0.1 0.1						Additional Sample collected in 0-0.5' sampling interval with a push core.
				1.4 - 2.3' **SILT:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, very soft, trace subrounded sand [some fine, some medium], homogeneous, moist, some wood debris (0.25"), faint sulfur-like odor.	ML			0.2 0.1						
				2.3' End of Boring.										

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T02A5-2ndAttempt

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/11/2012	4/11/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	567.8 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994426.895 Feet ☐ S 450816.4129 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	48 18		0.5 1.0 1.5	0 - 0.5' **WELL-GRADED SAND:** SW, very dark brown (10YR 2/2), 30% black (10YR 2/1) mottling, well graded, mostly subrounded sand [mostly fine, little medium, little coarse], trace silt, little wood debris (0.25" to 1"), faint sulfur-like odor.	SW			0							Additional Sample collected in 0-0.5' sampling interval with a push core.
				0.5 - 0.95' **SILT:** ML, very dark brown (10YR 2/2), 50% black (10YR 2/1) mottling, slow dilatency, low toughness, nonplastic, trace sand [mostly fine], homogeneous, little wood debris (0.25" to 1"), faint sulfur-like odor.	ML			0						
				0.95 - 1.3' **FILL:** to **SILT:** (FILL), Mostly Wood Debris (0.25" to 3"), Black (10YR 2/1), some silt, trace fine sand, homogeneous.	(FILL)			0						
				1.3 - 1.5' **WELL-GRADED SAND WITH GRAVEL:** (SW)g, very dark brown (10YR 2/2), well graded, mostly subrounded sand [mostly fine, little medium, little coarse], some subrounded gravel [mostly fine], trace silt, little wood debris.	(SW)g									
				1.5' End of Boring.										

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

Signature	Firm	Tel / Fax
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T02A6

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/11/2012	4/11/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	572.2 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location
☒ N ☒ E
4994388.455 Feet ☐ S 450819.1787 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	42 31.2		0.5 1.0 1.5 2.0 2.5	0 - 2.6' **SILT:** to **POORLY-GRADED SAND:** ML, very dark brown (10YR 2/2), 55% black (10YR 2/1) mottling, slow dilatency, low toughness, nonplastic, little sand [mostly fine], homogeneous, some wood debris (0.25" to 3"), mottling occurs at 0-0.8' mostly in the "A" interval, sulfur-like odor, 0.0-0.5' moist material, 0.5'-2.6' moist to dry material.	ML			0 0 0 0 0						Additional Sample collected in 0-0.5' sampling interval with a push core.
				2.6' End of Boring.										

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

Signature	Firm	
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T02A7

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/12/2012	4/12/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	570.5 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994399.432 Feet ☐ S 450829.6903 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	45 37.2		0.5 1.0 1.5 2.0 2.5 3.0	0 - 1.3' **POORLY-GRADED SAND:** SP, very dark brown (10YR 2/2), poorly graded, mostly rounded sand [mostly fine, few medium, trace coarse], little silt, homogeneous, wet, trace wood debris and organic silt, top 2" is wood chips with some organic silt. 1' -1.3' faint sulfur-like odor. 1.3 - 2.8' **SILT:** to **POORLY-GRADED SAND:** ML, very dark brown (10YR 2/2), slow dilatency, poorly graded, some sand [mostly fine, trace coarse], homogeneous, moist. 2' -2.8' some wood debris decreased silt content. 2.8 - 3.1' **POORLY-GRADED SAND:** SP, very dark grayish brown (10YR 3/2), poorly graded, mostly rounded sand [mostly fine, few medium], trace silt, homogeneous, moist. 3.1' End of Boring.	SP ML SP			0 0 0 0 0.5 0 0						Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature
Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
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Fax: 262.523.9001

Date Modified: 7/12/2012
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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T02A8-NATIVE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/17/2012	4/17/2012	rotary (mud)

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	572.1 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994395.59 Feet ☐ S 450843.2754 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
SS	24 2	WOR WOR WOR 1	0.5 1.0 1.5	0 - 8' **POORLY-GRADED SAND:** SP, very dark brown (10YR 2/2), poorly graded, mostly sand [mostly fine], little silt, homogeneous, wet, few wood debris, 2-4' some wood chips.				0.2	0					WOR = weight of rod
SS	24 7.2	1 2 1 1	2.0 2.5 3.0 3.5					0 0						
SS	24 2.5	1 2 2 1	4.0 4.5 5.0 5.5	4' - 6' mostly wood debris with trace red wood chips, wet.	SP			0 0						
SS	24 3.6	4 3 4 3	6.0 6.5 7.0 7.5					0 0						
SS	24 24	4 6 6 50	8.0 8.5 9.0	8 - 9.3' **LEAN CLAY:** CL, light brownish gray (10YR 6/2), 5% reddish brown (5YR 4/4) mottling, slow dilatency, low toughness, low to medium plasticity, trace sand [mostly fine], little silt, homogeneous, moist.	CL			0 0	0.25					
			9.5 10.0	9.3 - 10' **LEAN CLAY:** to **WELL-GRADED SAND:** CL, light brownish gray (10YR 6/2), slow dilatency,	CL									

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

Signature

Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 7/12/2012
Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number T02A8-NATIVE Use only as an attachment to Form 4400-122.

Sample										Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
				low toughness, low plasticity, some subrounded sand [mostly fine], little subrounded gravel [mostly fine], homogeneous, wet.				0						
				10' End of Boring. Refusal.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T02A-NATIVE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/19/2012	4/19/2012	rotary (mud)

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	572.0 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994387.288 Feet ☐ S 450813.0168 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
SS	24 2	WOR WOR WOR WOR	0.5 1.0 1.5	0 - 2' **SILT:** to **POORLY-GRADED SAND:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, soft, some sand [mostly fine], homogeneous, wet, few organic silt, trace wood debris, low recovery.	ML			0						WOR = weight of rod. Poor recovery throughout boring. WOH = weight of hammer
SS	24 2	WOH WOH 1 1	2.0 2.5 3.0 3.5	2 - 4' **FILL:** (FILL), mostly wood debris, some dark grayish brown sand, low recovery.	(FILL)			0 0						
SS	24 0	1 1/18	4.0 4.5 5.0 5.5	4 - 6' No recovery.				0 0						
SS	24 3	1/12 1/12	6.0 6.5 7.0 7.5	6 - 8' **FILL:** (FILL), mostly wood debris, some very dark brown sand, low recovery.	(FILL)			0 0						
SS	9.6 NM	3 50/3	8.0 8.5 9.0 9.5 10.0	8 - 8.4' **WELL-GRADED SAND WITH GRAVEL:** (SW)g, very dark grayish brown (10YR 3/2), rapid dilatency, well graded, mostly angular to subangular sand [little fine, mostly medium, little coarse], homogeneous, wet, trace wood debris. 8.4 - 8.8' **SILT:** ML, light brownish gray (10YR 6/2), slow dilatency, medium toughness, low plasticity, firm to hard, well graded, few sand [few coarse],	(SW)g ML			0 0	2.75					

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

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	262.522.1206 Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number T02A-NATIVE Use only as an attachment to Form 4400-122.

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
				few gravel [few fine], some clay, homogeneous, dry to moist.										
				8.8' few angular to subangular gravel [mostly fine], little clay, End of Boring-refusal at 8.8. Top of Bedrock.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T02B

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/4/2012	4/4/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	563.9 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994447.293 Feet ☐ S 450817.3972 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	12 6		0.5	0 - 0.5' **WELL-GRADED SAND:** SW, very dark grayish brown (10YR 3/2), well graded, mostly rounded sand [few fine, mostly medium, some coarse], few gravel [mostly fine], homogeneous, wet, trace wood debris, feldspar lithics. 0.5' End of Boring.	SW			0						Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature	Firm	
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T02C

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/4/2012	4/4/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	574.1 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994520.45 Feet ☐ S 450817.4614 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	15 12		0.5 1.0	0 - 1' **SILT:** ML, light brownish gray (10YR 6/2), slow dilatency, low toughness, nonplastic, trace gravel [mostly coarse], moist, 0-0.3 wet. 1' End of Boring.	ML			0						Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Page 1 of 1

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T03A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/5/2012	4/5/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	570.4 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994371.473 Feet ☐ S 450847.4661 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	56.4 48		0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0	0 - 2.9' **SILT:** ML, very dark brown (10YR 2/2), 40% black (10YR 2/1) mottling, slow dilatency, low toughness, nonplastic, homogeneous, moist to wet, few root debris. 1.5' -2' faint MGP-like odor, black 10YR 2/1 possibly staining. 2.9 - 4' **FILL:** ML, very dark brown (10YR 2/2), 40% black (10YR 2/1) mottling, slow dilatency, low toughness, nonplastic, few sand [mostly fine], homogeneous, moist to wet, some wood debris (40%), MGP-like odor. 4' End of Boring.	ML ML			0 0 0 0 6.3 0 0.9 1.2 1.8						Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature	Firm	Tel: 262.522.1206
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T03A1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/6/2012	4/6/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	572.8 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994388.516 Feet ☐ S 450845.5138 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	30 24		0.5 1.0 1.5 2.0	0 - 0.8' **POORLY-GRADED SAND:** to **SILT:** SP, very dark brown (10YR 2/2), rapid dilatency, low toughness, nonplastic, soft, poorly graded, mostly sand [mostly fine], some silt, homogeneous, wet, some very fine sand, trace wood debris.	SP			0.2 0.2						Additional Sample collected in 0-0.5' sampling interval with a push core.
				0.8 - 2' **SILT:** ML, very dark brown (10YR 2/2), 15% black (10YR 2/1) mottling, slow dilatency, low toughness, nonplastic, soft, trace sand [mostly fine], homogeneous, wet, trace very fine sand, few root debris, some organic silt, faint MGP-like odor, increasing sand and wood debris with depth, (2" by 1" piece of wood at bottom).	ML			0.6 0.2						
				2' End of Boring.										

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

Signature	Firm	Tel / Fax
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T03A2

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/6/2012	4/6/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	574.5 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994389.265 Feet ☐ S 450863.2487 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	9 6		0.5	0 - 0.5' **POORLY-GRADED SAND:** SP, very dark brown (10YR 2/2), poorly graded, little silt, homogeneous, wet, trace root fibers, coarse gravel and wood chips at the top of core sample. 0.5' End of Boring.	SP			0						Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature	Firm	
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Page 1 of 1

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T03A3

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/11/2012	4/11/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	571.1 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994371.863 Feet ☐ S 450862.3534 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	63 58.8		0.5	0 - 3.5' **SILT:** ML, very dark brown (10YR 2/2), rapid dilatency, low toughness, nonplastic, very soft, trace subrounded sand [mostly fine], homogeneous, wet, little wood debris (0.25" to 0.75"), sulfur-like odor.				0.1						Additional Sample collected in 0-0.5' sampling interval with a push core.
			1.0					0.1						
			1.5					0.1						
			2.0	1.7' black (10YR 2/1).	ML			0.1						
			2.5	2.5' -3.5' faint MGP-like odor.				0.1						
			3.0					0.1						
			3.5					0.2						
			4.0	3.5 - 4.9' **SILT:** ML, black (10YR 2/1), rapid dilatency, low toughness, nonplastic, very soft, trace subrounded sand [mostly fine], homogeneous, moist to wet, little wood debris, MGP-like odor, black staining present throughout.	ML									
			4.5	4.5' -4.9' faint petroleum-like odor.				0.7						
				4.9' End of Boring.				0.2						

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

Signature  Firm Natural Resource Technology, Inc.
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Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T03B

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/5/2012	4/5/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	571.0 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994400.211 Feet ☐ S 450847.1219 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	42 24		0.5 1.0 1.5 2.0	0 - 0.3' **FILL:** (FILL), mostly wood debris (2"x1"), very dark brown (10YR 2/2), little fine sand, few silt, homogeneous, wet. 0.3 - 1' **POORLY-GRADED SAND:** SP, very dark gray (10YR 3/1), poorly graded, homogeneous, wet. 0.8' trace wood debris. 1 - 1.5' **FILL:** (FILL), mostly Wood debris, (0.125" to 0.25") pieces of wood, yellowish brown (10YR 5/6), 50% very dark brown (10YR 2/2) mottling, trace fine sand, homogeneous, wet. 1.5 - 2' **POORLY-GRADED SAND:** to **FILL:** SP, very dark gray (10YR3/1), poorly graded, homogeneous, some wood debris (0.125" to 0.25") yellowish brown (10YR 5/6), increasing wood with depth and larger wood pieces with depth. 2' End of Boring.	(FILL) SP (FILL) SP			0 0 0 0						Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T03B1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/5/2012	4/5/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	571.5 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N 4994397.93 Feet ☐ S ☒ E 450847.252 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	36 19.2		0.5 1.0 1.5 2.0 2.5 3.0	0 - 1.8' **POORLY-GRADED SAND:** to **FILL:** SP, some wood debris. 1.8' End of Boring.	SP			0						Push Core Attempted (0-0.5') with No Recovery, No Analytical Sample Collected

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
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Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T03B2

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/10/2012	4/10/2012	vibratory

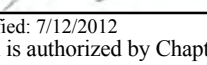
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	567.7 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location
4994415.787 Feet ☐ S ☒ N 450846.5891 Feet ☐ W ☒ E

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	30 19.2		0.5 1.0 1.5	0 - 0.8' **POORLY-GRADED SAND:** SP, very dark gray (10YR 3/1), mostly sand [mostly fine], homogeneous, moist, insect larve at top 2" of interval, some wood debris (2"), few very fine sand.	SP			0 0						Additional Sample collected in 0-0.5' sampling interval with a push core.
				0.8 - 1.8' **FILL, FILL:** (FILL), Mostly wood debris (3" x 2"), very dark gray (10YR 3/1), few medium sand, few very fine sand.	(FILL)			0 0						
				1.8' End of Boring.										

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T03B3

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/12/2012	4/12/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	567.7 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994406.309 Feet ☐ S 450863.9323 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	42 21.6		0.5 1.0 1.5	0 - 0.7' **SILT:** to **POORLY-GRADED SAND:** ML, very dark brown (10YR 2/2), poorly graded, some sand [mostly fine], homogeneous, wet, little wood debris. 0.7 - 1.8' **POORLY-GRADED SAND:** SP, very dark brown (10YR 2/2), poorly graded, few silt, homogeneous, wet, little wood debris, strong sulfur-like odor, wood debris increasing with depth. 1.8' End of Boring.	ML SP									Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature
Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012
Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T03C

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/5/2012	4/5/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	565.5 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994429.096 Feet ☐ S 450847.9021 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	45 6		0.5	0 - 0.5' **WELL-GRADED SAND WITH GRAVEL:** to **FILL:** (SW)g, very dark grayish brown (10YR 3/2), mostly subrounded to rounded sand [little fine, mostly medium], few subrounded to rounded gravel [mostly fine, trace coarse], homogeneous, moist, some wood debris, faint sulfur-like odor. 0.5' End of Boring.	(SW)g			0							Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature	Firm	
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T03D

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/10/2012	4/10/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	567.2 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N 4994459.9 Feet ☐ S ☒ E 450847.747 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	30 6		0.5	0 - 0.5' **FILL:** (FILL), mostly wood debris, black (10YR 2/1), little angular to subangular little fine gravel and few coarse gravel, homogeneous, moist, trace dark brown (10YR 3/3) wood chips. 0.5' End of Boring.	(FILL)			0						Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature
Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012
Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T03E

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/4/2012	4/4/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	571.2 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994490.181 Feet ☐ S 450847.7889 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	24 8.4		0.5	0 - 0.5' **FILL, FILL:** to **SILT:** (FILL), mostly wood debris, top 2" silt (very dark grayish brown 10YR3/2).	(FILL)			0 0 0						Additional Sample collected in 0-0.5' sampling interval with a push core.
				0.5 - 0.7' **WELL-GRADED GRAVEL:** GW, little sand [mostly coarse], homogeneous, wet, few wood debris.	GW									
				0.7' End of Boring.										

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

Signature
Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012
Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T03ER

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/19/2012	4/19/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	571.5 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994491.032 Feet ☐ S 450845.3459 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	18 9.6		0.5	0 - 0.8' **WELL-GRADED SAND:** SW, very dark brown (10YR 2/2), 30% black (10YR 2/1) mottling, well graded, mostly subrounded sand [mostly fine, little medium, little coarse], homogeneous, moist, trace root and wood debris and wood chips, few organics. 0.8' End of Boring.	SW										Additional Sample collected in 0-0.5' sampling interval with a push core.

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012
Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T03HH

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/3/2012	4/3/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	568.3 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994362.252 Feet ☐ S 450856.6814 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
CS	75.6 73.2		0.5	0 - 1.4' **SILT:** ML, slow dilatency, low toughness, nonplastic, very soft, little clay, homogeneous, wet, few organic silt, faint sulfur-like odor.	ML			0						Additional Sample collected in 0-0.5' sampling interval with a push core.
			1.0					0						
			1.5	1.4 - 2.7' **SILT:** to **LEAN CLAY:** ML, slow dilatency, low toughness, nonplastic, very soft, some clay, homogeneous, wet, few organic silt, faint sulfur-like odor.	ML			0						
			2.0					0						
			2.5					0						Difficulty detecting odors in upper intervals due to very strong odors from bottom intervals.
			3.0	2.7 - 3.7' **SILT:** to **LEAN CLAY:** ML, slow dilatency, low toughness, nonplastic, soft, some clay, lensed, moist to wet, trace organics and woody fibers, faint sulfur-like odor, lenses of black (10YR 2/1).	ML			0.3						
			3.5					0.3						
			4.0	3.7 - 4.6' **SILT:** to **LEAN CLAY:** ML, slow dilatency, low toughness, nonplastic, soft, some clay, lensed, moist to wet, trace organics and woody fibers, strong MGP-like odor, lenses of black (10YR 2/1), little malleable viscous emulsified NAPL droplets (0.1" to 0.2" diameter).	ML			8						
			4.5					38.1						
			5.0					11.1						
			5.5	4.6 - 6.1' **SILT:** to **FILL:** ML, slow dilatency, low toughness, nonplastic, soft, little clay, homogeneous, moist, some organics and some woody debris, strong MGP-like odor, malleable viscous NAPL wetted.	ML			20.5						
			6.0					5.6						Viscous emulsified NAPL present on outside of vibrocore tube (5.5-6.5').
				6.1' End of Boring.										

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

Signature	Firm	Tel: 262.522.1206
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T03HH-NATIVE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/19/2012	4/19/2012	rotary (mud)

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	570.0 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994361.585 Feet ☐ S 450855.9225 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 SS	24 0	WOH WOH WOH WOH	0.5 1.0 1.5 2.0	0 - 2' No Recovery.										2" Split Spoon. WOH = weight of hammer
2 SS	24 18	WOH WOH WOH WOH	2.5 3.0 3.5 4.0	2 - 8.5' **SILT:** to **ORGANIC SILT:** ML, very dark brown (10YR 2/2), 50% black (10YR 2/1) mottling, wet, trace root debris, some organic silt, faint petroleum-like odor.				0.3						2" Split Spoon.
3 SS	6 3	WOH	4.5	3.8' - 4' increased root debris. 4' - 5.5' little viscous emulsified NAPL (0.4" diameter droplets of weathered coal tar), strong MGP-like odor.				1.8						2" Split Spoon.
4 SS	24 12	2 2 2 4	5.0 5.5 6.0		ML			1.5						3" Split Spoon.
				5.5' - 6.5' black (10YR 2/1), moist, some viscous emulsified NAPL (0.6" to 1.2" diameter droplets of weathered coal tar), strong MGP-like odor.				3.3						
5 SS	24 12	3 3 3 5	6.5 7.0 7.5 8.0 8.5	6.5' - 8.5' black (10YR 2/1), moist, mostly viscous NAPL (Oil wetted), high plasticity (resulting form NAPL content), strong MGP-like odor, some silt, little organic silt, trace wood debris. 7.5' - 8.5' some wood debris (dark yellowish brown (10YR 4/4), little organic silt.				9 4.9						3" Split Spoon, viscous NAPL present on outside of sampler.
				8.5' End of Boring. Refusal on top of bedrock. Freshly broken fine gravel sized fragments adhered to drill bit.										Attempted 3" split spoon sampler.

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

Signature	Firm	Tel:
	Natural Resource Technology 23713 W. Paul Road Pewaukee, WI 53072	262.523.9000 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/4/2012	4/4/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	568.3 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994356.871 Feet ☐ S 450875.0618 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	24 20.4		0.5 1.0 1.5	0 - 1.7' **SILT:** ML, very dark grayish brown (10YR 3/2), slow dilatency, low toughness, nonplastic, very soft, homogeneous, wet, black (10YR 2/1) NAPL staining, trace sheen, trace hair, little organic material, faint MGP-like odor (0-0.4') and increases to strong (0.4-1.7').	ML			0 5.4 10.7 14.7						
				1.7' End of Boring.				6.1						

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04A1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/11/2012	4/11/2012	vibratory

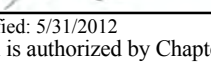
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	576.3 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994378.657 Feet ☐ S 450892.6558 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	21.6 13.2		0.5	0 - 0.25' **FILL:** (FILL), black (10YR 2/1), homogeneous, wet, mostly wood debris,black (10YR 2/1),wet, sulfur-like odor.	(FILL)			0.1						
			1.0	0.25 - 1.1' **POORLY-GRADED SAND:** SP, very dark grayish brown (10YR 3/2), mostly subrounded sand [mostly fine, few medium, few coarse], trace silt, homogeneous, moist.	SP			0.1						
				1.1' End of Boring.				0.1						

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04B

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/5/2012	4/5/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	573.2 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994388.944 Feet ☐ S 450877.6281 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	54 37.2		0.5	0 - 0.5' **FILL:** to **SILT:** (FILL), mostly wood debris, very dark brown (10YR 2/2), some silt, little fine sand, homogeneous, wet.	(FILL)			0						
			1.0	0.5 - 2.6' **POORLY-GRADED SAND:** to **SILT:** SP, very dark brown (10YR 2/2), mostly sand [mostly fine, little medium], homogeneous, wet, little wood debris.	SP			0						
			1.5	1.7' wood debris content increasing with depth.				0						
			2.0	2' nodule of silt (3" diameter, same description as silt found at 2.6-3.1').				0						
			2.5					0						
			3.0	2.6 - 3.1' **SILT:** ML, light brownish gray (10YR 6/2), slow dilatency, low toughness, nonplastic, soft, homogeneous, dry to moist.	ML			0						
				3.1' End of Boring.										

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

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04B1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/12/2012	4/12/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	567.1 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994405.66 Feet ☐ S 450876.2003 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	33 20.4		0.5 1.0 1.5	0 - 1.2' **POORLY-GRADED SAND:** SP, very dark brown (10YR 2/2), mostly sand [mostly fine, few medium], little silt, wet, little very fine sand, trace wood debris, moisture content decreases with depth, top 2.5" of interval has some wood debris, silt, and organic silt. 1' wood chips (4" length by 4" width), strong sulfur-like odor. 1.2 - 1.7' **FILL:** to **POORLY-GRADED SAND:** (FILL), mostly wood debris, some fine sand, little very fine sand, little silt, few medium sand, moist, strong sulfur-like odor. 1.7' End of Boring.	SP (FILL)			0 0 0 0						

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

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04B-NATIVE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/17/2012	4/17/2012	rotary (mud)

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	575.0 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994386.894 Feet ☐ S 450878.7069 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	24 18		0.5	0 - 1.2' **SILT:** to **FILL:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, soft, poorly graded, few rounded sand [mostly fine], homogeneous, wet, some wood debris, little organic silt.	ML			0.2						0-3 feet sampled with Osterberg Sampler
			1.0					0						
			1.5					0						
			2.0	1.2 - 2.2' **WELL-GRADED SAND:** SW, dark grayish brown (10YR 4/2), mostly subrounded to rounded sand [little fine, mostly medium, trace coarse], trace subrounded to rounded gravel [mostly fine], trace silt, homogeneous, wet.	SW			0						
2 CS	12 12		2.5	2.2 - 2.5' **WELL-GRADED SAND:** SW, black (10YR 2/1), mostly subrounded sand [trace fine, mostly medium, little coarse], little silt, wet, silts are black.	SW			0	1.75					
3 SS	12 8.4	10 14	3.0					0						3 feet to EOB sampled with 2" split spoon
			3.5	2.5 - 8' **SILT:** ML, light brownish gray (10YR 6/2), slow dilatency, low toughness, nonplastic, poorly graded, little sand [mostly fine], homogeneous, dry, soft to firm, increasing moisture content with depth.										
4 SS	24 19.2	16 12 18 17	4.0					0	1					
			4.5											
			5.0		ML			0						
			5.5											
5 SS	24 13.2	10 18 21 11	6.0	6' - 8' increased fine sand content, low plasticity, moist to wet.				0						
			6.5											
			7.0					0						
			7.5											
6 SS	24 24	3 3 3 4	8.0	8 - 10' **SILT:** ML, light brownish gray (10YR 6/2), slow dilatency, low toughness, low plasticity, trace sand [mostly fine], little clay, moist, little clay content increasing with depth, soft to firm.	ML			0						
			8.5											
			9.0					0	0.25					
			9.5	9.3' - 10' 5% reddish brown (5YR 4/4) mottling.										
			10.0											

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

Signature	Firm	Tel: 262.522.1206
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number T04B-NATIVE Use only as an attachment to Form 4400-122.

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 (10.6 ev)	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
7 SS	24 21.6	3 3 4 4	10.5	10 - 11.5' **LEAN CLAY:** CL, light brownish gray (10YR 6/2), 5% reddish brown (5YR 4/4) mottling, slow dilatency, low toughness, medium plasticity, firm, trace subrounded gravel [mostly fine], little silt, homogeneous, moist.	CL			0	0.75					
			11.0					0	0.75					
			11.5	11.5 - 11.8' **LEAN CLAY:** to **POORLY-GRADED SAND:** CL, light brownish gray (10YR 6/2), slow dilatency, low toughness, low plasticity, some sand [mostly fine], few subrounded gravel [mostly fine], little silt, homogeneous, moist, soft to firm, glacial till.	CL									
8 SS	3.6 3.6	50/3.6	12.0		SW			0						
				11.8 - 12.3' **WELL-GRADED SAND:** to **LEAN CLAY:** SW, light brownish gray (10YR 6/2), soft, mostly subangular sand [mostly fine, few medium, few coarse], some clay, homogeneous, moist to wet, glacial till.										
				12.3' End of Boring. Refusal.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04C

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/5/2012	4/5/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	566.3 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994418.256 Feet ☐ S 450877.9924 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	21 9.6		0.5	0 - 0.8' **POORLY-GRADED SAND:** SP, dark grayish brown (10YR 4/2), mostly subrounded to rounded sand [mostly fine, some medium, trace coarse], homogeneous, moist. 0.5' very dark grayish brown (10YR 3/2), increasing coarse sand, fine gravel, and wood debris with depth. 0.8' End of Boring.	SP			0 0 0						

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

Signature	Firm	
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04D

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/10/2012	4/10/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	568.0 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994450.447 Feet ☐ S 450878.9956 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	30 20.4		0.5 1.0 1.5	0 - 0.3' **ORGANIC SILT:** OL, very dark grayish brown (10YR 3/2), rapid dilatency, low toughness, nonplastic, poorly graded, little sand [mostly fine], trace subrounded gravel [mostly coarse], homogeneous, wet, some wood debris, sulfur-like odor.	OL										
				0.3 - 1.7' **ORGANIC SILT:** to **FILL:** OL, very dark grayish brown (10YR 3/2), slow dilatency, low toughness, nonplastic, poorly graded, trace sand [mostly fine], moist to wet, some wood debris, top 2" of interval is mostly poorly graded sand, little organic silt, and trace wood debris, increasing sand content with depth. 1.2' - 1.7' mostly wood chips (color of wood chips is stained dusky red (10YR 3/3) from 1.2' to 1.4', possible landscaping wood chips, faint cedar odor).	OL										
				1.7' End of Boring.										

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04E

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/10/2012	4/10/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	571.9 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994479.91 Feet ☐ S 450877.891 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	6 6		0.5	0 - 0.5' **WELL-GRADED GRAVEL:** GW, black (10YR 2/1), some subrounded sand [trace fine, few medium, little coarse], mostly subrounded to rounded gravel [mostly fine, little coarse], homogeneous, moist.	GW			0						
				0.5' End of Boring.										

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04HH

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/4/2012	4/4/2012	vibratory

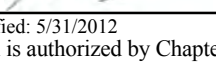
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	575.7 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994329.448 Feet ☐ S 450879.9288 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	81 75.6		0.5	0 - 1.4' **FILL:** to **SILT:** (FILL), mostly wood debris, black (10YR 2/1) some silt, slow dilatancy, low toughness, nonplastic, soft, poorly graded, some fine sand, homogeneous, trace sheen, wet, stained black, MGP-like odor, increasing with sand content with depth, trace root debris.	(FILL)			4.1						
			1.0					53.7						
			1.5					30						
				0.5' - 1.4' little viscous emulsified NAPL, weathered coal tar droplets (0.2" to 0.6" diameter).	ML			54.2						
			2.0	1.4 - 2.4' **SILT:** to **ORGANIC SILT:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, poorly graded, trace sand [mostly fine], wet, 80% stained black (10YR 2/1), some organic silt, little roots and wood debris, strong MGP-like odor, trace viscous emulsified NAPL, weathered coal tar droplets (0.2" diameter).				7.2						
			2.5					2.3						
			3.0					0.4						
			3.5					0.2						
			4.0	2.4 - 6' **POORLY-GRADED SAND:** SP, very dark grayish brown (10YR 3/2), 60% black (10YR 2/1) mottling, soft, mostly sand [mostly fine], little silt, lensed, little roots and woody debris, trace organic silt.	SP			0.2						
			4.5	2.6' lense of silt and woody debris (2" thick).				0.3						
			5.0	3.2' interval grading into silt.				0.3						
			5.5	3.9' - 6' mostly silt, little sand.				0.6						
			6.0	6 - 6.3' **SILT:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, very soft, poorly graded, trace sand [mostly fine], homogeneous, wet, little root debris and wood chips, strong MGP-like odor, some viscous emulsified NAPL, weathered coal tar droplets (0.4" diameter).	ML			9.1						
				6.3' End of Boring.				7.4						

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04N

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/4/2012	4/4/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	574.8 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994331.076 Feet ☐ S 450883.6933 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	63 62.4		0.5	0 - 0.3' **POORLY-GRADED SAND:** to **FILL:** SP, mostly sand [mostly fine], trace silt, homogeneous, wet, some wood debris (wood chip are less than 0.5" in length), trace organics.	SP									
			1.0		SP									
			1.5	0.3 - 1.2' **POORLY-GRADED SAND:** SP, very dark grayish brown (10YR 3/2), 20% black (10YR 2/1) mottling, mostly rounded sand [mostly fine, few medium, trace coarse], trace rounded gravel [mostly fine], homogeneous, wet, trace organics, trace wood debris, faint MGP-like odor.				19.1						
			2.0					21.5						
			2.5		SP			38.3						
			3.0	1.2 - 3.4' **POORLY-GRADED SAND:** to **SILT:** SP, very dark grayish brown (10YR 3/2), mostly sand [mostly fine, trace medium], some silt, homogeneous, little wood debris, strong MGP-like odor, stained black (10YR 2/1), possibly sheen.				45.3						
			3.5					48.1						
			4.0	3.4 - 4.4' **POORLY-GRADED SAND:** SP, dark gray (10YR 4/1), mostly gravel [mostly fine], trace silt, homogeneous, trace twigs, strong MGP-like odor.	SP			29.1						
			4.5					19.8						
			5.0	4.4 - 5.2' **SILT:** ML, dark brown (10YR 3/3), slow dilatency, low toughness, nonplastic, very soft, poorly graded, some sand [mostly fine], homogeneous, moist, color grades to very dark gray (10YR 3/1) with depth, little organics, little roots, odor stronger MGP-like at the top of the interval and grades to faint MGP-like with depth.	ML			2.2						
								0						
				5.2' End of Boring.										

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

Signature	Firm	Tel: 262.522.1206
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04N-NATIVE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/19/2012	4/19/2012	rotary (mud)

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	575.4 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994344.74 Feet ☐ S 450881.3875 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 SS	24 0	WOH WOH WOH WOH	0.5 1.0 1.5 2.0	0 - 2' No Recovery.										WOH = weight of rod. WOH = weight of hammer
2 SS	24 3	WOH WOH WOH WOH	2.5 3.0 3.5	2 - 4.5' **SILT:** to **POORLY-GRADED SAND:** ML, black (10YR 2/1), slow dilatency, low toughness, low plasticity, soft, poorly graded, little sand [mostly fine], homogeneous, wet, some organic silt, trace wood debris, some viscous emulsified NAPL (weathered coal tar droplets (0.1" to 0.2" diameter), strong MGP-like odor, stained black.	ML			6.2 36.2						weathered NAPL present on outside of split spoon sampler, trace sheen droplets (5mm in diameter) along inside of sampler.
3 SS	24 7	WOH WOH 1 1	4.0 4.5 5.0 5.5	4.5 - 8' **SILT:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, soft, poorly graded, some sand [mostly fine], homogeneous, moist, little wood debris, trace organic silt, strong MGP-like odor.				3.2 0.7						
4 SS	24 3	WOH WOH WOH WOH	6.0 6.5 7.0 7.5	6' - 8' trace sheen droplets (0.15" diameter).	ML			1.1 0.7						trace sheen droplets along inside of split spoon sampler
5 SS	24 0	WOH 1/12 1	8.0 8.5 9.0 9.5 10.0	8 - 10' No Recovery. Slough had a PID reading of 2.3, trace sheen droplets along inside of split spoon sampler (0.2" diameter).										

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
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Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number T04N-NATIVE Use only as an attachment to Form 4400-122. Page 2 of 2

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
6 SS	18 9	42 12 8	10.5	10 - 10.3' **WELL-GRADED SAND:** SW, light brownish gray (10YR 6/2), mostly subangular sand [mostly fine, little medium, few coarse].	SW			0						
					ML									
			11.0	10.3 - 10.6' **SILT:** to **LEAN CLAY:** ML, light brownish gray (10YR 6/2), slow dilatency, medium toughness, nonplastic, firm, well graded, few subangular sand [mostly fine], little subangular gravel [some fine, some medium, some coarse], some clay, homogeneous, moist.	BDX (LS)			0						
			11.5	10.6 - 11.5' **LIMESTONE:** BDX (LS), fine to coarse gravel sized angular limestone fragments, freshly broken, no visible or olfactory observations of impacts.				0						
				11.5' End of Boring. Refusal in bedrock..										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04N-NATIVE-1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/19/2012	4/19/2012	rotary (mud)

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	575.4 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994345.161 Feet ☐ S 450881.2642 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			0.5	0 - 10' Blind Drilled. See Boring Log T04N-NATIVE.										
			1.0											
			1.5											
			2.0											
			2.5											
			3.0											
			3.5											
			4.0											
			4.5											
			5.0											
			5.5											
			6.0											
			6.5											
			7.0											
			7.5											
			8.0											
			8.5											
			9.0											
			9.5											
			10.0											

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
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Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number T04N-NATIVE-1 Use only as an attachment to Form 4400-122. Page 2 of 2

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 SS	14.4 14.4	3 2 50/3	10.5 11.0	10 - 10.2' **SILT:** ML, black (10YR 2/1), slow dilatency, low toughness, nonplastic, soft, poorly graded, little sand [mostly fine], homogeneous, wet, stained black, some organic silt, few wood debris, strong MGP-like odor, trace sheen droplets (0.2" diameter).	ML			0.8						3" split spoon
				10.2 - 10.4' **WELL-GRADED SAND:** SW, very dark grayish brown (10YR 3/2), mostly sand [mostly fine, little medium, few coarse], homogeneous, wet, few root and wood debris, strong MGP-like odor.	SW									Material from 10 - 10.2 feet was smeared on the outside of lower intervals making odors difficult to segregate.
				10.4 - 11.2' **SILT:** ML, light brownish gray (10YR 6/2), slow dilatency, low to medium toughness, low plasticity, well graded, trace sand [mostly fine], little subangular gravel [some fine, some medium, some coarse], little clay, lensed, moist, odor at top of interval, faint MGP-like odor, glacial till.	ML									
				11.2' End of Boring. Refusal on top of bedrock.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04NR

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/19/2012	4/19/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	575.4 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994331.52 Feet ☐ S 450883.8483 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	34.4 12		0.5 1.0	0 - 0.2' **SILT:** to **ORGANIC SILT:** ML, black (10YR 2/1), slow dilatency, low toughness, nonplastic, soft, homogeneous, wet, some organic silt, few wood debris, faint sulfur-like odor.	ML									
				0.2 - 0.5' **POORLY-GRADED SAND:** to **SILT:** SP, very dark brown (10YR 2/2), 20% black (10YR 2/1) mottling, mostly sand [mostly fine, few medium, trace coarse], some silt, homogeneous, moist to wet, little organic silt, few wood debris, faint MGP-like odor.	SP									
				0.5 - 1' **POORLY-GRADED SAND:** SP, black (10YR 2/1), mostly sand [mostly fine], few silt, homogeneous, moist, little wood debris, strong MGP-like odor.	SP									
				1' End of Boring.										

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

Signature	Firm	
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04SW3

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/3/2012	4/3/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	574.6 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994342.806 Feet ☐ S 450877.8554 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	68.4 68.4		0.5	0 - 2.3' **SILT:** ML, very dark grayish brown (10YR 3/2), slow dilatency, low toughness, nonplastic, very soft, little sand [mostly fine], homogeneous, trace sheen, wet, trace roots, trace plant debris, trace woody debris, some organics, 95% stained black (10YR 2/1), top 4.8" faint MGP-like odor. 0.4' - 2.3' strong MGP-like odor. 0.5' grades to some sand with depth.	ML			2.3						
			1.0					4.5						
			1.5					8.5						
			2.0											
			2.5	2.3 - 3.4' **POORLY-GRADED SAND:** to **SILT:** SP, very dark grayish brown (10YR 3/2), mostly sand [mostly fine], some silt, homogeneous, wet, trace twigs, trace wood debris, 60% stained black (10YR 2/1), strong MGP-like odor.	SP			10						
			3.0					1.6						
			3.5					3.8						
			4.0	3.4 - 5.7' **POORLY-GRADED SAND:** SP, very dark grayish brown (10YR 3/2), mostly sand [mostly fine], homogeneous, moist, 30% very dark brown (10YR 2/2) and black (10YR 2/1) mottling, trace very fine wood chips.	SP			0						
			4.5					0						
			5.0					0						
			5.5					0						
				5.7' End of Boring.				0						

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04SW3R

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/3/2012	4/3/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	574.8 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994343.207 Feet ☐ S 450878.0266 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	32.4 16.8		0.5 1.0	0 - 0.2' **SILT:** to **ORGANIC SILT:** ML, black (10YR 2/1), 30% very dark brown (10YR 2/2) mottling, slow dilatency, low toughness, nonplastic, soft, few sand [mostly fine], homogeneous, wet, some organic silt, little wood debris, faint MGP-like odor.	ML										3" Ace Hardware Socket (3/4") for Ratcheting Wrench in Top of Core Tube
				0.2' - 0.8' decreased wood content, moist, strong MGP-like odor. 0.8 - 1.4' **POORLY-GRADED SAND:** SP, very dark grayish brown (10YR 3/2), 20% black (10YR 2/1) mottling, mostly sand [mostly fine], some silt, moist, trace wood chips, few root, few wood debris, strong MGP-like odor.	SP									
				1.4' End of Boring.										

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04SW4

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/4/2012	4/4/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	575.7 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994372.411 Feet ☐ S 450877.0052 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	36 30		0.5	0 - 0.7' **FILL:** to **POORLY-GRADED SAND:** (FILL), mostly wood debris, wood is 3" length by 1" width on average, very dark brown (10YR 2/2), some fine sand, trace medium sand, little silt, trace organics, homogeneous, wet.	(FILL)			0						
			1.0					0						
			1.5	0.7 - 1.8' **POORLY-GRADED SAND:** to **FILL:** SP, very dark grayish brown (10YR 3/2), mostly rounded sand [some fine, some medium], homogeneous, moist to wet, some wood debris, trace organics, wood is 3" length by 1" width on average.	SP			0						
			2.0		(FILL)			0						
			2.5	1.8 - 2.5' **FILL:** to **POORLY-GRADED SAND:** (FILL), mostly wood debris, wood is 3" length by 1" width on average, very dark brown (10YR 2/2) mostly fine sand, few medium sand, homogeneous, wet.										
				2.5' End of Boring.										

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

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T05A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/5/2012	4/5/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	575.9 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994376.26 Feet ☐ S 450907.7689 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	13.2 9.6		0.5	0 - 0.8' **POORLY-GRADED SAND:** SP, very dark grayish brown (10YR 3/2), mostly rounded sand [some fine, mostly medium, trace coarse], homogeneous, wet, wood piece at bottom of interval with 4" length and 1" width. 0.8' End of Boring.	SP			1220						High PID reading. No Visual or Olfactory Evidence. A Full Recalibration of the PID was Completed. Material was checked with the Same Result.

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

Signature
Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
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Date Modified: 5/31/2012
Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T05A1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/9/2012	4/9/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	565.4 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994388.062 Feet ☐ S 450907.3843 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	30 25.2		0.5	0 - 0.5' **SILT:** to **POORLY-GRADED SAND:** ML, black (10YR 2/1), slow dilatency, low toughness, nonplastic, soft, some sand [mostly fine], homogeneous, wet, trace wood debris, few organic silt.	ML			0						
			1.0					0						
			1.5	0.5 - 2.1' **SILT:** ML, grayish brown (10YR 5/2), slow dilatency, low toughness, low plasticity, soft, little clay, homogeneous, moist to wet.	ML			0	0					
			2.0					0						
				2.1' End of Boring.				0	0.25					

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

Signature	Firm	Tel: 262.522.1206
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T05A2

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/9/2012	4/9/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	574.9 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994374.6 Feet ☐ S 450924.0969 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	24 16.8		0.5 1.0	0 - 1.4' **POORLY-GRADED SAND:** SP, black (10YR 2/1), mostly subrounded to rounded sand [mostly fine, little medium], little silt, top 2.5" of interval has trace wood debris and few coarse gravel, silt content decreases with depth. 0.5' brown (10YR 4/3) with 25% very dark gray (10YR 3/1) mottling. 1.4' End of Boring.	SP			0 0 0 0						

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

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T05A3

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/13/2012	4/13/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	564.5 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994398.326 Feet ☐ S 450905.4797 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	6 6		0.5	0 - 0.5' **SILT:** to **FILL:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, very soft, poorly graded, little subrounded sand [mostly fine], trace subrounded gravel [mostly fine], homogeneous, wet, some wood debris (0.25" to 2" in length), gravel is 0.5" to 1" diameter, mussel shells.	ML			0.3						
				0.5' End of Boring.										

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T05C1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/9/2012	4/9/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	567.3 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994431.87 Feet ☐ S 450909.275 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	18 3.6			0 - 0.3' **WELL-GRADED GRAVEL:** to **FILL:** GW, very dark brown (10YR 2/2), mostly subangular to subrounded gravel [mostly fine, little coarse], homogeneous, moist, some wood debris, feldspar lithics. 0.3' End of Boring.	GW			0						

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

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T05D

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/10/2012	4/10/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	567.7 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994463.948 Feet ☐ S 450908.4009 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	42 30		0.5 1.0 1.5 2.0 2.5	0 - 2.5' **SILT:** to **FILL:** ML, rapid dilatency, low toughness, nonplastic, poorly graded, trace sand [mostly fine], trace gravel [mostly coarse], wet, some fine wood debris, few wood chips (1" in length by 1" in width). 1' wood debris content decreases from 45% to 25%, decreasing wood debris content with depth, increasing silt content with depth. 1.7' color is very dark grayish brown (10YR 3/2) and low plasticity.	ML			0 0 0 0 0						
				2.5' End of Boring.				0						

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

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T05HH1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/4/2012	4/4/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	568.2 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994353.578 Feet ☐ S 450906.2808 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	21 15.6		0.5 1.0	0 - 1.3' **SILT:** to **WELL-GRADED GRAVEL:** ML, black (10YR 2/1), very soft, well graded, little sand [mostly fine, little coarse], some subangular to subrounded gravel [mostly fine], homogeneous, wet, few wood debris, few root fiber, strong MGP-like odor, gravel is stained. 1.3' End of Boring.	ML			0.3 2.9 2.3 5.5						

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

Signature	Firm	
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T05HH3

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/9/2012	4/9/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	569.1 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994354.611 Feet ☐ S 450921.9167 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	12 6		0.5	0 - 0.5' **SILT:** to **POORLY-GRADED SAND:** ML, black (10YR 2/1), slow dilatency, low toughness, nonplastic, very soft, some sand [mostly fine, trace coarse], wet, few stained wood debris, trace root debris, strong MGP-like odor. 0.5' End of Boring.	ML			10.9						No Recovery in Vibrocore Tube. Viscous Emulsified NAPL (weathered coal tar) was Present on Outside of Core Tube.

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

Signature	Firm	
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T05N

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/3/2012	4/3/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	568.8 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994360.094 Feet ☐ S 450908.154 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	42 30		0.5 1.0 1.5 2.0 2.5	0 - 0.5' **SILT:** ML, very dark brown (10YR 2/2), no dilatency, low toughness, nonplastic, very soft, little sand [mostly fine], homogeneous, wet, trace fine wood fiber, few organics.	ML			0						4/4/2012: There was visual evidence of NAPL in Plastic Container Containing Extra Sample Material.
				0.5 - 1.2' **SILT:** ML, black (10YR 2/1), no dilatency, low toughness, nonplastic, very soft, few sand [mostly fine, some medium], homogeneous, wet, trace fine wood fiber, little organics, stained, petroleum-like odor.	ML			0.9						
				1.2 - 1.4' **FILL:** (FILL), mostly wood debris (0.25" diameter), brown (10YR 4/3), little fine sane, some silt, trace organics, homogeneous, moist, sulfur-like odor.	(FILL)			1.7						
				1.4 - 1.6' **POORLY-GRADED SAND:** SP, very dark grayish brown (10YR 3/2), mostly rounded sand [some fine, some medium], homogeneous, moist, faint MGP-like odor.	SP			0.2						
				1.6 - 1.8' **SILT:** ML, black (10YR 2/1), no dilatency, low toughness, nonplastic, very soft, trace sand [mostly fine], homogeneous, wet, trace wood debris, few organics, strong MGP-like odor, stained.	ML			3.4						
				1.8 - 2.5' **SILT:** ML, dark brown (10YR 3/3), no dilatency, low toughness, nonplastic, very soft, little sand [mostly fine], homogeneous, moist, little wood debris, faint sulfur-like odor.	ML			0.4						
				2.5' End of Boring.										

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

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T05N2

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/6/2012	4/6/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	571.8 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994362.261 Feet ☐ S 450922.5019 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	33 26.4		0.5 1.0 1.5 2.0	0 - 0.6' **SILT:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, trace sand [mostly fine], homogeneous, wet, trace plant debris. 0.6 - 2.2' **POORLY-GRADED SAND:** to **SILT:** SP, very dark gray (10YR 3/1), mostly sand [mostly fine], homogeneous, wet, trace wood debris (some wood pieces are 2" in length by 2" in width), faint sulfur-like odor. 1.7' increasing wood pieces with depth. 1.8' - 2.2' mostly wood debris. 2.2' End of Boring.	ML SP			0 0 0 0 0 0						

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

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T05N-NATIVE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/18/2012	4/18/2012	rotary (mud)

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	570.9 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994362.018 Feet ☐ S 450909.6171 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 SS	21 / 6	WOR WOR WOH WOH	0.5	0 - 2.6' **SILT:** to **ORGANIC SILT:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, soft, poorly graded, little sand [mostly fine], homogeneous, wet, some organic silt.	ML			0						WOR = weight of rod. WOH = weight of hammer
			1.0					0						
			1.5					0						
2 SS	24	WOH WOH 1 1	2.0	2' - 2.6' wet, some organic silt, few wood debris (stained black (10YR 2/1), faint MGP-like odor.										No PID readings between 2 and 6.5 feet.
			2.5											
			3.0	2.6 - 4' **ORGANIC SILT:** to **SILT:** OL, dark brown (10YR 3/3), slow dilatency, low toughness, nonplastic, soft, poorly graded, little sand [mostly fine], some silt, homogeneous, moist.	OL									
			3.5											
3 SS	24 / 0	2 1 1 1	4.0	4 - 6' No Recovery.										
			4.5											
			5.0											
			5.5											
4 SS	8.4 / 8.4	7 50/3	6.0	6 - 6.2' **WELL-GRADED SAND:** SW, grayish brown (10YR 5/2), mostly subangular sand [few fine, mostly medium, little coarse], some angular to subangular gravel [mostly fine, little coarse], homogeneous, wet.	SW									
			6.5	6.2 - 6.7' **SILT:** ML, light grayish brown (10YR 6/2), slow dilatency, low toughness, nonplastic, firm, well graded, few subangular sand [some medium, some coarse], little subangular gravel [mostly fine, little coarse], homogeneous, dry to moist, glacial till.	ML			0						
				6.7' End of Boring. Refusal on Bedrock. 0.25" thick freshly broken limestone in tip of sampler..										

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

Signature	Firm	
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Page 1 of 1

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T06A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/4/2012	4/4/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	569.7 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994358.339 Feet ☐ S 450937.6983 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	54 38.4		0.5	0 - 0.8' **SILT:** to **ORGANIC SILT:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, very soft, poorly graded, little sand [mostly fine], wet, some organic silt, trace root fiber, strong sulfur-like odor, grades to sand with depth.	ML			0						
			1.0					0						
			1.5	0.8 - 1.9' **POORLY-GRADED SAND:** SP, very dark grayish brown (10YR 3/2), mostly sand [mostly fine, trace medium], trace silt, homogeneous, wet, faint sulfur-like odor.	SP			0						
			2.0											
			2.5	1.9 - 2.6' **SILT:** to **FILL:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, very soft, trace sand [mostly fine], lensed, wet, some wood debris, increasing wood debris with depth, few organic silt, lenses of black (10YR 2/1), faint MGP-like odor.	ML			0.8						
			3.0		SP (FILL)			1.1						
				2.6 - 3' **POORLY-GRADED SAND:** SP, very dark grayish brown (10YR 3/2), mostly sand [mostly fine, trace medium], trace silt, homogeneous, moist, faint sulfur-like odor.										
				3 - 3.2' **FILL:** (FILL), mostly wood debris, very dark brown (10YR 2/2), poorly graded, few fine sand, few silt, homogeneous, wet, little root fiber, faint sulfur-like odor.										
				3.2' End of Boring.										

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T06A1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/10/2012	4/10/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	569.4 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994365.754 Feet ☐ S 450937.3739 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	30 21		0.5 1.0 1.5	0 - 1.5' **POORLY-GRADED SAND:** to **FILL:** SP, dark grayish brown (10YR 4/2), mostly subangular to subrounded sand [mostly fine, little medium, few coarse], homogeneous, moist to wet, some wood chips.	SP			0.6 0.6						
				0.5' increased wood chip content (4" width by 4" length pieces) and increasing organic silt with depth (up to 30% at bottom of interval).				0 0.4						
				1.5 - 1.7' **POORLY-GRADED SAND:** to **ORGANIC SILT:** SP, black (10YR 2/1), rapid dilatency, mostly subangular to subrounded sand [mostly fine, little medium, few coarse], homogeneous, moist to wet, some organic silt, faint to strong MGP-like odor.	SP			0.4						
				1.7' End of Boring.										

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

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	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T06A2

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/10/2012	4/10/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	563.3 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994389.346 Feet ☐ S 450939.209 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	6 2.4		0.5	0 - 0.5' **FILL:** to **SILT:** (FILL), mostly wood debris, black (10YR 2/1), little subrounded fine sand. 0.5' End of Boring.	(FILL)			0						Poor Recovery.

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

Signature
Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
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Fax: 262.523.9001

Date Modified: 5/31/2012
Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T06B3

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/3/2012	4/3/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	563.9 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994408.987 Feet ☐ S 450937.3962 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	6 6		0.5	0 - 0.5' **POORLY-GRADED SAND:** SP, very dark brown (10YR 2/2), mostly rounded sand [mostly medium, little coarse], little gravel [mostly fine], homogeneous, wet, trace wood chips, few organic material, sulfur-like odor. 0.5' End of Boring.	SP			0.4						

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
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Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T06C3

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/3/2012	4/3/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	565.7 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994430.895 Feet ☐ S 450932.5787 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	6 6		0.5	0 - 0.5' **WELL-GRADED SAND:** SW, very dark grayish brown (10YR 3/2), mostly rounded sand [little fine, mostly medium, little coarse], trace rounded gravel [mostly fine], homogeneous, wet, trace wood debris (twigs and wood chips), feldspar lithics. 0.5' End of Boring.	SW			0						

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

Signature	Firm	
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T06D

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/6/2012	4/6/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	575.6 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994459.621 Feet ☐ S 450936.8689 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	54 30.0		0.5	0 - 0.9' **SILT:** to **FILL:** ML, very dark brown (10YR 2/2), rapid dilatency, low toughness, nonplastic, very soft, poorly graded, little sand [little fine, few medium, trace coarse], homogeneous, wet, some wood debris, faint sulfur-like odor.	ML			0						
			1.0					0						
			1.5	0.9 - 2.5' **POORLY-GRADED SAND:** SP, very dark gray (10YR 3/1), 15% very dark brown (10YR 2/2) mottling, mostly sand [mostly fine, few medium], trace gravel [mostly fine], homogeneous, moist, trace wood chips (length is 0.4").	SP			0						
			2.0					0						
			2.5	2.5' End of Boring.				0						

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

Signature 
Firm Natural Resource Technology, Inc.
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Date Modified: 5/31/2012
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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T06HH1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/5/2012	4/5/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	572.0 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994345.879 Feet ☐ S 450938.0624 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	12 12		0.5	0 - 0.5' **FILL:** (FILL), mostly wood debris (5" long X 2" wide pieces of wood), very dark brown (10YR 2/2), some fine sand, few silt, homogeneous, wet.	(FILL)			0						
			1.0	0.5 - 1' **POORLY-GRADED SAND:** to **SILT:** SP, very dark gray (10YR 3/1), rapid dilatency, low toughness, nonplastic, soft, mostly sand [mostly fine], some silt, homogeneous, wet, little wood debris.	SP			0						
				1' End of Boring.				0						

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

Signature	Firm	Tel: 262.522.1206
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T06HH1-NATIVE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/18/2012	4/18/2012	rotary (mud)

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	569.7 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994348.09 Feet ☐ S 450936.1933 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	6 / 6		0.5	0 - 0.5' **SILT:** to **POORLY-GRADED SAND:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, soft, homogeneous, wet, some sand, little wood debris, faint sulfur-like odor.	ML			0						0 - 0.5 feet Osterberg sampler
2 SS	24 / 5	10 2 2 2	1.0	0.5 - 2.5' **SILT:** to **FILL:** ML, black (10YR 2/1), rapid dilatency, low toughness, nonplastic, poorly graded, little sand [mostly fine, some medium], homogeneous, wet, some wood debris, faint sulfur-like odor, broken ceramic fragment at top of interval.	ML			0 0 0						0.5 feet - EOB 2" split spoon sampler
			1.5											
			2.0											
			2.5											
3 SS	24 / 4	4 3 2 2	3.0	2.5 - 4.5' **POORLY-GRADED SAND:** to **FILL:** SP, black (10YR 2/1), mostly sand [mostly fine, some medium], homogeneous, wet, some wood debris, strong MGP-like odor, trace broken ceramic fragments, some viscous emulsified NAPL (0.25" weathered coal tar droplets). 3' - 3.5' wood pieces.	SP			5 4.1						
			3.5											
			4.0											
			4.5											
4 SS	24 / 7	3 1 2 50	5.0	4.5 - 6.5' **WELL-GRADED SAND:** SW, light brownish gray (10YR 6/2), mostly sand [some fine, mostly medium, few coarse], few gravel [mostly fine, some coarse], homogeneous, strong MGP-like odor, interval grades from trace to few viscous emulsified NAPL (0.2" weathered coal tar droplets).	SW			1 1.5						
			5.5											
			6.0											
			6.5	6.5' End of Boring. Refusal. Drill bit bouncing on hard material (likely bedrock).										

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

Signature	Firm	Tel / Fax
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Page 1 of 1

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T06HH1-NATIVE1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/18/2012	4/18/2012	rotary (mud)

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	568.6 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N 4994355.724 Feet ☐ S ☒ E 450943.6343 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			0.5	0 - 2.5' Blind Drilled. See boring log T06HH1-Native.										
			1.0											
			1.5											
			2.0											
1 SS	24 12	2 2 2 50	2.5	2.5 - 3.5' **SILT:** to **ORGANIC SILT:** ML, slow dilatency, low toughness, nonplastic, soft, poorly graded, little sand [mostly fine], homogeneous, moist to wet, few wood chips, interval grades from trace to little viscous emulsified NAPL (weathered coal tar droplets (0.4" to 1.6")), strong MGP-like odor.	ML			0.8						
			3.0					1.2						
			3.5		SW			1.8						
			4.0	3.5 - 4.2' **WELL-GRADED SAND:** SW, mostly rounded sand [little fine, mostly medium, few coarse], trace rounded gravel [mostly fine], homogeneous, strong MGP-like odor.										
			4.5	4.2 - 4.5' **SILT:** ML, slow dilatency, low toughness, nonplastic, soft, poorly graded, few sand [mostly fine], homogeneous.	ML			0						
			5.0	4.5' End of Boring. Refusal on top of bedrock. Freshly broken gravel pieces in tip of sampler.										

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

Signature  Firm Natural Resource Technology, Inc.
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Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T06N1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/3/2012	4/3/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	573.5 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994372.802 Feet ☐ S 450937.7974 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	18 15.6		0.5 1.0	0 - 1.3' **POORLY-GRADED SAND:** SP, very dark grayish brown (10YR 3/2), mostly rounded sand [some fine, some medium, few coarse], trace rounded gravel [some fine, some coarse], homogeneous, moist to wet.	SP			0 0 0 0						
				1.3' End of Boring.										

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

Signature	Firm	Tel: 262.522.1206
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Fax: 262.523.9001

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Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T06N1-NATIVE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/17/2012	4/17/2012	rotary (mud)

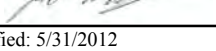
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	575.0 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994374.248 Feet ☐ S 450939.2583 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 SS	24 3	WOH 1 2 14	0.5	0 - 2.5' **WELL-GRADED SAND:** SW, very dark grayish brown (10YR 3/2), mostly subrounded sand [mostly fine, some medium], homogeneous, wet.	SW			0						WOH = weight of hammer
			1.0					0						
			1.5											Slight Resistance of Sampler Likely Due to Wood Debris.
2 SS	24 12	5 6 8 15	2.0					0						
			2.5	2.5 - 3.4' **SILT:** ML, grayish brown (10YR 5/2), slow dilatency, low toughness, nonplastic, firm to hard, poorly graded, trace subrounded sand [some fine, some coarse], homogeneous, moist.	ML			0	1.5					
			3.0											
			3.5	3.4 - 4' **POORLY-GRADED SAND:** to **SILT:** SP, grayish brown (10YR 5/2), mostly subrounded sand [mostly fine], homogeneous.	SP			0						
3 SS	24 15.6	4 4 5 5	4.0					0						
			4.5	4 - 6.5' **SILT:** ML, grayish brown (10YR 5/2), slow dilatency, low toughness, nonplastic, firm, poorly graded, trace subrounded sand [some fine, some coarse], homogeneous, moist.	ML									
			5.0											
			5.5	5.5' - 6.0' soft.				0						
4 SS	24 13.2	3 15 15 20	6.0					0.1	0.5					
			6.5	6.5 - 9.5' **SILT:** to **LEAN CLAY:** ML, brown (7.5YR 4/3), 20% grayish brown (10YR 5/2) mottling, slow dilatency, low to medium toughness, low plasticity, firm, well graded, few subangular to subrounded sand [some fine, some coarse], few subangular to subrounded gravel [mostly fine], some clay, homogeneous, dry to moist, glacial till.	ML									
			7.0											
			7.5					0.1	1					
5 SS	24 5.4	12 13 14 20	8.0					0	2.25					
			8.5	7.5' - 9.5' 50% brown (7.5YR 4/4) mottling, little fine sand, trace coarse subangular gravel.										
			9.0					0	4.5					
			9.5											
			10.0	9.5 - 10' **WELL-GRADED SAND:** SW, brown (7.5YR 5/3), mostly rounded sand [mostly fine, little	SW									

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

Signature  Firm Natural Resource Technology, Inc. Tel: 262.522.1206
23713 W. Paul Road, St. D Pewaukee, WI 53072 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number T06N1-NATIVE Use only as an attachment to Form 4400-122. Page 2 of 2

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 (10.6 ev)	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
6 SS	24 7	10 15 8 5	10.5	medium], trace subangular gravel [mostly coarse], little silt, homogeneous, moist to wet, glacial till.	SP			0	0					
			11.0	10 - 11' **POORLY-GRADED SAND:** to **SILT:** SP, brown (7.5YR 5/3), mostly subangular to subrounded sand [mostly fine, little medium, little coarse], little gravel [mostly fine], some silt, homogeneous, moist, glacial till.	SW			0	0					
7 SS	12 2	13 53	12.0	11 - 12' **WELL-GRADED SAND:** SW, grayish brown (10YR 5/2), mostly subangular to subrounded sand [mostly fine, little medium, little coarse], homogeneous, moist, glacial till.	GW			0						
			13.0	12 - 13' **WELL-GRADED GRAVEL:** GW, grayish brown (10YR 5/2), few sand [mostly medium], mostly angular gravel [mostly fine, some coarse], glacial till.				0						
			13.5	13' End of Boring. Refusal on top of bedrock.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T06N2

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/11/2012	4/11/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	571.4 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994376.154 Feet ☐ S 450952.2659 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	42 33.6		0.5 1.0 1.5 2.0 2.5	0 - 1.4' **SILT:** ML, very dark brown (10YR 2/2), rapid dilatency, low toughness, nonplastic, very soft, poorly graded, little subrounded sand [mostly fine], homogeneous, wet, some wood debris (0.25" to 3" pieces), sulfur-like odor.	ML									PID not used due to moisture and temp. issues
				1.4 - 1.9' **POORLY-GRADED SAND:** to **SILT:** SP, very dark brown (10YR 2/2), little silt, homogeneous, wet, some wood debris, live worm present in sand, sulfur-like odor.	SP									
				1.9 - 2.8' **SILT:** ML, grayish brown (10YR 5/2), slow dilatency, low toughness, nonplastic, hard, moist, 0.2" - 0.4" gravel lense at top of unit, trace subrounded coarse gravel.	ML									
				2.8' End of Boring.										

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

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T07A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/4/2012	4/4/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	569.8 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N 4994346.72 Feet ☐ S ☒ E 450968.054 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	12 0		0.5 1.0	0 - 1' **WELL-GRADED GRAVEL:** GW. 1' End of Boring.	GW									No Recovery. Rock in Core Catcher.

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T07A1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/6/2012	4/6/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	565.8 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994354.713 Feet ☐ S 450980.6563 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	38.4 24.0		0.5	0 - 0.5' **FILL:** (FILL), mostly wood debris, wood pieces have a faint MGP-like odor, very dark brown (10YR 2/2), poorly graded little fine sand, wet.	(FILL)			0						
			1.0	0.5 - 1.3' **SILT:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, very soft, poorly graded, few sand [mostly fine], few gravel [mostly coarse], homogeneous, wet, little organic silt, few wood pieces.	ML			0						
			1.5	0.9' gravel piece (2" diameter).				0						
			2.0	1.2' gravel piece (4" diameter).				0						
				1.3 - 2' **SILT:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, very soft, poorly graded, trace sand [mostly fine], homogeneous, moist to wet, trace organic silt, trace root debris.	ML			0						
				2' End of Boring.										

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

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	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T07A2

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/11/2012	4/11/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	573.9 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994362.181 Feet ☐ S 450968.3543 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	15.6 8.4		0.5	0 - 0.7' **FILL:** to **SILT:** (FILL), mostly wood debris, trace sand (some coarse and trace fine), some silt, wet, faint sulfur-like odor.	(FILL)			0.4						
			1.0	0.7' End of Boring.				0 0						
			1.5											
			2.0											
			2.5											
			3.0											
			3.5											
			4.0											
			4.5											
			5.0											
			5.5											
			6.0											
			6.5											
			7.0											

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
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Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Page 1 of 1

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T07B

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/2/2012	4/2/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	568.8 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994374.882 Feet ☐ S 450969.3919 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	6 6		0.5	0 - 0.5' **SILT:** ML, very dark brown (10YR 2/2), rapid dilatency, low toughness, nonplastic, soft, poorly graded, little sand [mostly fine], trace gravel [mostly fine], homogeneous, wet, little wood debris.	ML			0.5						
				0.5' End of Boring.										

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T07B4

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/10/2012	4/10/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	559.6 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N 4994390.87 Feet ☐ S ☒ E 450969.235 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	2.4 2.4			0 - 0.2' **FILL:** (FILL), Mostly wood debris, Black (10YR 2/1) some subrounded fine gravel, little subrounded coarse sand, trace silt. 0.2' End of Boring.	(FILL)									No Sample Poor Recovery.

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
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Fax: 262.523.9001

Date Modified: 5/31/2012
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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T07B6

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/11/2012	4/11/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	562.6 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994377.433 Feet ☐ S 450983.9613 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	24 9.6		0.5	0 - 0.8' **GRAVELLY SILT:** g(ML), dark grayish brown (10YR 4/2), slow dilatency, low toughness, nonplastic, firm, some subrounded to rounded gravel [some fine, some medium, some coarse], moist, trace wood debris, gravel is 0.2" to 0.8" diameter. 0.2' - 0.8' little subrounded sand [mostly fine], no wood debris, grayish brown (10YR 5/2). 0.8' End of Boring.	g(ML)			0 0 0						

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

Signature

Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012
Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T07C

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/5/2012	4/5/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	561.6 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994405.951 Feet ☐ S 450968.6682 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	6 6		0.5	0 - 0.5' **WELL-GRADED SAND WITH GRAVEL:** (SW)g, dark gray (10YR 4/1), mostly rounded sand [little fine, mostly medium, few coarse], some rounded gravel [little fine, few coarse], homogeneous, wet. 0.5' End of Boring.	(SW)g			0					

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T07D

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/6/2012	4/6/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	568.5 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994435.61 Feet ☐ S 450969.3432 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	12 6		0.5	0 - 0.5' **POORLY-GRADED SAND:** SP, very dark brown (10YR 2/2), mostly subrounded sand [mostly fine, little coarse], little subrounded gravel [mostly fine], trace silt, homogeneous, wet. 0.5' End of Boring.	SP			0 0						

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

Signature Firm Natural Resource Technology, Inc. Tel: 262.522.1206
23713 W. Paul Road, St. D Pewaukee, WI 53072 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T07N

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/6/2012	4/6/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	573.4 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994362.642 Feet ☐ S 450988.757 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 44.4		0.5	0 - 0.3' **POORLY-GRADED SAND:** to **FILL:** SP, very dark brown (10YR 2/2), mostly sand [mostly fine, little medium], little silt, homogeneous, wet, some wood debris.	SP			0.7						
			1.0	0.3 - 1.3' **POORLY-GRADED SAND:** SP, very dark grayish brown (10YR 3/2), mostly rounded sand [mostly fine, little medium], trace rounded gravel [mostly fine], homogeneous, wet, trace wood pieces (0.25" length by 0.125" width).	SP			0						
			1.5					0						
			2.0					0						
			2.5	1.3 - 3.7' **POORLY-GRADED SAND:** to **SILT:** SP, light brownish gray (10YR 6/2), mostly rounded sand [mostly fine], little gravel [some fine, some coarse], some silt, homogeneous, moist.	SP			0						
			3.0	2.4' - 3.0' sand is mostly medium, trace silt.				0						
			3.5	3' - 3.7' trace silt, no gravel.				0						
				3.7' End of Boring.										

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

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T07N-NATIVE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/16/2012	4/16/2012	vibratory

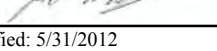
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	572.9 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994363.883 Feet ☐ S 450987.8825 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 SS	24 8	WOH WOH 1 3	0.5	0 - 0.5' **POORLY-GRADED SAND:** SP, very dark brown (10YR 2/2), mostly sand [mostly fine, trace coarse], trace gravel [mostly fine], homogeneous, moist.	SP									WOH = weight of rod
			1.0	0.5 - 10.5' **SILT:** ML, light brownish gray (10YR 6/2), slow dilatency, low toughness, nonplastic, soft, little sand [mostly fine], dry to moist, glacial till.										
2 SS	24 17	8 6 10 12	1.5 2.0 2.5 3.0 3.5 4.0											
3 SS	24 11	7 11 20 24	4.5 5.0		ML				3.5					
4 SS	24 11	5 9 8 7	5.5 6.0 6.5 7.0 7.5	7.5' - 10.5' moist, low to medium plasticity, decreased sand content.										
5 SS	24 24	3 3 5 8	8.0 8.5 9.0 9.5 10.0						0.25 0.25 0.25					

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number T07N-NATIVE Use only as an attachment to Form 4400-122.

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
6 SS	24 10		10.5		ML									
			11.0	10.5 - 12' **WELL-GRADED SAND:** SW, dark yellowish brown (10YR 4/6), mostly sand [some fine, mostly medium, trace coarse], trace silt, homogeneous, moist.	SW									
			11.5											
7 SS	6 4	7/3.5 50/2.5	12.0											
			12.5	12 - 12.5' **SILT:** to **WELL-GRADED SAND:** ML, dark yellowish brown (10YR 4/6), slow dilatency, low toughness, nonplastic, soft, some subrounded sand [mostly fine], homogeneous, wet.	ML									
				12.5' End of Boring. Refusal on top of bedrock. Freshly broken gravel pieces in tip of sampler.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T08A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/2/2012	4/2/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	564.9 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N 4994353.08 Feet ☐ S ☒ E 450999.003 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	12 0		0.5 1.0	0 - 1' **POORLY-GRADED SAND:** to **FILL:** SP, mostly sand [mostly fine], some wood debris, large shell. 1' End of Boring.	SP									No Recovery

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T08A2

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/2/2012	4/2/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	564.6 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994353.045 Feet ☐ S 451005.8013 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	18 12		0.5	0 - 0.4' **FILL:** (FILL), mostly wood debris (4" long wood pieces), very dark gray (10YR 3/1), moist.	(FILL)			0						
			1.0	0.4 - 0.8' **FILL:** (FILL), mostly wood debris (2" length by 0.125" width wood pieces), black (10YR 2/1), trace silt, moist.	(FILL)			0						
				0.8 - 1' **SILT:** ML, black (10YR 2/1), no dilatency, low toughness, nonplastic, very soft, few sand [mostly fine], homogeneous, wet, trace fine wood debris.	ML			0						
				1' End of Boring.				0						

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T08A3

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/10/2012	4/10/2012	vibratory

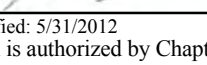
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	565.2 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994372.237 Feet ☐ S 450999.8762 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	48 38.4		0.5	0 - 0.5' **SILT:** ML, dark grayish brown (10YR 4/2), slow dilatency, low toughness, nonplastic, trace gravel [mostly fine], wet, trace wood debris, gravel has a diameter of 0.4".	ML			0						
			1.0					0						
			1.5	0.5 - 2.2' **SILT:** ML, dark grayish brown (10YR 4/2), slow dilatency, low toughness, nonplastic, trace gravel [mostly fine], wet.	ML			0						
			2.0											
			2.5	2.2 - 2.7' **SILT WITH SAND:** (ML)s, dark grayish brown (10YR 4/2), slow dilatency, low toughness, nonplastic, well graded, some subrounded sand [mostly fine, trace coarse], wet.	(ML)s			0						
			3.0		ML			0						
				2.7 - 3.2' **SILT:** ML, dark grayish brown (10YR 4/2), slow dilatency, low toughness, nonplastic, some subrounded sand [mostly fine], trace gravel [mostly fine], wet, gravel has a diameter of 0.4".				0.1						
				3.2' End of Boring.				0.1						

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Page 1 of 1

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T08A4

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/11/2012	4/11/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	561.3 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994371.536 Feet ☐ S 451013.8005 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	6 6		0.5	0 - 0.5' **SILT:** to **FILL:** ML, black (10YR 2/1), slow dilatency, low toughness, nonplastic, very soft, trace sand [mostly fine], homogeneous, wet, some wood debris (0.25" to 3" in length), sulfur-like odor. 0.5' End of Boring.	ML			0.4 0						majority of sample from push core.

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

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T08A5

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/11/2012	4/11/2012	vibratory

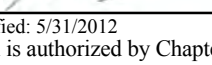
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	568.4 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994356.942 Feet ☐ S 451011.382 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	24 21.6		0.5 1.0 1.5	0 - 1.8' **SILT:** ML, grayish brown (10YR 5/2), slow dilatency, low toughness, nonplastic, firm to hard, homogeneous, moist to wet, trace wood debris, trace subrounded poorly-graded sand [mostly fine] in top 2.5" of interval.	ML			0 0 0 0						
				1.8' End of Boring.				0						

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T08B3

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/5/2012	4/5/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	561.0 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994378.406 Feet ☐ S 450999.3931 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	30 20.4		0.5	0 - 0.5' **FILL:** (FILL), wood pieces are 4" length by 2" width, very dark brown (10YR 2/2), poorly graded few fine sand, little silt, homogeneous, wet.	(FILL)			0.1						
			1.0	0.5 - 1.3' **POORLY-GRADED SAND:** SP, very dark gray (10YR 3/1), mostly rounded sand [mostly fine, little medium], homogeneous, wet.	SP			0.1						
			1.5	1.3 - 1.7' **FILL:** (FILL), wood pieces are 4" length by 2" width, very dark brown (10YR 2/2), poorly graded few fine sand, little silt, homogeneous, wet.	(FILL)			0.4						
				1.7' End of Boring.										

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T08B4

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/13/2012	4/13/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	561.5 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994392.222 Feet ☐ S 450997.8242 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	15 6		0.5	0 - 0.5' **SILT:** to **WELL-GRADED SAND:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, very soft, some subrounded sand [mostly fine], little subrounded gravel [mostly fine], homogeneous, wet, little wood debris (3" length by 0.25" width), gravel is 0.25" to 1" diameter.	ML			0 0						
				0.5' End of Boring.										

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

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T08C

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/5/2012	4/5/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	564.9 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994410.812 Feet ☐ S 450998.8906 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	36 6		0.5	0 - 0.5' **FILL:** (FILL), mostly wood debris, wood pieces have a 2" length and 2" width, very dark brown (10YR 2/2), poorly graded few fine and little medium sand, trace rounded fine gravel, homogeneous, wet, increasing sand content with depth, sand is very dark gray (10YR 3/1). 0.5' End of Boring.	(FILL)			0 0						

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

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T08HH

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/6/2012	4/6/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	574.0 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994428.132 Feet ☐ S 450997.3968 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	30 21.6		0.5 1.0 1.5	0 - 1.1' **WELL-GRADED SAND:** SW, very dark gray (10YR 3/1), mostly subrounded sand [mostly fine, little medium, little coarse], few subrounded gravel [mostly fine], homogeneous, wet, possible foundry sand, top 6" of interval has few coarse subrounded to rounded gravel, trace root fiber decreasing content with depth, gravel content increasing with depth, faint sulfur-like odor, possible foundry sand. 0.5' - 1.1 grades to black (10YR 2/1). 1.1 - 1.8' **SILT:** ML, grayish brown (10YR 5/2), slow dilatency, low toughness, nonplastic, trace clay, dry to moist, soft to firm. 1.8' homogeneous, End of Boring.	SW ML			0 0 0 0						

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

Signature  Firm Natural Resource Technology, Inc.
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Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T09A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/4/2012	4/4/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	567.4 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994348.93 Feet ☐ S 451028.141 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	0.3 9			0 - 0.3' **FILL:** (FILL), mostly wood debris, wood pieces have a 3" length and 0.25" width, very dark brown (10YR 2/2), few fine sand, homogeneous, wet. 0.3' End of Boring.	(FILL)			0 0						

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

Signature	Firm	Tel: 262.522.1206
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T09A2

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/6/2012	4/6/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	566.4 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994358.285 Feet ☐ S 451045.8049 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	12 6		0.5	0 - 0.5' **SILT:** to **POORLY-GRADED SAND:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, very soft, some sand [some fine, few medium], homogeneous, wet, little wood debris.	ML			0						
				0.5' End of Boring.				0						

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

Signature	Firm	
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Page 1 of 1

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T09A3

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/6/2012	4/6/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	572.5 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994363.14 Feet ☐ S 451045.4398 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	36 32.4		0.5 1.0 1.5 2.0 2.5	0 - 2.7' **SILT:** ML, light brownish gray (10YR 6/2), slow dilatency, medium toughness, low plasticity, soft, homogeneous, moist to wet, top 3.5" of interval contains few coarse gravel (0-0.3').	ML			0 0 0 0 0 0						
				2.7' End of Boring.										

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012
Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T09A6

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/11/2012	4/11/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	563.4 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994365.15 Feet ☐ S 451029.5719 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	33 27.6		0.5 1.0 1.5 2.0	0 - 1.9' **SILT:** ML, dark grayish brown (10YR 4/2), slow dilatency, low toughness, nonplastic, trace gravel [mostly fine], homogeneous, wet, gravel has a diameter of 0.4". 0.5' - 1.9' moist.	ML			0 0 0 0						
				1.9 - 2.3' **SILT WITH SAND:** (ML)s, dark grayish brown (10YR 4/2), some subrounded sand [mostly fine, trace coarse], trace subrounded gravel [mostly fine], gravel has a diameter of 0.4" to 0.8". 2.3' End of Boring.	(ML)s			0 0						

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T09A7

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/13/2012	4/13/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	566.9 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994361.291 Feet ☐ S 451051.0034 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	14.4 14.4		0.5 1.0	0 - 1.2' **FILL:** to **SILT:** (FILL), mostly wood debris, very dark brown (10YR 2/2), slow dilatancy, low toughness, nonplastic, very soft, trace subrounded fine sand, homogeneous, wet.	(FILL)			0 0 0						
				1.2' End of Boring.				0						

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

Signature	Firm	
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T09B1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/5/2012	5/5/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	559.5 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994375.49 Feet ☐ S 451031.971 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	9.6 0		0.5	0 - 0.8' **WELL-GRADED GRAVEL:** to **FILL:** GW, some wood debris, little sand.	GW									No Recovery in Vibrocore, Push Core Attempted (0-0.5') with No Recovery. Gravel, Wood, and Sand in Core Catcher.
				0.8' End of Boring.										

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T09C

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/5/2012	4/5/2012	vibratory

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	571.5 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994409.463 Feet ☐ S 451029.2351 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	30 22.8		0.5	0 - 0.5' **POORLY-GRADED SAND:** SP, very dark gray (10YR 3/1), mostly rounded sand [mostly fine, little medium], trace silt, homogeneous, wet, top 2.5" of interval contains some silt and wood debris.	SP			0						
			1.0	0.5 - 0.9' **SILT:** to **POORLY-GRADED SAND:** ML, dark gray (10YR 4/1), slow dilatency, some subrounded to rounded sand [mostly fine, little coarse], wet, decreasing sand content with depth.	ML			0						
			1.5	0.9 - 1.9' **SILT:** ML, grayish brown (10YR 5/2), slow dilatency, low toughness, low plasticity, trace sand [mostly fine], homogeneous, dry to moist, soft to firm.	ML			0						
				1.9' End of Boring.				0						

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

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Tel: 262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

APPENDIX A3

SEDIMENT GEOTECHNICAL DATA

CGC, Inc.
Construction • Geotechnical
Consulting Engineering/Testing

May 14, 2012

Ms. Jody Barbeau
Mr. Brian Hennings
Natural Resource Technology, Inc.
23713 West Paul Road, Suite D
Pewaukee, WI 53072

Email: jbarbeau@naturalrt.com
bhennings@naturalrt.com

Paper Copy: ☐ will be mailed
☒ will not be mailed

Re: Geotechnical Laboratory Testing
Marinette
NRT Project #1549
PO # 3400002533

Dear Ms. Barbeau and Mr. Hennings:

As requested, we have completed tests on the samples you submitted to our geotechnical laboratory on April 26, 2012. The following tests were performed:

- Atterberg Limits
- Natural Moisture Content
- Organic Content of Soils by Loss-on-Ignition
- Specific Gravity of Soils
- Particle Size Analysis (sieve plus hydrometer)

Test results are summarized on the attached tables and test reports. Please call if you have any questions.

Sincerely,

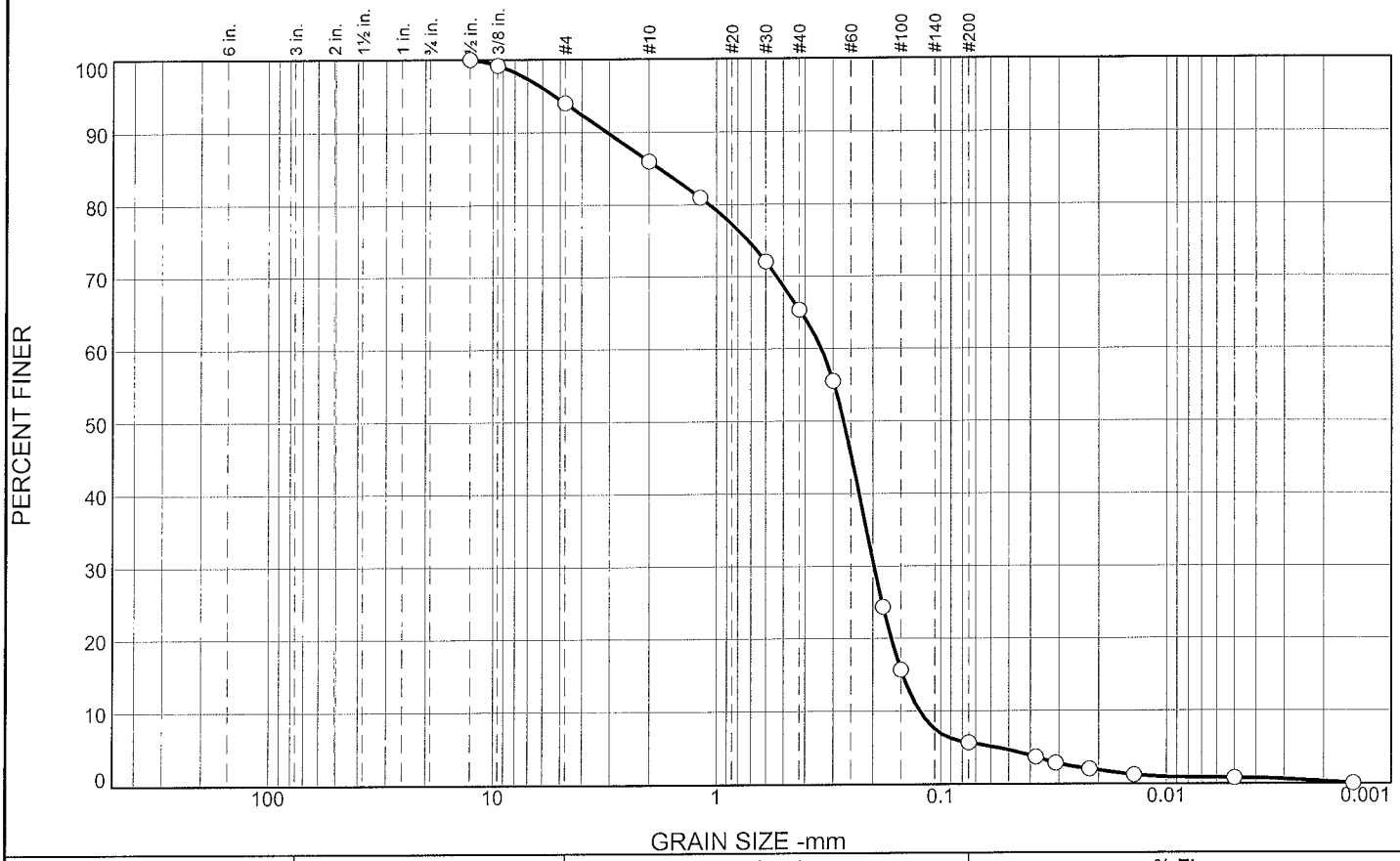
CGC, Inc.

Kirk J. Solberg
Laboratory Supervisor

Encl: As stated

2921 Perry Street, Madison WI 53713
Telephone: 608/288-4100
FAX: 608/288-7887

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	6.0	8.0	20.6	59.7	4.9	0.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2	100.0		
3/8	99.2		
#4	94.0		
#10	86.0		
#16	81.0		
#30	72.1		
#40	65.4		
#50	55.5		
#80	24.4		
#100	15.7		
#200	5.7		

* (no specification provided)

Material Description

Black Organic Fine to Medium Sand, Little Gravel, Trace Clay

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 3.0802 D_{85}= 1.7968 D_{60}= 0.3381
D_{50}= 0.2694 D_{30}= 0.1975 D_{15}= 0.1473
D_{10}= 0.1236 C_u= 2.74 C_c= 0.93

Classification

USCS= SP-SM AASHTO= A-3

Remarks

Natural Moisture = 48.9%
Organic Content = 10.0%
Specific Gravity = 2.50

Sample Number: 042012383

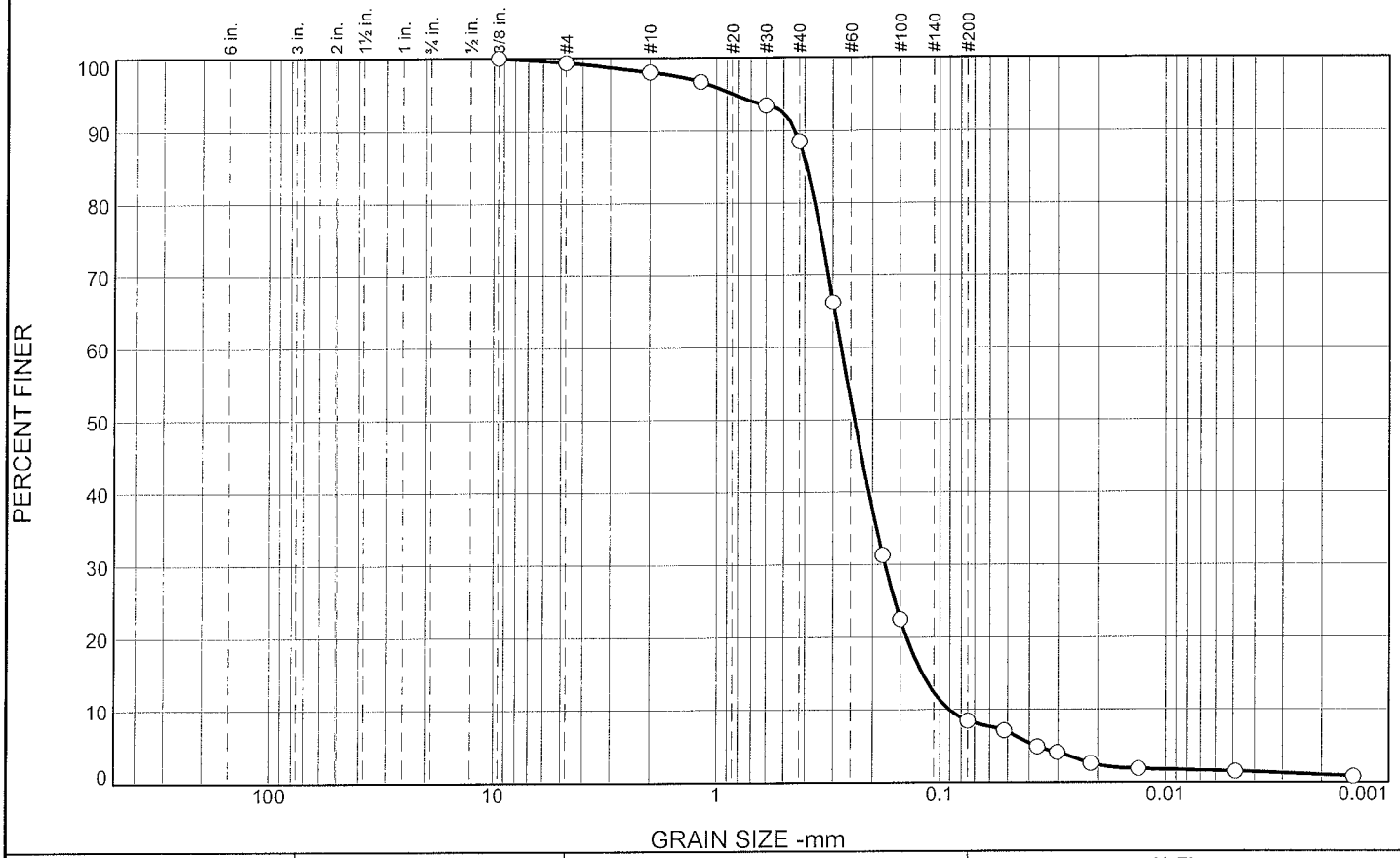
Date: 5/10/12

CGC, Inc.

Client: NRT
Project: Marinette (NRT# 1549)
Project No: C11059-4 **Figure**

Tested By: DRW/KJS **Checked By:** DAS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.7	1.3	9.5	80.0	7.0	1.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8	100.0		
#4	99.3		
#10	98.0		
#16	96.7		
#30	93.4		
#40	88.5		
#50	66.3		
#80	31.3		
#100	22.5		
#200	8.5		

* (no specification provided)

Material Description

Black Organic Fine to Medium Sand, Little Silt, Trace Gravel and Clay

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 0.4440 D_{85}= 0.3941 D_{60}= 0.2760
D_{50}= 0.2407 D_{30}= 0.1756 D_{15}= 0.1198
D_{10}= 0.0907 C_u= 3.04 C_c= 1.23

Classification

USCS= SP-SM AASHTO= A-3

Remarks

Natural Moisture = 24.0%
Organic Content = 6.0%
Specific Gravity = 2.56

Sample Number: 042012384

Date: 5/10/12

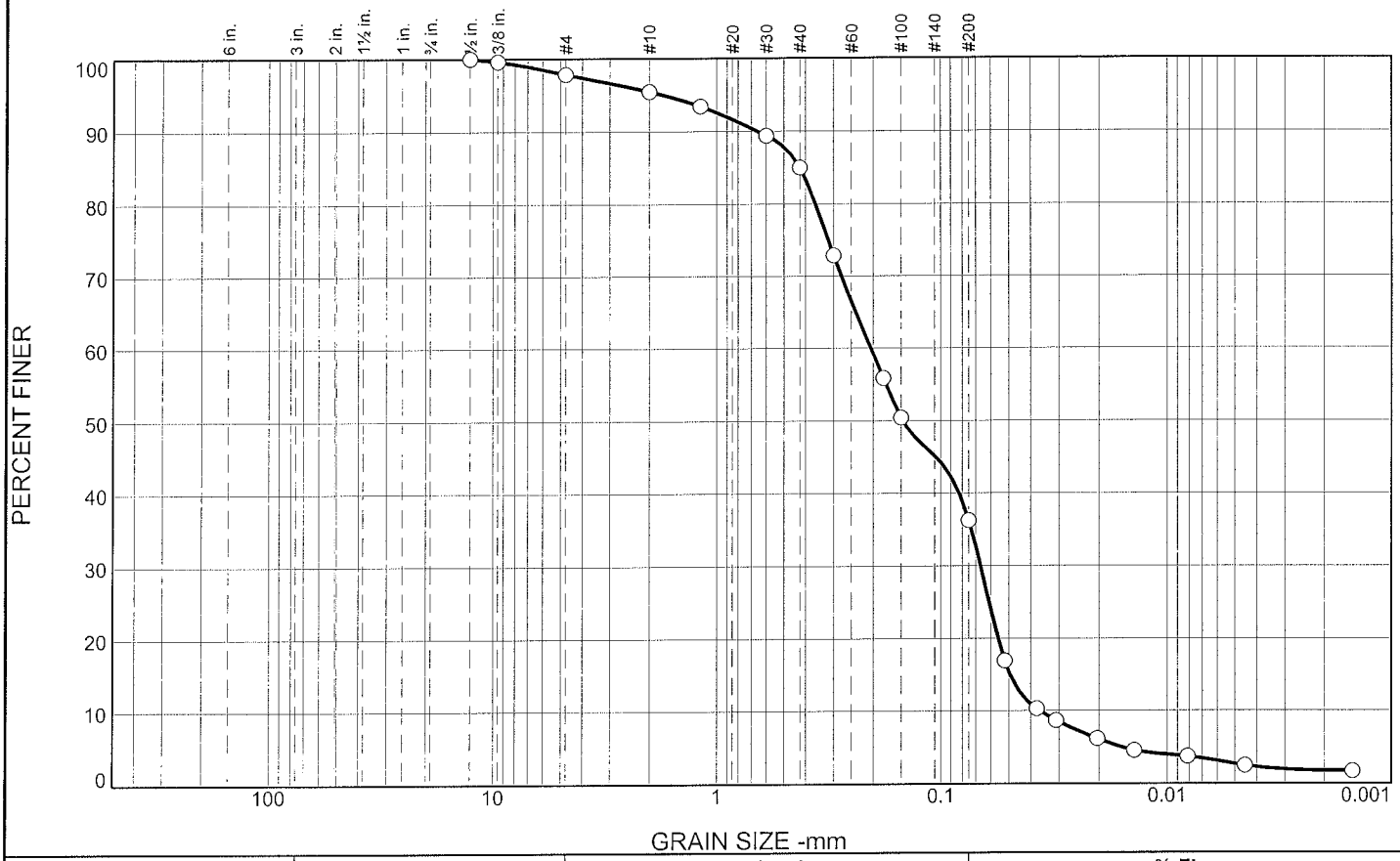
CGC, Inc.

Client: NRT
Project: Marinette (NRT# 1549)

Project No: C11059-4 **Figure**

Tested By: DRW/KJS **Checked By:** DAS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.1	2.5	10.4	48.7	33.6	2.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2	100.0		
3/8	99.6		
#4	97.9		
#10	95.4		
#16	93.4		
#30	89.4		
#40	85.0		
#50	72.9		
#80	55.9		
#100	50.4		
#200	36.3		

* (no specification provided)

Material Description

Black Organic Silty Fine to Medium Sand, Trace Gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 0.6576 D_{85}= 0.4246 D_{60}= 0.2048
D_{50}= 0.1473 D_{30}= 0.0665 D_{15}= 0.0493
D_{10}= 0.0363 C_u= 5.64 C_c= 0.59

Classification

USCS= SM AASHTO= A-4(0)

Remarks

Natural Moisture = 61.1%
Organic Content = 12.6%
Specific Gravity = 2.45

Sample Number: 042012385

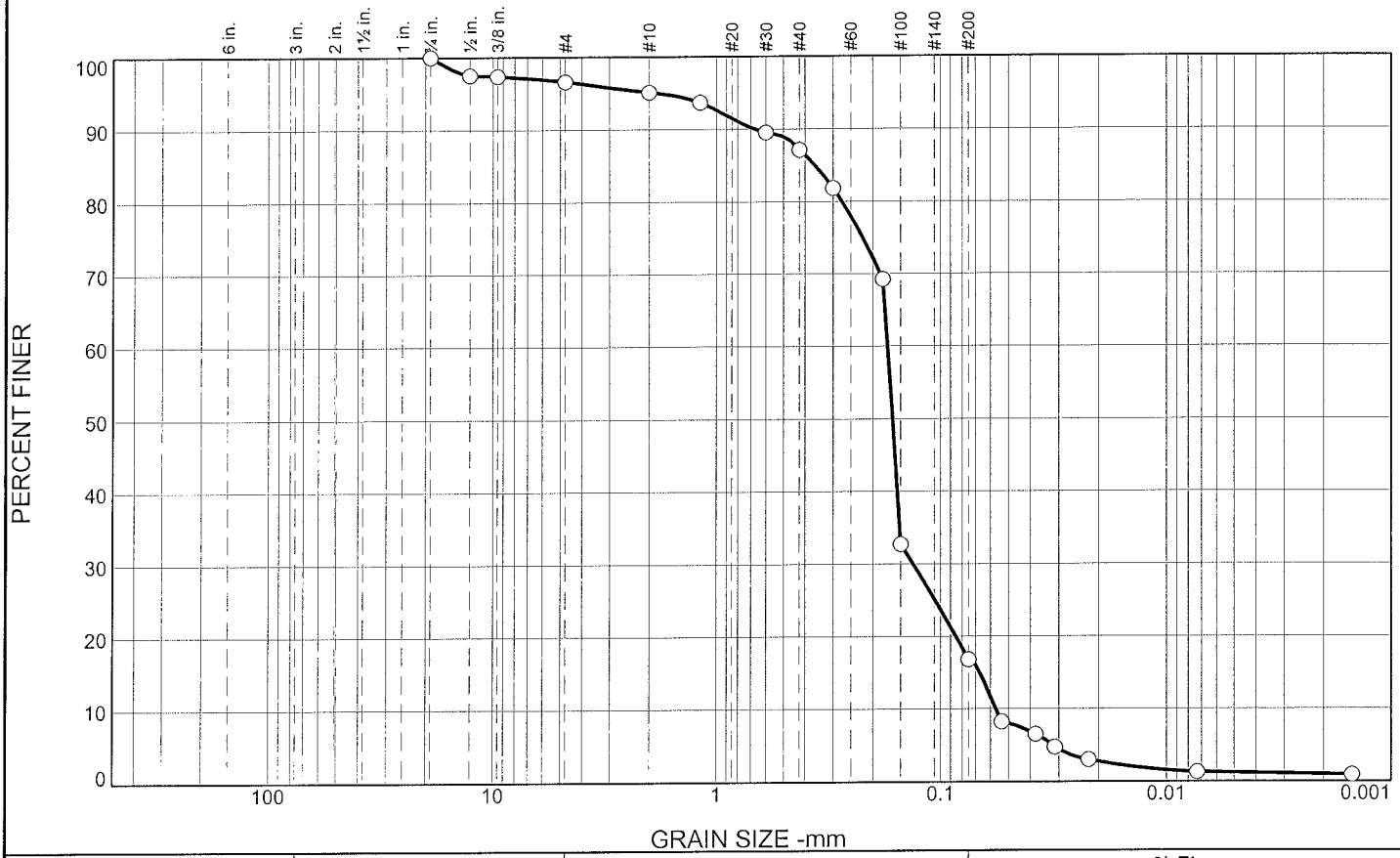
Date: 5/10/12

CGC, Inc.

Client: NRT
Project: Marinette (NRT# 1549)
Project No: C11059-4 **Figure**

Tested By: DRW/KJS **Checked By:** DAS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.4	1.5	8.0	70.3	15.6	1.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4	100.0		
1/2	97.5		
3/8	97.4		
#4	96.6		
#10	95.1		
#16	93.7		
#30	89.5		
#40	87.1		
#50	81.8		
#80	69.2		
#100	32.7		
#200	16.8		

* (no specification provided)

Material Description

Black Organic Fine to Medium Sand, Some Silt, Trace Gravel and Clay

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 0.6718 D_{85}= 0.3621 D_{60}= 0.1713
D_{50}= 0.1633 D_{30}= 0.1321 D_{15}= 0.0667
D_{10}= 0.0571 C_u= 3.00 C_c= 1.78

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Natural Moisture = 27.6%
Organic Content = 9.3%
Specific Gravity = 2.46

Sample Number: 042012386

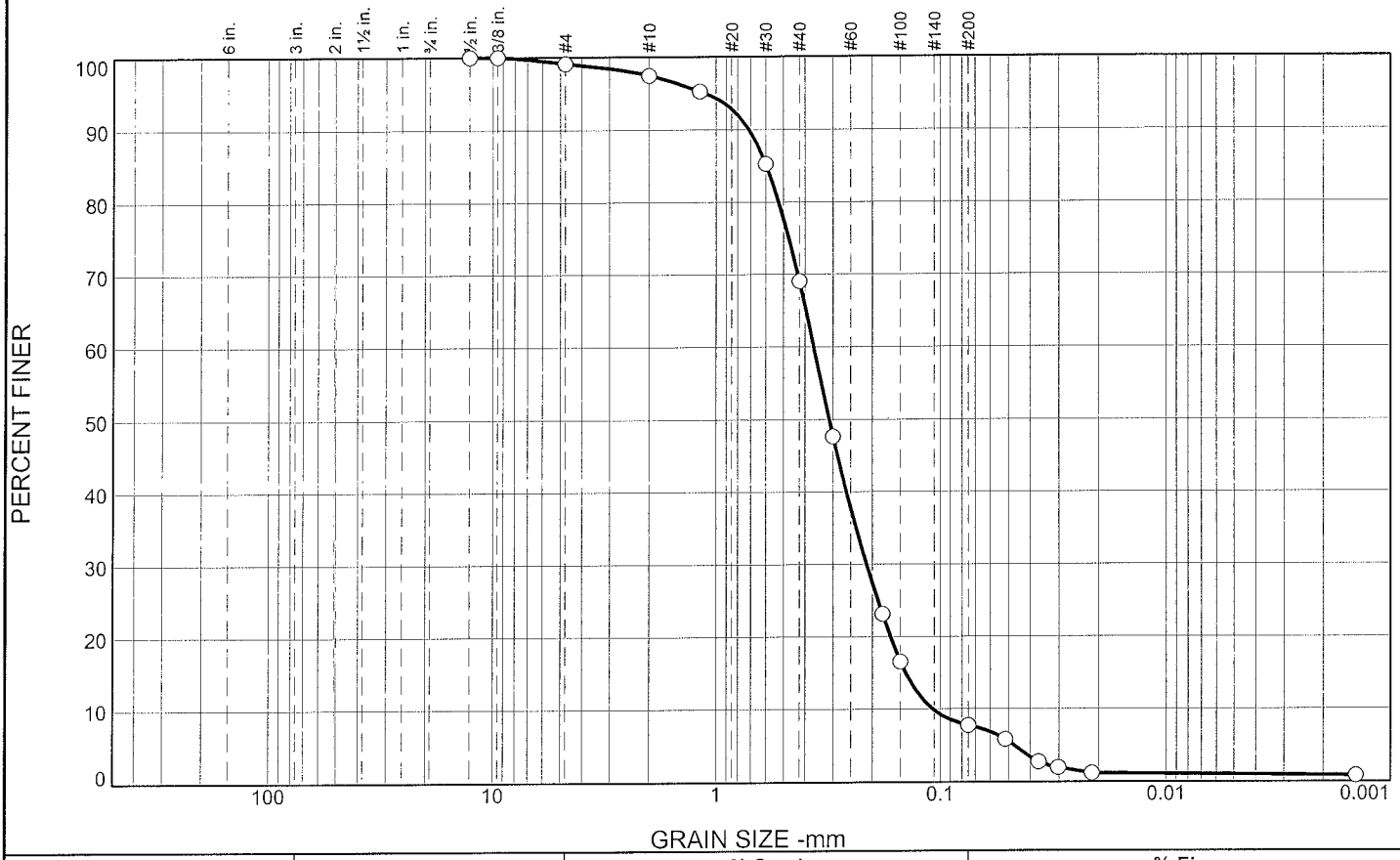
Date: 5/10/12

CGC, Inc.

Client: NRT
Project: Marinette (NRT# 1549)
Project No: C11059-4 **Figure**

Tested By: DRW/KJS **Checked By:** DAS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.9	1.6	28.4	61.3	6.8	1.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2	100.0		
3/8	100.0		
#4	99.1		
#10	97.5		
#16	95.3		
#30	85.3		
#40	69.1		
#50	47.7		
#80	23.1		
#100	16.6		
#200	7.8		

* (no specification provided)

Material Description

Black Fine to Medium Sand, Little Silt, Trace Gravel, Clay, and Organics

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 0.7136 D_{85}= 0.5955 D_{60}= 0.3662
D_{50}= 0.3119 D_{30}= 0.2120 D_{15}= 0.1420
D_{10}= 0.1077 C_u= 3.40 C_c= 1.14

Classification

USCS= SP-SM AASHTO= A-3

Remarks

Natural Moisture = 57.6%
Organic Content = 2.9%
Specific Gravity = 2.59

Sample Number: 042012387

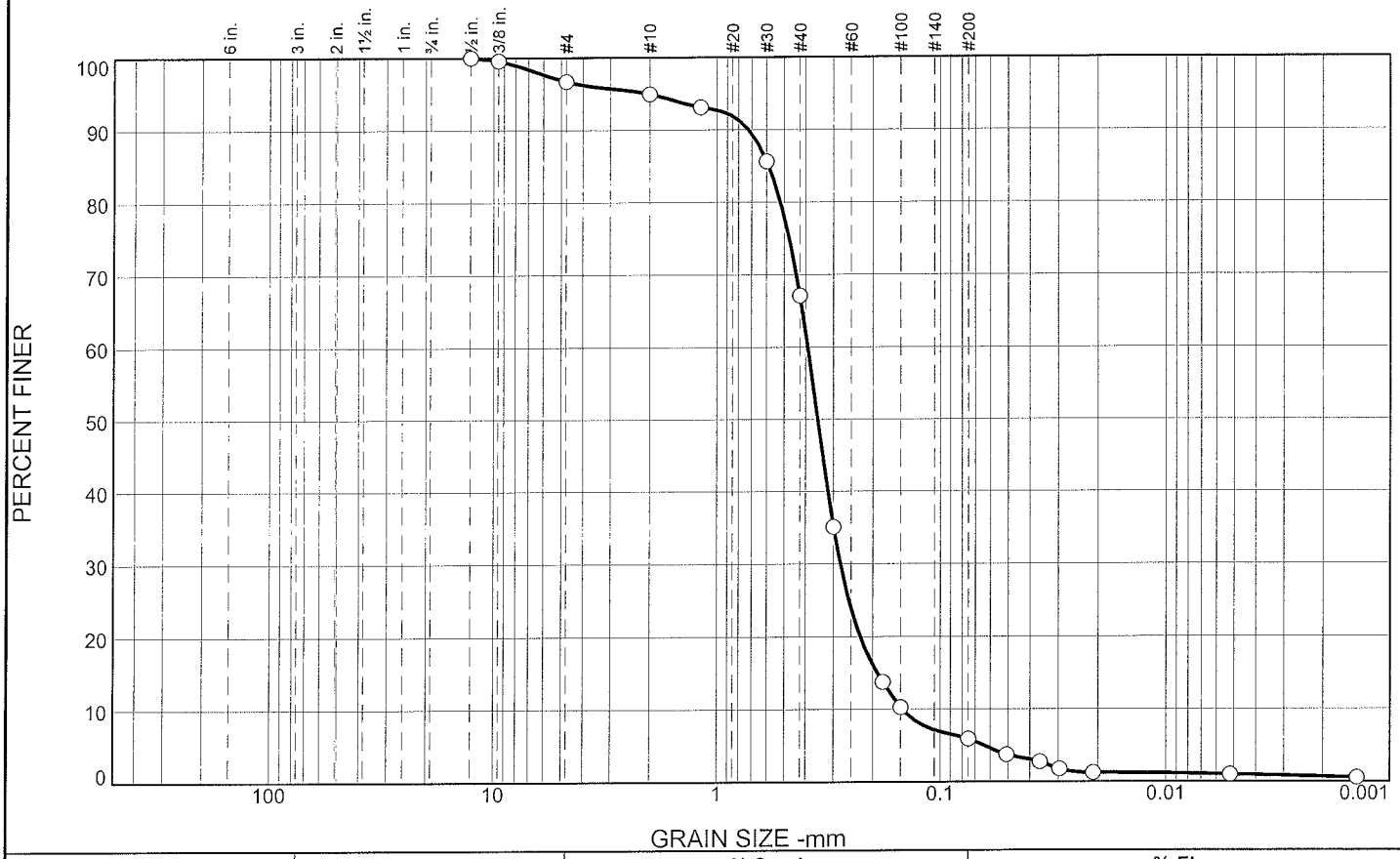
Date: 5/10/12

CGC, Inc.

Client: NRT
Project: Marinette (NRT# 1549)
Project No: C11059-4 **Figure**

Tested By: DRW/KJS **Checked By:** DAS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.3	1.7	27.9	61.2	4.9	1.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2	100.0		
3/8	99.6		
#4	96.7		
#10	95.0		
#16	93.1		
#30	85.6		
#40	67.1		
#50	35.1		
#80	13.8		
#100	10.3		
#200	5.9		

* (no specification provided)

Material Description

Black Fine to Medium Sand, Trace Silt, Gravel, Clay, and Organics

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 0.7245 D_{85}= 0.5891 D_{60}= 0.3919
D_{50}= 0.3534 D_{30}= 0.2794 D_{15}= 0.1900
D_{10}= 0.1469 C_u= 2.67 C_c= 1.36

Classification

USCS= SP-SM AASHTO= A-3

Remarks

Natural Moisture = 30.4%
Organic Content = 1.5%
Specific Gravity = 2.64

Sample Number: 042012388

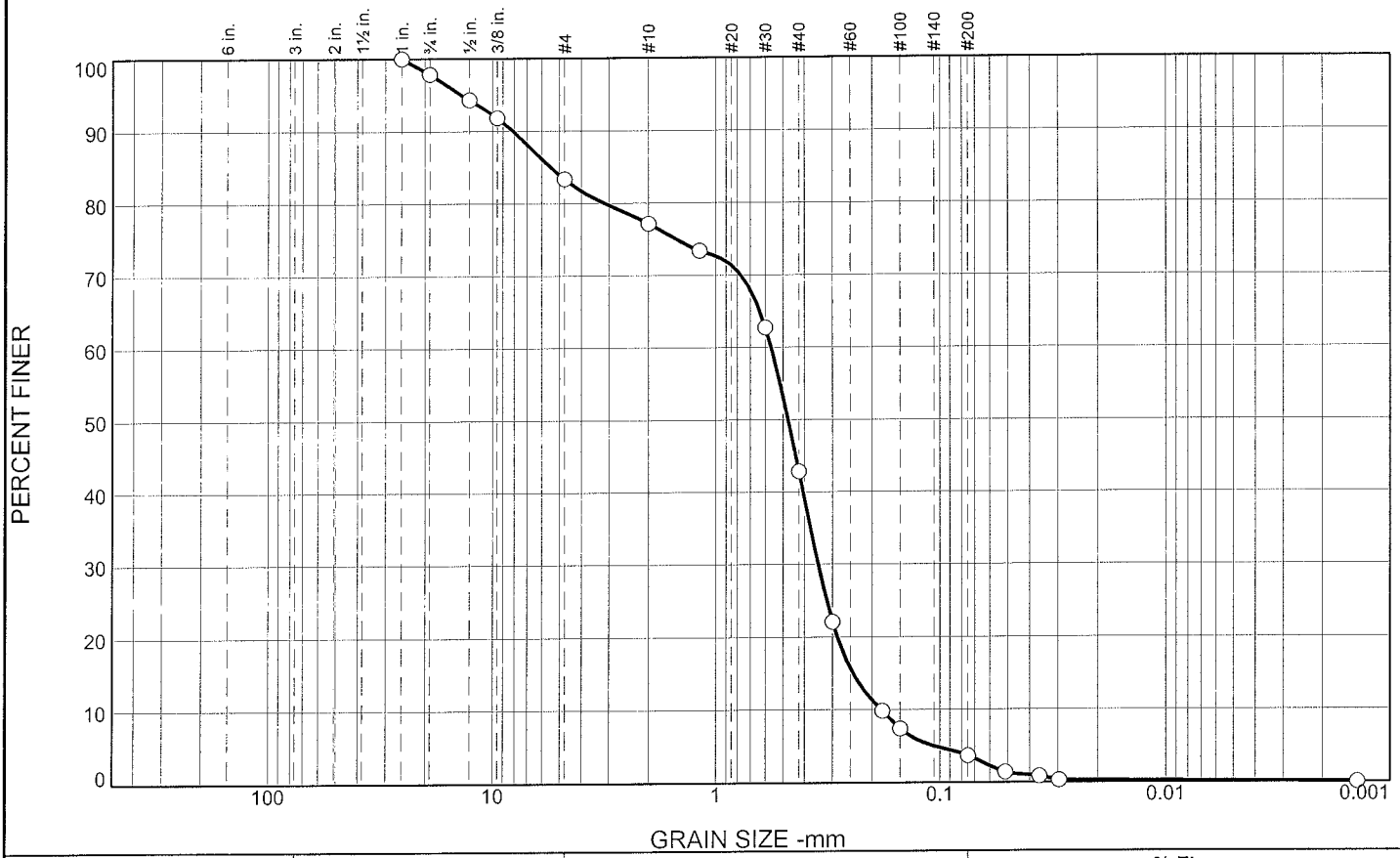
Date: 5/10/12

CGC, Inc.

Client: NRT
Project: Marinette (NRT# 1549)
Project No: C11059-4 **Figure**

Tested By: DRW/KJS **Checked By:** DAS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.2	14.5	6.1	34.3	39.2	3.5	0.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
3/4	97.8		
1/2	94.3		
3/8	91.8		
#4	83.3		
#10	77.2		
#16	73.4		
#30	62.7		
#40	42.9		
#50	22.1		
#80	9.8		
#100	7.4		
#200	3.7		

* (no specification provided)

Material Description

Black Fine to Medium Sand, Some Gravel, Trace Silt and Organics

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 8.0944 D_{85}= 5.4973 D_{60}= 0.5654
D_{50}= 0.4745 D_{30}= 0.3479 D_{15}= 0.2432
D_{10}= 0.1822 C_u= 3.10 C_c= 1.17

Classification

USCS= SP AASHTO= A-1-b

Remarks

Natural Moisture = 26.8%
Organic Content = 1.7%
Specific Gravity = 2.66

Sample Number: 042012389

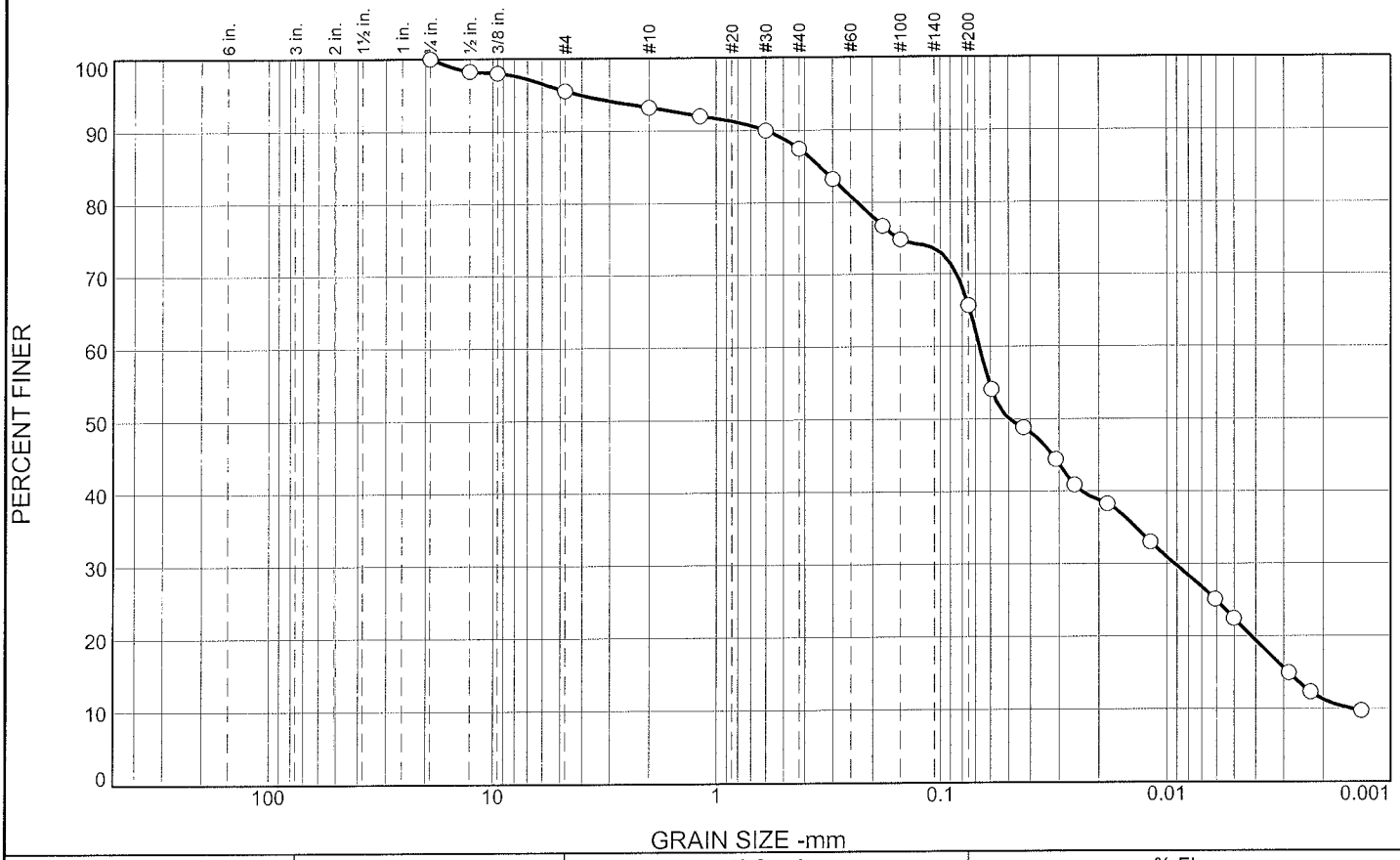
Date: 5/10/12

CGC, Inc.

Client: NRT
Project: Marinette (NRT# 1549)
Project No: C11059-4 **Figure**

Tested By: DRW/KJS **Checked By:** DAS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.4	2.4	5.7	21.8	43.3	22.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4	100.0		
1/2	98.3		
3/8	98.0		
#4	95.6		
#10	93.2		
#16	92.0		
#30	90.0		
#40	87.5		
#50	83.2		
#80	76.7		
#100	74.8		
#200	65.7		

* (no specification provided)

Material Description

Gray to Tan Silt, Some Sand, Trace Gravel and Organics

Atterberg Limits

PL= 13 LL= 15 PI= 2

Coefficients

D_{90}= 0.6026 D_{85}= 0.3438 D_{60}= 0.0671
D_{50}= 0.0496 D_{30}= 0.0092 D_{15}= 0.0029
D_{10}= 0.0015 C_u= 45.63 C_c= 0.86

Classification

USCS= ML AASHTO= A-4(0)

Remarks

Natural Moisture = 19.0%
Organic Content = 3.9%
Specific Gravity = 2.68

Sample Number: 042012390

Date: 5/10/12

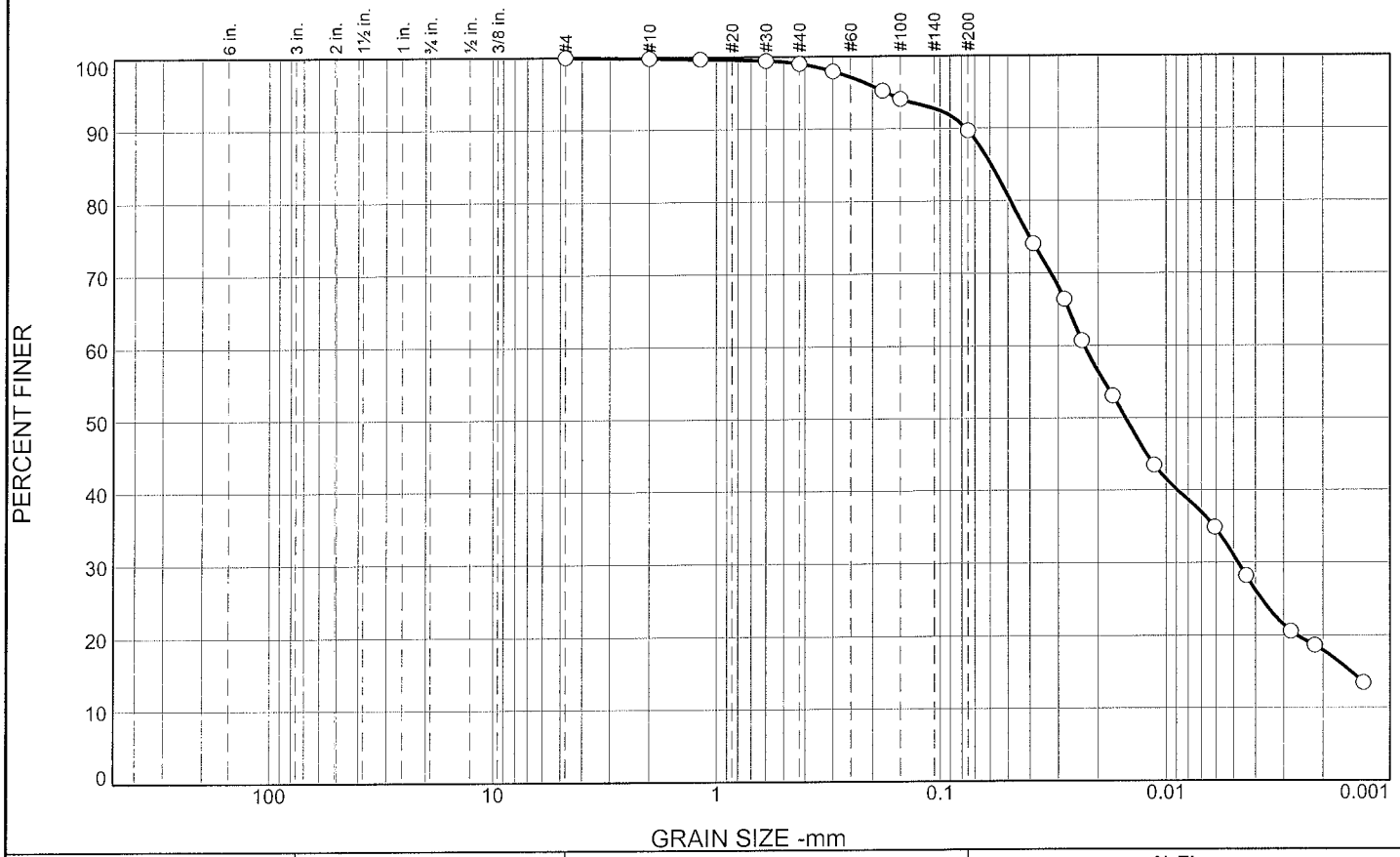
CGC, Inc.

Client: NRT
Project: Marinette (NRT# 1549)

Project No: C11059-4 **Figure**

Tested By: DRW/KJS **Checked By:** DAS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	0.8	9.3	58.7	31.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.8		
#16	99.7		
#30	99.4		
#40	99.0		
#50	97.9		
#80	95.2		
#100	94.1		
#200	89.7		

* (no specification provided)

Material Description

Gray to Tan Organic Silty Clay, Little Sand

Atterberg Limits

PL= 14 LL= 19 PI= 5

Coefficients

D_{90}= 0.0765 D_{85}= 0.0593 D_{60}= 0.0231
D_{50}= 0.0151 D_{30}= 0.0048 D_{15}= 0.0015
D_{10}= C_u= C_c=

Classification

USCS= OL AASHTO= A-4(1)

Remarks

Natural Moisture = 19.5%
Organic Content = 4.7%
Specific Gravity = 2.74

Sample Number: 042012391

Date: 5/10/12

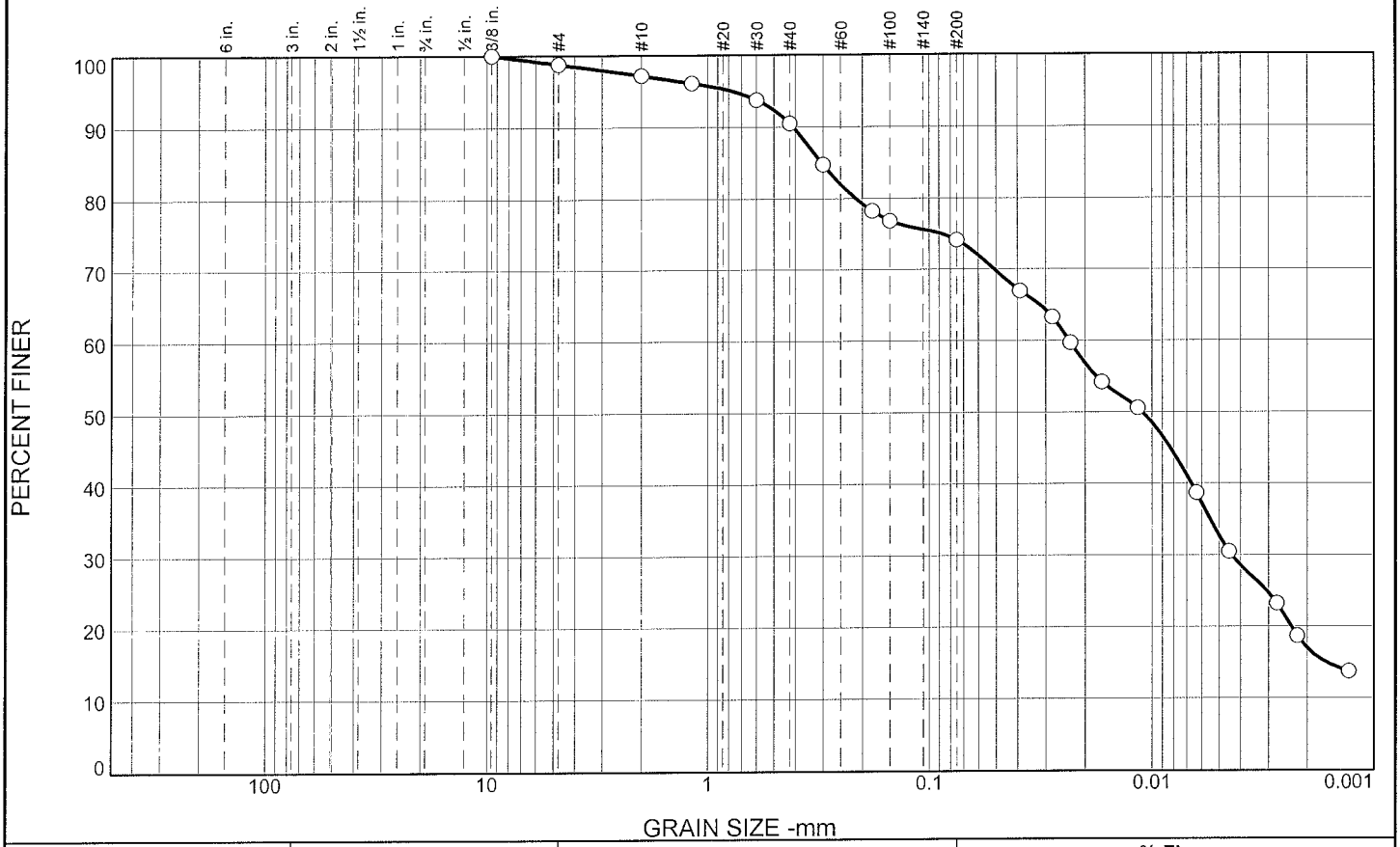
CGC, Inc.

Client: NRT
Project: Marinette (NRT# 1549)

Project No: C11059-4 **Figure**

Tested By: DRW/KJS **Checked By:** DAS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.2	1.6	6.7	16.4	41.4	32.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8	100.0		
#4	98.8		
#10	97.2		
#16	96.1		
#30	93.8		
#40	90.5		
#50	84.8		
#80	78.2		
#100	76.9		
#200	74.1		

* (no specification provided)

Material Description

Black Organic Clay, Some Sand, Trace Gravel

Atterberg Limits

PL= 13 LL= 22 PI= 9

Coefficients

D_{90}= 0.4104 D_{85}= 0.3044 D_{60}= 0.0236
D_{50}= 0.0111 D_{30}= 0.0044 D_{15}= 0.0017
D_{10}= C_u= C_c=

Classification

USCS= OL AASHTO= A-4(4)

Remarks

Natural Moisture = 24.1%
Organic Content = 5.1%
Specific Gravity = 2.77

Sample Number: 042012392

Date: 5/10/12

CGC, Inc.

Client: NRT
Project: Marinette (NRT# 1549)

Project No: C11059-4 **Figure**

Tested By: DRW/KJS **Checked By:** DAS

ALSO SEE ELECTRONIC SAMPLE CONTROL

Sample Control Log

1549-SCL-2011 RI-002

Project Name: WPSC Marinette MGP Site

Project ID: 1549 / CERCLIS ID - WIN000509952

Task ID:

Analytical Laboratory: PACE / Test America

Geotechnical Laboratory:

Field Staff ID(s): JJW, NDK

	Month (2-digit)	Date (2-digit)	Year (2-digit)	Sample Number (3-digit)	Unique Sample ID	Sample Media	Sample Location	Sample Depth (feet)	QC Sample Information (duplicate, blank, etc...)	COC Number	Notes (turnaround time, handling notes
12:40	04	16	12	300	041612300	Sed	TO7N-Native	0-2		1549301 1549301TA (TOC)	Standard
13:20	04	16	12	301	041612301			2-3.5			
13:40	04	16	12	302	041612302			~~2-3.5~~ 3.5-5.5			
13:40	04	16	12	303	041612303			5.5-7.5			
13:50	04	16	12	304	041612304			7.5-9.5			
13:50	04	16	12	305	041612305			9.5-11.5			
14:00	04	16	12	306	041612306			11.5-12.5			
~~14:00~~ 17:00	04	16	12	307	041612307	W	Equip. Blank	Split Spoon DI water			1549303
13:05	04	17	12	308	041712308	Sed	TO4B NATIVE	0-0.5			Replicate
1305	04	17	12	309	041712309	SED	TO4B NATIVE	0.5-1.5			Replicate
1310	04	17	12	310	041712310	SED		1.5-2.5			Replicate
13:15	04	17	12	311	041712311	SED	QC(DUP)	1.5-2.5	TO4B Native 1.5-2.5		
13:10	04	17	12	312	041712312	SED	TO4B NATIVE	2.5-3.5	MS/MSD		Replicate
14:05	04	17	12	313	041712313	SED	TO4B NATIVE	3.5-5.5			
14:20	04	17	12	314	041712314	SED	TO4B NATIVE	5.5-7.5		1549301 1549301TA (TOC)	

7

Natural Resource Technology

Sample Control Log

1549-SCL-2011 RI-002

Project Name: WPSC Marinette MGP Site

Project ID: 1549 / CERCLIS ID - WIN000509952

Task ID:

Analytical Laboratory:

Geotechnical Laboratory:

Field Staff ID(s):

	Month (2-digit)	Date (2-digit)	Year (2-digit)	Sample Number (3-digit)	Unique Sample ID	Sample Media	Sample Location	Sample Depth (feet)	QC Sample Information (duplicate, blank, etc...)	COC Number	Notes (turnaround time, handling notes
14:25	04	17	16	315	041712315	SED	T04B NATIVE	7.5-9.5		1549315 1549301TA (TOC)	
14:35	04	17	16	316	041712316		↓	9.5-11.5		↓	
14:50	04	17	17	317	041712317	SED	T04B NATIVE	11.5-12.3		1549301 1549301TA(TOC)	
9:00				318			T06N-1- NATIVE	0-1.5		1549302	16 PAH only
9:00				319				1.5-2.5		1549302 1549301TA(TOC)	
9:30				320				2.5-3.5		1549302	BTEX & 16 PAH only
9:30				321				3.5-4.5		1549302 1549301TA (TOC)	
9:55				321D				4.5-5.5		1549302	16 PAH only
10:20				323				5.5-7.5		1549302 1549301TA (TOC)	
10:45				324				7.5-9.5		↓	
10:55				325			↓	9.5-11.5		↓	
10:55				326			T06N-1- NATIVE	11.5-13.0		1549302 1549301TA (TOC)	
15:45				327			T02A8 NATIVE	0-2'		1549302	16 PAH only (T02A8 in PICS)
15:50				328			↓	2-4		1549302	METALS, 16 PAH, BTEX only
16:00				329			↓ NATIVE T02A8	4-6		1549302	BTEX 16 PAH only

Natural Resource Technology

Sample Control Log

1549-SCL-2011 RI-002

Project Name: WPSC Marinette MGP Site

Project ID: 1549 / CERCLIS ID - WIN000509952

Task ID:

Analytical Laboratory:

Geotechnical Laboratory:

Field Staff ID(s):

	Month (2-digit)	Date (2-digit)	Year (2-digit)	Sample Number (3-digit)	Unique Sample ID	Sample Media	Sample Location	Sample Depth (feet)	QC Sample Information (duplicate, blank, etc...)	COC Number	Notes (turnaround time, handling notes
16:10	04	17	12	330	041712330	SED	TOSAB NATIVE	6-8		1549302	PAH BTEX ONLY TOSAB in PH
16:20	〃	〃	〃	331	041712331	SED	TOSAB NATIVE	8-10		1549302 1549302TA (TOC)	
17:00	04	~~17~~	12	332	041712332	WATER	~~Split Spoon~~ DI Water	Equipmt Blank	~~Rinsate Blank~~	1549303	Metals, TOC, 16 PAH, BTEX
10:55	04	18	12	333	041812333	TO6HH1 Native	0-0.5	SED		1549304	BTEX, PAH, METALS
11:00	04	18	12	334	041812334	TO6HH1 Native	0.5-2.5	SED		1549304 1549303TA	~~BTEX & PAH only~~
11:30	04	18	12	335	041812335	TO6HH1 Native	2.5-4.5	SED		~~1549304~~ NDC 1549002	Archive * ~~BTEX & PAH only~~
11:40	04	18	12	336	041812336	SED	NATIVE TO6HH1	4.5-5.5		1549002	Archive * Screen
11:40	04	18	12	337	041812337	SED	NATIVE TO6HH1	5.5-6.5		1549002	Archive * Screen
	04	18	12	338	041812338	SED	NATIVE TO6HH2	2.5-3.5		1549002	Archive * Screen
3:20	04	18	12	339	041812339	SED	NATIVE TO6HH2	3.5-4.5		1549304	BTEX & 16 PAH * Screen
3:40	04	18	12	340	041812340	SED	NATIVE TO6HH2	4.5-5.3		1549304	BTEX & 16 PAH
5:10	04	18	12	341	041812341	〃	NATIVE TOSN	0-2'		〃	BTEX, 16 PAH, METALS
5:20	04	18	12	342	041812342	〃	NATIVE TOSN	2-4'		〃	~~Archive~~ * Screen 16 PAH BTEX
5:35	04	18	12	343	041812343	SED	NATIVE TOSN	6'-6.7'		1549304	BTEX, 16 PAH,
7:20	04	18	12	344	041812344	Water	~~Equipmt Blank~~	~~Split Spoon~~ DI WATER		1549303	METALS, TOC, 16 PAH BTEX

Natural Resource Technology

Sample Control Log

1549-SCL-2011 RI-002

Project Name: WPSC Marinette MGP Site

Project ID: 1549 / CERCLIS ID - WIN000509952

Task ID:

Analytical Laboratory:

Geotechnical Laboratory:

Field Staff ID(s):

	Month (2-digit)	Date (2-digit)	Year (2-digit)	Sample Number (3-digit)	Unique Sample ID	Sample Media	Sample Location	Sample Depth (feet)	QC Sample Information (duplicate, blank, etc...)	COC Number	Notes (turnaround time, handling notes
11:25	04	~~12~~ 19	12	345	041912345	SED	T02A-NATIVE	0-2		1549304	16 PAH only
9:30	04	19	12	346	041912346	↓	↓	2-4		↓	BTEX & 16 PAH only
10:10	04	19	12	347	041912347	↓	↓	6-8		↓	BTEX & 16 PAH only
10:25	04	19	12	348	041912348	SED	T02A NATIVE	8-88'		1549304	BTEX & 16 PAH only
16:00	04	19	12	349	041912349	WATER	~~Equipm't~~ Blank	Split Spoon DI WATER		1549303	16 PAH, BTEX, TOC, METALS
12:00	04	19	12	350	041912350	SED	T04N-NATIVE	2-4		1549002	Archived *Screen
12:10	04	19	12	351	041912351	↓	↓	4-5		1549304	BTEX & 16 PAH *Scree
12:19	04	19	12	352	041912352	↓	↓	5-6		↓	BTEX & 16 PAH *Scree
~~12:20~~	~~04~~	~~19~~	~~12~~	~~353~~	~~041912353~~	↓	T04N-NATIVE	6-8		↓	~~16 PAH only~~ *Screen
12:40	04	19	12	354	041912354	SED	T04N NATIVE	~~10-11.5~~ MDL 10-10.6		1549304	16 PAH only
14:30	04	19	12	355	041912355	↓	T04N NATIVE-1	10-10.5	QC11	1549304	~~BTEX~~ Standard *Scree
14:35	04	19	12	356	041912356	↓	T04N NATIVE	~~QC (DUP)~~	10.0-10.5	1549304	BTEX Standard *Scree
14:30	04	19	12	357	041912357	SED	T04N-NATIVE	10.5-11.2	MS/MSD	1549304 1549301TA	B Standard
14:40	04	19	12	358	041912358	↓	T03HH-NATIVE	2-2.5		1549304	BTEX & 16 PAH
14:40	04	19	12	359	041912359	SED	T03HH-NATIVE	2.5-4.5		1549304 1549301T/A	Standard *Screen

Natural Resource Technology

Sample Control Log

1549-SCL-2011 RI-002

Project Name: WPSC Marinette MGP Site

Project ID: 1549 / CERCLIS ID - WIN000509952

Task ID:

Analytical Laboratory:

Geotechnical Laboratory:

Field Staff ID(s):

Month (2-digit)	Date (2-digit)	Year (2-digit)	Sample Number (3-digit)	Unique Sample ID	Sample Media	Sample Location	Sample Depth (feet)	QC Sample Information (duplicate, blank, etc...)	COC Number	Notes (turnaround time, handling notes
04	19	12	360	041912360	TO3HH NATIVE	4.5-5.5	SED		1549002	Archive
04	19	12	361	041912361	↓	5.5-6.5	↓		↓	↓
04	19	12	362	041912362	↓	6.5-7.5	↓		↓	↓
04	19	12	363	041912363	NATIVE TO3HH -	7.5-8.5	SED		1549002	Archive
04	20	12	372	042012372	TO3HH	3.5-4.5	SED ML	NR 347 Composite Sample	1549306	1549301TA
↓	↓	↓	↓	↓	TO3HH	4.5-5.5	↓	↓	↓	↓
↓	↓	↓	↓	↓	TO3HH	5.5-6.1	↓		↓	↓
04	20	12	373	042012373	TO4N	1.5-2.5	SED ML	NR 347 Composite Sample	1549306	1549301TA
↓	↓	↓	↓	↓	TO4N	2.5-3.5	↓	↓	↓	↓
04	20	12	374	042012374	TO3A-3	2.5-3.5	SED ML	NR 347 Composite Sample	1549306	1549301TA
↓	↓	↓	↓	↓	TO3A3	3.5-4.5	↓	↓	↓	↓
↓	↓	↓	↓	↓	TO3A3	4.5-4.9	↓	↓	↓	↓
04	20	12	375	042012375	TO4N	0.5-1.5	SED Sand	NR347 Composite	1549306	1549301TA
↓	↓	↓	↓	↓	TO4N	3.5-4.5	↓	↓	↓	↓
				BGH						

Screen

Screen

Natural Resource Technology

Sample Control Log

1549-SCL-2011 RI-002

Project Name: WPSC Marinette MGP Site

Project ID: 1549 / CERCLIS ID - WIN000509952

Task ID:

Analytical Laboratory:

Geotechnical Laboratory:

Field Staff ID(s):

	Month (2-digit)	Date (2-digit)	Year (2-digit)	Sample Number (3-digit)	Unique Sample ID	Sample Media (name)	Sample Location	Sample Depth (feet) (Media)	QC Sample Information (duplicate, blank, etc...)	COC Number	Notes (turnaround time, handling notes
1040	04	20	12	376	042012376	T04SW3	3.5-4.5	SED sand	NR347 composite	1549306	1549301TA
	↓	↓	↓	↓	↓	T04SW3	4.5-5.7	↓	↓	↓	↓
1046	04	20	12	377	042012377	T05N-2	1.5-2.2	SED sand	NR347 composite	1549306	1549301TA
	↓	↓	↓	↓	↓	T04HH	2.5-3.5	↓	↓	↓	↓
1054	04	20	12	378	042012378	T05A1	0.5-1.5	SED lower silt	NR347 composite	1549306	1549301TA
	↓	↓	↓	↓	↓	T05A1	1.5-2.1	↓	↓	↓	↓
100	04	20	12	379	042012379	T05A3	0.5-1.5	SED lower silt	NR 347 composite	1549306	1549301TA
	↓	↓	↓	↓	↓	T05A3	1.5-2.5	↓	↓	↓	↓
110	04	20	12	380	042012380	T09A6	0.5-1.5	SED lower silt	NR347 Composite	1549306	1549301TA
	↓	↓	↓	↓	↓	T09A6	1.5-2.3	↓	↓	↓	↓
125	04	20	12	381	042012381	Sample ID's 042012372		vol. (2 hmd full)	Protocol B composite of NR347 materials	1549303 NDK	
	↓	↓	↓	↓	↓	042012373		↓	↓	↓	↓
						042012374					
						042012375					
						042012376					
						042012377					
2:45	04	20	12	382	042012382	LIQUID WASTE → Composite		Water		1549303	

Natural Resource Technology

Sample Control Log

1549-SCL-2011 RI-002

Project Name: WPSC Marinette MGP Site

Project ID: 1549 / CERCLIS ID - WIN000509952

Task ID:

Analytical Laboratory:

Geotechnical Laboratory:

Field Staff ID(s):

Month (2-digit)	Date (2-digit)	Year (2-digit)	Sample Number (3-digit)	Unique Sample ID	Sample Media	Sample Location	Sample Depth (feet)	QC Sample Information (duplicate, blank, etc...)	COC Number	Notes (turnaround time, handling notes
13:20 04	20	12	383	042012383	Sample ID #'s	042012381 042012312 042012313 042012314 042012315 042012316 042012317	Sample location T04N 0-0.5 1.5-2.5 2.5-3.5	GEO TECHNICAL	CGC→ 1549201CGC	Similar material to NR 347 composite SILT & SAND GEO TECHNICAL SAMPLE
13:40 04	20	12	384	042012384		T05H H3 T05N2 T06D T06A T06N1			CGC→ 1549201CGC	SILT GEO TECHNICAL SAMPLE
13:45 04	20	12	385	042012385		T04HH T04A T04B			1549201CGC	SILT GEO TECHNICAL SAMPLE
13:50 04	20	12	386	042012386		T03A3 T03A1 T03A T03B3			1549201CGC	SILT GEO TECHNICAL SAMPLE
14:00 04	20	12	387	042012387		T04A1, T04SW3 T04N				SAND GEOTECHNICAL SAMPLE
14:02 04	20	12	388	042012388	SAMPLE ID #'s	T04B1 T05A2 T04C T05A		GEO TECHNICAL		SAND GEOTECHNICAL

NATURAL RESOURCE TECHNOLOGY

Sample Control Log

1549-SCL-2011 RI-002

Project Name: WPSC Marinette MGP Site
Project ID: 1549 / CERCLIS ID - WIN000509952
Task ID:

Analytical Laboratory:
Geotechnical Laboratory:
Field Staff ID(s):

	Month (2-digit)	Date (2-digit)	Year (2-digit)	Sample Number (3-digit)	Unique Sample ID	Sample Media (Name)	Sample Location	Sample Depth (feet)	QC Sample Information (duplicate, blank, etc...)	COC Number	Notes (turnaround time, handling notes
14:00	04	20	12	389	042012389	SAMPLE ID#'S	T06A1, T06C3, T06NT, T07N		GEOTECHNICAL SAMPLES	1549201CGC	SAND GEO TECHNICAL
14:10	04	20	12	390	042012390		T08A3, T07B, T07N			1549201CGG	Lower SILT GEOTECHNICAL
14:15	04	20	12	391	042012391		T02C, T04B, T06NT, T05A1, T09A3				Lower Silt GEOTECHNICAL
4:20	04	20	12	392	042012392		T09A10, ~~T0420~~ 042012380, 042012379, 042012378, T08A5, T09C				Lower Silt GEOTECHNICAL
○	04	20	12	393	042012393	WATER TRIP BLANK			TRIPBLANK	1549303	
							NDK				

NATURAL RESOURCE TECHNOLOGY

APPENDIX B

ACCESS AGREEMENT BETWEEN THE CITY OF MARINETTE AND WPSC

AGREEMENT

This Agreement is executed by and between Wisconsin Public Service Corporation (hereinafter "WPS") and the City of Marinette (hereinafter the "City") and made effective this 1st day of May, 2012.

WHEREAS, in the past, WPS operated a coal gasification processing plant on property now owned by the City, which property is bounded by Mann Street, Ludington Street and Ely Street ("Marinette Gas Plant"); and

WHEREAS, in 1993, WPS and the City entered into an access agreement relating to the investigation of environmental contamination associated with its coal gasification plant supervised by the Wisconsin Department of Natural Resources ("WDNR"); and

WHEREAS, WPS is now engaged with the United States Environmental Protection Agency ("U.S. EPA") in a program to assess and remediate environmental contamination resulting from certain former coal gasification facilities ("Gas Plant Contamination"), including the Gas Plant Contamination related to its former facility located in Marinette, Wisconsin ("Marinette Gas Plant Contamination"); and

WHEREAS, the City is willing to update and supersede the prior 1993 agreement with this new Agreement granting access to WPS, WDNR and U.S. EPA and their contractors, subcontractors, agents and representatives to the property owned by the City as more specifically delineated in **Appendix A** (the "City Property"), so that WPS may investigate and remediate, as appropriate, Marinette Gas Plant Contamination.

NOW, THEREFORE, the City and WPS agree as follows:

1. General Purpose for Access. WPS will investigate and remediate Marinette Gas Plant Contamination in accordance with the final orders, decisions and directives of U.S. EPA, including any consent orders, consent decrees or other orders or final directives of U.S. EPA relating to the Marinette Gas Plant Contamination (the "Work"). WPS entered into an Administrative Settlement Agreement and Order on Consent ("AOC") with U.S. EPA to conduct the Work and may enter into other agreements with U.S. EPA in the future to undertake additional work. A copy of the current AOC is attached as **Appendix B**. The City understands that any Work to be performed on City Property will be in accord with the requirements of the AOC or such other order, decree or other final directives issued by U.S. EPA to WPS.

2. Access for Work/Permits and Approvals. The City grants WPS, WDNR and U.S. EPA and their designated representatives, contractors and subcontractors (the "Access Parties") access to City Property to conduct the Work. WPS will provide the City written notice at least 10 business days prior to initiating the Work (the "Notice") and shall secure from the City all local permits and approvals required by law to conduct the Work. The City acknowledges that under the Comprehensive Environmental Response, Compensation and Liability Act, as amended ("Superfund") WPS is not required to obtain certain permits for the Work. The City will cooperate with WPS, WDNR and U.S. EPA in identifying those permits and approvals, not otherwise exempted, that are necessary for the Work. For those permits and

approvals, not otherwise exempted that are required for the Work, WPS shall submit a timely, complete application to the City for its review and approval.

3. Standards Applicable to Access. All activities covered by this Agreement must be conducted by the Access Parties in a manner that will not unreasonably interfere with the City's use of the City Property without the prior written consent of the City; provided, however, it is understood that in order to undertake the Work WPS will be required to restrict access to City Property in the area of the Boom Landing.

4. Sharing of Information. WPS will provide the City with a copy of the U.S. EPA approved work plan covering the proposed Work at the time of the Notice. In addition, WPS shall provide the City with data and analyses from samples taken from property owned by the City in accordance with the requirements of U.S. EPA, including any relevant consent orders, decrees, approvals or directives (the "Data/Analysis") within 30 days of WPS's approval from U.S. EPA to do so. WPS shall use its best efforts to arrange for the sharing of data and information with the City in accordance with the requirements and directives of U.S. EPA.

5. Restoration. At the completion of the Work, WPS shall restore the City Property to the condition that existed prior to the initiation of the Work, unless the City and WPS agree to an alternate restoration plan, the approval of such alternative plan shall not be unreasonably withheld by the City. Prior to initiating restoration, WPS shall provide the City with a restoration plan for review and comment. All restoration plans and activities shall be in accordance with this Agreement and applicable law including any applicable requirements of U.S. EPA.

6. Cooperation on Public Outreach. The City agrees to undertake reasonable efforts to cooperate with requests made by WPS regarding outreach to members of the public during the performance of the Work. Such cooperation may include joint public informational meetings, assistance in informing area residents of the Work, identifying truck routes to and from the areas where the Work will be performed, periodic coordination meetings and providing appropriate web links on the City webpage.

7. Indemnity. Subject to Section 8 below, WPS agrees to hold the City harmless and indemnify it from any and all claims, losses, liabilities, judgments or reasonable expenses arising from (i) Marinette Gas Plant contamination and (ii) the conduct of the Work or the conduct of its contractors or subcontractors while on the City Property (the "Indemnity"). For the avoidance of doubt, if the activities conducted at the former coal gasification plant (whether during the ownership of WPS or its predecessor-in-title) resulted in Gas Plant Contamination on or beneath the City Property or migration of Gas Plant Contamination occurred and remediation of such Gas Plant Contamination is required by U.S. EPA, WPS further agrees, subject to Section 8 below, to hold the City harmless and indemnify it from the expenses of performing such remediation to the extent required by U.S. EPA.

8. Limitations on Indemnity. Nothing in this Agreement, including but not limited to the Indemnity set forth in Section 7 above, shall be construed as covering or applying to any contaminants which are from sources, facilities, locations, structures or activities other

than from the activities of WPS or its predecessor-in-title during the period of WPS's or its predecessor-in-title's operation of the former coal gasification facility (such contaminants not covered by the Indemnity in Section 7 above referred to as "Other Contaminants"). Provided, however, if the contamination at issue was originally generated from the Marinette Gas Plant, the burden of proof shall be upon WPS to establish that the contamination constitutes Other Contamination. In addition, nothing in this Agreement, including but not limited to the Indemnity set forth in Section 7 above, shall be construed as applying to any Other Contaminants that have migrated onto or otherwise come to be located on or beneath the City Property. WPS shall not be responsible for investigating and/or remediating such Other Contaminants under this Agreement. Should WPS be required to remediate Marinette Gas Plant Contamination and should such remediation by WPS also remediate, either in whole or in part, Other Contaminants which either are located on or beneath the City Property or associated with or related to operations of activities of the City (the "Casual Other Contamination") to the extent such Other Contamination contributed to the cost of the work required by U.S. EPA, the City and WPS shall in good faith attempt to allocate the cost of such remediation (the "Cost Allocation"). However, should WPS and the City be unable to reach an agreement on allocating the costs, both WPS and the City reserve any and all claims, rights and/or defenses each may have against the other in such a situation. In the event WPS encounters contaminants that it reasonably believes to constitute Causal Other Contamination, WPS shall provide the City with written notice at least 30 days prior to undertaking any work that it believes will be subject to the Cost Allocation, unless WPS is unable to provide such notice due to the requirements of U.S. EPA. If 30 days prior notice is not possible given the directives of U.S. EPA, WPS shall provide notice as soon as possible to the City.

9. Notification of Claims. If any claims or demands are made against the City, which claim or demand would be covered by the Indemnity set forth above in Section 7, the City shall promptly notify WPS of the claim or demand in time for WPS to adequately and appropriately respond to such claim or demand. Timeliness of the notice of the claim or demand by the City shall be considered a material condition of this Agreement. Upon receipt of such notice from the City, WPS shall have the right to defend and/or compromise any such claims after notifying the City that WPS agrees that any such claim is covered by the Indemnity. Nothing in this paragraph is intended or shall be construed as a waiver of any procedures necessary to be taken by a third party in order to make a claim , against the City nor is it intended as a waiver of any limitations of liability applicable to a municipal corporation under Wisconsin law.

10. Non-waiver of Rights. Except as otherwise provided herein, neither party waives any rights, remedies or defenses that it has or may have in accordance with the laws of the State of Wisconsin.

11. Notices. During the conduct of the Work or other activities contemplated by this Agreement, the following shall be the contact persons for the parties:

a. for WPS:

Brian F. Bartoszek
Manager-Remediation & Solid Waste
Integrys Business Support LLC
P. O. Box 19001
Green Bay, WI 54307-9001
Email – *BFBartoszek@integrysgroup.com*

b. for the City:

Marinette City Attorney
P. O. Box 135
Marinette, WI 54143
Email – [_____]JSbar@marinette.wi.us

Notices may be sent via e-mail provided, however, that notices relating to Section 9 shall be sent by Certified Mail.

12. Entire Agreement. This Agreement constitutes the entire understanding of the parties with respect to this matter.

13. Governing Law. This Agreement shall be governed by the internal laws of the State of Wisconsin.

14. Counterparts. The Parties agree that this Agreement may be signed electronically and exchanged between each other either digitally or by facsimile. This Agreement shall be deemed effective upon receipt by each Party, either electronically or by mail, of the other Party's signed copy of this Agreement.

15. Termination. This Agreement may be terminated by the City at any time for cause by the City providing at least 60 days prior written notice of such termination, which 60 days shall be calculated from the date the termination is deemed effective (the "Termination Date"). As of the Termination Date, this Agreement shall be deemed to be null and void, and the parties shall have such rights that exist under applicable law in the absence of this Agreement

IN WITNESS WHEREOF, the parties shall have caused this Agreement to be duly executed as of the date first above written.

WISCONSIN PUBLIC SERVICE CORPORATION

By Connie K. Lawniczak
[Name] Connie K. Lawniczak
[Title] Director - Environmental Services

CITY OF MARINETTE, Wisconsin, a municipal corporation

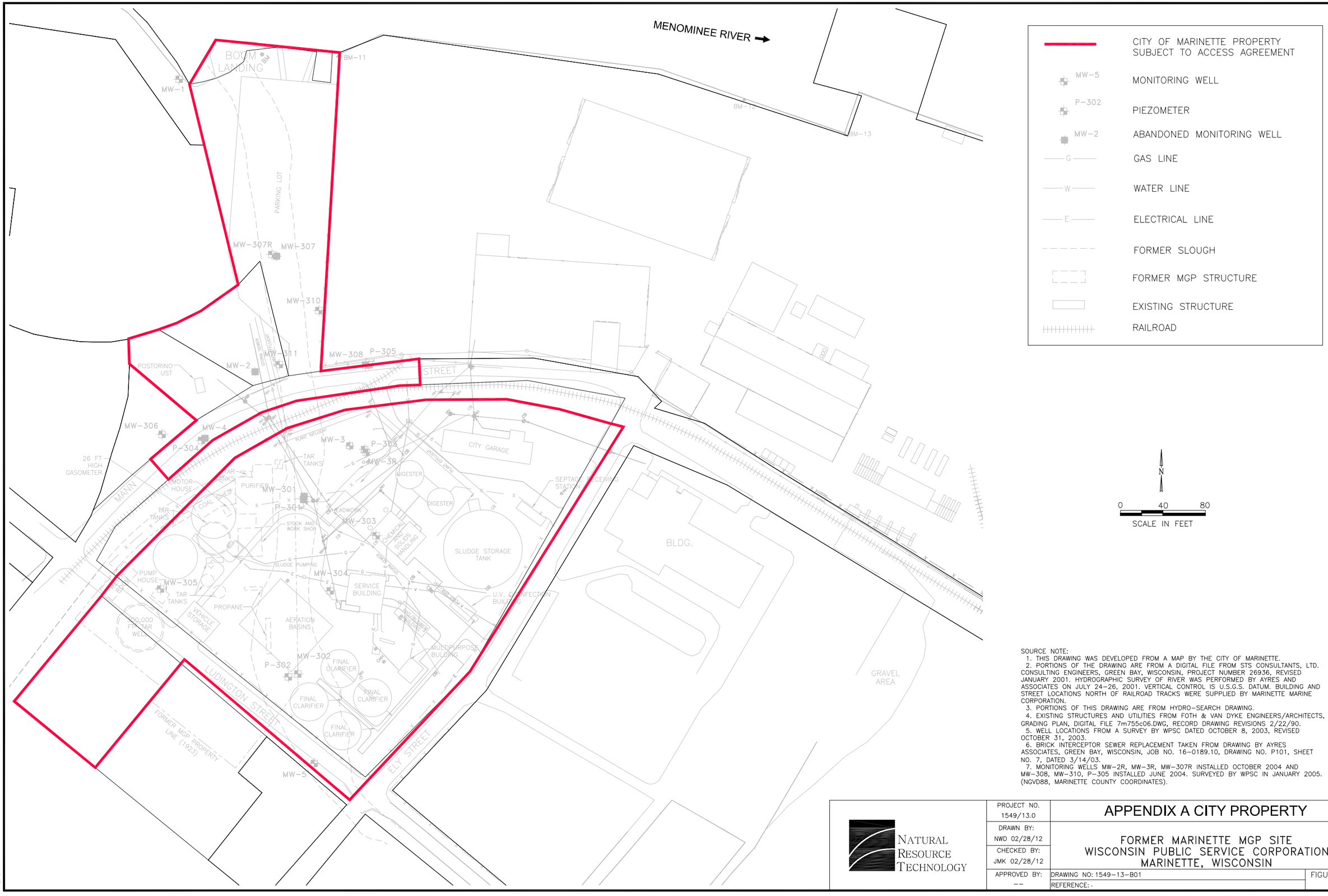
By _____
[Name] Denise J. Ruleau
[Title] Mayor

ATTEST:

By _____
Its City Clerk

APPENDIX A

[Delineation of property]



SOURCE NOTE:
1. THIS DRAWING WAS DEVELOPED FROM A MAP BY THE CITY OF MARINETTE.
2. PORTIONS OF THE DRAWING ARE FROM A DIGITAL FILE FROM STS CONSULTANTS, LTD. CONSULTING ENGINEERS, GREEN BAY, WISCONSIN, PROJECT NUMBER 26936, REVISED JANUARY 2001. HYDROGRAPHIC SURVEY OF RIVER WAS PERFORMED BY AYRES AND ASSOCIATES ON JULY 24–26, 2001. VERTICAL CONTROL IS U.S.G.S. DATUM. BUILDING AND STREET LOCATIONS NORTH OF RAILROAD TRACKS WERE SUPPLIED BY MARINETTE MARINE CORPORATION.
3. PORTIONS OF THIS DRAWING ARE FROM HYDRO–SEARCH DRAWING.
4. EXISTING STRUCTURES AND UTILITIES FROM FOTH & VAN DYKE ENGINEERS/ARCHITECTS, GRADING PLAN, DIGITAL FILE 7m755c06.DWG, RECORD DRAWING REVISIONS 2/22/90.
5. WELL LOCATIONS FROM A SURVEY BY WPSC DATED OCTOBER 8, 2003, REVISED OCTOBER 31, 2003.
6. BRICK INTERCEPTOR SEWER REPLACEMENT TAKEN FROM DRAWING BY AYRES ASSOCIATES, GREEN BAY, WISCONSIN, JOB NO. 16–0189.10, DRAWING NO. P101, SHEET NO. 7, DATED 3/14/03.
7. MONITORING WELLS MW–2R, MW–3R, MW–307R INSTALLED OCTOBER 2004 AND MW–308, MW–310, P–305 INSTALLED JUNE 2004. SURVEYED BY WPSC IN JANUARY 2005. (NGVD88, MARINETTE COUNTY COORDINATES).

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1549/13.0	APPENDIX A CITY PROPERTY	
DRAWN BY: NWD 02/28/12	FORMER MARINETTE MGP SITE WISCONSIN PUBLIC SERVICE CORPORATION MARINETTE, WISCONSIN	
CHECKED BY: JMK 02/28/12		
APPROVED BY: --	DRAWING NO: 1549–13–B01	FIGURE NO. 1
	REFERENCE: .	

Feb 28, 2012 2:18pm PLOTTED BY: ndraskovich SAVED BY: ndraskovich
X:\ACAD\data\Projects\15\1549 Marinette\13\1549–13–B01.dwg WI–PT
IMAGES:
XREFS:

APPENDIX B

[Administrative Settlement Agreement and Order on Consent]

APPENDIX C

FINAL DESIGN REPORT, TEMPORARY COFFERDAM (ENGINEERING PARTNERS INTERNATIONAL)

ENGINEERING PARTNERS
INTERNATIONAL LLC

1299 Eagan Industrial Road, Suite 201
Eagan, Minnesota 55121
Phone: 651.209.0108 | Fax: 651.209.0109
www.engineeringpartners.net

FINAL DESIGN REPORT

Temporary Cofferdam

Sediment Removal Action
Former Marinette MGP Site
Wisconsin Public Service Corporation
Marinette, Wisconsin

August 29, 2012

Submitted to

Natural Resource Technology, Inc.

Pewaukee, Wisconsin

ENGINEERING PARTNERS INTERNATIONAL LLC

FINAL DESIGN REPORT
TEMPORARY COFFERDAM
SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
Marinette, Wisconsin
August 29, 2012
EPI Project No. 12.232

1.0 PROJECT SUMMARY

The proposed removal actions for the referenced project will remove contaminated sediments from portions of the Menominee River. The removal actions will occur in two separate areas along the south shoreline of the river, one near Boom Landing and one at Nestegg Marina.

The removal actions will be completed in the "wet" using mechanical dredging methods. A temporary cofferdam will be constructed around the main dredge area near Boom Landing to isolate the removal area and contain suspended sediments during dredging operations. No dewatering will occur within the cofferdam. The purpose of the cofferdam is to reduce the potential for contaminated sediment and non-aqueous phase liquid (NAPL) coal tar transport down river during dredging, and not to facilitate dewatering during sediment removal.

The area of planned sediment removal is adjacent to existing sheet pile dock walls at Boom Landing, Nestegg Marina, and Marinette Marine. The existing sheet pile walls were constructed at various times. Design documents are available for the Boom Landing sheet pile walls and boat ramp; however, to our knowledge, design or as-built drawings are not available for the sheet pile walls on the Nestegg and Marinette Marine properties.

Bedrock in the sediment removal areas is relatively shallow and it is anticipated that the sheet piles at the existing dock walls were driven to the top of bedrock at the time of construction. Dredging adjacent to the existing sheet pile walls will remove some or all of the soil support in front of the walls. As a result, a phased dredging approach is required to reduce the potential for excessive movement of the existing walls.

This report summarizes the design of the temporary cofferdam and the phased dredging approach required to protect existing sheet pile walls in the dredge area. A copy of the temporary sheet pile cofferdam design and construction drawings are included in Attachment A of this report; a copy of our analyses is included in Attachment B.

2.0 SITE DESCRIPTION

The former Marinette MGP site is located on the Menominee River approximately 1.5 miles west of the inlet to Lake Michigan. The site lies between the Marinette Marine facility to the east and Nestegg Marina to the west.

The water level in the Menominee River is typically in the range of 577 to 578 feet (NAVD 88 datum), with an ordinary high water (OHW) level of 578.6 feet. The water level in the river typically does not change rapidly and is largely controlled by the water level in Lake Michigan.

The river bed (mudline) elevation in the dredge areas ranges from approximately 568 to 575 feet, resulting in water depths on the order of about 2 to 10 feet. There is an existing sand bar in the river north of Boom Landing and east of Nestegg Marina. The sand bar parallels the river and is about 400 feet long by 40 feet wide. The top of the sand bar is at approximately elevation 575 feet.

The top of bedrock in the area of this site ranges from approximately elevation 560 to 567 feet, with elevations in the range of 562 to 564 feet common in the area of the proposed cofferdam. This results in sediment thicknesses of approximately 4 to 13 feet in the dredge areas. The sediment generally consists of a mixture of very loose sand and soft to very soft silt, clay, and organics. Based on obstructions and reduced sample recoveries during sediment coring activities completed by Natural Resource Technology, Inc. (NRT) the sediment contains a significant amount of debris.

A layer of firm to stiff clay or medium dense sand is often present within about 2 feet of the top of bedrock elevation. In general, the sediments in the sand bar are of a relatively higher consistency / relative density than the sediments outside the sand bar. The bedrock in this area generally consists of limestone.

The anticipated dredge depths vary considerably, but are expected to be up to about 10 feet below existing mud line. In some cases, dredging will remove all sediment down to the top of bedrock elevation.

Existing grade along the south shoreline of the river ranges from approximately elevation 582 to 584 feet. The topography of the south shoreline is relatively flat to gently sloping. Existing sheet pile walls line portions of the shoreline along the Marinette Marine property, Boom Landing, and Nestegg Marina.

There is a sewer outfall structure that discharges sanitary and storm water sewer flows to the river between Boom Landing and Nestegg Marina. This outfall structure will be reconstructed as part of an upland barrier wall construction (designed by others) associated with this sediment removal project. Sewer flows will be bypassed outside of the cofferdam cell during dredging operations.

3.0 TECHNICAL APPROACH

The design of the temporary containment cofferdam is based on the following criteria:

- Top of temporary cofferdam sheet piles at elevation 582.0
- Water elevation inside and outside the cofferdam at elevation 577 to 578
- Up to 1 foot of differential water level will be allowed between the inside and outside of the cofferdam
- Existing mudline elevation along the sheet pile alignment ranges from elevation 568 to 575
- Bottom of excavation (dredge line) at the sheet pile cofferdam will be less than 1 foot. Additional dredge offsets and limitations will be applied to account for reduced sheet pile embedment below mudline due to shallow bedrock
- Top of bedrock elevation along the sheet pile alignment ranges from 560 to 564
- Minimum sheet pile embedment will be 9 feet for the east and west walls and 7 feet for the north wall that is embedded in the sand bar
- Ice loads (static and dynamic) are not considered in the sheet pile design and measures will be required to prevent ice loading (both inside and outside the cofferdam)
- No mooring of equipment or barges to the cofferdam sheet pile will be allowed

The presence of relatively soft sediments overlying shallow bedrock limits the amount of differential water head and soil pressures, as well as the amount of ice load that can be resisted by the sheet pile. Limiting differential water head to less than 1 foot, maintaining the specified dredge offsets from the sheet pile, and preventing ice loads against the sheet pile is critical to the overall performance of the cofferdam.

3.1 Geotechnical Design Parameters

Sediments in the river generally consist of very loose sand and soft to very soft silt, clay, and organics. A layer of firm to stiff clay or medium dense sand is present within about 2 feet of the top of bedrock elevation at some locations. The mud line and top of limestone bedrock elevations along the cofferdam alignment vary.

Geotechnical design parameters (GDP) used to analyze and design the sheet pile cofferdam were developed based on subsurface information presented on the logs of borings drilled in April 2012 for this project. Copies of pertinent boring logs used in our analyses are included in Attachment B. The GDPs used for the cofferdam analysis and design are summarized in Table 1.

TABLE 1
GEOTECHNICAL DESIGN PARAMETERS
SHEET PILE COFFERDAM

Unit	Thickness (ft) *(1)*	Description	SPT Value	Friction Angle (deg.)	Cohesion (psf)	Unit Weight (pcf)
1	varies	Very loose/soft sediment *(2)*	1	22	0	90
2	varies	Medium Dense/Stiff Sand/Clay	12	36	0	120
3	--	Limestone Bedrock	50+	48	5000	155

Keynotes:
(1) Thickness varies with bedrock and mud line elevation. The analyses for various locations along the cofferdam consider the varying thickness of sediment and soil layers overlying bedrock.
(2) The friction angle and unit weight are increased to 26 deg. and 100 pcf, respectively, for the sand bar (i.e., evaluation of the north cofferdam wall).

3.2 Cofferdam Analyses

The cofferdam sheet pile was analyzed using Civil Tech Shoring Suites V.8 software. The GDPs described above were used as input parameters in the analyses.

Unbalanced water pressures were varied in the analyses to determine a maximum allowable unbalanced water pressure between inside and outside of the cofferdam. As the unbalanced water pressure was increased, the required pile embedment depth into the sediment increased until further increase would require pile embedment in bedrock. The unbalanced water pressure resulting in a pile tip elevation at the top of bedrock was assumed to be the maximum allowable unbalanced water level. In this case, our analyses indicate that an unbalanced water level of 1 foot is the maximum allowable for this project.

Because of the limited sheet pile embedment depths in the sediment along the east and west legs of the cofferdam, no dredging will be allowed within 10 feet of the east wall and within 20 feet of the west wall of the cofferdam sheet pile without further engineering review. Although dredging directly up against the north wall of the cofferdam is not anticipated, a limited amount of dredging up to the sheet pile cofferdam (as discussed below) is permitted along the north wall of the cofferdam, which is embedded in the sand bar.

Although dredging up to the north wall of the temporary sheet pile cofferdam is not anticipated, the allowable dredge depths at the north cofferdam wall were analyzed. To analyze the allowable dredge depth against the north wall of the cofferdam, the dredge depths were gradually increased until the resulting pile tip embedment depth equaled the top of bedrock. The corresponding dredge depth is taken as the maximum allowable dredge depth at the north wall of the cofferdam. Our analyses indicate that up to 1 foot of sediment may be dredged along portions of the north wall of the cofferdam that are embedded in the sand bar. This assumes a minimum pile embedment depth of 7 feet below existing mudline.

Dredge offsets and dredge depth limits in the vicinity of the cofferdam are summarized on the drawings included in Attachment A. A copy of our cofferdam analyses is included in Attachment B.

3.3 Cofferdam Design

The cofferdam design is summarized on drawings included in Attachment A. The cofferdam consists of PZ22 sheet piles (or alternate sheet pile section of equal or greater section modulus) by 22 feet +/- long (lengths vary depending on bedrock elevation). A minimum 9 feet of embedment in sediment is assumed along the east and west walls of the cofferdam, and 7 feet of embedment along the north wall.

The cofferdam sheet pile will not be structurally connected to the existing sheet pile walls along the south shoreline of the river. Instead, the sheet pile for the cofferdam will be stopped approximately 2 feet from the existing walls. The gap between the cofferdam sheet pile and the shoreline sheet pile will be closed using sand bags. The top of the sand bags will be a maximum of 1 foot above the water level at the time of construction. The sand bag tie in points will therefore act as weirs in the event of a rapid water level change, and are intended to limit the unbalanced water head in the cofferdam to 1 foot or less.

Construction of the cofferdam will be performed from the river using a floating plant. The contractors must evaluate available data on water depths to determine the feasibility of barge access to the area of the sheet pile cofferdam. Launching of barges and equipment will not be permitted at the boat ramp at Boom Landing and will have to occur at an offsite location to be determined by the contractor.

The relatively soft/loose sediment could result in difficulties maintaining the alignment of sheet pile during installation. The contractor must evaluate temporary stabilization measures, such as the use of large sand bags (“Super Sacks”) up against both side of the sheet pile to provide alignment control and stability during and after pile installation.

Due to the potential for significant debris in the sediments along the cofferdam alignment, the sheet pile installation contractor may need to pre-excavate portions of the wall alignment to remove obstructions to sheet pile penetration. Any excavations along the cofferdam alignment prior to sheet pile installation should be backfilled with clean granular fill (less than 5% passing the No. 200 sieve) prior to installing the sheet pile.

The contractor must provide a means for preventing ice development / ice loads on the sheet pile cofferdam after the sheet pile are installed. The sheet pile walls are not designed to resist ice loads (static or dynamic) due to the limited sheet pile embedment in the relatively thin / soft sediments. Based on the anticipated construction schedule, the dredging operations should be completed before the spring thaw. However, ice flows could develop during periods of winter thaw cycles. The contractor must continually monitor the river for ice flows and provide a means for preventing impact of ice flows on the sheet pile cofferdam. Based on the proximity of the sheet pile cofferdam outside the main river channel, together with the geometry of the upstream shoreline, ice flow impacts are not considered a high risk given the time of year within which the work will take place. The anticipated river construction period is from the middle of October 2012 to the middle of January 2013, with completion no later than the end of February 2013.

3.4 Existing Sheet Pile Wall Protection

Dredging up to the existing shoreline sheet pile walls must be completed in a manner that will not disturb or otherwise compromise the structural integrity of the existing sheet pile walls or other shoreline structures. Because of the relatively shallow bedrock in this area, removal of sediment up against the existing sheet pile walls could have a destabilizing effect on the walls and result in excessive movement and distress to the walls.

Design documents are available for the Boom Landing sheet pile walls and the boat ramp; however, to our knowledge, design or as-built drawings are not available for the sheet pile walls on the Nestegg and Marinette Marine properties. Available information on the existing sheet pile walls will be made available to the contractor, either as an appendix to the bid documents, or upon request.

Based on project schedule considerations, a phased dredging approach has been chosen as a shoreline wall protection measure. With this approach, dredge offset limits have been established at the existing shoreline sheet pile walls such that any dredging that occurs within those limits must be done in a staged or phased manner. The staged dredging permits a limited amount of excavation to be open adjacent to the existing sheet pile walls at any one time.

Any dredging that occurs within 15 feet of the existing sheet pile wall at Boom Landing and Marinette Marine must occur in a manner such that no more than 8 feet of excavation is open below the existing mud line elevation at any one time. Each stage of the excavation must be backfilled before moving to the next stage of excavation along the existing wall. The dredge offsets and staged dredging approach near existing sheet pile walls are summarized on the drawings included in Attachment A.

The Contractor should submit their plan for completing the staged excavation / shoreline protection measures adjacent to existing sheet pile walls in accordance with submittal requirements defined in the contract documents.

ATTACHMENTS:

A – Cofferdam Construction Drawings
B – Cofferdam Analyses

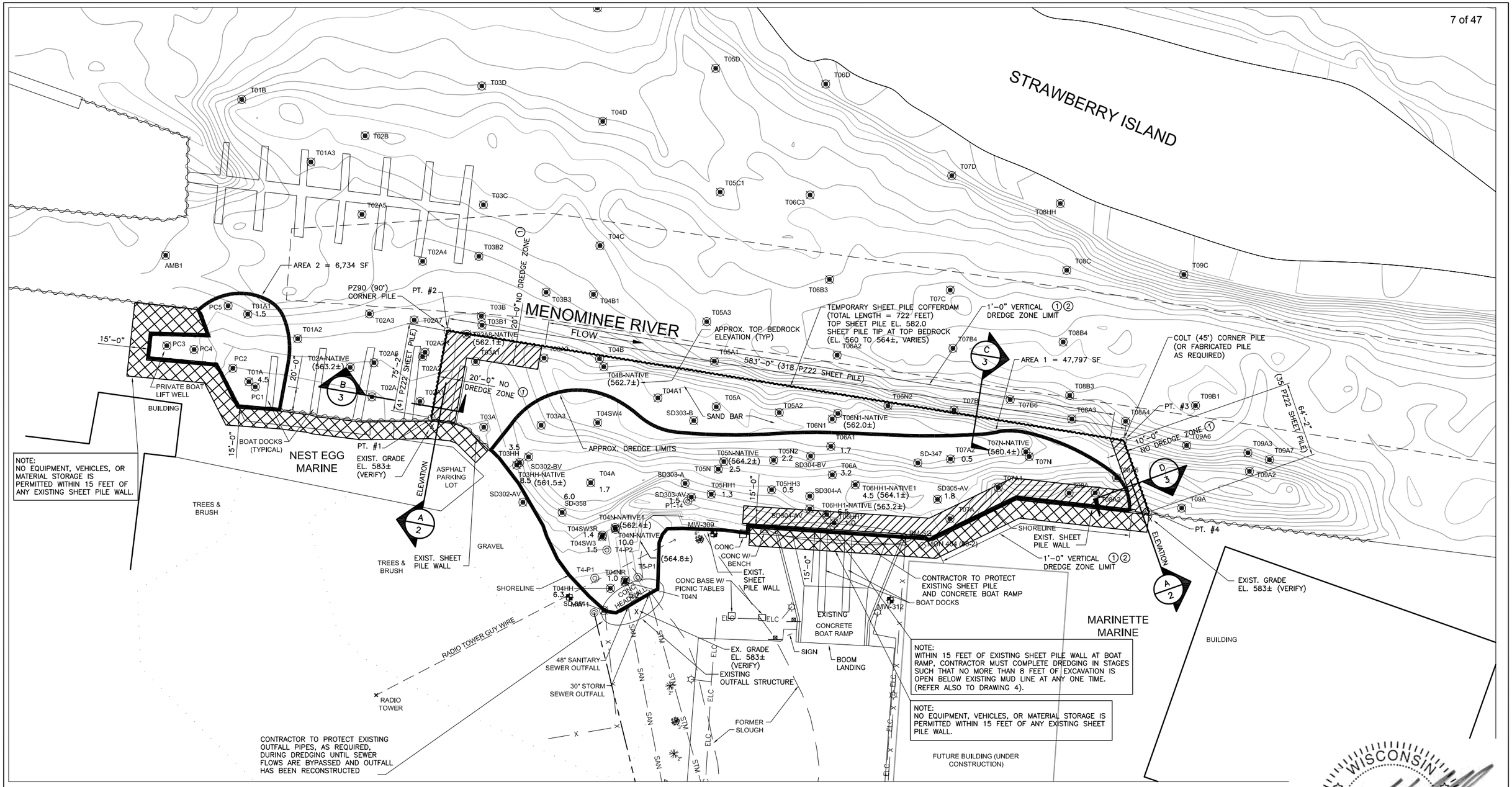
REFERENCES:

Draft Figure 2 “Extent of NAPL & PAH ≥ 22.85 mg/kg” prepared by NRT and dated July 12, 2012.
Soil Boring Logs prepared by NRT and dated May 31, 2012.
Project Manual for Nestegg Marina and Boom Landing Dockwall Improvements prepared by Ayres Associates and dated August 2003.
Outfall Sewer drawings prepared by Foth & Van Dyke and dated January 1989.
Sheet Pile Wall Details & Sections (Sheet No. 1), Remedial Design, Boom Landing, WPSC, Marinette, WI dated June 10, 2004.

ENGINEERING PARTNERS INTERNATIONAL LLC

ATTACHMENT A

COFFERDAM CONSTRUCTION DRAWINGS



COFFERDAM ALIGNMENT		
PT. #	NORTH	EAST
1	149,302.76	805,259.20
2	149,376.69	805,272.71
3	149,283.26	805,847.64
4	149,222.60	805,868.91

NOTE: COORDINATES DENOTE INSIDE FACE OF SHEET PILE COFFERDAM. AT CONTRACTOR'S OPTION, POINTS 2 AND 3 MAY BE SHIFTED SOUTH UP TO 5 FEET AS REQUIRED TO PROVIDE INCREASED PILE EMBEDMENT WHILE PROVIDING ENOUGH DRAFT FOR BARGE ACCESS.

NOTES:

1. HORIZONTAL DATUM IS MARINETTE COUNTY COORDINATE SYSTEM. UNITS = US FOOT. VERTICAL DATUM IS NAVD88.

2. BATHYMETRIC SURVEY DONE BY ENVIROSCAN, INC. NOVEMBER 15, 2011.

PLAN – TEMPORARY COFFERDAM

0 20 40 80

KEYNOTES:

① CONTACT ENGINEER BEFORE COMPLETING ANY DREDGING WITHIN THE HORIZONTAL OR VERTICAL NO DREDGE ZONES IDENTIFIED ALONG THE TEMPORARY COFFERDAM SHEET PILE.

② DREDGE DEPTHS OF LESS THAN 1 FOOT ARE ANTICIPATED AT THE NORTH WALL OF THE TEMPORARY SHEET PILE COFFERDAM. CONTACT ENGINEER IF DREDGE DEPTHS GREATER THAN 1 FOOT ARE ANTICIPATED AT THE NORTH COFFERDAM WALL.

WISCONSIN
CHAD A. UNDERWOOD
E-36151
HUDSON, WIS.
8/29/12
PROFESSIONAL ENGINEER

REV	DESCRIPTION OF REVISION	BY	DATE
△			
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FILE: 12232-01 | DATE: 08/30/12 | PROJECT # 12.232

ENGINEERING PARTNERS INTERNATIONAL, LLC
1299 EAGAN INDUSTRIAL RD, SUITE 201
EAGAN, MINNESOTA 55121
TELEPHONE O: (651) 209-0108 I F: (651) 209-0109

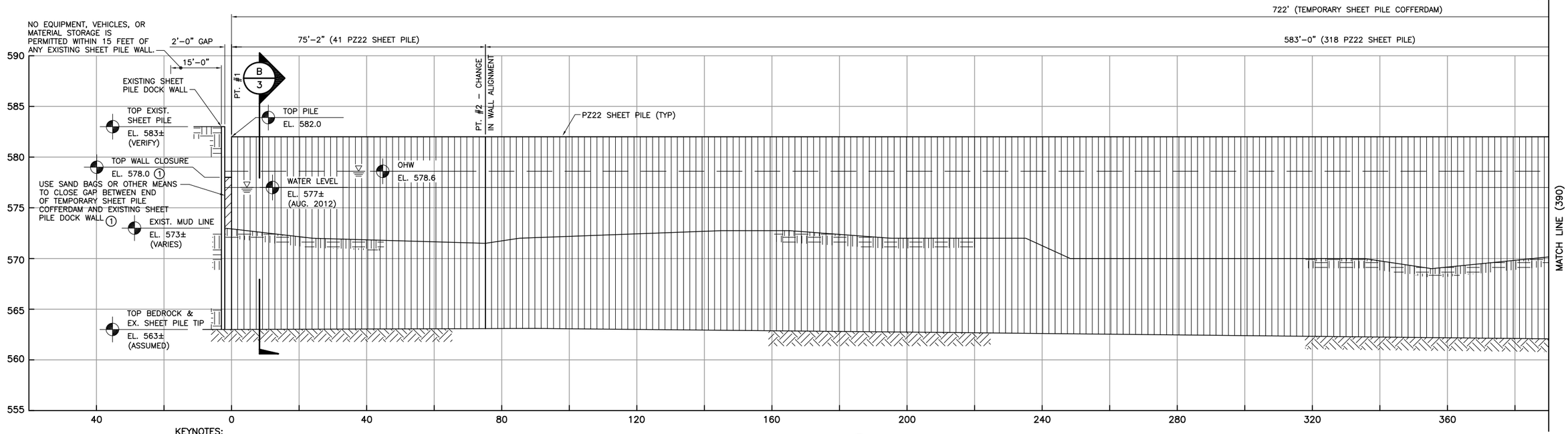
WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED	CAU
DRAWN	MSR
CHECKED	GTG
PEER REVIEWED	
PROJECT MANAGER	CAU
DATE	08/29/12

NATURAL RESOURCE TECHNOLOGY, INC.

TEMPORARY COFFERDAM, WPSC
FORMER MARINETTE MARINE MGP SITE
MARINETTE, WI

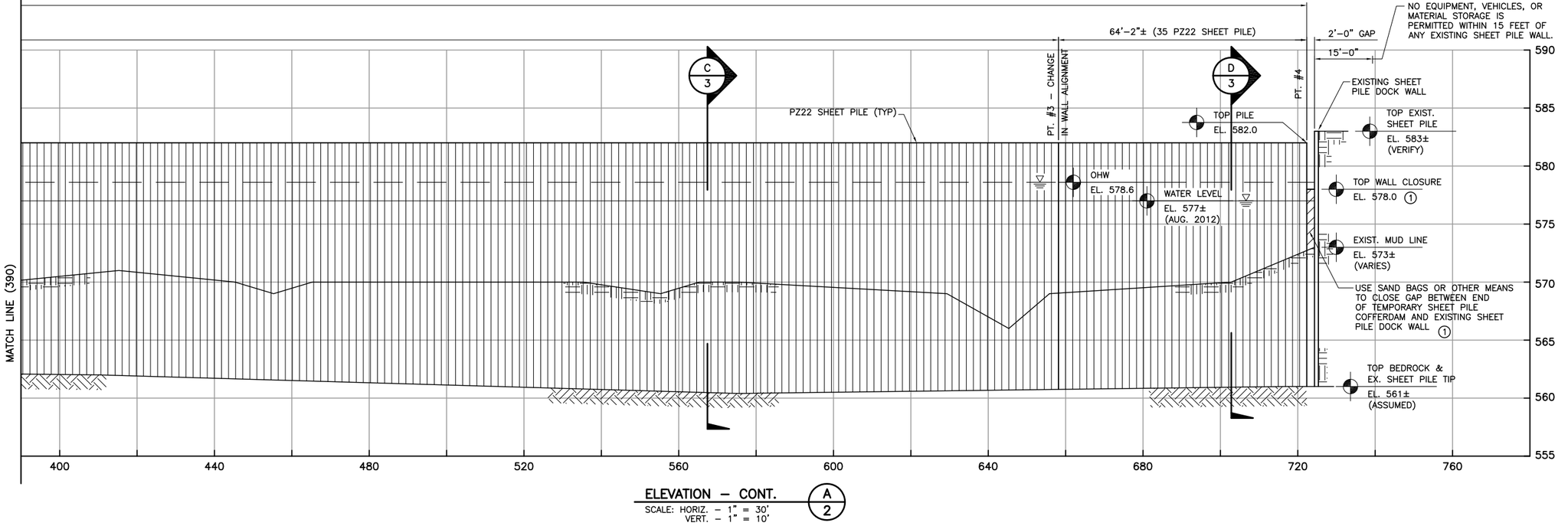
REVISION	△
PROJECT	12.232
DRAWING	1
SHEET	OF



KEYNOTES:

(1) SET TOP OF SAND BAG CLOSURE AT MAXIMUM OF 1'-0" ABOVE THE WATER LEVEL AT THE TIME OF SHEET PILE INSTALLATION.

ELEVATION A/2
SCALE: HORIZ. – 1" = 30'
VERT. – 1" = 10'



ELEVATION – CONT. A/2
SCALE: HORIZ. – 1" = 30'
VERT. – 1" = 10'

WISCONSIN
CHAD A. UNDERWOOD
E-36151
HUDSON, WIS.
8/29/12
PROFESSIONAL ENGINEER

REV	DESCRIPTION OF REVISION	BY	DATE
1			
2			
3			
4			
5			

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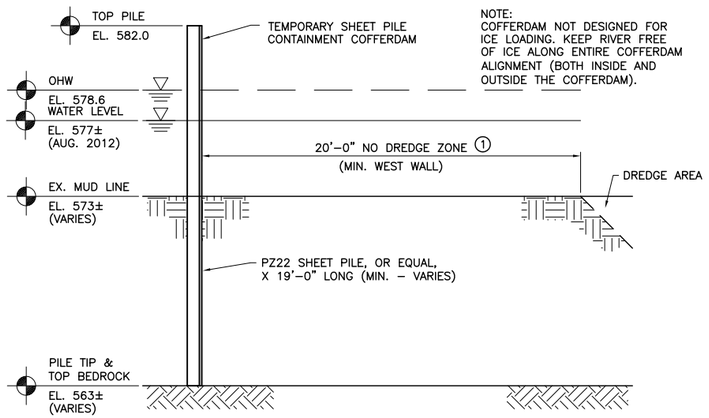
DESIGNED	CAU
DRAWN	MSR
CHECKED	GTG
PEER REVIEWED	
PROJECT MANAGER	CAU
DATE	08/29/12

NATURAL RESOURCE TECHNOLOGY, INC.

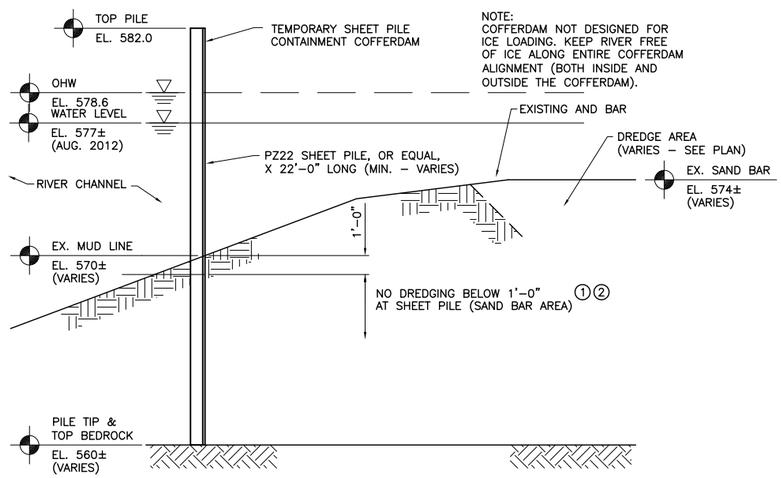
TEMPORARY COFFERDAM, WPSC
FORMER MARINETTE MARINE MGP SITE
MARINETTE, WI

REVISION 1
PROJECT 12.232
DRAWING 2
SHEET OF

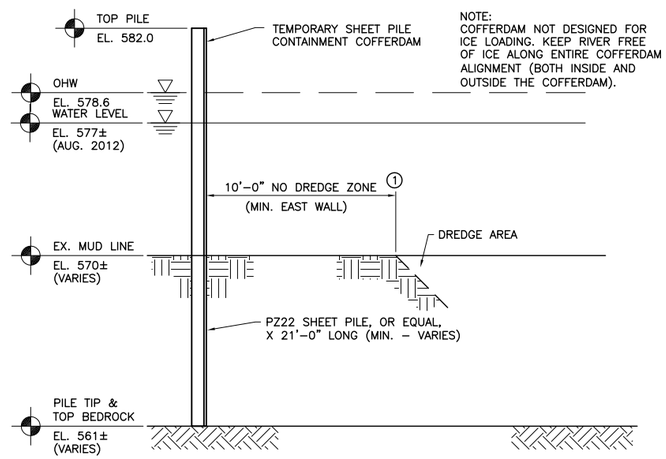
FILE: 12232-02 | DATE: 08/29/12 | PROJECT # 12.232



SECTION B/3
SCALE: 1/8" = 1'–0"



SECTION C/3
SCALE: 1/8" = 1'–0"



SECTION D/3
SCALE: 1/8" = 1'–0"

KEYNOTES:

① CONTACT ENGINEER BEFORE COMPLETING ANY DREDGING WITHIN THE HORIZONTAL OR VERTICAL NO DREDGE ZONES IDENTIFIED ALONG THE TEMPORARY COFFERDAM SHEET PILE.

② DREDGE DEPTHS OF LESS THAN 1 FOOT ARE ANTICIPATED AT THE NORTH WALL OF THE TEMPORARY SHEET PILE COFFERDAM AND AT THE EXISTING SHEET PILE WALL AT THE MARINETTE MARINE FACILITY. CONTACT ENGINEER IF DREDGE DEPTHS GREATER THAN 1 FOOT ARE ANTICIPATED AT THESE SHEET PILE WALLS.

GENERAL NOTES:

1. GENERAL
   - A. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE DUE TO IMPROPER INSTALLATION OR EXTRACTION OF THE SHEET PILE.
2. FIELD CONDITIONS
   - A. VERIFY DEPTH AND LIMITS OF EXCAVATION PRIOR TO START OF WORK.
   - B. VERIFY UNDERGROUND UTILITY LOCATIONS AND ANY OTHER BURIED OBSTRUCTIONS BEFORE COMMENCING ANY WORK. NOTIFY ENGINEER OF CONFLICTS.
   - C. VERIFY ACCESS TO SITE VIA WATER OR LAND, BRIDGE CLEARANCES, WATER DEPTHS AFFECTING ACCESS OR AFFECTING THE PROPOSED WORK; AND VERIFY OR COORDINATE CLEARING OF SITE AT WORK LOCATIONS.
3. SAFETY
   - A. THE ENGINEER AND THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION SAFETY.
   - B. THE ENGINEER DOES NOT CONTROL THE MEANS AND METHODS OF CONSTRUCTION.
   - C. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING OSHA FALL PROTECTION WHERE REQUIRED AT THE TOPS OF THE SHEET PILE WALLS.
4. USE OF DOCUMENTS
   - A. USE OF THESE DOCUMENTS IS PROHIBITED FOR OTHER PROJECTS, ADDITIONS TO OR EXTENSIONS OF THIS PROJECT OR FOR THE COMPLETION OF THE PROJECT BY OTHERS EXCEPT WITH THE WRITTEN PERMISSION OF ENGINEERING PARTNERS INTERNATIONAL, LLC.

TEMPORARY COFFERDAM NOTES:

1. LOADS
   - A. DO NOT MOOR FLOATING PLANT TO COFFERDAM OR ALLOW DEBRIS OR ICE TO ACCUMULATE AGAINST THE COFFERDAM SHEET PILE.
   - B. THE TEMPORARY COFFERDAM IS DESIGNED FOR CONTAINMENT OF SUSPENDED SEDIMENT AND NON–AQUEOUS PHASE LIQUID (NAPL) COAL TAR DURING DREDGING OPERATIONS. THE COFFERDAM IS DESIGNED FOR UP TO 1 FOOT OF WATER LEVEL DIFFERENCE BETWEEN THE INSIDE AND OUTSIDE OF THE COFFERDAM RESULTING FROM A TEMPORARY RISE IN WATER LEVEL INSIDE OR OUTSIDE THE COFFERDAM.
   - C. THE COFFERDAM IS NOT DESIGNED FOR UNBALANCED WATER LEVELS GREATER THAN 1 FOOT. CONSTRUCT SHORELINE / COFFERDAM CLOSURES TO ALLOW WATER OVERFLOW IN OR OUT OF THE COFFERDAM IF THE DIFFERENTIAL WATER LEVEL EXCEEDS 1'–0".
   - D. THE COFFERDAM IS NOT DESIGNED FOR ICE LOADING. KEEP RIVER FREE OF ICE ADJACENT TO SHEET PILE COFFERDAM (BOTH INSIDE AND OUTSIDE THE COFFERDAM) UNTIL WORK IS COMPLETED.
   - E. IF COFFERDAM CELL IS TO BE DEWATERED FOR EXCAVATION OF SEDIMENTS, THEN THIS COFFERDAM DESIGN IS TO BE MODIFIED. NO DEWATERING OF CELL IS TO TAKE PLACE UNLESS FIRST APPROVED BY ENGINEER.
2. MATERIALS
   - A. STEEL SHEET PILE SECTIONS SHALL BE ASTM A572 GR 50, Fy = 50 KSI.
   - B. STEEL MEMBER SIZES SHOWN ON DRAWINGS ARE MINIMUM REQUIRED FOR STRENGTH AND MAY BE SUBSTITUTED WITH SECTIONS OF LARGER CROSS–SECTIONAL AREA AND SECTION MODULUS.
   - C. SURPLUS AND USED MATERIALS MAY BE USED FOR THE TEMPORARY SUPPORT SYSTEMS. IF MILL CERTIFICATIONS ARE NOT AVAILABLE FOR STEEL MEMBERS PROVIDE TEST DATA AND MEASUREMENTS TO CONFIRM THE ADEQUACY OF THE MATERIALS FOR USE..
3. WELDING
   - A. ALL WELDS SHALL CONFORM TO AWS D1.1 AND SIZED AS SHOWN ON THE DRAWINGS.
4. INSTALLATION
   - A. THE METHOD OF INSTALLATION OF THE SHEET PILE SHALL BE AT THE DISCRETION OF THE CONTRACTOR INSTALLER. HOWEVER, CARE SHOULD BE GIVEN TO NOT DAMAGE ANY PILE DURING THE DRIVING / INSTALLATION PROCESS. IF, IN THE OPINION OF THE ENGINEER, A PILE IS DAMAGED TO THE EXTENT IT WILL NOT SERVE THE INTENDED PURPOSE IN THE TEMPORARY STRUCTURE, IT SHALL BE REMOVED AND A REPLACEMENT PILE INSTALLED.
   - B. A MINIMUM PILE EMBEDMENT OF 9 FEET INTO SEDIMENT TO THE TOP OF BEDROCK IS ASSUMED FOR THE EAST AND WEST LEGS OF THE COFFERDAM. A MINIMUM EMBEDMENT OF 7 FEET IS ASSUMED FOR THE NORTH WALL OF THE COFFERDAM EMBEDDED IN THE SAND BAR. CONTACT ENGINEER IF SEDIMENT THICKNESS IS LESS THAN WHAT HAS BEEN ASSUMED AS ADDITIONAL DREDGE OFFSET LIMITS AND/OR SHEET PILE STABILIZATION MEASURES MAY HAVE TO BE APPLIED.
   - C. VIBRATORY OR IMPACT INSTALLATION OF STEEL SHEET PILE IS PERMITTED FOR THE COFFERDAM.
   - D. ALL SHEET PILES SHALL BE NUMBERED BY THE CONTRACTOR, AND ACCURATE INSTALLATION RECORDS SHALL BE MAINTAINED FOR EACH PILE. INSTALLATION RECORDS FOR EACH PILE TO INCLUDE THE PILE TYPE/DESIGNATION, MANUFACTURER, AND PILE SECTION MODULUS, AND THE CONTRACTOR'S ASSIGNED PILE NUMBER, PILE LENGTH, TOP OF PILE ELEVATION, AND PILE TIP ELEVATION.
   - E. CONTRACTOR TO PROVIDE LARGE SAND BAGS (SUPER SACKS) INSIDE AND OUTSIDE THE SHEET PILE WALL, OR OTHER MEANS OF MAINTAINING SHEET PILE STABILITY AND ALIGNMENT DURING AND AFTER INSTALLATION IN AREAS OF RELATIVELY SHALLOW AND SOFT SEDIMENTS.
   - F. DEBRIS SHOULD BE ANTICIPATED WITHIN THE SEDIMENT ALONG THE COFFERDAM ALIGNMENT. PRE–EXCAVATION COULD BE REQUIRED ALONG PORTIONS OF THE COFFERDAM ALIGNMENT TO REMOVE DEBRIS TO ALLOW SHEET PILE INSTALLATION TO THE TOP OF BEDROCK. ANY EXCAVATION ALONG THE COFFERDAM ALIGNMENT PRIOR TO SHEET PILE INSTALLATION SHALL BE BACKFILLED WITH SAND WITH LESS THAN 5% PASSING THE NO. 200 SIEVE BEFORE SHEET PILE INSTALLATION.
   - G. SALVAGED MATERIALS SHALL BE DECONTAMINATED AS REQUIRED AND REMAIN THE PROPERTY OF THE CONTRACTOR.
5. MONITORING
   - A. DEFLECTION MONITORING WILL BE COMPLETED BY THE ENGINEER OR OWNER'S REPRESENTATIVE USING OPTICAL SURVEY METHODS IN ACCORDANCE WITH THE CONSTRUCTION QUALITY ASSURANCE PROJECT PLAN (CQAPP).
   - B. ENGINEERING PARTNERS IS TO BE NOTIFIED IF HORIZONTAL OR VERTICAL DEFLECTION EXCEEDS 1/2 INCH SO THAT THE WALL PERFORMANCE CAN BE REVIEWED TO DETERMINE IF ADDITIONAL SHEET PILE STABILIZATION MEASURES ARE REQUIRED.
6. REMOVAL
   - A. REMOVE ALL TEMPORARY SHEET PILE USED IN THE COFFERDAM CONSTRUCTION UPON COMPLETION OF DREDGING OPERATIONS.
   - B. REMOVE ANY SAND BAGS OR OTHER MATERIALS USED FOR SHORELINE TIE IN OR FOR MAINTAINING SHEET PILE STABILITY.
   - C. DECONTAMINATE AND/OR PROPERLY DISPOSE OF ALL MATERIALS USED IN THE TEMPORARY COFFERDAM CONSTRUCTION BEFORE REMOVING FROM THE SITE.

WORK SEQUENCE:

1. PROVIDE ACCESS TO THE WORK LOCATIONS
   - A. SUBMIT WORK PLAN DESCRIBING PROPOSED ACCESS AND WORK LOCATIONS, AS WELL AS THE PROPOSED STAGED DREDGING / PROTECTION MEASURES ADJACENT TO EXISTING SHEET PILE WALLS IN ACCORDANCE WITH THE TIMELINE AND SUBMITTAL PROCEDURES DEFINED IN THE CONTRACT DOCUMENTS.
   - B. DELIVER BARGES TO WORK LOCATION AND STABILIZE IN RIVER AT LOCATION CONVENIENT FOR INSTALLING SHEETPILING.
   - C. CONTRACTOR SHALL NOT OPERATE EQUIPMENT OR VEHICLES, OR STORE MATERIALS WITHIN 15 FEET OF THE BACK OF ANY EXISTING SHEET PILE WALL.
   - D. NO STRUCTURAL CONNECTION SHALL BE MADE BETWEEN THE TEMPORARY SHEET PILE COFFERDAM AND THE EXISTING SHEET PILE WALLS. ANY GAPS BETWEEN THE ENDS OF THE COFFERDAM SHEET PILE AND EXISTING SHORELINE SHEET PILE SHALL BE CLOSED WITH SAND BAGS TO THE TOP OF COFFERDAM ELEVATION.
2. INSTALL COFFERDAM SHEET PILES IN RIVER
   - A. PLACE SHEET PILES IN RIVER AT PLAN LOCATIONS, WITH TOPS AND TIPS TO ELEVATIONS AS NOTED ON PLANS.
   - B. NOTIFY ENGINEER IF BEDROCK IS ENCOUNTERED SHALLOWER THAN ESTIMATED ON THE DRAWINGS SO THAT THE NEED FOR ADDITIONAL DREDGE OFFSETS AND/OR SHEET PILE STABILIZATION MEASURES CAN BE EVALUATED.
   - C. IF BEDROCK IS NOT ENCOUNTERED BEFORE THE PILE TIP REACHES ELEVATION 560, THE PILES MAY BE TERMINATED AT ELEVATION 560.
   - D. MAKE SHEET PILE COFFERDAM END TIE–IN TO SHORELINES USING NON–STRUCTURAL CONNECTIONS. CONSTRUCT SHORELINE / COFFERDAM CLOSURES TO ALLOW WATER OVERFLOW IN OR OUT OF THE COFFERDAM IF THE DIFFERENTIAL WATER LEVEL EXCEEDS 1'–0".
   - E. KEEP RIVER FREE OF ICE ADJACENT TO COFFERDAM (BOTH INSIDE AND OUTSIDE THE COFFERDAM), AS REQUIRED, TO PREVENT ICE LOADING ON THE COFFERDAM.
   - F. NO DEWATERING OF CELL IS ANTICIPATED AND NO DEWATERING SHALL TAKE PLACE UNLESS FIRST APPROVED BY ENGINEER.
3. DREDGING AND BACKFILLING OF CONTAMINATED SOILS (BY DREDGING CONTRACTOR)
   - A. DREDGING OPERATIONS WILL BEGIN AFTER COFFERDAM IS INSTALLED.
   - B. REMOVE CONTAMINATED SEDIMENT FROM WITHIN THE COFFERDAM.
   - C. NO DREDGING SHALL OCCUR WITHIN THE DREDGE OFFSET LIMITS FROM THE SHEET PILE COFFERDAM SHOWN ON THE DRAWINGS UNLESS FIRST APPROVED BY THE ENGINEER IN WRITING.
   - D. DREDGE DEPTHS OF LESS THAN 1 FOOT ARE ANTICIPATED AT THE NORTH WALL OF THE COFFERDAM AND AT THE EXISTING SHEET PILE WALL AT THE MARINETTE MARINE FACILITY. CONTACT ENGINEER IF DREDGE DEPTHS GREATER THAN 1 FOOT ARE ANTICIPATED AT THESE SHEET PILE WALLS SO THAT THE NEED FOR TEMPORARY SHEET PILE WALL STABILIZATION MEASURES CAN BE EVALUATED.
   - E. BACKFILL COFFERDAM CELL AS REQUIRED.
4. REMOVAL OF STEEL SHEET PILING FROM RIVER
   - A. PULL COFFERDAM SHEETPILING AND STOCK MATERIALS ON BARGE.
   - B. TRANSFER SHEET PILE TO LAND SITE FOR CLEANING, EXAMINATION AND DECONTAMINATION AS REQUIRED.
   - C. DECONTAMINATE MATERIALS REMOVED FROM THE RIVER.
   - D. REMOVE MATERIALS FROM PROJECT SITE.

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FILE: 12232-03 | DATE: 08/29/12 | PROJECT # 12.232

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WARNING
0 1/2 1
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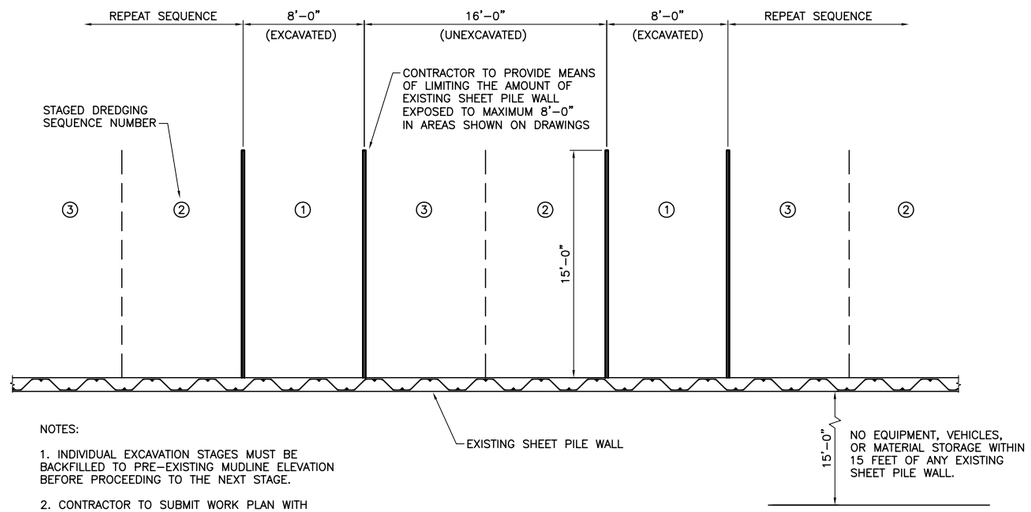
DESIGNED	CAU
DRAWN	MSR
CHECKED	GTG
PEER REVIEWED	
PROJECT MANAGER	CAU
DATE	08/29/12

NATURAL RESOURCE TECHNOLOGY, INC.

TEMPORARY COFFERDAM, WPSC
FORMER MARINETTE MARINE MGP SITE
MARINETTE, WI

REVISION	△
PROJECT	12.232
DRAWING	3
SHEET	OF



NOTES:

1. INDIVIDUAL EXCAVATION STAGES MUST BE BACKFILLED TO PRE–EXISTING MUDLINE ELEVATION BEFORE PROCEEDING TO THE NEXT STAGE.

2. CONTRACTOR TO SUBMIT WORK PLAN WITH PROPOSED METHOD OF STAGED DREDGING IN ACCORDANCE WITH THE TIMELINE AND SUBMITTAL REQUIREMENTS DEFINED IN THE CONTRACT DOCUMENTS.

TYPICAL STAGED DREDGING PLAN – BOOM LANDING & MARINETTE MARINE

SCALE: 1" = 10'

N

FILE: 12232-04 | DATE: 08/30/12 | PROJECT # 12.232

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EAGAN, MINNESOTA 55121
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DRAWN	MSR
CHECKED	GTG
PEER REVIEWED	
PROJECT MANAGER	CAU
DATE	08/29/12

NATURAL RESOURCE TECHNOLOGY, INC.

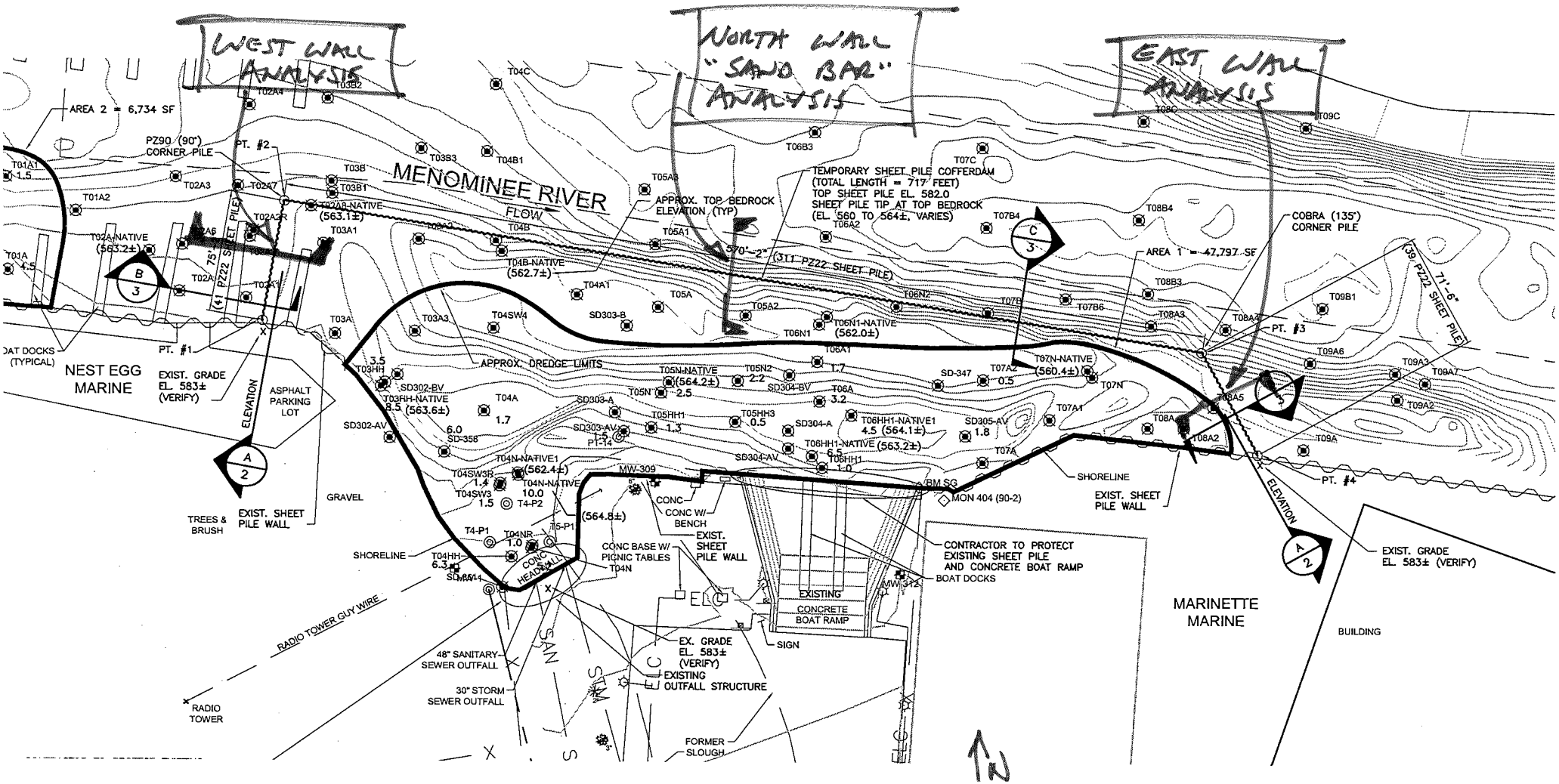
TEMPORARY COFFERDAM, WPSC
FORMER MARINETTE MARINE MGP SITE
MARINETTE, WI

REVISION	△
PROJECT	12.232
DRAWING	4
SHEET	OF

ENGINEERING PARTNERS INTERNATIONAL LLC

ATTACHMENT B

COFFERDAM ANALYSES

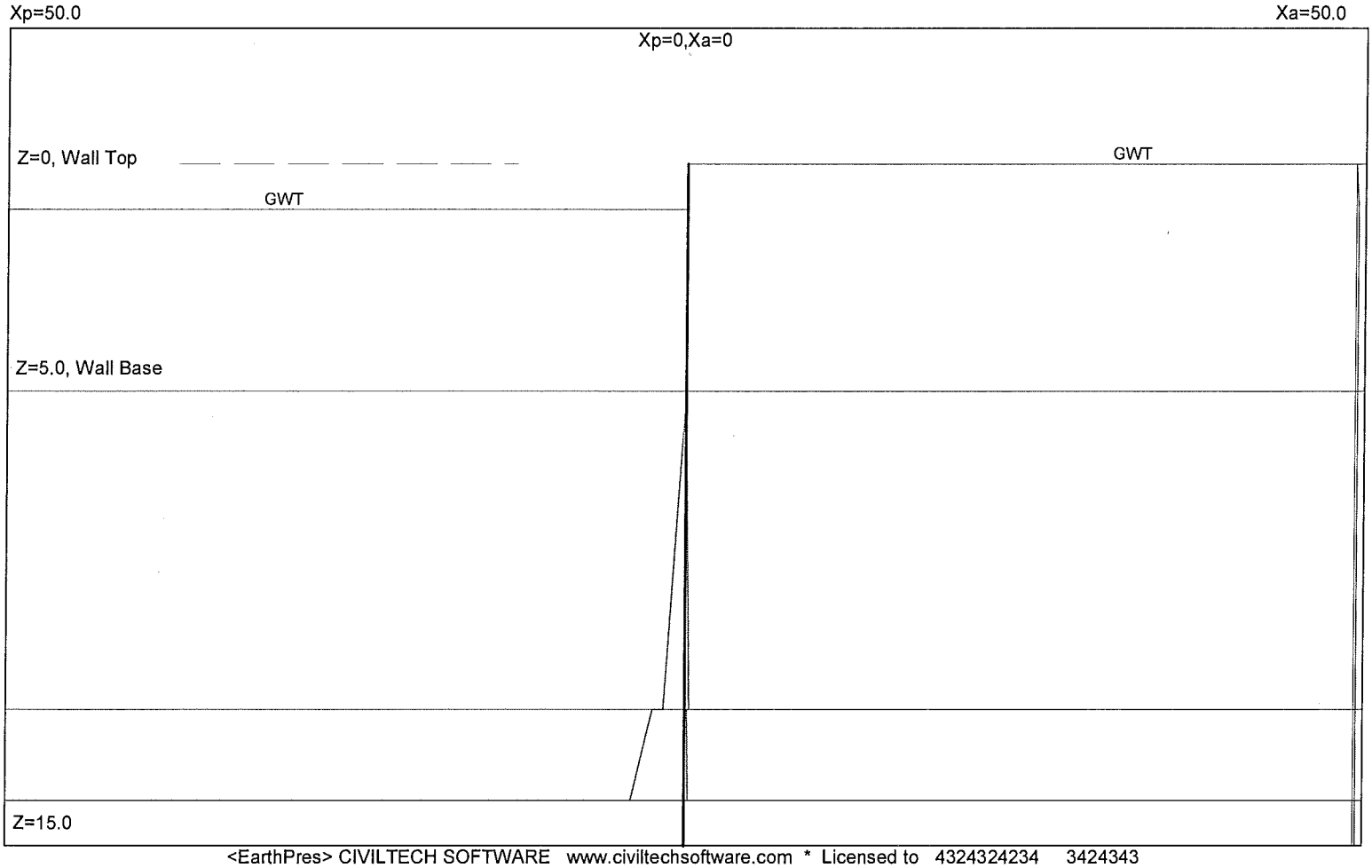


TEMP COFFERDAM ANALYSES

- CAM 8/21/12

Marinette Former MGP (west wall)

5ft water (1ft diff.), 9ft embed



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UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf
Date: 8/22/2012 File: J:\Projects\12.232 Marinette MGP Sediment Removal Action Cofferdam (NRT)\civiltech\5ft water (1ft diff) 9ft embed.ep8

* INPUT DATA *

Wall Height=5.0 Total Soil Types= 3

Soil No.	Weight	Saturate	Phi	Cohesion	Nspt	Type	Description
1	90.0	100.0	22.0	0.0	0	4	L Sand
2	120.0	130.0	36.0	0.0	0	4	MD Sand
3	155.0	165.0	48.0	5.0	0	1	Bedrock

Ground Surface at Active Side:

Line	Z1	Xa1	Z2	Xa2	Soil No.	Description
1	5.0	0.0	5.0	800.0	1	L Sand
2	12.0	0.0	12.0	800.0	2	MD Sand
3	14.0	0.0	14.0	800.0	3	Bedrock

Water Table at Active Side:

Point	Z-water	X-water
1	0.0	0.0
2	0.0	80000.0

Ground Surface at Passive Side:

Line	Z1	Xp1	Z2	Xp2	Soil No.	Description
1	5.0	0.0	5.0	800.0	1	L Sand
2	12.0	0.0	12.0	800.0	2	MD Sand
3	14.0	0.0	14.0	800.0	3	Bedrock

Water Table at Passive Side:

Point	Z-water	X-water
1	1.0	0.0
2	1.0	80000.0

Wall Friction Options: 1.* No wall friction
Wall Batter Angle = 0
Apparent Pressure Conversion: 1.* Default (Terzaghi and Peck)*
Water Density = 62.4
Water Pressure: 1.* No seepage at wall tip

* OUTPUT RESULTS *

Eae (Total Force above Base)= 0.00 per one linear foot (or meter) width along wall height
Ea (Total Static Force above Base)= 0.00

Driving Pressure above Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pa1	Z2	Pa2	Slope	Ka
0.00	0.00	5.00	0.00	0.0000	0.0000

Driving Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pa1	Z2	Pa2	Slope	Ka
5.00	0.00	12.00	0.12	0.0171	0.4550
12.00	0.06	14.00	0.10	0.0186	0.2744
14.00	0.00	25.00	0.00	0.6277	6.1177

Passive Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pp1	Z2	Pp2	Slope	Kp
5.00	0.0	12.00	0.6	0.083	2.1980
12.00	0.9	14.00	1.5	0.289	4.2823
14.00	28.0	25.00	36.6	0.784	7.6383

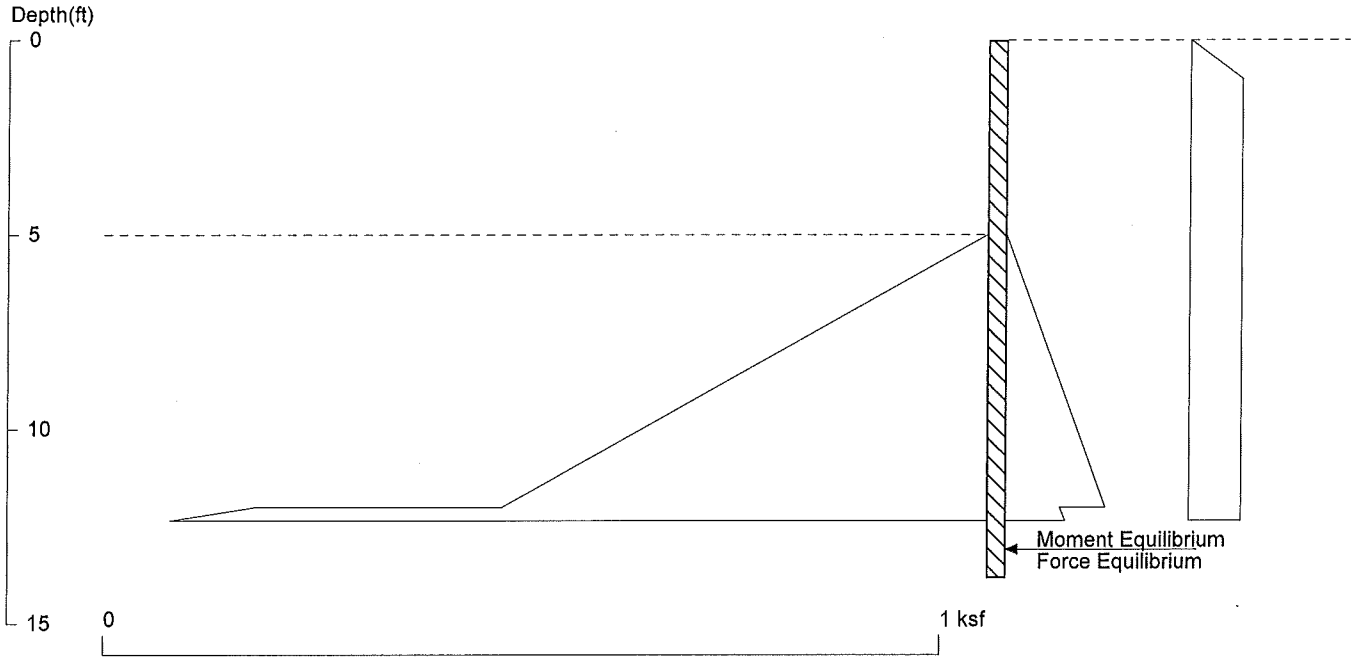
Water Pressure - Output to Shoring - Multiplier of Pressure = 1

No	Z1	Pw1	Z2	Pw2	kw1
0	0.00	0.00	1.00	0.06	0.06
1	1.00	0.06	25.00	0.06	0.00

UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf

Marinette Former MGP (west wall)

5ft water (1ft diff.), 9ft embed



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File: J:\Projects\12.232 Marinette MGP Sediment Removal Action Cofferdam (NRT)\civiltech\5ft water (1ft diff) 9ft embed

Wall Height=5.0 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=8.82 Min. Pile Length=13.82

MOMENT IN PILE: Max. Moment=1.54 per Pile Spacing=1.0 at Depth=9.02

PILE SELECTION:

Request Min. Section Modulus = 0.6 in3/ft=30.20 cm3/m, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66

PZ22 has Section Modulus = 18.1 in3/ft=973.06 cm3/m. It is greater than Min. Requirements!

Top Deflection = 0.70(in) based on E (ksi)=29000.00 and I (in4)/foot=84.4

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
*	Above	Base		
0.000	0.000	5.000	0.000	0.000000
*	Below	Base		
5.000	0.000	12.00	0.120	0.017107
12.00	0.065	14.00	0.102	0.018552
*	Water	Pres.		
0.000	0.000	1.000	0.062	0.062400
1.000	0.062	25.00	0.062	0.000000

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
5.0	0.00	12.0	0.58	0.083
12.0	0.87	14.0	1.45	0.289
14.0	27.98	25.0	36.60	0.784

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	5.00	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	5.00	1.00

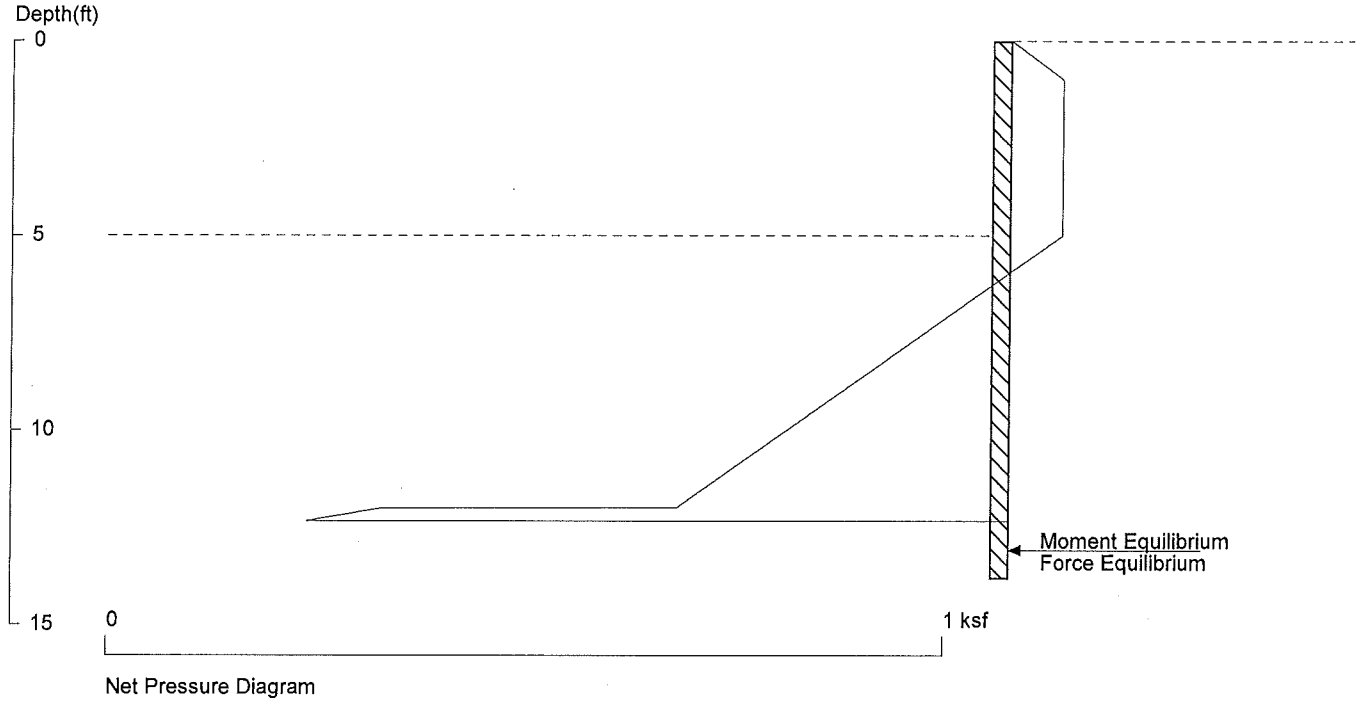
EXTERNAL FORCE ACTING ON WALL (Pusing on Wall - Positive; Against Wall - Negative)

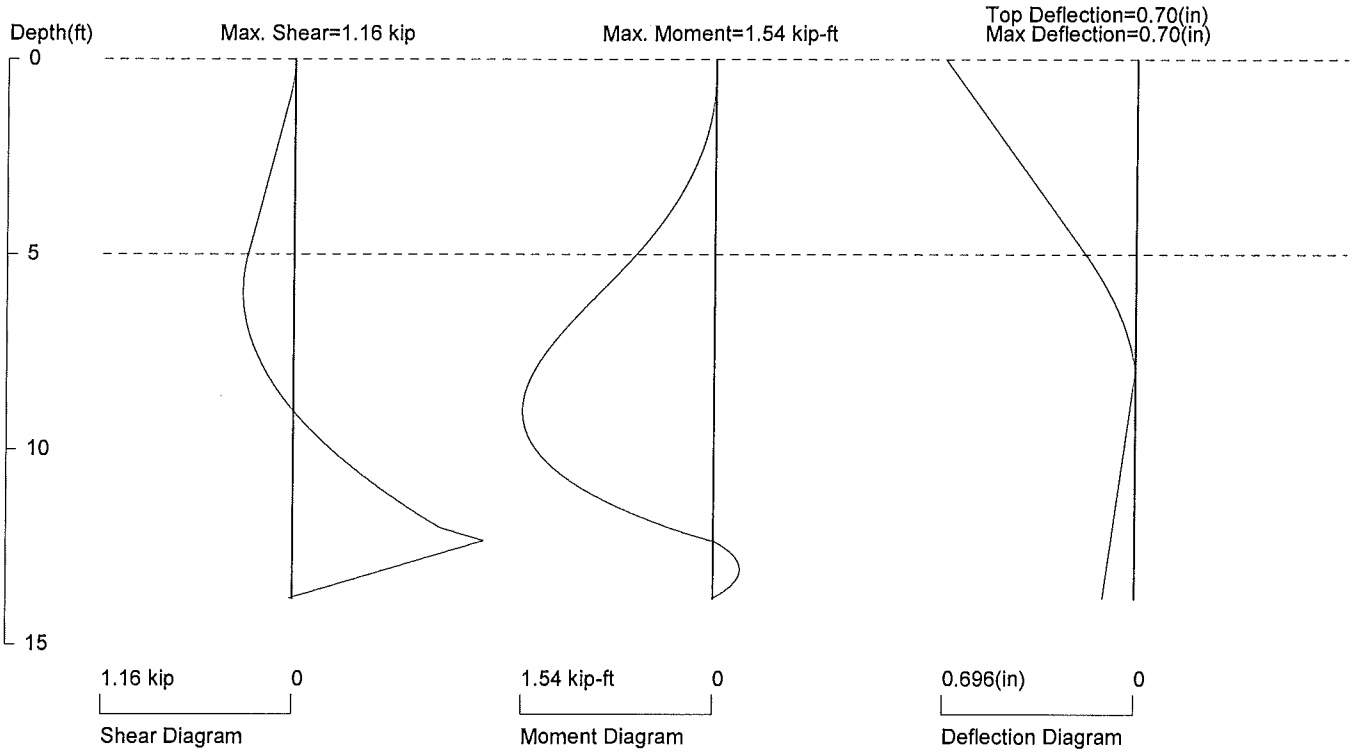
No.	Z force	Force	Angle	Spacing
1	0.00	0.00	0.0	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft3; Deflection - in

Marinette Former MGP (west wall)

5ft water (1ft diff.), 9ft embed





PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

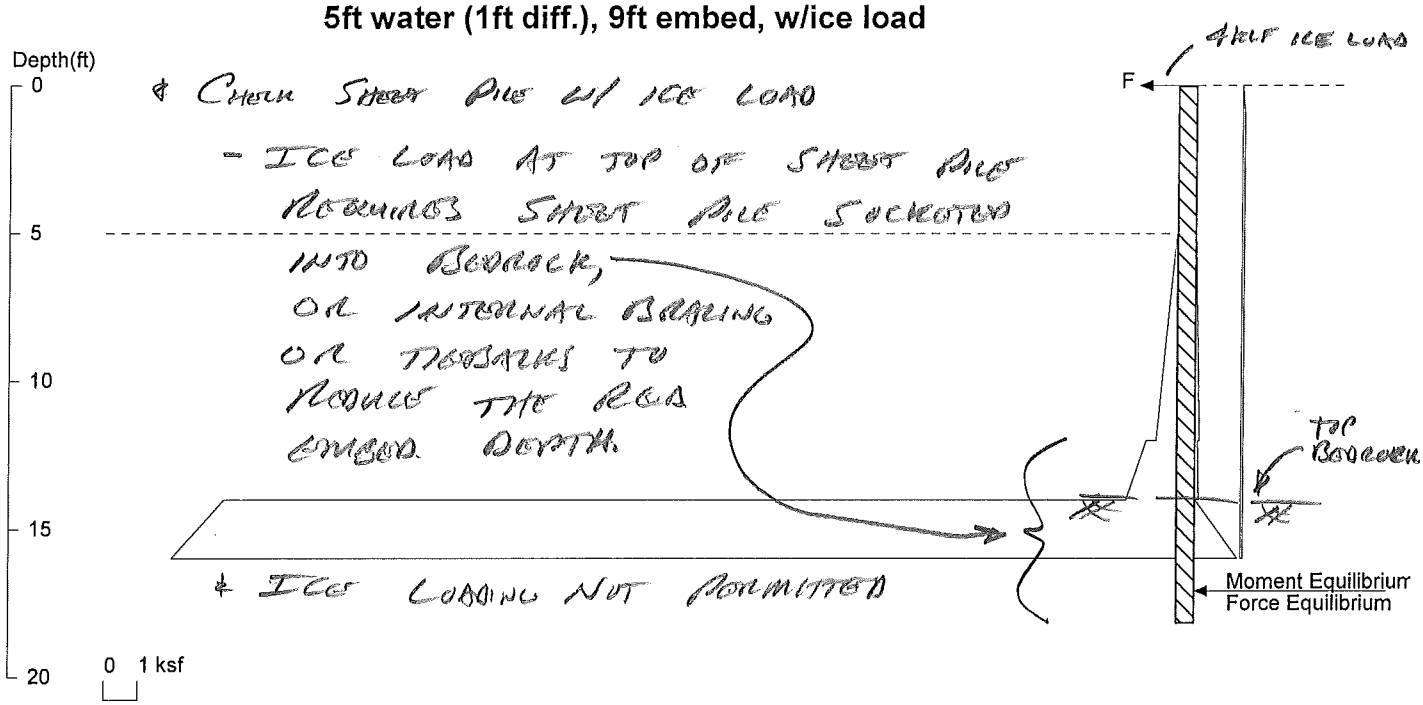
Based on pile spacing: 1.0 foot or meter

User Input Pile, PZ22: E (ksi)=29000.0, I (in4)/foot=84.4

File: J:\Projects\12.232 Marinette MGP Sediment Removal Action Cofferdam (NRT)\civiltech\5ft water (1ft diff) 9ft embed (cant).sh8

Marinette Former MGP (west wall)

5ft water (1ft diff.), 9ft embed, w/ice load



Licensed to 4324324234 3424343 Date: 8/22/2012

File: J:\Projects\12.232 Marinette MGP Sediment Removal Action Cofferdam (NRT)\civiltech\5ft water (1ft diff) 9ft embed

Wall Height=5.0 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=13.17 Min. Pile Length=18.17

MOMENT IN PILE: Max. Moment=52.74 per Pile Spacing=1.0 at Depth=14.05

PILE SELECTION:

Request Min. Section Modulus = 17.6 in3/ft=945.05 cm3/m, Fy= 50 ksi = 345 MPa, Fb/Fy=0.72

PZ22 has Section Modulus = 18.1 in3/ft=973.06 cm3/m. It is greater than Min. Requirements!

Top Deflection = 0.78(in) based on E (ksi)=29000.00 and I (in4)/foot=84.4

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
*	Above	Base		
0.000	0.000	5.000	0.000	0.000000
*	Below	Base		
5.000	0.000	12.00	0.120	0.017107
12.00	0.065	14.00	0.102	0.018552
14.00	0.000	25.00	0.000	0.627672
*	Water	Pres.		
0.000	0.000	1.000	0.062	0.062400
1.000	0.062	25.00	0.062	0.000000

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
5.0	0.00	12.0	0.58	0.083
12.0	0.87	14.0	1.45	0.289
14.0	27.98	25.0	36.60	0.784

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	5.00	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	5.00	1.00

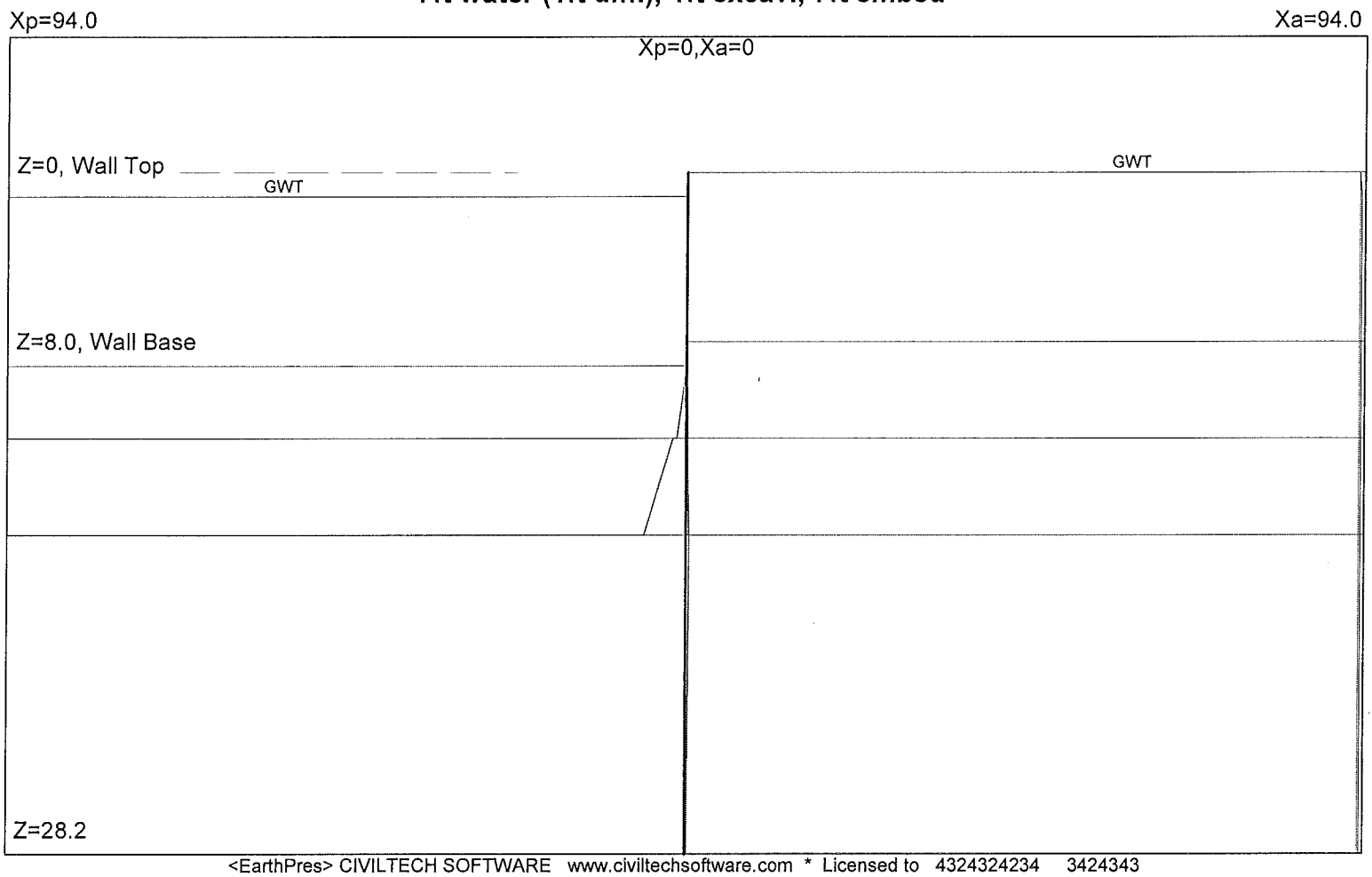
EXTERNAL FORCE ACTING ON WALL (Pusing on Wall - Positive; Against Wall - Negative)

No.	Z force	Force	Angle	Spacing
1	0.00	4.00	0.0	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft3; Deflection - in

Marinette Former MGP (at sand bar)

7ft water (1ft diff.), 1ft excav., 7ft embed



UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf

Date: 8/27/2012 File: J:\Projects\12.232 Marinette MGP Sediment Removal Action Cofferdam (NRT)\civiltech\7ft water (1ft diff) 1ft excv 7ft embed.ep8

* INPUT DATA *

Wall Height=8.0 Total Soil Types= 3

Soil No.	Weight	Saturate	Phi	Cohesion	Nspt	Type	Description
1	100.0	110.0	26.0	0.0	0	4	L Sand
2	120.0	130.0	36.0	0.0	0	4	MD Sand
3	155.0	165.0	48.0	5.0	0	1	Bedrock

Ground Surface at Active Side:

Line	Z1	Xa1	Z2	Xa2	Soil No.	Description
1	7.0	0.0	7.0	800.0	1	L Sand
2	11.0	0.0	11.0	800.0	2	MD Sand
3	15.0	0.0	15.0	800.0	3	Bedrock

Water Table at Active Side:

Point	Z-water	X-water
1	0.0	0.0
2	0.0	80000.0

Ground Surface at Passive Side:

Line	Z1	Xp1	Z2	Xp2	Soil No.	Description
1	8.0	0.0	8.0	800.0	1	L Sand
2	11.0	0.0	11.0	800.0	2	MD Sand
3	15.0	0.0	15.0	800.0	3	Bedrock

Water Table at Passive Side:

Point	Z-water	X-water
1	1.0	0.0
2	1.0	80000.0

Wall Friction Options: 1.* No wall friction
Wall Batter Angle = 0
Apparent Pressure Conversion: 1.* Default (Terzaghi and Peck)*
Water Density = 62.4
Water Pressure: 1.* No seepage at wall tip

* OUTPUT RESULTS *

Eae (Total Force above Base)= 0.01 per one linear foot (or meter) width along wall height
Ea (Total Static Force above Base)= 0.01

Driving Pressure above Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pa1	Z2	Pa2	Slope	Ka
7.00	0.00	8.00	0.02	0.0186	0.3905

Driving Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pa1	Z2	Pa2	Slope	Ka
8.00	0.02	11.00	0.07	0.0186	0.3905
11.00	0.05	15.00	0.12	0.0178	0.2633
44.70	0.00	47.00	1.98	0.8609	8.3911

Passive Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pp1	Z2	Pp2	Slope	Kp
8.00	0.0	11.00	0.4	0.122	2.5611
11.00	0.5	15.00	1.6	0.269	3.9748
15.00	28.7	47.00	51.2	0.702	6.8416

Water Pressure - Output to Shoring - Multiplier of Pressure = 1

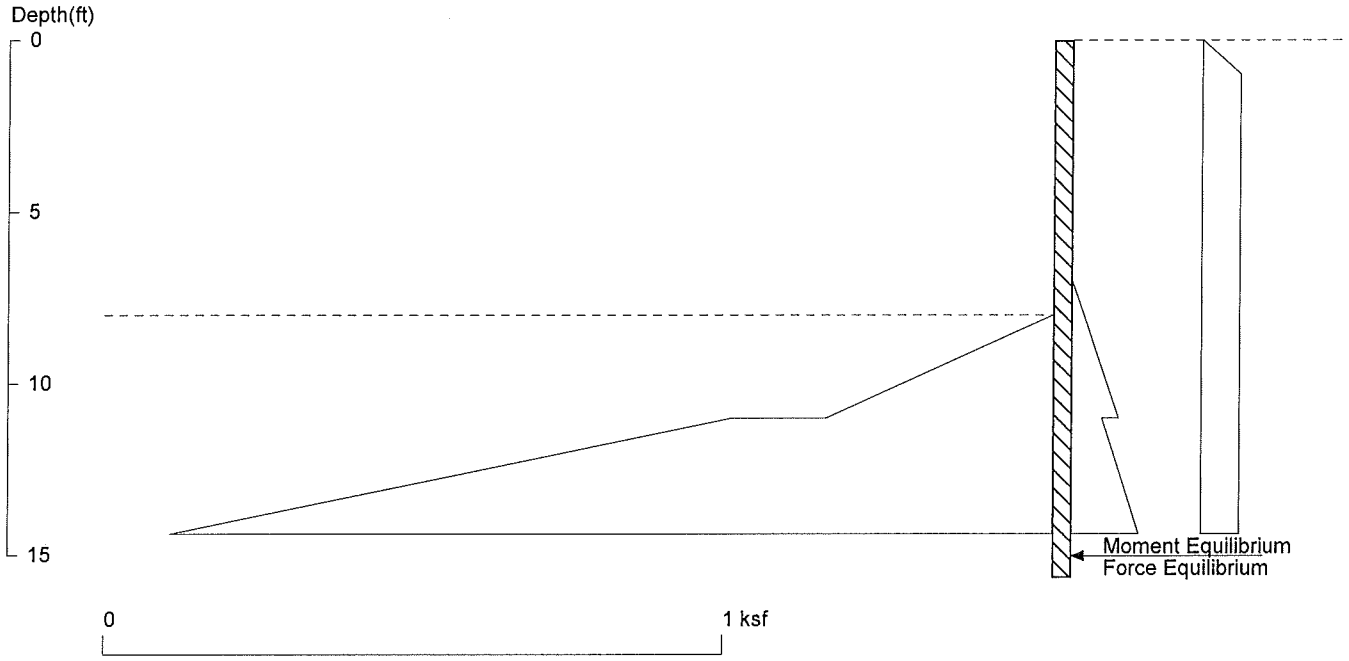
No	Z1	Pw1	Z2	Pw2	kw1
0	0.00	0.00	1.00	0.06	0.06
1	1.00	0.06	47.00	0.06	0.00

UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf

Date: 8/27/2012 File Name: J:\Projects\12.232 Marinette MGP Sediment Removal Action Cofferdam (NRT)\civiltech\7ft water (1ft diff) 1ft excv 7ft e

Marinette Former MGP (at sand bar)

7ft water (1ft diff.), 1ft excav., 7ft embed



Licensed to 4324324234 3424343 Date: 8/27/2012

File: J:\Projects\12.232 Marinette MGP Sediment Removal Action Cofferdam (NRT)\civiltech\7ft water (1ft diff) 1ft excv 7f

Wall Height=8.0 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=7.65 (8~10ft is recommended!!!) Min. Pile Length=15.65
MOMENT IN PILE: Max. Moment=3.14 per Pile Spacing=1.0 at Depth=11.54

PILE SELECTION:
Request Min. Section Modulus = 1.1 in3/ft=61.47 cm3/m, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
PZ22 has Section Modulus = 18.1 in3/ft=973.06 cm3/m. It is greater than Min. Requirements!
Top Deflection = 0.40(in) based on E (ksi)=29000.00 and I (in4)/foot=84.4

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
*	Above	Base		
7.000	0.000	8.000	0.019	0.018586
*	Below	Base		
8.000	0.019	11.00	0.074	0.018586
11.00	0.048	15.00	0.120	0.017799
*	Water	Pres.		
0.000	0.000	1.000	0.062	0.062400
1.000	0.062	47.00	0.062	0.000000

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
8.0	0.00	11.0	0.37	0.122
11.0	0.52	15.0	1.59	0.269
15.0	28.71	47.0	51.17	0.702

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	8.00	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	8.00	1.00

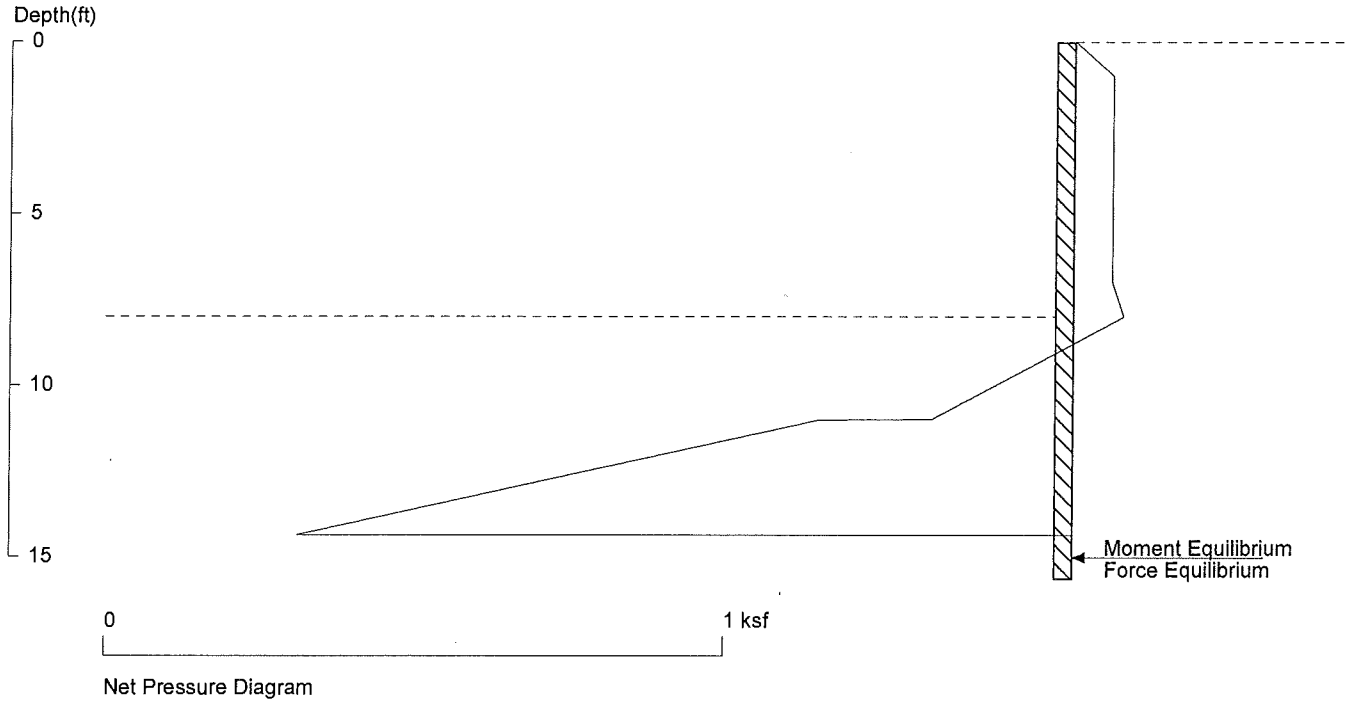
EXTERNAL FORCE ACTING ON WALL (Pusing on Wall - Positive; Against Wall - Negative)

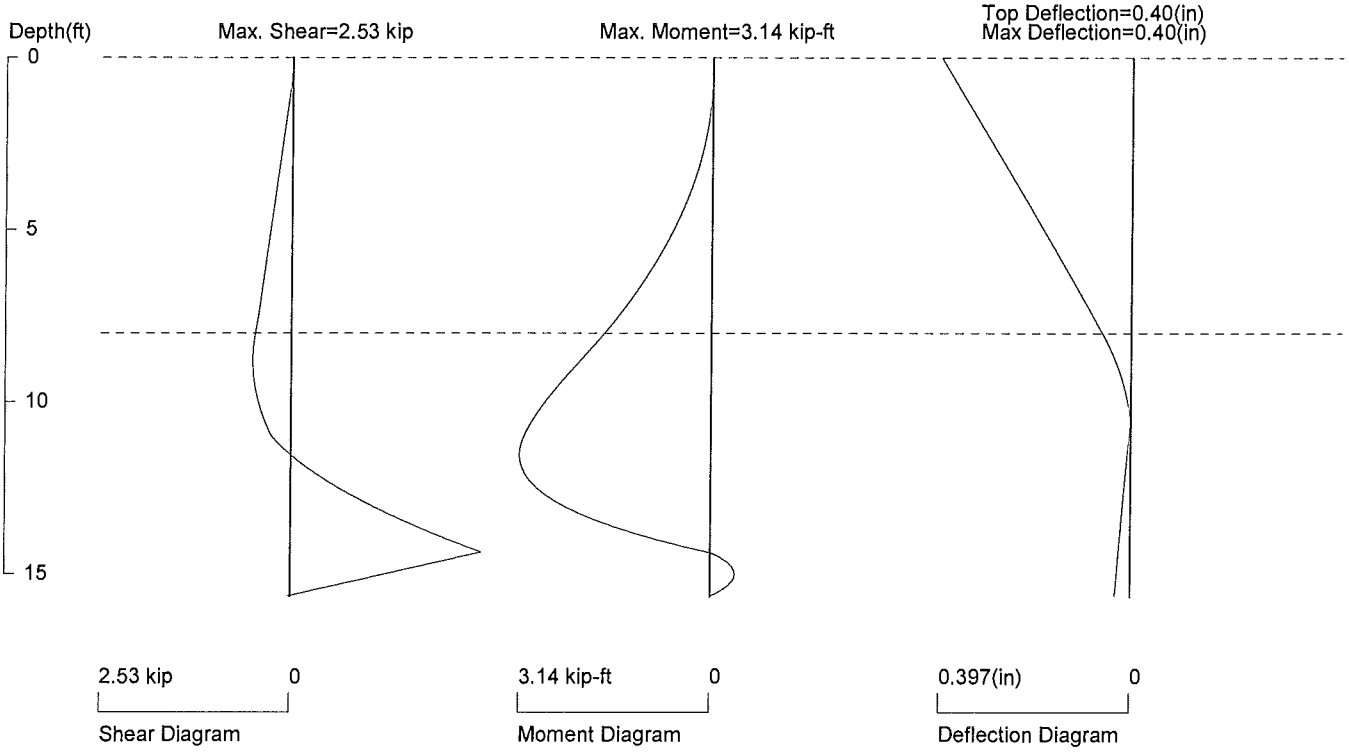
No.	Z force	Force	Angle	Spacing
1	0.00	0.00	0.0	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft3; Deflection - in

Marinette Former MGP (at sand bar)

7ft water (1ft diff.), 1ft excav., 7ft embed





PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

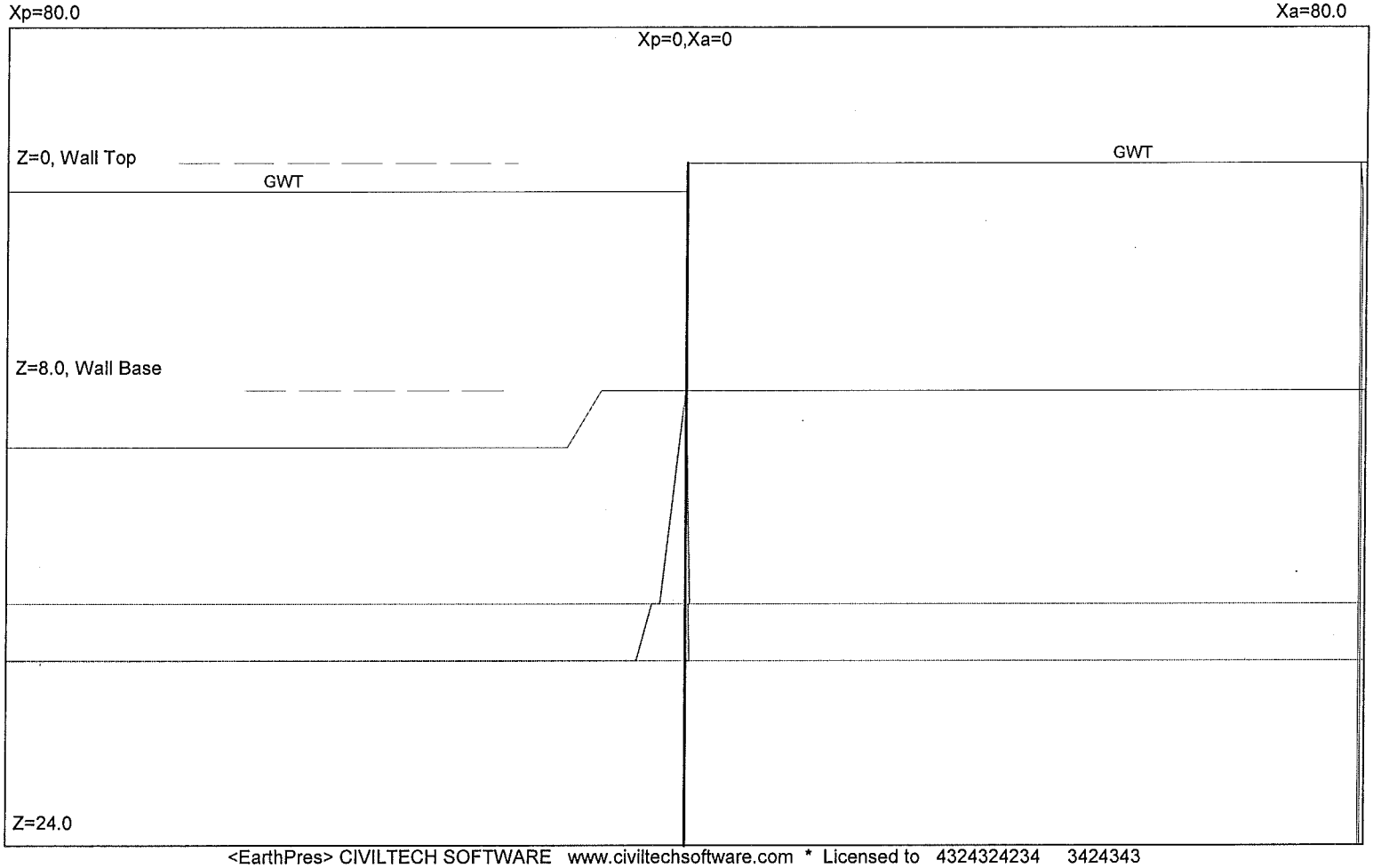
Based on pile spacing: 1.0 foot or meter

User Input Pile, PZ22: E (ksi)=29000.0, I (in4)/foot=84.4

File: J:\Projects\12.232 Marinette MGP Sediment Removal Action Cofferdam (NRT)\civiltech\7ft water (1ft diff) 1ft excv 7ft embed (cant).sh8

Marinette Former MGP (east wall)

8ft water (1ft diff.), 10ft bench, 10ft embed



UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf

Date: 8/22/2012 File: J:\Projects\12.232 Marinette MGP Sediment Removal Action Cofferdam (NRT)\civiltech\8ft water (1ft diff) 10ft bench 10ft embed.ep8

* INPUT DATA *

Wall Height=8.0 Total Soil Types= 3

Soil No.	Weight	Saturate	Phi	Cohesion	Nspt	Type	Description
1	100.0	110.0	26.0	0.0	0	4	L Sand
2	120.0	130.0	36.0	0.0	0	4	MD Sand
3	155.0	165.0	48.0	5.0	0	1	Bedrock

Ground Surface at Active Side:

Line	Z1	Xa1	Z2	Xa2	Soil No.	Description
1	8.0	0.0	8.0	800.0	1	L Sand
2	15.5	0.0	15.5	800.0	2	MD Sand
3	17.5	0.0	17.5	800.0	3	Bedrock

Water Table at Active Side:

Point	Z-water	X-water
1	0.0	0.0
2	0.0	80000.0

Ground Surface at Passive Side:

Line	Z1	Xp1	Z2	Xp2	Soil No.	Description
1	8.0	0.0	8.0	10.0	1	L Sand
2	8.0	10.0	10.0	14.0	1	L Sand
3	10.0	14.0	10.0	800.0	1	L Sand

4	15.5	0.0	15.5	800.0	2	MD Sand	
5	17.5	0.0	17.5	800.0	3	Bedrock	

Water Table at Passive Side:

Point	Z-water	X-water
1	1.0	0.0
2	1.0	80000.0

Wall Friction Options: 1.* No wall friction
Wall Batter Angle = 0
Apparent Pressure Conversion: 1.* Default (Terzaghi and Peck)*
Water Density = 62.4
Water Pressure: 1.* No seepage at wall tip

* OUTPUT RESULTS *

Eae (Total Force above Base)= 0.00 per one linear foot (or meter) width along wall height
Ea (Total Static Force above Base)= 0.00

Driving Pressure above Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pa1	Z2	Pa2	Slope	Ka
0.00	0.00	8.00	0.00	0.0000	0.0000

Driving Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pa1	Z2	Pa2	Slope	Ka
8.00	0.00	15.50	0.14	0.0186	0.3905
15.50	0.09	17.50	0.13	0.0182	0.2700
17.50	0.00	40.00	0.00	0.9558	9.3153

Passive Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pp1	Z2	Pp2	Slope	Kp
8.00	0.0	15.50	0.8	0.108	2.2663
15.50	1.1	17.50	1.6	0.254	3.7525
17.50	28.6	40.00	44.4	0.703	6.8498

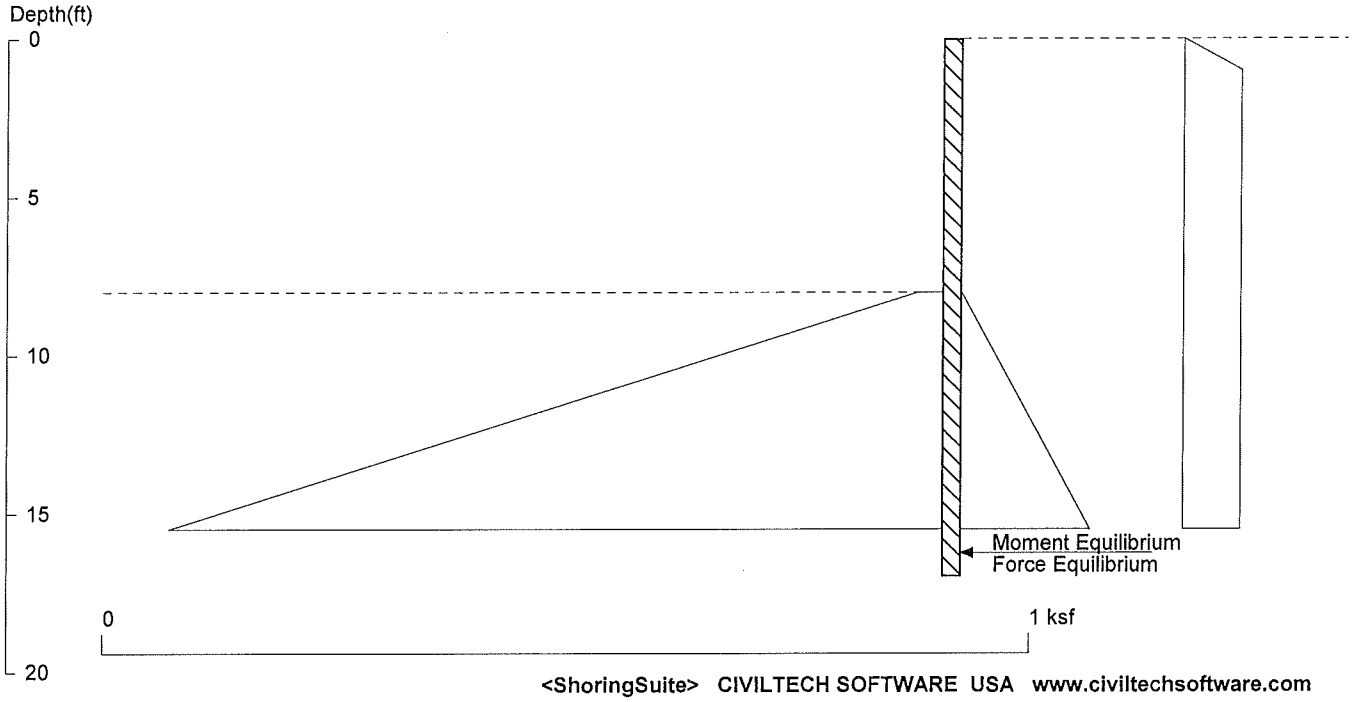
Water Pressure - Output to Shoring - Multiplier of Pressure = 1

No	Z1	Pw1	Z2	Pw2	kw1
0	0.00	0.00	1.00	0.06	0.06
1	1.00	0.06	40.00	0.06	0.00

UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf

Marinette Former MGP (east wall)

8ft water (1ft diff.), 10ft bench, 10ft embed



Licensed to 4324324234 3424343 Date: 8/22/2012

File: J:\Projects\12.232 Marinette MGP Sediment Removal Action Cofferdam (NRT)\civiltech\8ft water (1ft diff) 10ft bench

Wall Height=8.0 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=8.98 Min. Pile Length=16.98
MOMENT IN PILE: Max. Moment=2.96 per Pile Spacing=1.0 at Depth=11.66

PILE SELECTION:
Request Min. Section Modulus = 1.1 in3/ft=57.90 cm3/m, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
PZ22 has Section Modulus = 18.1 in3/ft=973.06 cm3/m. It is greater than Min. Requirements!
Top Deflection = 0.51(in) based on E (ksi)=29000.00 and I (in4)/foot=84.4

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
*	Above	Base		
0.000	0.000	8.000	0.000	0.000000
*	Below	Base		
8.000	0.000	15.50	0.139	0.018586
15.50	0.090	17.50	0.127	0.018249
*	Water	Pres.		
0.000	0.000	1.000	0.062	0.062400
1.000	0.062	40.00	0.062	0.000000

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
8.0	0.03	15.5	0.83	0.108
15.5	1.11	17.5	1.62	0.254
17.5	28.62	40.0	44.44	0.703

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	8.00	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	8.00	1.00

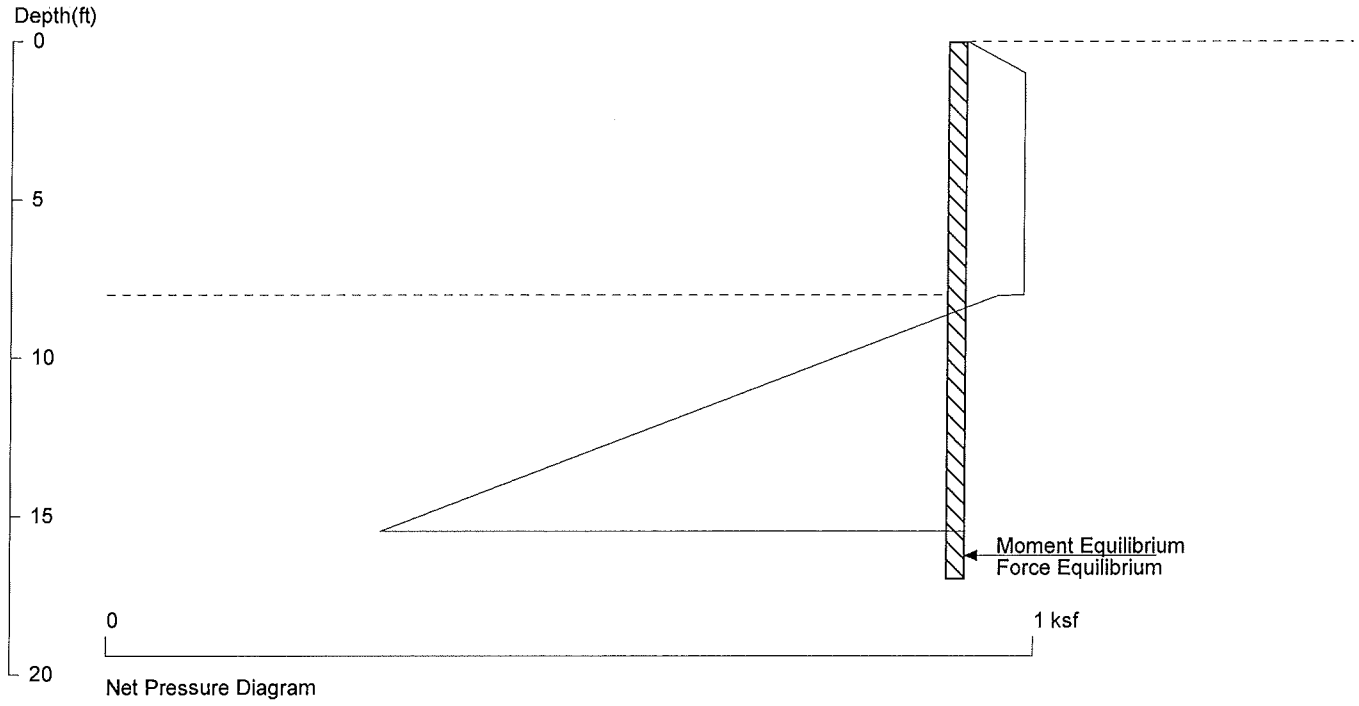
EXTERNAL FORCE ACTING ON WALL (Pusing on Wall - Positive; Against Wall - Negative)

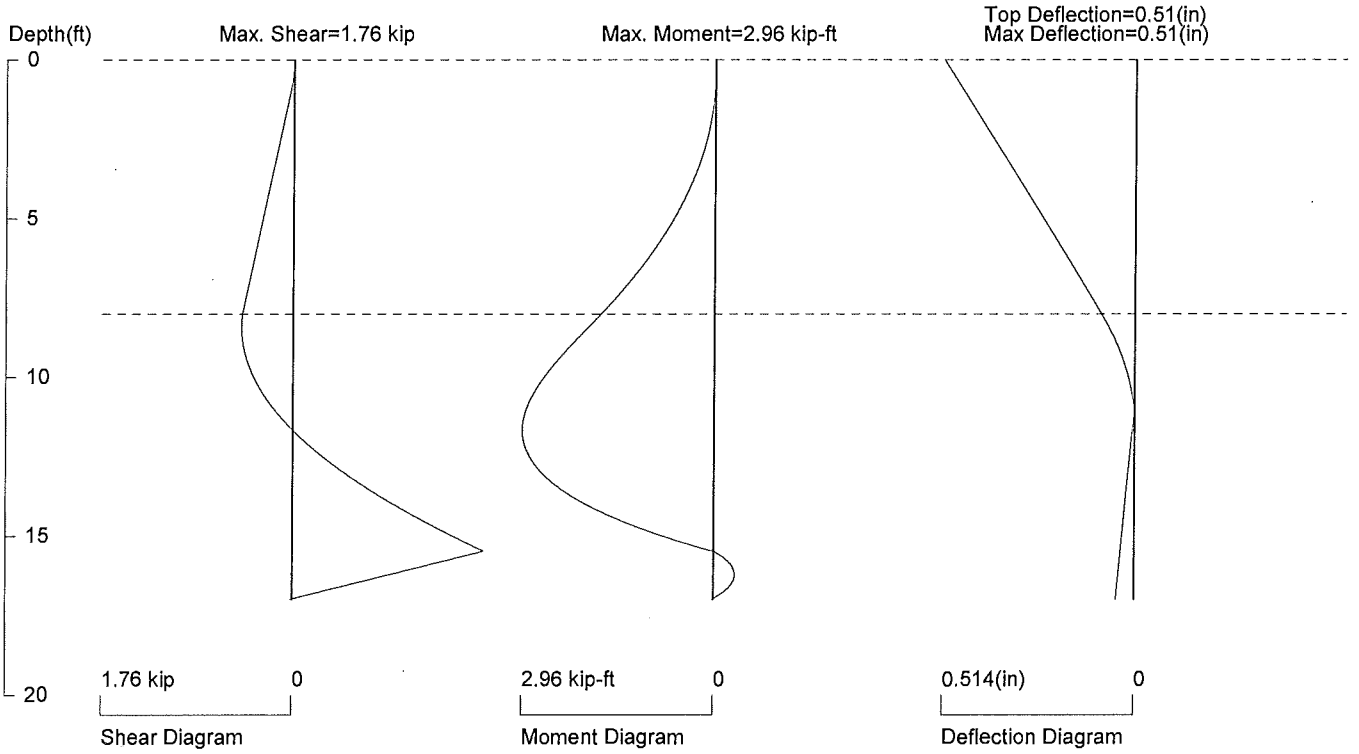
No.	Z force	Force	Angle	Spacing
1	0.00	0.00	0.0	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft3; Deflection - in

Marinette Former MGP (east wall)

8ft water (1ft diff.), 10ft bench, 10ft embed





PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 1.0 foot or meter

User Input Pile, PZ22: E (ksi)=29000.0, I (in4)/foot=84.4

File: J:\Projects\12.232 Marinette MGP Sediment Removal Action Cofferdam (NRT)\civiltech\8ft water (1ft diff) 10ft bench 10ft embed.sh8

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T02A8-NATIVE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/17/2012	4/17/2012	rotary (mud)

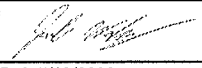
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	572.1 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994395.59 Feet ☐ S 450843.2754 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
SS	24 2	WOR WOR WOR 1	0.5 1.0 1.5	0 - 8' **POORLY-GRADED SAND:** SP, very dark brown (10YR 2/2), poorly graded, mostly sand [mostly fine], little silt, homogeneous, wet, few wood debris, 2-4' some wood chips.				0.2	0					WOR = weight of rod
SS	24 7.2	1 2 1 1	2.0 2.5 3.0 3.5					0 0						
SS	24 2.5	1 2 2 1	4.0 4.5 5.0 5.5	4' - 6' mostly wood debris with trace red wood chips, wet.	SP			0 0						
SS	24 3.6	4 3 4 3	6.0 6.5 7.0 7.5					0 0						
SS	24 24	4 6 6 50	8.0 8.5 9.0 9.5 10.0	8 - 9.3' **LEAN CLAY:** CL, light brownish gray (10YR 6/2), 5% reddish brown (5YR 4/4) mottling, slow dilatency, low toughness, low to medium plasticity, trace sand [mostly fine], little silt, homogeneous, moist. 9.3 - 10' **LEAN CLAY:** to **WELL-GRADED SAND:** CL, light brownish gray (10YR 6/2), slow dilatency,	CL CL			0 0	0.25					

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

Signature  Firm Natural Resource Technology, Inc. Tel: 262.522.1206
23713 W. Paul Road, St. D Pewaukee, WI 53072 Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number T02A8-NATIVE Use only as an attachment to Form 4400-122. Page 2 of 2

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 (10.6 ev)	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
				low toughness, low plasticity, some subrounded sand [mostly fine], little subrounded gravel [mostly fine], homogeneous, wet.	SC2.1			0						
				10' End of Boring. Refusal.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T02A-NATIVE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/19/2012	4/19/2012	rotary (mud)

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	572.0 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994387.288 Feet ☐ S 450813.0168 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
SS	24 2	WOR WOR WOR WOR	0.5 1.0 1.5	0 - 2' SILT: to POORLY-GRADED SAND: ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, soft, some sand [mostly fine], homogeneous, wet, few organic silt, trace wood debris, low recovery.	ML			0						WOR = weight of rod. Poor recovery throughout boring. WOH = weight of hammer
SS	24 2	WOH WOH 1 1	2.0 2.5 3.0 3.5	2 - 4' FILL: (FILL), mostly wood debris, some dark grayish brown sand, low recovery.	(FILL)			0 0						
SS	24 0	1 1/18	4.0 4.5 5.0 5.5	4 - 6' No recovery.				0 0						
SS	24 3	1/12 1/12	6.0 6.5 7.0 7.5	6 - 8' FILL: (FILL), mostly wood debris, some very dark brown sand, low recovery.	(FILL)			0 0						
SS	9.6 NM	3 50/3	8.0 8.5 9.0 9.5 10.0	8 - 8.4' WELL-GRADED SAND WITH GRAVEL: (SW)g, very dark grayish brown (10YR 3/2), rapid dilatency, well graded, mostly angular to subangular sand [little fine, mostly medium, little coarse], homogeneous, wet, trace wood debris. 8.4 - 8.8' SILT: ML, light brownish gray (10YR 6/2), slow dilatency, medium toughness, low plasticity, firm to hard, well graded, few sand [few coarse],	(SW)g ML			0 0	2.75					

563.2

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

Signature [signature] Firm Natural Resource Technology, Inc. Tel: 262.522.1206
23713 W. Paul Road, St. D Pewaukee, WI 53072 Fax: 262.523.9001

Date Modified: 7/12/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number T02A-NATIVE Use only as an attachment to Form 4400-122. Page 2 of 2

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID (10.6 ev)	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
				few gravel [few fine], some clay, homogeneous, dry to moist.										
				8.8' few angular to subangular gravel [mostly fine], little clay, End of Boring-refusal at 8.8. Top of Bedrock.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Page 1 of 1

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T03HH-NATIVE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/19/2012	4/19/2012	rotary (mud)

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	570.0 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994361.585 Feet ☐ S 450855.9225 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 10.6 eV Lamp	Soil Properties: Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 SS	24 / 0	WOH WOH WOH WOH	0.5 1.0 1.5 2.0	0 - 2' No Recovery.										2" Split Spoon. WOH = weight of hammer
2 SS	24 / 18	WOH WOH WOH WOH	2.5 3.0 3.5 4.0	2 - 8.5' SILT: to ORGANIC SILT: ML, very dark brown (10YR 2/2), 50% black (10YR 2/1) mottling, wet, trace root debris, some organic silt, faint petroleum-like odor.				0.3						2" Split Spoon.
3 SS	6 / 3	WOH	4.5	3.8' - 4' increased root debris. 4' - 5.5' little viscous emulsified NAPL (0.4" diameter droplets of weathered coal tar), strong MGP-like odor.				1.8						2" Split Spoon.
4 SS	24 / 12	2 2 2 4	5.0 5.5 6.0 6.5		ML			1.5						3" Split Spoon.
5 SS	24 / 12	3 3 3 5	7.0 7.5 8.0 8.5	5.5' - 6.5' black (10YR 2/1), moist, some viscous emulsified NAPL (0.6" to 1.2" diameter droplets of weathered coal tar), strong MGP-like odor. 6.5' - 8.5' black (10YR 2/1), moist, mostly viscous NAPL (Oil wetted), high plasticity (resulting form NAPL content), strong MGP-like odor, some silt, little organic silt, trace wood debris. 7.5' - 8.5' some wood debris (dark yellowish brown (10YR 4/4), little organic silt.				3.3 9 4.9						3" Split Spoon, viscous NAPL present on outside of sampler.
				8.5' End of Boring. Refusal on top of bedrock. Freshly broken fine gravel sized fragments adhered to drill bit.				541.5						Attempted 3" split spoon sampler.

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

Signature	Firm	Tel:
	Natural Resource Technology 23713 W. Paul Road Pewaukee, WI 53072	262.523.9000 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04B-NATIVE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/17/2012	4/17/2012	rotary (mud)

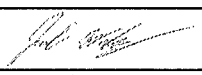
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	575.0 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994386.894 Feet ☐ S 450878.7069 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	24 18		0.5	0 - 1.2' **SILT:** to **FILL:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, soft, poorly graded, few rounded sand [mostly fine], homogeneous, wet, some wood debris, little organic silt.	ML			0.2 0						0-3 feet sampled with Osterberg Sampler
			1.0					0						
			1.5	1.2 - 2.2' **WELL-GRADED SAND:** SW, dark grayish brown (10YR 4/2), mostly subrounded to rounded sand [little fine, mostly medium, trace coarse], trace subrounded to rounded gravel [mostly fine], trace silt, homogeneous, wet.	SW			0						
2 CS	12 12		2.0					0						
			2.5	2.2 - 2.5' **WELL-GRADED SAND:** SW, black (10YR 2/1), mostly subrounded sand [trace fine, mostly medium, little coarse], little silt, wet, silts are black.	SW			0	1.75					
3 SS	12 8.4	10 14	3.0					0						
			3.5	2.5 - 8' **SILT:** ML, light brownish gray (10YR 6/2), slow dilatency, low toughness, nonplastic, poorly graded, little sand [mostly fine], homogeneous, dry, soft to firm, increasing moisture content with depth.										3 feet to EOB sampled with 2" split spoon
4 SS	24 19.2	16 12 18 17	4.0					0	1					
			4.5											
			5.0		ML			0						
			5.5											
5 SS	24 13.2	10 18 21 11	6.0	6' - 8' increased fine sand content, low plasticity, moist to wet.				0						
			6.5											
			7.0					0						
			7.5											
6 SS	24 24	3 3 3 4	8.0	8 - 10' **SILT:** ML, light brownish gray (10YR 6/2), slow dilatency, low toughness, low plasticity, trace sand [mostly fine], little clay, moist, little clay content increasing with depth, soft to firm.				0						
			8.5		ML									
			9.0					0	0.25					
			9.5	9.3' - 10' 5% reddish brown (5YR 4/4) mottling.										
			10.0											

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number T04B-NATIVE Use only as an attachment to Form 4400-122. Page 2 of 2

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 (10.6 ev)	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
7 SS	24 21.6	3 3 4 4	10.5	10 - 11.5' **LEAN CLAY:** CL, light brownish gray (10YR 6/2), 5% reddish brown (5YR 4/4) mottling, slow dilatency, low toughness, medium plasticity, firm, trace subrounded gravel [mostly fine], little silt, homogeneous, moist.	CL			0	0.75					
			11.0					0	0.75					
			11.5	11.5 - 11.8' **LEAN CLAY:** to **POORLY-GRADED SAND:** CL, light brownish gray (10YR 6/2), slow dilatency, low toughness, low plasticity, some sand [mostly fine], few subrounded gravel [mostly fine], little silt, homogeneous, moist, soft to firm, glacial till.	CL									
8 SS	3.6 3.6	50/3.6	12.0	11.8 - 12.3' **WELL-GRADED SAND:** to **LEAN CLAY:** SW, light brownish gray (10YR 6/2), soft, mostly subangular sand [mostly fine, few medium, few coarse], some clay, homogeneous, moist to wet, glacial till.	SW			0						
				12.3' End of Boring. Refusal.										

562.7

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04N-NATIVE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/19/2012	4/19/2012	rotary (mud)

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	575.4 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994344.74 Feet ☐ S 450881.3875 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 SS	24 0	WOH WOH WOH WOH	0.5 1.0 1.5 2.0	0 - 2' No Recovery.										WOH = weight of rod. WOH = weight of hammer
2 SS	24 3	WOH WOH WOH WOH	2.5 3.0 3.5 4.0	2 - 4.5' SILT: to POORLY-GRADED SAND: ML, black (10YR 2/1), slow dilatency, low toughness, low plasticity, soft, poorly graded, little sand [mostly fine], homogeneous, wet, some organic silt, trace wood debris, some viscous emulsified NAPL (weathered coal tar droplets (0.1" to 0.2" diameter), strong MGP-like odor, stained black.	ML			6.2 36.2						weathered NAPL present on outside of split spoon sampler, trace sheen droplets (5mm in diameter) along inside of sampler.
3 SS	24 7	WOH WOH 1 1	4.5 5.0 5.5 6.0	4.5 - 8' SILT: ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, soft, poorly graded, some sand [mostly fine], homogeneous, moist, little wood debris, trace organic silt, strong MGP-like odor.				3.2 0.7						
4 SS	24 3	WOH WOH WOH WOH	6.5 7.0 7.5 8.0	6' - 8' trace sheen droplets (0.15" diameter).	ML			1.1 0.7						trace sheen droplets along inside of split spoon sampler
5 SS	24 0	WOH 1/12 1	8.5 9.0 9.5 10.0	8 - 10' No Recovery. Slough had a PID reading of 2.3, trace sheen droplets along inside of split spoon sampler (0.2" diameter).										

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

Signature  Firm Natural Resource Technology, Inc. Tel: 262.522.1206
23713 W. Paul Road, St. D Pewaukee, WI 53072 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number T04N-NATIVE Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Sample Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID (10.6 ev)	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
6 SS	18 9	8 12 12	10.5	10 - 10.3' **WELL-GRADED SAND:** SW, light brownish gray (10YR 6/2), mostly subangular sand [mostly fine, little medium, few coarse].	SW			0						
			11.0	10.3 - 10.6' **SILT:** to **LEAN CLAY:** ML, light brownish gray (10YR 6/2), slow dilatency, medium toughness, nonplastic, firm, well graded, few subangular sand [mostly fine], little subangular gravel [some fine, some medium, some coarse], some clay, homogeneous, moist.	ML			0						
			11.5	10.6 - 11.5' **LIMESTONE:** BDX (LS), fine to coarse gravel sized angular limestone fragments, freshly broken, no visible or olfactory observations of impacts.	BDX (LS)			0						
				11.5' End of Boring. Refusal in bedrock..										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T04N-NATIVE-1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/19/2012	4/19/2012	rotary (mud)

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	575.4 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994345.161 Feet ☐ S 450881.2642 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			0.5	0 - 10' Blind Drilled. See Boring Log T04N-NATIVE.										
			1.0											
			1.5											
			2.0											
			2.5											
			3.0											
			3.5											
			4.0											
			4.5											
			5.0											
			5.5											
			6.0											
			6.5											
			7.0											
			7.5											
			8.0											
			8.5											
			9.0											
			9.5											
			10.0											

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

Signature	Firm	Tel: 262.522.1206
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT

Form 4400-122A

Boring Number T04N-NATIVE-1 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 SS	14.4 / 14.4	3 2 5 3	10.5 — 11.0	10 - 10.2' **SILT:** ML, black (10YR 2/1), slow dilatency, low toughness, nonplastic, soft, poorly graded, little sand [mostly fine], homogeneous, wet, stained black, some organic silt, few wood debris, strong MGP-like odor, trace sheen droplets (0.2" diameter).	ML			0.8						3" split spoon
				10.2 - 10.4' **WELL-GRADED SAND:** SW, very dark grayish brown (10YR 3/2), mostly sand [mostly fine, little medium, few coarse], homogeneous, wet, few root and wood debris, strong MGP-like odor.	SW									Material from 10 - 10.2 feet was smeared on the outside of lower intervals making odors difficult to segregate.
				10.4 - 11.2' **SILT:** ML, light brownish gray (10YR 6/2), slow dilatency, low to medium toughness, low plasticity, well graded, trace sand [mostly fine], little subangular gravel [some fine, some medium, some coarse], little clay, lensed, moist, odor at top of interval, faint MGP-like odor, glacial till.	ML									
				11.2' End of Boring. Refusal on top of bedrock.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Page 1 of 1

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T05N-NATIVE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/18/2012	4/18/2012	rotary (mud)

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	570.9 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994362.018 Feet ☐ S 450909.6171 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 SS	21 6	WOR WOR WOH WOH	0.5 1.0 1.5	0 - 2.6' **SILT:** to **ORGANIC SILT:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, soft, poorly graded, little sand [mostly fine], homogeneous, wet, some organic silt.	ML			0 0 0						WOR = weight of rod. WOH = weight of hammer
2 SS	24	WOH WOH 1 1	2.0 2.5	2' - 2.6' wet, some organic silt, few wood debris (stained black (10YR 2/1), faint MGP-like odor.										No PID readings between 2 and 6.5 feet.
			3.0 3.5	2.6 - 4' **ORGANIC SILT:** to **SILT:** OL, dark brown (10YR 3/3), slow dilatency, low toughness, nonplastic, soft, poorly graded, little sand [mostly fine], some silt, homogeneous, moist.	OL									
3 SS	24 0	2 1 1 1	4.0 4.5 5.0 5.5	4 - 6' No Recovery.										
4 SS	8.4 8.4	7 50/3	6.0 6.5	6 - 6.2' **WELL-GRADED SAND:** SW, grayish brown (10YR 5/2), mostly subangular sand [few fine, mostly medium, little coarse], some angular to subangular gravel [mostly fine, little coarse], homogeneous, wet.	SW ML			0						
				564.2										
				6.2 - 6.7' **SILT:** ML, light grayish brown (10YR 6/2), slow dilatency, low toughness, nonplastic, firm, well graded, few subangular sand [some medium, some coarse], little subangular gravel [mostly fine, little coarse], homogeneous, dry to moist, glacial till.										
				6.7' End of Boring. Refusal on Bedrock. 0.25" thick freshly broken limestone in tip of sampler..										

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

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Page 1 of 1

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T06HH1-NATIVE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/18/2012	4/18/2012	rotary (mud)

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	569.7 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994348.09 Feet ☐ S 450936.1933 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	6 6		0.5	0 - 0.5' **SILT:** to **POORLY-GRADED SAND:** ML, very dark brown (10YR 2/2), slow dilatency, low toughness, nonplastic, soft, homogeneous, wet, some sand, little wood debris, faint sulfur-like odor.	ML			0						0 - 0.5 feet Osterberg sampler
2 SS	24 5	10 2 2 2	1.0	0.5 - 2.5' **SILT:** to **FILL:** ML, black (10YR 2/1), rapid dilatency, low toughness, nonplastic, poorly graded, little sand [mostly fine, some medium], homogeneous, wet, some wood debris, faint sulfur-like odor, broken ceramic fragment at top of interval.	ML			0 0 0						0.5 feet - EOB 2" split spoon sampler
3 SS	24 4	4 3 2 2	1.5 2.0 2.5 3.0	2.5 - 4.5' **POORLY-GRADED SAND:** to **FILL:** SP, black (10YR 2/1), mostly sand [mostly fine, some medium], homogeneous, wet, some wood debris, strong MGP-like odor, trace broken ceramic fragments, some viscous emulsified NAPL (0.25" weathered coal tar droplets). 3' - 3.5' wood pieces.	SP			5 4.1						
4 SS	24 7	3 1 2 50	3.5 4.0 4.5 5.0	4.5 - 6.5' **WELL-GRADED SAND:** SW, light brownish gray (10YR 6/2), mostly sand [some fine, mostly medium, few coarse], few gravel [mostly fine, some coarse], homogeneous, strong MGP-like odor, interval grades from trace to few viscous emulsified NAPL (0.2" weathered coal tar droplets).	SW			1 1.5						
			5.5 6.0 6.5	6.5' End of Boring. Refusal. Drill bit bouncing on hard material (likely bedrock).				563.2						

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

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Page 1 of 1

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T06HH1-NATIVE1

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/18/2012	4/18/2012	rotary (mud)

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	568.6 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994355.724 Feet ☐ S 450943.6343 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			0.5	0 - 2.5' Blind Drilled. See boring log T06HH1-Native.										
			1.0											
			1.5											
			2.0											
1 SS	24 12	2 2 2 50	2.5	2.5 - 3.5' SILT: to ORGANIC SILT: ML, slow dilatency, low toughness, nonplastic, soft, poorly graded, little sand [mostly fine], homogeneous, moist to wet, few wood chips, interval grades from trace to little viscous emulsified NAPL (weathered coal tar droplets (0.4" to 1.6")), strong MGP-like odor.	ML			0.8						
			3.0					1.2						
			3.5		SW			1.8						
			4.0	3.5 - 4.2' WELL-GRADED SAND: SW, mostly rounded sand [little fine, mostly medium, few coarse], trace rounded gravel [mostly fine], homogeneous, strong MGP-like odor.	ML			0						
			4.5	4.2 - 4.5' SILT: ML, slow dilatency, low toughness, nonplastic, soft, poorly graded, few sand [mostly fine], homogeneous.										
			5.0	4.5' End of Boring. Refusal on top of bedrock. Freshly broken gravel pieces in tip of sampler.										

564.1

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

Signature

Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T06N1-NATIVE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Billy Harrison Subsurface Exploration Services, LLC	4/17/2012	4/17/2012	rotary (mud)

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	575.0 Feet (NAVD)	8.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994374.248 Feet ☐ S 450939.2583 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 SS	24 3	WOH 1 2 14	0.5	0 - 2.5' **WELL-GRADED SAND:** SW, very dark grayish brown (10YR 3/2), mostly subrounded sand [mostly fine, some medium], homogeneous, wet.	SW			0 0						WOH = weight of hammer Slight Resistance of Sampler Likely Due to Wood Debris.
2 SS	24 12	5 6 8 15	2.5	2.5 - 3.4' **SILT:** ML, grayish brown (10YR 5/2), slow dilatency, low toughness, nonplastic, firm to hard, poorly graded, trace subrounded sand [some fine, some coarse], homogeneous, moist.	ML			0 0	1.5					
3 SS	24 15.6	4 4 5 5	3.5	3.4 - 4' **POORLY-GRADED SAND:** to **SILT:** SP, grayish brown (10YR 5/2), mostly subrounded sand [mostly fine], homogeneous.	SP			0						
			4.0	4 - 6.5' **SILT:** ML, grayish brown (10YR 5/2), slow dilatency, low toughness, nonplastic, firm, poorly graded, trace subrounded sand [some fine, some coarse], homogeneous, moist.	ML			0						
			4.5											
			5.0											
			5.5	5.5' - 6.0' soft.				0						
4 SS	24 13.2	3 15 15 20	6.0					0.1	0.5					
			6.5	6.5 - 9.5' **SILT:** to **LEAN CLAY:** ML, brown (7.5YR 4/3), 20% grayish brown (10YR 5/2) mottling, slow dilatency, low to medium toughness, low plasticity, firm, well graded, few subangular to subrounded sand [some fine, some coarse], few subangular to subrounded gravel [mostly fine], some clay, homogeneous, dry to moist, glacial till.										
			7.0											
			7.5					0.1	1					
5 SS	24 5.4	12 13 14 20	8.0		ML			0	2.25					
			8.5	7.5' - 9.5' 50% brown (7.5YR 4/4) mottling, little fine sand, trace coarse subangular gravel.										
			9.0					0	4.5					
			9.5											
			10.0	9.5 - 10' **WELL-GRADED SAND:** SW, brown (7.5YR 5/3), mostly rounded sand [mostly fine, little	SW									

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

Signature	Firm	Tel:
	Natural Resource Technology, Inc. 23713 W. Paul Road, St. D Pewaukee, WI 53072	262.522.1206 Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT

Form 4400-122A

Boring Number T06N1-NATIVE Use only as an attachment to Form 4400-122. Page 2 of 2

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 (10.6 ev)	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
6 SS	24 7	10 15 8 5	10.5	medium], trace subangular gravel [mostly coarse], little silt, homogeneous, moist to wet, glacial till.	SP			0	0					
			11.0	10 - 11' POORLY-GRADED SAND: to SILT: SP, brown (7.5YR 5/3), mostly subangular to subrounded sand [mostly fine, little medium, little coarse], little gravel [mostly fine], some silt, homogeneous, moist, glacial till.	SW			0	0					
7 SS	12 2	13 53	12.0	11 - 12' WELL-GRADED SAND: SW, grayish brown (10YR 5/2), mostly subangular to subrounded sand [mostly fine, little medium, little coarse], homogeneous, moist, glacial till.	GW			0						
			13.0	12 - 13' WELL-GRADED GRAVEL: GW, grayish brown (10YR 5/2), few sand [mostly medium], mostly angular gravel [mostly fine, some coarse], glacial till.				0						
				13' End of Boring. Refusal on top of bedrock.		562.0								

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Marinette Former MGP		T07N-NATIVE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Andrew Millspaugh Natural Resource Technology, Inc.	4/16/2012	4/16/2012	vibratory

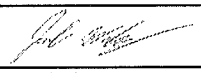
WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet (NAVD)	572.9 Feet (NAVD)	4.0 inches

Local Grid Origin ☒ (estimated: ☒) or Boring Location ☐
State Plane N, E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☒ N ☒ E
4994363.883 Feet ☐ S 450987.8825 Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Marinette	38	Marinette

Sample Number and Type	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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 SS	24 8	WOH WOH 1 3	0.5	0 - 0.5' **POORLY-GRADED SAND:** SP, very dark brown (10YR 2/2), mostly sand [mostly fine, trace coarse], trace gravel [mostly fine], homogeneous, moist.	SP									WOH = weight of rod
			1.0	0.5 - 10.5' **SILT:** ML, light brownish gray (10YR 6/2), slow dilatency, low toughness, nonplastic, soft, little sand [mostly fine], dry to moist, glacial till.										
2 SS	24 17	8 6 10 12	2.0											
			2.5											
			3.0											
			3.5											
3 SS	24 11	7 11 20 24	4.0											
			4.5											
			5.0		ML				3.5					
			5.5											
4 SS	24 11	5 9 8 7	6.0											
			6.5											
			7.0											
			7.5	7.5' - 10.5' moist, low to medium plasticity, decreased sand content.										
5 SS	24 24	3 3 5 8	8.0											
			8.5						0.25					
			9.0						0.25					
			9.5						0.25					
			10.0											

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

Signature  Firm Natural Resource Technology, Inc.
23713 W. Paul Road, St. D Pewaukee, WI 53072
Tel: 262.522.1206
Fax: 262.523.9001

Date Modified: 5/31/2012 Template: WDNR SBL 1998 - Project: 1549_GINT_2012.GPJ

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT

Form 4400-122A

Boring Number T07N-NATIVE Use only as an attachment to Form 4400-122. Page 2 of 2

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 (10.6 ev)	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			10.5		ML									
6 SS	24 10		11.0	10.5 - 12' **WELL-GRADED SAND:** SW, dark yellowish brown (10YR 4/6), mostly sand [some fine, mostly medium, trace coarse], trace silt, homogeneous, moist.	SW									
			11.5											
			12.0											
7 SS	6 4	7/3.5 50/2.5	12.5	12 - 12.5' **SILT:** to **WELL-GRADED SAND:** ML, dark yellowish brown (10YR 4/6), slow dilatency, low toughness, nonplastic, soft, some subrounded sand [mostly fine], homogeneous, wet.	ML			560.4						
				12.5' End of Boring. Refusal on top of bedrock. Freshly broken gravel pieces in tip of sampler.										

APPENDIX D

EXAMPLE WPDES DISCHARGE PERMIT

WPDES PERMIT

Substantive Requirements of a

STATE OF WISCONSIN

DEPARTMENT OF NATURAL RESOURCES

PERMIT TO DISCHARGE UNDER THE WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM

Wisconsin Public Service Corp Integrys Group

at Campmarina on the Sheboygan River

is permitted, under the authority of Chapter 283, Wisconsin Statutes, to discharge from a facility located at

732 North Water Street

to

The Sheboygan River

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in this permit.

The permittee shall not discharge after the date of expiration. If the permittee wishes to continue to discharge after this expiration date an application shall be filed for reissuance of this permit, according to Chapter NR 200, Wis. Adm. Code, at least 180 days prior to the expiration date given below.

State of Wisconsin Department of Natural Resources
For the Secretary

By _____
Curt Nickels
Wastewater Engineer

_____
Date Permit Signed/Issued

PERMIT TERM: EFFECTIVE DATE - June 01, 2011 **EXPIRATION DATE – May 1, 2012**

TABLE OF CONTENTS

1 Influent Requirements

1.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
701	Influent sample point at the mixing/storage tank.

1.2 Monitoring Requirements

The permittee shall comply with the following monitoring requirements.

1.2.1 Sampling Point 701 - Influent Sample Point

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Suspended Solids, Total		mg/L	Daily	Grab	
PAHs		mg/L	Per Cycle	Grab	
PCB Total		µg/L	Per Cycle	Grab	

2 Surface Water Requirements

2.1 Sampling Point(s)

The discharge(s) shall be limited to the waste type(s) designated for the listed sampling point(s).

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
001	Wastewater is treated with primary settling, and polymer addition if needed, multi-media filtration, and granular activated carbon. Geotextile filters and oil/water separators may also be added to the treatment train if needed.

2.2 Monitoring Requirements and Effluent Limitations

The permittee shall comply with the following monitoring requirements and limitations.

2.2.1 Sampling Point (Outfall) 001 - Effl Tank Prior to Discharge

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	At Discharge	Total Daily	
Suspended Solids, Total	Daily Max	10 mg/L	At Discharge	3-Grab Comp	
pH Field		su	At Discharge	3-Grab Comp	
PCB Total	Daily Max	0.8 µg/L	At Discharge	3-Grab Comp	
PAHs	Monthly Avg	0.1 mg/L	At Discharge	3-Grab Comp	

2.2.1.1 Polynuclear Aromatic Hydrocarbon Group

The polynuclear aromatic hydrocarbons (PAH) group regulated by this permit shall include a summation of the following individual compounds: benzo(a)anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene. Compliance with the monthly average PAH group limit can be demonstrated by using EPA method 610 or 8310 HPLC and reporting no detect of any of these PAH compounds, or by reporting the sum of the PAH group detected amounts equal to or less than 0.1 ug/L.

2.2.1.2 Total Metals Analyses

Measurements of total metals and total recoverable metals shall be considered as equivalent.

2.2.1.3 Mercury Monitoring

The permittee shall collect and analyze all mercury samples according to the data quality requirements of ss. NR 106.145(9) and (10), Wisconsin Administrative Code. The limit of quantitation (LOQ) used for the effluent and field

blank shall be less than 1.3 ng/L, unless the samples are quantified at levels above 1.3 ng/L. The permittee shall collect at least one mercury field blank for each set of mercury samples (a set of samples may include combinations of intake, influent, effluent or other samples all collected on the same day). The permittee shall report results of samples and field blanks to the Department on Discharge Monitoring Reports.

2.2.2 Outfall 001 Additional Startup Monitoring

The following parameters shall be monitored once during the first full scale discharge except as otherwise approved using 3 Grab Composite samples (a grab sample is needed for Cr^{+6}). Continued effluent monitoring shall be conducted during every discharge for parameters which have detectable results greater than one fifth of the lowest limit presented in the table below. The Permittee shall also make treatment system modifications to increase the treatment efficiency in removing the detected pollutants. If further testing indicates that the pollutants are no longer present in the effluent, monitoring may be waived by written authorization by the Department.

	Limits Corresponding to Criteria : All Values in ug/l Unless Noted				
Parameter	ATC Daily Max	CTC Weekly Avg	WC Monthly Avg	HTC Monthly Avg	HCC Monthly Avg
Arsenic, Total Recoverable	680	486			50
Cadmium , Total Recoverable	76	12.2		160	
Chromium $^{+6}$	32	35.07		2236	
Copper, Total Recoverable	89	100.8			
Manganese , Total Recoverable					
Mercury, Total Recoverable					
Chlordane					0.00192
Dieldrin	0.48	0.176		0.00271	4.31×10^{-5}
Endrin	0.172	0.23			
4,4'-DDT			5.8×10^{-5}	1.41×10^{-2}	1.04×10^{-3}
4,4'-DDD			5.8×10^{-5}		
4,4'-DDE			5.8×10^{-5}		
Nitrogen, Ammonia (NH_3-N) Total	11.2 mg/L for estimated effluent pH of 8.2 s.u. (varies with pH)				

3 Standard Requirements

NR 205, Wisconsin Administrative Code (Conditions for Industrial Dischargers): The conditions in ss. NR 205.07(1) and NR 205.07(3), Wis. Adm. Code, are included by reference in this permit. The permittee shall comply with all of these requirements. Some of these requirements are outlined in the Standard Requirements section of this permit. Requirements not specifically outlined in the Standard Requirement section of this permit can be found in ss. NR 205.07(1) and NR 205.07(3).

3.1 Reporting and Monitoring Requirements

3.1.1 Monitoring Results

Monitoring results obtained during the previous month shall be summarized and reported on a Department Wastewater Discharge Monitoring Report. The report may require reporting of any or all of the information specified below under 'Recording of Results'. This report is to be returned to the Department no later than the date indicated on the form. A copy of the Wastewater Discharge Monitoring Report Form or an electronic file of the report shall be retained by the permittee.

Monitoring results shall be reported on an electronic discharge monitoring report (eDMR) or in a form approved by the department for reporting results of monitoring of sludge use or disposal practices.

If the permittee monitors any pollutant more frequently than required by this permit, the results of such monitoring shall be included on the Wastewater Discharge Monitoring Report.

The permittee shall comply with all limits for each parameter regardless of monitoring frequency. For example, monthly, weekly, and/or daily limits shall be met even with monthly monitoring. The permittee may monitor more frequently than required for any parameter.

An Electronic Discharge Monitoring Report Certification sheet shall be signed and submitted with each electronic Discharge Monitoring Report submittal. This certification sheet, which is not part of the electronic report form, shall be signed by a principal executive officer, a ranking elected official or other duly authorized representative and shall be mailed to the Department at the time of submittal of the electronic Discharge Monitoring Report. The certification sheet certifies that the electronic report form is true, accurate and complete.

3.1.2 Sampling and Testing Procedures

Sampling and laboratory testing procedures shall be performed in accordance with Chapters NR 218 and NR 219, Wis. Adm. Code and shall be performed by a laboratory certified or registered in accordance with the requirements of ch. NR 149, Wis. Adm. Code. Groundwater sample collection and analysis shall be performed in accordance with ch. NR 140, Wis. Adm. Code. The analytical methodologies used shall enable the laboratory to quantitate all substances for which monitoring is required at levels below the effluent limitation. If the required level cannot be met by any of the methods available in NR 219, Wis. Adm. Code, then the method with the lowest limit of detection shall be selected. Additional test procedures may be specified in this permit.

3.1.3 Recording of Results

The permittee shall maintain records which provide the following information for each effluent measurement or sample taken:

- the date, exact place, method and time of sampling or measurements;
- the individual who performed the sampling or measurements;
- the date the analysis was performed;
- the individual who performed the analysis;
- the analytical techniques or methods used; and
- the results of the analysis.

3.1.4 Reporting of Monitoring Results

The permittee shall use the following conventions when reporting effluent monitoring results:

- Pollutant concentrations less than the limit of detection shall be reported as < (less than) the value of the limit of detection. For example, if a substance is not detected at a detection limit of 0.1 mg/L, report the pollutant concentration as < 0.1 mg/L.

- Pollutant concentrations equal to or greater than the limit of detection, but less than the limit of quantitation, shall be reported and the limit of quantitation shall be specified.

- For the purposes of reporting a calculated result, average or a mass discharge value, the permittee may substitute a 0 (zero) for any pollutant concentration that is less than the limit of detection. However, if the effluent limitation is less than the limit of detection, the department may substitute a value other than zero for results less than the limit of detection, after considering the number of monitoring results that are greater than the limit of detection and if warranted when applying appropriate statistical techniques.

3.1.5 Records Retention

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the application for the permit for a period of at least 3 years from the date of the sample, measurement, report or application, except for sludge management forms and records, which shall be kept for a period of at least 5 years.

3.1.6 Other Information

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or correct information to the Department.

3.2 System Operating Requirements

3.2.1 Noncompliance Notification

- The permittee shall report the following types of noncompliance by a telephone call to the Department's regional office within 24 hours after becoming aware of the noncompliance;
  - any noncompliance which may endanger health or the environment;
  - any violation of an effluent limitation resulting from an unanticipated bypass;
  - any violation of an effluent limitation resulting from an upset; and
  - any violation of a maximum discharge limitation for any of the pollutants listed by the Department in the permit.

- A written report describing the noncompliance shall also be submitted to the Department's regional office within 5 days after the permittee becomes aware of the noncompliance. On a case-by-case basis, the Department may waive the requirement for submittal of a written report within 5 days and instruct the permittee to submit the written report with the next regularly scheduled monitoring report. In either case, the written report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times; the steps taken or planned to reduce, eliminate and prevent reoccurrence of the noncompliance; and if the noncompliance has not been corrected, the length of time it is expected to continue.

- The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

NOTE: Section 292.11(2)(a), Wisconsin Statutes, requires any person who possesses or controls a hazardous substance or who causes the discharge of a hazardous substance to notify the Department of Natural Resources **immediately** of any discharge not authorized by the permit. The discharge of a hazardous substance that is not authorized by this permit or that violates this permit may be a hazardous substance spill. To report a hazardous substance spill, call DNR's 24-hour HOTLINE at **1-800-943-0003**.

3.2.2 Unscheduled Bypassing

Any unscheduled bypass or overflow of wastewater at the treatment works or from the collection system is prohibited, and the Department may take enforcement action against a permittee for such occurrences under s. 283.89, Wis. Stats., unless all of the following occur:

- The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage.
- There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance.
- The permittee notifies the department of the unscheduled bypass or overflow. The permittee shall notify the department within 24 hours of initiation of the bypass or overflow occurrence by telephone, voicemail, fax or e-mail. Within 5 days of conclusion of the bypass or overflow occurrence, the permittee shall submit to the department in writing, all of the following information:
  - Reason the bypass or overflow occurred, or explanation of other contributing circumstances that resulted in the overflow event. If the overflow or bypass is associated with wet weather, provide data on the amount and duration of the rainfall or snow melt for each separate event.
  - Date the bypass or overflow occurred.
  - Location where the bypass or overflow occurred.
  - Duration of the bypass or overflow and estimated wastewater volume discharged.
  - Steps taken or the proposed corrective action planned to prevent similar future occurrences.
  - Any other information the permittee believes is relevant.

3.2.3 Scheduled Bypassing

Any construction or normal maintenance which results in a bypass of wastewater is prohibited unless authorized by the Department in writing. If the Department determines that there is significant public interest in the proposed action, the Department may schedule a public hearing or notice a proposal to approve the bypass. Each request shall specify the following minimum information:

- Proposed date of bypass.
- Estimated duration of the bypass.
- Alternatives to bypassing.
- Measures to mitigate environmental harm caused by the bypass.
- Estimated volume of the bypass.

3.2.4 Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training as required in

ch. NR 114, Wis. Adm. Code, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

3.2.5 Spill Reporting

The permittee shall notify the Department in accordance with ch. NR 706 (formerly NR 158), Wis. Adm. Code, in the event that a spill or accidental release of any material or substance results in the discharge of pollutants to the waters of the state at a rate or concentration greater than the effluent limitations established in this permit, or the spill or accidental release of the material is unregulated in this permit, unless the spill or release of pollutants has been reported to the Department in accordance with s. NR 205.07 (1)(s), Wis. Adm. Code.

3.2.6 Planned Changes

In accordance with ss. 283.31(4)(b) and 283.59, Stats., the permittee shall report to the Department any facility expansion, production increase or process modifications which will result in new, different or increased discharges of pollutants. The report shall either be a new permit application, or if the new discharge will not violate the effluent limitations of this permit, a written notice of the new, different or increased discharge. The notice shall contain a description of the new activities, an estimate of the new, different or increased discharge of pollutants and a description of the effect of the new or increased discharge on existing waste treatment facilities. Following receipt of this report, the Department may modify this permit to specify and limit any pollutants not previously regulated in the permit.

3.2.7 Duty to Halt or Reduce Activity

Upon failure or impairment of treatment facility operation, the permittee shall, to the extent necessary to maintain compliance with its permit, curtail production or wastewater discharges or both until the treatment facility operations are restored or an alternative method of treatment is provided.

3.3 Surface Water Requirements

3.3.1 Permittee-Determined Limit of Quantitation Incorporated into this Permit

For pollutants with water quality-based effluent limits below the Limit of Quantitation (LOQ) in this permit, the LOQ calculated by the permittee and reported on the Discharge Monitoring Reports (DMRs) is incorporated by reference into this permit. The LOQ shall be reported on the DMRs, shall be the lowest quantifiable level practicable, and shall be no greater than the minimum level (ML) specified in or approved under 40 CFR Part 136 for the pollutant at the time this permit was issued, unless this permit specifies a higher LOQ.

3.3.2 Appropriate Formulas for Effluent Calculations

The permittee shall use the following formulas for calculating effluent results to determine compliance with average concentration limits and mass limits and total load limits:

Weekly/Monthly/Six-Month/Annual Average Concentration = the sum of all daily results for that week/month/six-month/year, divided by the number of results during that time period.

Weekly Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the week.

Monthly Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the month.

Annual Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the entire year.

Total Monthly Discharge: = monthly average concentration (mg/L) x total flow for the month (MG/month) x 8.34.

Total Annual Discharge: = sum of total monthly discharges for the calendar year.

3.3.3 Visible Foam or Floating Solids

There shall be no discharge of floating solids or visible foam in other than trace amounts.

4 Summary of Reports Due

FOR INFORMATIONAL PURPOSES ONLY

Description	Date	Page
Wastewater Discharge Monitoring Report	no later than the date indicated on the form	4

Report forms shall be submitted to the address printed on the report form. Any facility plans or plans and specifications for municipal, industrial, industrial pretreatment and non industrial wastewater systems shall be submitted to the Bureau of Watershed Management, P.O. Box 7921, Madison, WI 53707-7921. All other submittals required by this permit shall be submitted to: Southeast Region - Plymouth, 1155 Pilgrim Road, Plymouth, WI 53073

Permit Fact Sheet

1 General Information

Permit Number:	WI-0064831-01-0
Permittee Name:	Wisconsin Public Service Corp Sheboygan River
Address:	732 N. Water Street
City/State/Zip:	Sheboygan, WI 53081
Discharge Location:	Campmarina, Sheboygan River, Sheboygan, WI
Receiving Water:	Sheboygan River
StreamFlow ($Q_{7,10}$):	NA
Stream Classification:	Warm Water Sport Fishery

2 Facility Description

This project is designed for the removal of contaminated sediment from the Sheboygan River. Likely contaminants that will be encountered are Suspended Solids, Polynuclear Aromatic Hydrocarbons (PAHs), Polychlorinated Bi-Phenyls (PCBs), and Non Aqueous Phase Liquids (NAPL).

Mechanically dredged sediments from the Sheboygan River will be loaded into scows where solid material will be stabilized to meet landfill disposal criteria. Liquid wastewater will be treated by primary settling, and polymer addition, if needed, multi-media filtration, and granulated activated carbon. The volume of wastewater from this dredging operation is anticipated to be very low. Therefore, the discharge of treated effluent will likely be done in a batch type process.

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
701		Influent sample point at the mixing/storage tank.
001		Liquid wastewater will be treated by Primary settling and polymer addition if needed, multi-media filtration, granulated activated carbon filtration, and final clarification.

3 Influent - Proposed Monitoring

3.1 Sample Point Number: 701- Influent Sample Point

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Suspended Solids, Total		mg/L	Daily	Grab	
PAHs		mg/L	Per Cycle	Grab	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
PCB Total		ug/L	Per Cycle	Grab	

3.1.1 Explanation of Limits and Monitoring Requirements

The monitoring of the primary pollutants of concern will provide the permittee with valuable information of condition of the incoming wastewater to be treated. This information can be used to make treatment process adjustments as needed.

4 Surface Water - Proposed Monitoring and Limitations

4.1 Sample Point Number: 001- Treated Effluent

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	At Discharge	Total Daily	
Suspended Solids, Total	Daily Max	10 mg/L	At Discharge	3-Grab Comp	
pH Field		su	At Discharge	3-Grab Comp	
PCB Total	Daily Max	0.8 ug/L	At Discharge	3-Grab Comp	
PAHs	Monthly Avg	0.1 mg/L	At Discharge	3-Grab Comp	

4.1.1.1 Polynuclear Aromatic Hydrocarbon Group

The polynuclear aromatic hydrocarbons (PAH) group regulated by this permit shall include a summation of the following individual compounds: benzo(a)anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene. Compliance with the monthly average PAH group limit can be demonstrated by using EPA method 610 or 8310 HPLC and reporting no detect of any of these PAH compounds, or by reporting the sum of the PAH group detected amounts equal to or less than 0.1 ug/L.

4.1.1.2 Total Metals Analyses

Measurements of total metals and total recoverable metals shall be considered as equivalent.

4.1.1.3 Mercury Monitoring

The permittee shall collect and analyze all mercury samples according to the data quality requirements of ss. NR 106.145(9) and (10), Wisconsin Administrative Code. The limit of quantitation (LOQ) used for the effluent and field

blank shall be less than 1.3 ng/L, unless the samples are quantified at levels above 1.3 ng/L. The permittee shall collect at least one mercury field blank for each set of mercury samples (a set of samples may include combinations of intake, influent, effluent or other samples all collected on the same day). The permittee shall report results of samples and field blanks to the Department on Discharge Monitoring Reports.

4.1.2 Outfall 001 Additional Startup Monitoring

The following parameters shall be monitored once during the first full scale discharge except as otherwise approved using 3 Grab Composite samples (a grab sample is needed for Cr^{+6}). Continued effluent monitoring shall be conducted during every discharge for parameters which have detectable results greater than one fifth of the lowest limit presented in the table below. The Permittee shall also make treatment system modifications to increase the treatment efficiency in removing the detected pollutants. If further testing indicates that the pollutants are no longer present in the effluent, monitoring may be waived by written authorization by the Department.

	Limits Corresponding to Criteria : All Values in ug/l Unless Noted				
Parameter	ATC Daily Max	CTC Weekly Avg	WC Monthly Avg	HTC Monthly Avg	HCC Monthly Avg
Arsenic, Total Recoverable	680	486			50
Cadmium , Total Recoverable	76	12.2		160	
Chromium $^{+6}$	32	35.07		2236	
Copper, Total Recoverable	89	100.8			
Manganese , Total Recoverable					
Mercury, Total Recoverable					
Chlordane					0.00192
Dieldrin	0.48	0.176		0.00271	4.31×10^{-5}
Endrin	0.172	0.23			
4,4'-DDT			5.8×10^{-5}	1.41×10^{-2}	1.04×10^{-3}
4,4'-DDD			5.8×10^{-5}		
4,4'-DDE			5.8×10^{-5}		
Nitrogen, Ammonia (NH_3-N) Total	11.2 mg/L for estimated effluent pH of 8.2 s.u. (varies with pH)				

4.1.3 Explanation of Limits and Monitoring Requirements

Water Quality Based Limits and WET Requirements and Disinfection (if applicable)

A water quality based limit for PCBs would be very low. The typical level of quantitation for PCBs is 0.8ug/L. Therefore the monthly average limit is based on this analytical level of detection used for evaluating PCBs in treated waste and the removal efficiency of the treatment process.

The limitation for PAHs is consistent with the WPDES general permit (WPDES Permit No. WI-0046566-5) for contaminated groundwater that is treated and then discharged to surface water.

Limitations for Total Suspended Solids and other pollutants are based on the removal efficiency of the treatment process.

5 Attachments:

6 Proposed Expiration Date:

May 1, 2012

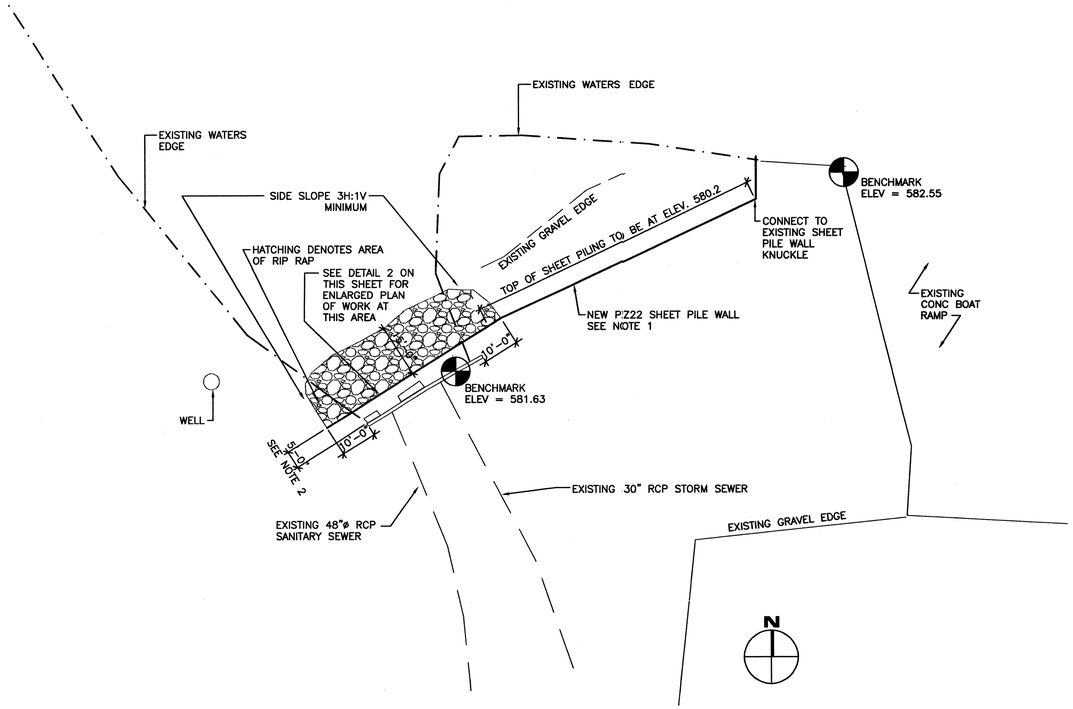
Prepared By:

Curt Nickels Wastewater Engineer

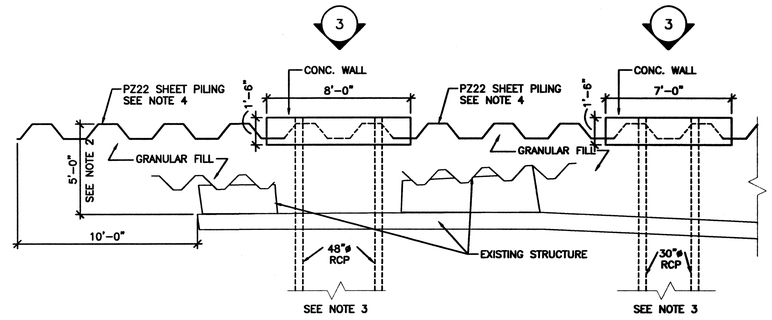
Date: April 27, 2011

APPENDIX E

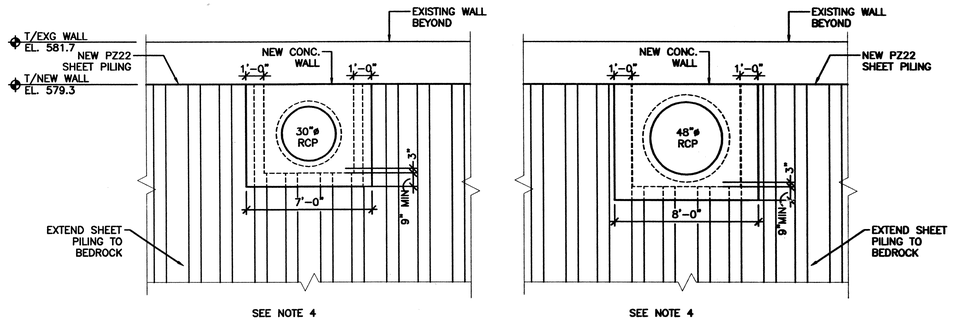
NEW OUTFALL STRUCTURE DRAWING AND SPECIFICATIONS



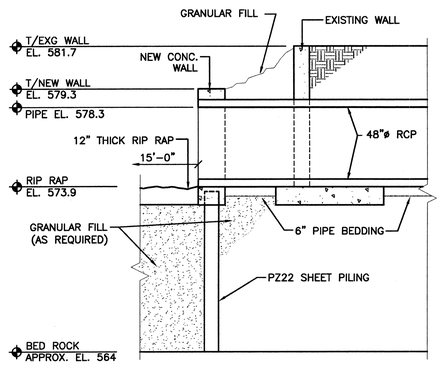
1 OVERALL PLAN AT SHEET PILE WALL
1" = 20'



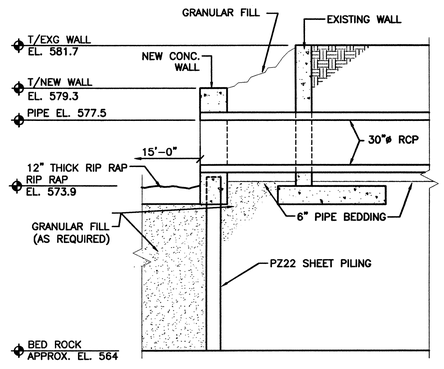
2 ENLARGED PLAN AT OUTLETS
1/4" = 1'-0"



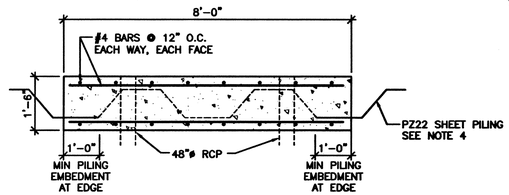
3 ELEVATION AT OUTLETS
1/4" = 1'-0"



4 SECTION THROUGH SANITARY SEWER OUTLET
1/4" = 1'-0"



5 SECTION THROUGH STORM SEWER OUTLET
1/4" = 1'-0"



NOTES:
1. CENTER SHEET PILING IN CONC WALL
2. PROVIDE 2" CONCRETE COVER
3. DETAIL SHOWN FOR 48"ø RCP. 30"ø RCP SIMILAR.

6 DETAIL PLAN AT CONC WALL
1/2" = 1'-0"

GENERAL NOTES:

1. SHEETING SHALL BE DRIVEN TO BEDROCK. EXCAVATE AND REMOVE ANY DEBRIS. SEE SPECIFICATIONS FOR BACKFILL MATERIAL. TRENCH EXCAVATION SHALL FOLLOW CURRENT OSHA STANDARDS.
2. DIMENSION TO BE FIELD VERIFIED. SHEETING AT COVE SHALL BE PLACED NORTH OF EXISTING WALL/SHEETING.
3. EXISTING 30 INCH AND 48 INCH RCP SHALL BE REMOVED ONLY AS REQUIRED TO EXTEND LENGTH. CUT EXISTING CONCRETE WALL ONLY AS REQUIRED FOR PIPE REMOVAL AND INSTALLATION. ALL NEW RCP PIPE SHALL BE ANCHORED TOGETHER AND ANCHORED TO EXISTING RCP PIPE.
4. PZ22 SHEET PILING SIZE SHOWN. SEE SPECIFICATIONS FOR ALTERNATIVE PROPERTIES.

AYRES ASSOCIATES
Architects / Engineers / Scientists / Surveyors
3433 Oakwood Hills Parkway, P.O. Box 1590
Eau Claire, Wisconsin 54702-1590
(715) 834-3161

SHEET PILE WALL DETAILS & SECTIONS

REMEDIAL DESIGN
BOOM LANDING SEDIMENT REMEDIATION
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

CAD FILE: NRT-MAR.DWG
REFERENCE FILES: X-SITE.DWG

PROJECT NO.	26-0284.00
DRAWN BY:	SJH 06/10/04
CHECKED BY:	TMR 06/10/04
APPROVED BY:	TMR
SHEET NO.	1

SPECIFICATIONS

FOR

NEW OUTFALL STRUCTURE AND SHEET PILE WALL
FOCUSED NAPL AND SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

AUGUST 2012

Prepared for:

Natural Resource Technology

AYRES ASSOCIATES

Engineers/Architects/Scientists/Surveyors

3433 Oakwood Hills Parkway
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(715) 834-3161, FAX (715) 831-7500

Ayres Associates Project No. 26-0284.00

NEW OUTFALL STRUCTURE AND SHEET PILE WALL
FOCUSED NAPL AND SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

TABLE OF CONTENTS

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 Section Includes

A. Definitions.

B. Location of Project.

C. Existing Site Conditions and Uses.

D. Work by Contractor.

E. Work by Company.

F. Work by Owner.

1.02 Definitions

A. Owner: City of Marinette (City).

B. Company: Wisconsin Public Service Corporation (WPSC).

C. Engineer or A/E: Natural Resource Technology, Inc. (NRT).

D. Contractor: The Contractor performing the work described herein.

E. Drawings: Sheet 1 titled, "Sheet Pile Wall Details & Sections", supplemented by the set of construction drawings titled, “Focused NAPL and Sediment Removal Action, Former Marinette MGP Site, Wisconsin Public Service Corporation, Marinette, Wisconsin.”

F. Specifications: Appendix E-Specifications of which this is the first Section.

G. Work: All labor, supplies, and materials for completing the construction, as shown and specified.

1.03 Location of Project

A. Site: 480 Mann Street, Marinette, Wisconsin. Bound by Mann Street to the south, on the north by the Menominee River, on the east by Marinette Marine and on the west by Nestegg Marine.

1.04 Existing Site Conditions and Uses

A. The former Marinette manufactured gas plant (MGP) was located approximately 750 feet south of the Menominee River in Marinette, Wisconsin. The City of Marinette’s Waste Water Treatment Plant (WWTP) now occupies this property. Boom Landing Park and Boat Launch (Boom Landing, the site) occupies the land between the Menominee River and the WWTP. The site is located at Northeast ¼, Northwest ¼, Section 6, T30N, R24E, Marinette County.

B. Access to the Site will be provided by entrance from Mann Street.

C. Overhead and underground utilities are present at the site.

1.05 Work by Contractor

A. Work includes excavation and backfilling, sheet pile construction, reinforced concrete construction, and reinforced concrete pipe removal and installation.

1.06 Work by Company

A. None.

1.07 Work by Owner

A. None.

PART 2 (Not Used)

PART 3 (Not Used)

END OF SECTION

SECTION 02315

EXCAVATING AND FILLING

PART 1 GENERAL

1.01 Summary
A. Provide excavating and filling as shown and as specified.

1.02 Classification
A. Excavation of materials encountered under this work will be unclassified without regard to type, difficulty to remove, or suitability for use in construction.

1.03 Submittals
A. Test Reports: Two weeks prior to start of construction, indicate source and submit gradation analysis of proposed fill and backfill materials for review. Make submittals in accordance with Division 1, Section 01330 of Focused NAPL and Sediment Removal Action Technical Specifications.

1.04 Testing
A. A/E may perform tests to verify that soils and completed work meet specified requirements. However, these tests are not intended to provide Contractor with information he may need to assure that materials and workmanship meet requirements of specifications, and their performance will not relieve Contractor of responsibility of performing his own tests for that purpose. Where soil materials do not conform to type or density specified, soil shall be replaced or reworked to conform. Cost of extra tests for replaced or reworked areas shall be paid for by Contractor.

1.05 Protection
A. Protect existing improvements, utilities, trees and shrubs, and reference marks at the site. Have location of underground utilities marked before beginning work.

1.06 Blasting
A. Use of explosives is not permitted.

PART 2 PRODUCTS

2.01 Soil Materials, General
A. Soil materials shall be free of organic matter, debris, frozen soils, ice, and other objectionable materials. Rock particles larger than maximum size specified shall be removed prior to placement of soil.

B. Select existing material from required excavations may be used for fill or backfill if it meets the specified product requirements. If necessary, furnish additional approved material from suitable off-site sources.

2.02 Granular Fill
A. Select soils complying with ASTM D2487 soil classification groups GW (well-graded gravel), GP (poorly-graded gravel), SW (well-graded sand), or SP (poorly-graded sand). Aggregate shall pass a 1-1/2-in. sieve and not more than 35% shall be retained on a No. 10 sieve. Maximum 5% by weight shall pass a No. 200 sieve.

2.03 Granular Bedding and Backfill

A. Select soils suitable for use as Granular Fill, except coarse aggregate shall pass a 3/4-in. sieve.

2.04 Washed or Crushed Stone

A. Clean, hard, tough, durable, 1-1/2 in. washed stone, crushed rock, crushed gravel, or gravel free from adherent coatings and soft, flat, or elongated particles.

2.05 Backfill

A. Previously excavated soils, free of debris and aggregate larger than 3 in., and suitable for intended purpose.

PART 3 EXECUTION

3.01 Preparation

A. Layout and stake lines and grades as required to complete the work.

3.02 Excavation for Structures

A. Excavate to achieve necessary dimensions, lines, and grades. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 ft, and extending a sufficient distance from footings and foundations as required for bracing and supports, concrete formwork, other required construction, and for inspection.

B. For footings and foundations, take care not to disturb bottom of excavation. Excavate to final grade just before concrete is placed. Trim bottoms to required lines and grades to leave solid, undisturbed base to receive granular fill or concrete as shown.

3.03 Trenching

A. Excavate trenches so that pipe can be laid safely and accurately to required line and grade. Hand excavate for bells, fittings and projections to allow for proper jointing and to insure that pipe rests evenly along barrel and is not resting on bell.

B. In sand and gravel soils, bottom of trench may be shaped to fit bottom 1/3 of pipe. In silt or clay soils, bottom of trench shall be 4 in. below pipe barrel and 3 in. below bell. Provide Granular Bedding as specified below.

C. Trench widths in ordinary soil shall be limited at top of pipe to not less than a 6 in. clearance on either side of barrel to allow for installation of bedding material between pipe and trench wall. Maximum trench width at top of pipe shall be outside pipe diameter plus 24 in. (30 in. minimum). Trench above top of pipe may be sloped, stepped or vertical to comply with state and federal regulations regarding trenches.

3.04 Unauthorized Excavation

A. Unauthorized excavation consists of removal of materials beyond indicated elevations or side dimensions without specific direction of A/E. Unauthorized excavation, as well as remedial work, shall be at Contractor's expense. Notify A/E if unauthorized excavations are made.

B. Under footings and foundations, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation. Lean concrete or compacted fill may be used to bring elevations to proper position when approved by A/E.

C. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed.

3.05 Additional Excavation (Over Excavation)

A. When excavation has reached required subgrade elevation, notify A/E who will make an inspection of conditions. Inform A/E of unsuitable, unconsolidated subgrade soils.

B. If unsuitable bearing materials, such as poorly compacted fill, existing foundations, rubble, debris, or organic deposits, are encountered at required subgrade elevations, carry excavations deeper and replace excavated material with properly compacted Granular Fill as directed by A/E.

C. Removal of unsuitable material and its replacement as directed will be paid for as extra work, unless a pay item is included in the Bid Schedule. Do not proceed with extra or unit price work until authorized.

3.06 Stability of Excavations

A. Maintain sides and slopes of excavations in a safe condition until completion of backfilling. Slope sides of excavations to angle of repose of material excavated; otherwise, shore and brace where sloping is not possible either because of space restrictions or stability of material excavated. Take precautions to prevent slides or cave-ins when excavations are made in locations adjacent to backfilled excavations, and when sides of excavations are subjected to vibrations from traffic, machinery, or any other source. Comply with applicable codes and ordinances.

3.07 Dewatering

A. Perform earthwork in a manner to prevent surface water and ground water from flowing into excavations. Promptly remove water from excavations using pumps, sumps, and dewatering system components necessary to convey water away from excavations.

B. Convey water removed from excavations and rain water to collection or run-off areas. Provide and maintain temporary drainage ditches and other diversions outside excavation limits for each structure. Do not use foundation or utility trench excavations as temporary drainage ditches.

C. If water contains sheen and if directed by Engineer (as defined in Section 01010), refer to Section 02241 of the Focused NAPL and Sediment Removal Action Technical Specifications.

3.08 Unstable Trench Bottom

A. When trench bottom is unstable because of ground water, A/E may require extra excavation to remove unstable material. Provide Washed or Crushed Stone foundation followed by Granular Bedding as required in "Trench Bedding and Backfill" article.

3.09 Stockpiling

A. Stockpile excavated materials meeting the requirements for fill and backfill where directed until required for the work. Place, grade, and shape stockpiles for proper drainage. Locate stockpiles a sufficient distance from edge of excavations, even though such excavations may be sheeted and braced, to prevent such material from falling or sliding into excavations and to prevent cave-ins.

3.10 Cold Weather Protection

A. Protect excavation bottoms against freezing when atmospheric temperature is less than 35 deg F by covering with dry insulating materials of sufficient depth to prevent frost penetration.

3.11 Examination of Subgrade

A. Examine subgrade prior to placement of fill or backfill. Do not place materials on frozen subgrade. Plow, strip, or break-up sloped surfaces steeper than 1 vertical to 4 horizontal so that material will bond with subgrade. When subgrade has a density less than that specified for

the particular area, breakup ground surface, pulverize, moisture-condition to optimum content, and compact top 12 in. to density specified in Part 4 Schedules.

3.12 Filling and Backfilling, General

A. Do not place fill or backfill until required excavation and subgrade preparation have been inspected and approved by A/E.

B. Place fill or backfill in approximately horizontal layers; do not exceed the maximum lift thickness specified in Part 4 Schedules before compaction. Spread piles and windrows uniformly.

C. Adjacent to structures, place fill or backfill to prevent damage and allow structures to assume loads gradually and uniformly, at approximately the same rate on all sides of structure. Adjacent to earth-retaining structures, do not place fill or backfill until concrete has reached specified 28-day compressive strength (minimum 14 days). Do not travel heavy equipment over cast-in-place concrete work until it has reached specified 28-day compressive strength (minimum 14 days), unless otherwise approved.

3.13 Granular Fill

A. Provide 6 in. of Granular Fill immediately below concrete slabs and elsewhere as indicated on Drawings.

3.14 Trench Bedding and Backfill

A. Bedding, haunching, and initial backfill for rigid pipes shall be in accordance with ASTM C12, Class C or better.

B. Trenches dug in sandy or gravelly materials may use undisturbed earth for bedding provided surface is shaped to conform to pipe. Provide Granular Bedding in all other trenches from subgrade to a point supporting bottom 1/3 of pipe for rigid pipe and to springline (mid-height) for flexible pipe. Place and compact bedding so that it fills and supports pipe haunch area.

C. Immediately after installation of pipe, provide tamped Granular Backfill up to a minimum depth of 1 ft above pipe. Take special care in placing and tamping initial backfill material so alignment and grade of pipe is not disturbed nor pipe damaged.

D. Backfill more than 1 ft over pipe shall meet material requirements for area in which pipe is located.

3.15 Backfill

A. Provide Backfill material to bring excavations to natural or designated grade, except where a higher class of material is required.

B. Backfill excavations as promptly as work permits, but not until completion of the following:

1. Acceptance by A/E of construction below finish grade.
2. Removal of concrete formwork.
3. Removal of shoring and bracing, and backfilling of voids with satisfactory materials.
4. Removal of trash and debris.

3.16 Control of Moisture Content

A. During placement and compaction, maintain moisture content of materials within optimum range.

B. Apply water to fill materials by sprinkling materials at borrow site or after placement on fill if necessary. Obtain uniform moisture distribution by discing, blading or other approved methods prior to compaction of layer.

C. If material is too wet when deposited on fill, remove or dry it to specified moisture content prior to compaction.

D. If top surface of a preceding layer of compacted fill becomes too dry to permit suitable bond, scarify and moisten it by sprinkling to an acceptable moisture content prior to placement of next layer of fill.

3.17 Compaction

A. Compact each layer of soil material to not less than the percentage of maximum density specified in Part 4 Schedules.

B. Provide compaction equipment required to obtain specified compaction. Compaction by travel of grading equipment is not considered adequate for uniform compaction. Small vibratory compactors are required wherever fill is placed adjacent to foundation walls, footings, and piers. Pipe bedding and initial backfill shall be hand or mechanically tamped.

3.18 Restoration

A. Unless otherwise specified, restore surface drainage, pavements, lawns, and other areas disturbed by construction to their original conditions. Areas shall be sloped to drain.

B. Reinstall disturbed riprap where indicated on Drawings. Reuse existing material moved out-of-way at start of work. If necessary furnish additional material of similar size from off-site sources.

C. Complete restoration as described in Section 02940 of the Focused NAPL and Sediment Removal Action Technical Specifications.

3.19 Maintenance

A. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.

B. Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add fill or backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.20 Disposal of Excess and Waste Materials

A. Remove excess excavated material, trash, debris, and other waste materials.

B. Excess and waste material shall be handled and disposed of as described in Section 02940 of the Focused NAPL and Sediment Removal Action Technical Specifications.

PART 4 SCHEDULES

4.01 Compaction Schedule

Material Type	Usage	Lift Thickness [1]	Compaction [2]
Granular Fill	Below concrete slabs.	6"	92%
	Other designated areas.	8"-10"	90%
Granular Bedding	Below pipe and conduit.	6"	85%
Granular Backfill	Initial backfill around pipe and conduit.	6"	85%
Washed or Crushed Stone	Unstable trench bottom	6"	85%
Backfill	Unpaved areas 10 ft. or less outside structure line.	8"	90%
	Unpaved areas more than 10 ft. outside structure line.	12"	85%

[1] Place manually compacted materials in maximum 4 in. layers.

[2] Percent of maximum density determined in accordance with ASTM D1557 (Modified Proctor test).

END OF SECTION

SECTION 02469

STEEL SHEET PILING

PART 1 GENERAL

1.01 Summary
A. Provide steel sheet piling as shown and as specified.

1.02 Submittals
A. Shop Drawings: Submit shop drawings showing layout and materials; include pile designation, material and section properties, embedment, pile formula, hammer model, energy rating, frequency, and amplitude.

B. Make submittals in accordance with Division 1, Section 01330 of the Focused NAPL & Sediment Removal Action Technical Specifications.

1.03 Protection of Adjoining Property
A. Protect structures, underground utilities, and other construction from damage caused by pile driving operations.

B. Contractor shall notify all property owners immediately adjacent to or abutting project. An inspection of each property shall be made jointly by property owner, Company, Contractor, and A/E to document existing conditions prior to construction as well as after construction is complete.

C. Claims of damage arising from driving or withdrawal of piling shall be the responsibility of and settled by Contractor.

PART 2 PRODUCTS

2.01 Sheet Piles
A. Steel sheet piles shall be new piling, conforming to ASTM A328. Sheet piles shall be standard interlocking type having positive interlocks effective in both longitudinal and traverse directions, and continuous throughout length of pile. Fabrication of piles from shorter lengths will not be permitted.

B. A/E will not allow use of used sheet piles.

2.02 Hammer
A. Provide low frequency, vibratory driving hammer. Hammer shall provide an eccentric moment of 3470 in.-lb, frequency range of from 700 to 1020 vibrations per minute, and an amplitude of 5/16 to 1 in.

PART 3 EXECUTION

3.01 Site Preparation
A. Complete dredging and backfill within area to be occupied by bearing piles before piles are driven as described in Section 02325 of the Focused NAPL and Sediment Removal Action Techinical Specifications.

3.02 Protection of Pile Heads
A. Protect heads of piles by suitable caps, heads, blocks, mandrels, and other devices. Cut heads of steel piles square and fit with a steel driving cap. Provide driving heads, mandrels,

and other devices as needed for special types of piles conforming to recommendations of pile manufacturer.

3.03 Driving Sheet Piling

A. Drive piling in a manner to insure perfect interlocking throughout entire length of each pile. Hold piles in proper alignment during driving by means of assembling frames or other suitable temporary guide structures. Remove temporary guide structures when they have served their purpose.

B. Any time that forward edge of sheet pile wall is found to be out of correct alignment, piling already assembled and partly driven shall be driven to required depth, and taper piles shall then be driven to bring forward edge into correct alignment before additional regular piling is assembled and driven. Maximum permissible taper in a single pile shall be 1/4 in. per ft. of length.

3.04 Cutoff

A. Cut piles at specified elevations. Length of pile cut off shall be sufficient to permit removal of damaged material.

END OF SECTION

SECTION 02630

CONCRETE PIPE

PART 1 GENERAL

1.01 Summary
A. Provide concrete pipe as shown and as specified.

1.02 Related Sections
02315 Excavating and Filling.

1.03 Material Handling
A. Carefully unload and store pipe to prevent chipping, cracking, or damage to surface. Pipe shall not be skidded upon ground.

PART 2 PRODUCTS

2.01 Reinforced Concrete Pipe
A. ASTM C76, Class III minimum. Joints shall be bell and spigot or tongue and groove type with rubber ring gasket, ASTM C443.

PART 3 EXECUTION

3.01 Line and Grade
A. Maintain line and grade of existing pipe.

3.02 Laying of Pipe
A. Connect to existing pipe as indicated on Drawings.

B. Pipe shall be laid immediately following the trench preparation and bedding provisions of Section 02315.

C. Exercise care when handling pipe. Ropes, slings, or other devices must be used for lowering pipe into trench. Only pipe which is suitable for use is to remain on site. Damaged or broken pipe shall be immediately separated from acceptable pipe.

D. Lay pipe uniformly to line and grade on a prepared bed providing even support along entire barrel. Excavate bell holes in bedding material so pipe will rest on barrel and not on bell. As work progresses, interior of sewer shall be cleared of dirt and debris. Do not lay pipe where water is above bedding material except where A/E determines that foundation is stable, pipe will not be displaced upward, and joint construction will not be affected by water.

E. Each pipe shall be bedded by hand or by equally careful means to 12-in. cover before laying subsequent pipes. Fill space between pipe and trench wall in 6-in. layers and manually compact. Pipe sizes larger than 15-in. diameter may require mechanical compaction of bedding material.

F. When work is not in progress, water may be allowed to flow into newly laid pipe if provisions are made to prevent dirt from washing into pipe.

3.03 Jointing
A. Joint materials and methods shall conform to manufacturer's recommendations and the following procedures.

B. Rubber-type gasket joint shall be made using lubricant of vegetable origin. If rubber gasket is O-ring type, groove in spigot shall be lubricated before setting gasket.

3.04 Leakage Inspection

A. New pipe shall be inspected for excessive infiltration and sand leakage. Contractor shall repair infiltration and sand leaks which may cause a continued maintenance problem.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 Summary
A. Provide cast-in-place concrete work as shown and as specified.

1.02 Submittals
A. Shop Drawings: Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315.

B. Mix Designs: Submit proposed mix designs to A/E ten days prior to beginning concrete work. Do not begin concrete production until mixes have been reviewed.

C. Delivery Tickets: Submit delivery ticket to A/E for each load of concrete delivered to project.

D. Test Reports: Testing agency shall submit copy of field and laboratory reports to A/E.

E. Make submittals in accordance with Division 1, Section 01330 of the Focused NAPL & Sediment Removal Action Technical Specifications.

1.03 Codes and Standards
A. Comply with the following codes and standards, except as otherwise designated:

1. ACI 301 Specifications for Structural Concrete.
2. ACI 304 Guide for Measuring, Mixing, Transporting and Placing Concrete.
3. ACI 318 Building Code Requirements for Structural Concrete.
4. ACI SP-2 Manual of Concrete Inspection.

1.04 Quality Assurance
A. Prior to placing concrete, request review of reinforcement steel by A/E.

1.05 Testing
A. Company will arrange and pay for services of a qualified testing agency.

B. Testing agency shall test concrete to measure slump, entrained-air content, and compressive strength to determine compliance with specifications. Furnish test apparatus and cylinders, perform on-site sampling and testing, submit samples, and perform laboratory tests.

C. On-site tests shall be performed under observation of A/E unless waived.

D. During progress of work, prepare three test cylinders per 25 cu yd or fraction thereof for each class of concrete placed each day. Identify samples, moist cure at 70 deg F for five days, and ship samples to testing laboratory for one 7-day compressive strength test and two 28-day tests.

E. Perform slump and air content tests on concrete from same batch as sampled for strength tests and whenever there is a change in consistency of concrete. If measured slump or air content falls outside specified limits, immediately check another portion of same batch. In event of a second failure, concrete shall be rejected.

F. Test procedures shall be in accordance with ASTM C31, C39, C143, C172, and C231.

G. Cost of tests, including materials and transportation, shall be paid by Company.

1.06 Weather Conditions

A. Protect concrete work from physical damage or reduced strength caused by frost, freezing actions, or low temperatures, in compliance with ACI 306.

B. When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305.

PART 2 PRODUCTS

2.01 Cement

A. Portland cement, ASTM C150, Type I.

2.02 Aggregates

A. Fine and coarse aggregates, ASTM C33, consisting of clean, hard, durable sand and crushed rock, crushed gravel, or gravel. Coarse aggregate shall meet grading requirements for size number 67, 57, or 467. Maximum coarse aggregate size for each class of concrete shall be as indicated in Part 4 Schedules. Ratio of coarse aggregate to fine aggregate shall not be less than 1:1 nor more than 2:1.

2.03 Water

A. Mixing water shall be potable, free of oil, acid, excessive alkalinity, organic matter, and salts.

2.04 Admixtures

A. Air-entrained admixture shall conform to ASTM C260. Other admixtures which do not adversely affect strength and durability of concrete may be used with permission of A/E, if used in strict accordance with manufacturer's instructions. Care shall be exercised to assure that the admixture does not increase or decrease air content outside of allowable limits. Do not use salt or chemical anti-freeze admixtures.

2.05 Reinforcing Steel

A. ASTM A615, Grade 60, new billet steel bars.

B. Provide metal chairs, stirrups, spacers, and hangers to support reinforcement and insure against displacement during placement of concrete. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).

2.06 Formwork

A. Forms for Exposed Finish Concrete: Construct forms for exposed concrete surfaces with water-resistant plywood, metal, metal-framed plywood-faced, or other acceptable panel type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system if shown. Provide form material with sufficient thickness to withstand pressure of newly placed concrete without bow or deflection. Rust-stained steel forms are not acceptable.

B. Forms for Unexposed Finish Concrete: Construct forms for concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal, or other acceptable material. Provide lumber that is dressed on at least one side and two edges for tight fit.

2.07 Moisture-Retaining Cover

A. Waterproof paper, polyethylene film, or polyethylene-coated burlap complying with ASTM C171.

2.08 Concrete Mixtures

A. Conform to minimum standards for class and usage in Part 4 Schedules.

B. Prepare design mixes for each type of concrete on the basis of compressive strength by methods recommended in ACI 318. Use an independent materials laboratory for preparing and reporting proposed mix designs.

PART 3 EXECUTION

3.01 Preparation

A. Wet forms with light oil.

B. Unless otherwise designated on Drawings, position reinforcement steel to provide minimum concrete cover of 3 in. for footings, 2 in. for foundation walls, 3 in. for bottom of slabs on grade, and 2 in. for slabs exposed to water.

3.02 Mixing Concrete

A. "Ready-mix" concrete shall be produced, delivered and handled in accordance with ASTM C94. Concrete shall be deposited at job site within one hour after introduction of water in mix. Care shall be taken in transferring concrete from truck or mixer to avoid segregation of aggregates in mixture.

3.03 Concrete Placement (General)

A. Place concrete as specified and in accordance with ACI 304. Maintain reinforcing steel in proper position.

B. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints. Deposit concrete as near as practicable to final location to avoid segregation from rehandling or flowing. Do not subject concrete to any procedure which will cause segregation.

C. Screed concrete to proper level to avoid excessive skimming or grouting.

D. Do not use concrete which becomes non-plastic and unworkable, or does not meet required quality control limits, or which has been contaminated by foreign materials. Do not use retempered concrete. Remove rejected concrete from project site.

E. Concrete shall not be placed around embedded items until they have been accurately adjusted and set to required alignment and grade.

3.04 Placing Concrete into Forms

A. Deposit concrete in forms in horizontal layers not deeper than 18 in. and in a manner to avoid inclined construction joints.

B. Remove temporary spreaders in forms when concrete placing reaches elevation of spreaders.

C. Consolidate concrete in forms by mechanical vibrating equipment and supplement by hand-spading, rodding or tamping. Use vibrators designed to operate at a speed of not less

than 6000 impulses per minute when submerged in concrete. Vibration of forms and reinforcing will not be permitted.

D. Do not use vibrators to move concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visibly effective. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other items without segregation of mix.

3.05 Finishing Formed Surfaces

A. Provide standard rough finish to formed surfaces to be concealed in finish work or by other construction, unless otherwise designated. Standard rough form finish shall be the concrete surface having texture imparted by form facing material, with defective areas repaired and patched and fins and other projections exceeding 1/4 in. in height rubbed down with wood blocks.

B. Provide standard smooth finish for formed surfaces exposed-to-view or to receive a covering applied directly or bonded to concrete, such as waterproofing, dampproofing, or paint. Standard smooth finish shall be the as-cast concrete surface obtained with form facing material, with defective areas repaired and patched and fins and other projections on surface completely removed and smoothed.

3.06 Finishing Unformed Surfaces

A. Thoroughly float surface after concrete has been struck off.

B. Edges shall be neatly trimmed with 1/4 in. radius edging tool.

3.07 Curing and Sealing

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures using moisture-retaining cover to wet cure surfaces. Cure formed and unformed concrete for seven days or until 75 percent of the required 28-day compressive strength is obtained, whichever is less.

3.08 Concrete Surface Repairs

A. Formed Surfaces: Request inspection of concrete surfaces immediately after removal of formwork. After inspection, repair and patch defective areas as soon as practicable.

1. Remove bulges and projections by chipping or tooling. Rub or grind surface after removal.
2. For patching, use dry-pack mortar consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve and only enough water as required for handling and placing. Cut out honeycomb, rock pockets, voids over 1/4 in. diameter, and holes left by tie rods and bolts. Remove defects down to solid concrete but, in no case, to a depth of less than 1 in. Make edges of cuts perpendicular to concrete surface or slightly undercut to provide a key at edge of cut. Thoroughly clean, dampen with water, and brush-coat area to be patched with bonding agent. Place patching mortar before bonding agent has dried. Compact mortar in place and strike off slightly higher than surrounding surface. For exposed-to-view surfaces, patch shall match color of surrounding concrete.
3. For patching less than 1 in. in depth, Contractor may propose a proprietary patching product in lieu of removing concrete to minimum depth of 1 in. Submit proposed product to A/E for approval.

PART 4 SCHEDULES

4.01 Classes of Concrete

Class	Min. Comp. Strength @ 28 days, p.s.i.	Max. Slump	Min. Max. Agg. Size	Cement, Bags/ C.Y.	Max. Water, Gal/ C.Y.	Max. Water-Cement Ratio	Air Content, % By Volume
AA	4000	3-1/2"	3/4"	6	30	0.45	5-7%

4.02 Usage Schedule

A. Use Class AA concrete for all work.

END OF SECTION

APPENDIX F

CONSTRUCTION QUALITY ASSURANCE PROJECT PLAN (CQAPP)

SMARTER SOLUTIONS

EXCEPTIONAL SERVICE

VALUE

Construction Quality Assurance Project Plan
Focused NAPL and Sediment Removal Action
Former Marinette MGP Site
City of Marinette, Marinette County, WI
Revision 0

August 30, 2012
NRT Project Number: 2098

NATURAL RESOURCE TECHNOLOGY

ENVIRONMENTAL CONSULTANTS

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

Acronyms and abbreviations used in this Construction Quality Assurance Project Plan include the following:

ACC	Acceptable Ambient Concentration
AOC	Administrative Order on Consent
ASTM	American Society for Testing and Materials
BMP	Best Management Practice
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
cfs	Cubic feet per second
COC	Contaminant or constituent of concern
CQA	Construction Quality Assurance
CQAPP	Construction Quality Assurance Project Plan
CQC	Construction Quality Control
CY	Cubic yard
DHFS	Department of Health and Family Services
DGPS	Differential global positioning system
DMU	Dredge Management Unit
FEMA	Federal Emergency Management Administration
FSP	Field Sampling Plan
GAC	Granular Activated Carbon
HAZWOPER	Hazardous Waste Operations and Emergency Response
IBS	Integrys Business Support, LLC
mg/kg	Milligrams per kilogram
mg/L	Milligrams per liter
MS/MSD	Matrix spike/Matrix spike duplicate
MGP	Manufactured Gas Plant
NRT	Natural Resource Technology, Inc.
NTU	Nephelometric turbidity unit
NAPL	Non-aqueous phase liquid
NAVD88	North American Vertical Datum of 1988
OSHA	Occupational Safety and Health Administration
PACE	Pace Analytical Services
PAH	Polycyclic aromatic hydrocarbon
ppm	Parts per million
QA	Quality assurance
QAM	Quality Assurance Manual
QAPP	Quality Assurance Project Plan
QC	Quality control
RTK-GPS	Real-time kinematic global positioning system
RI/FS	Remedial Investigation/Feasibility Study

Removal AOC	Removal Action Administrative Order by Consent
RPM_{10}	Respirable Particulates
Settlement Agreement	Settlement Agreement and Administrative Order on Consent
SOP	Standard operating procedure
s.u.	Standard unit
STAT	STAT Analysis Corporation
SAS	Superfund Alternatives Site
TVOC	Total Volatile Organic Compounds
TSCA	Toxic Substances Control Act
TSS	Total suspended solids
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USGS	United States Geological Society
VOC	Volatile Organic Compounds
WDNR	Wisconsin Department of Natural Resources
WPDES	Wisconsin Pollution Discharge Elimination System
WPSC	Wisconsin Public Service Corporation
WWTP	Waste Water Treatment Plant

1 INTRODUCTION

This Construction Quality Assurance Project Plan (CQAPP) was prepared as part of a non-time critical removal action to remove NAPL and near shore sediment with total PAH (13) concentrations equal to or exceeding 22.8 milligrams per kilogram (mg/kg) at the former Marinette Manufactured Gas Plant (MGP) in the Menominee River, Marinette, Wisconsin. Wisconsin Public Service Corporation (WPSC), a subsidiary of Integrys Energy Group (IEG), formally owned the MGP. The Site is managed by Integrys Business Support, LLC (IBS). WPSC and United States Environmental Protection Agency (USEPA) entered into a Multi-Site Settlement Agreement and Administrative Order on Consent (Settlement Agreement), CERCLA Docket No. V-W-06-C-847, effective May 5, 2006, to perform Remedial Investigation/Feasibility Study activities for six former MGPs including the Marinette Site in the Superfund Alternatives Site (SAS) Program. Under the RI/FS Settlement Agreement, sediment at the Marinette Site has been investigated in accordance with the USEPA-approved Site-Specific Work Plan, Revision 3, dated May 7, 2012. An Engineering Estimate/Cost Analysis (EE/CA) Report was prepared pursuant to the requirements of an Administrative Settlement Agreement and Order on Consent (AOC) for EE/CA, between the United States Environmental Protection Agency (USEPA) and WPSC, CERCLA Docket No. V-W-12-C-005, effective July 27, 2012, and in accordance with "Guidance on Conducting Non-Time Critical Removal Actions under CERCLA", EPA/540-R-93-057, Publication 9360.32, PB 93-963402, dated August 1993.

1.1 Purpose

This CQAPP is a companion document to the Focused NAPL Removal Plans and Specifications for the Menominee River and also relies on elements of the Remedial Investigation/Feasibility Study (RI/FS) Multi-Site Quality Assurance Project Plan (QAPP) - Revision 2, dated September 4, 2007. This CQAPP establishes requirements for managing and implementing the quality assurance (QA) and Quality Control (QC) systems. It provides the framework and criteria for task specific QC requirements and project specific QA plans. Implementation of the CQAPP will ensure the work is completed in accordance with the project goals.

This CQAPP was developed in general accordance with *Requirements for Quality Assurance Project Plans* (USEPA, 2001), *Guidance for Quality Assurance Project Plans* (USEPA, 2002), *Guidance on Systematic Planning Using the Data Quality Objective Process* (USEPA, 2006), *Construction Quality Management Guidance* (United States Army Corps of Engineers (USACE)), and *Quality Control* (USACE, 2008). To the extent possible, this CQAPP includes Standard Operating Procedures (SOP) from the USEPA-approved Multi-site Field Sampling Plan (FSP) – Revision 4, dated September 8, 2008, prepared for IBS.

The CQAPP establishes the requirements for the following:

- Personnel responsibilities and authority
- Procedures, guidelines, checklists, and forms for inspection, sampling, testing, and documentation of construction activities
- Deficiencies, noncompliance, and corrective actions
- Identification of proposed sampling activities

1.2 Scope

Remedial work activities addressed in this CQAPP include:

- Erosion control
- Site security
- Roadway/sidewalk/parking lot condition documentation
- Temporary sheet pile cofferdam
- Shoreline structure protection measures
- Upland barrier installation
- Bathymetric surveys
- Turbidity monitoring
- Post dredge sampling
- Verification sampling in NAPL-areas
- Verification sampling for PAHs
- Residual sand layer placement
- Sediment stabilization, transport, and disposal
- Water treatment and discharge into the Menominee River
- Fugitive emissions monitoring and mitigation
- Site restoration

1.3 Project Setting

1.3.1 Site Description

The former MGP is located at Latitude 45.100230° North, Longitude 87.632005° West, T30N, R24E, Section 6, SE ¼, NE ¼, 1603 Ely Street, Marinette, Marinette County, Wisconsin (Figure 1). The former MGP encompassed approximately 1 acre and is currently owned by the City of Marinette (City). The City operates a wastewater treatment plant (WWTP) at this property. The WWTP property is bounded on the north by Mann Street and railroad tracks, on the southwest by Ludington Street and then Ely Street on the southeast (Figure 2).

The former MGP was located within 700 feet of the Menominee River. MGP residuals in the Menominee River likely migrated from the MGP via a former slough that drained into the Menominee River at approximate river mile 185+00 (USACE) through what is now the City of Marinette's Boom Landing boat launch facility (Figure 2).

The River Portion of the Site is located approximately 2 miles from the river mouth draining into Lake Michigan. The River Portion of the Site includes a portion of the area between Boom Landing and Strawberry Island (Figure 2). Strawberry Island is located approximately 400 feet north of Boom Landing. This island has been mistakenly referred to as Boom Island in some previous reports.

The Menominee River is a gaining stream that receives groundwater and surface water from the Marinette area and discharges into Lake Michigan. The river separates Wisconsin from Michigan's Upper Peninsula along the northeast boundary of Wisconsin. The river is approximately 118 miles long as it flows into Lake Michigan. The drainage area for the Menominee River is 4,070 square miles according to the United States Geological Survey (USGS). Water depths in the River Portion of the Site range from 1 to 15 feet according to bathymetric survey conducted in November 2011. The river is approximately 1,075 feet wide near the River Portion of the Site.

The USGS had a stream monitoring station (USGS 04067651) in the mouth of the river until October 1995. The total flow from November 1994 until October 1995 was 36,933 cubic feet per second (cfs) with the greatest monthly flow of 5,585 cfs (May 1995) and the lowest monthly flow of 1,920 cfs (February 1995). The average daily flow during this period was 3,085 cfs.

Currently, the closest USGS stream monitoring station (USGS 04067500) to the Site is 18 miles upstream. The total flow at this station from October 1994 to September 1995 was 35,522 cfs with the greatest monthly flow of 5,391 cfs (May 1995) and the lowest monthly flow of 1,854 cfs (February 1995). The average daily flow during this period was 2,570 cfs. The total flow from September 2007 to September 2008 (most recent data) was 31,199 cfs with the greatest monthly flow of 7,786 cfs

(April 2008) and the lowest monthly flow of 1,170 cfs (September 2008). The average daily flow during this period was 2,668 cfs.

The 1978 Federal Emergency Management Agency (FEMA) map indicates the 100 year floodplain is at Elevation 585 feet above mean sea level (msl, referenced to the National Geodetic Vertical Datum of 1929).

1.3.2 Contaminants of Concern

The primary contaminants of concern (COC) associated with the Removal Action AOC is PAHs.

NAPL in the form of oil-coated/oil-wetted sediment and the highest sediment PAH are adjacent to the former MGP slough, at the southern shore of the Menominee River. Approximately 550 feet of the shoreline and 1.3 acres of the river are expected to be addressed under the Removal Action AOC. The concentrations and distributions of COCs have been studied and were used as the basis for the cleanup design, including excavation depths and the delineation of the dredge areas.

1.3.3 Cleanup Goals

The primary cleanup goal for the Removal Action AOC is removing sediment with visual observations of NAPL. NAPL is defined for this action as oil-wetted or oil-coated near-shore sediment. In addition to the NAPL-affected near-shore sediment, near shore sediment with PAHs above 22.8 mg/kg in the sediment have also been identified for removal.

1.3.4 Dredge Plan Summary

The work to be undertaken involves installation of a sheet pile cofferdam to contain the working area, securing shoreline features, mechanical dredging of sediment, stabilization of the sediments with reactive blending materials as needed, water treatment of MGP contact water, and disposal of approximately 8,500 cubic yards (CY) of contaminated sediments and 230 CY of non-contaminated sediments from the site. Dredge cut lines and the delineation of the dredge areas have been developed by Natural Resource Technology based on RI data collected in 2012.

Mechanically-dredged sediments are anticipated to be loaded into scows. Sediments will then be stabilized (e.g., blended with Portland cement or lime kiln dust) in the scows or directly loaded from the scows on to the sediment stabilization pad and be stabilized on the pad as needed to meet solid waste landfill disposal criteria. Following stabilization, sediments will be transported to a licensed solid waste facility, likely Waste Management's Menominee Landfill in Menominee, Michigan.

The design plans and specifications for the project contain requirements that the Contractor include the following minimum water treatment process steps, which are deemed the best available treatment technology reasonably achievable considering other successful contaminated sediment cleanup projects of a similar nature: solids settling/clarification, multi-media filtration, and granular activated carbon filtration/polish. Polymers are likely to be used in the clarification step. The Contractor will decide whether bag filters and an oil-water separator are also needed in the process train to comply with effluent limits, to be established by the Wisconsin Department of Natural Resources (WDNR) using Substantive Requirements of a Wisconsin Pollution Discharge Elimination System (WPDES) Permit. The Contractor will also decide the flow capacity and operating timeframe for the water treatment system, but given the anticipated relatively small volume of water to be treated from the mechanical dredging operations, it is anticipated that batch treatment will be utilized instead of near continuous operation.

2 PERSONNEL RESPONSIBILITY AND AUTHORITY

2.1 Overview

This section describes and documents the roles and responsibilities of the project personnel responsible for developing, approving, and implementing the CQAPP. The duties, responsibilities and authorities of project personnel are described in the following subsections. Role relationships are depicted in Figure 3 indicating direct and collaborative lines of communication. Direct lines reflect general reporting responsibilities for each of the identified roles. Key project roles and general reporting responsibilities are described in the following sections.

2.2 Project Manager

The Project Manager will be responsible for overall execution and progress of the remedial construction. The Project Manager's duties include:

- Coordinate with WPSC, USEPA, WDNR, and other project personnel, as necessary.
- Maintaining daily contact with the Project Engineer during progress of work.
- Evaluating the progress and performance of the remedial construction with respect to planned requirements and authorizations and the construction schedule.
- Reviewing and assessing site-specific documents, including the Contractor's scope of work, contract terms, and CQAPP.
- Monitoring budgetary expenditures and developing budgetary projections throughout the duration of the project.
- Providing technical support to Project Engineer as required to address potential modifications or changes to the Technical Specifications and Contract Drawings.
- Acquiring and applying technical and corporate resources, as needed, to ensure performance within budget and schedule constraints.
- Developing and meeting ongoing project and/or task staffing requirements.
- Reviewing the work performed on each task to ensure its quality, responsiveness, and timeliness.
- Reviewing and/or approving, or designating the review and approval of, project deliverables from the Contractor.

- Preparing and submitting, or designating such for, the reports listed in Section 5 of this document.
- Representing the Project team at meetings, as required.

The Project Manager for this site is Eric Tlachac.

2.3 Project Engineer

The Project Engineer is responsible for ensuring implementation of the approved Technical Specifications and Contract Drawings. The Project Engineer will report directly to the Project Manager. Duties of the Project Engineer include:

- Reviewing and becoming familiar with the Contractor's CQCP and quality procedures for each definable feature of work.
- Providing daily coordination and communication with the Field Engineer and Construction Quality Assurance (CQA) Engineer.
- Reviewing and approving Contractor Construction Quality Control (CQC) data for conformance with the Technical Specifications and Contract Drawings.
- Reviewing material certifications and related test results for compliance with the Technical Specifications, and reporting any deficiencies to the Contractor.
- Monitoring budgetary expenditures and developing budgetary projections throughout the duration of the project.
- Tracking various material quantities such as volumes of dredge material, tonnages of stabilized material, tonnages of material hauled off site for disposal, and tonnages and volumes of cap material placed.
- Reviewing Contractor draft applications for payment with respect to quantities claimed and conformance with approved change orders or field directives.
- Reviewing daily field engineering reports.
- Overseeing daily on-site field office administration with regard to tracking and filing project submittals and documents.
- Communicating daily with the CQA Engineer on the status of the sampling activities and geotechnical and chemical laboratory data.
- Providing daily oversight of the CQA operations.
- Leading weekly progress meetings with the Contractor, WPSC, USEPA, and WDNR.
- Preparing and distributing weekly electronic progress reports and updates to the overall construction schedule.

- Coordinating with the Contractor and relevant subcontractors to eliminate redundancy in QC/QA testing, where possible.

- Reviewing field directives and/or requests for change orders in cases where construction deviates from the intended design and/or Technical Specifications and Contract Drawings with the Project Manager.

The Project Engineer is Kenneth R Mika.

2.4 Corporate Safety Officer

The Corporate Safety Officer is responsible for reviewing, approving, and auditing the implementation of all site health and safety program elements and has direct access to corporate executive staff, as necessary, to resolve any health and safety issues. The Corporate Safety Officer, as well as any project personnel, has sufficient authority to stop work on the project as deemed necessary in the event of serious health and safety issues. The Corporate Safety Officer will report directly to the Off-site Project Manager. Duties of the Corporate Safety Officer include:

- Reviewing and approving health and safety plans and procedures.

- Providing health and safety consultation to project staff.

Complete details of the site health and safety program will be presented in the Contractor's and the Natural Resource Technology's (NRT's) Site-Specific Health and Safety Plan.

The Corporate Safety Officer for this site is Steve Wiskes.

2.5 On Site Health and Safety Officer

The On Site Health and Safety Officer is responsible for daily implementation of the approved, Site-Specific Health and Safety Plan. The On Site Health and Safety Officer has direct access to corporate executive staff, as necessary, to resolve any health and safety issues. The On Site Health and Safety Officer, as well as any project personnel, has sufficient authority to stop work on the project as deemed necessary in the event of serious health and safety issues. The On Site Health and Safety Officer will report directly to the Corporate Safety Officer.

The On-site Health and Safety Officer for this site is Chris Musson.

2.6 Field Engineer

The Field Engineer will report directly to the Project Engineer and have responsibility for general project and technical implementation of the project. The Field Engineer, or designee, will be present on site whenever work is in progress to ensure implementation of the approved Technical Specifications and Contract Drawings. The Field Engineer's duties include:

- Maintaining daily contact with the Project Engineer during progress of work.
- Evaluating the progress and performance of the construction with respect to planned requirements and authorizations and the construction schedule.
- Reviewing and assessing site-specific documents, including the contractors scope of work, contract terms, and CQAPP.
- Tracking various material quantities such as volumes of dredge material, tonnages of stabilized material, tonnages of material hauled off site for disposal, and tonnages and volumes of cap material placed.
- Developing and meeting ongoing project and/or task staffing requirements.
- Reviewing the work performed on each task to ensure its quality, responsiveness, and timeliness.
- Reviewing and/or approving, or designating the review and approval of, project deliverables before their submission to the Project Engineer.
- Preparing and submitting, or designating such for, the reports listed in Section 5 of this document.
- Representing the Project team at meetings, as required.
- Providing daily coordination and communication with the field staff during construction.
- Reviewing and approving subcontractor CQC data for conformance with the Technical Specifications and Contract Drawings.
- Reviewing material certifications and related test results for compliance with the Technical Specifications, and reporting any deficiencies to the Project Engineer.
- Preparing or reviewing daily field reports.
- Overseeing daily on-site field office administration with regard to tracking and filing project submittals and documents.
- Communicating daily with the On-site CQC Staff on the status of the sampling activities.
- Reviewing field directives and/or requests for change orders in cases where construction deviates from the intended design and/or Technical Specifications and Contract Drawings with the Off-site Project Manager.

The Field Engineer for this site is Chris Musson.

2.7 CQA Engineer

The CQA Engineer will be on site during all phases of construction requiring CQC or CQA testing by the Technical Specifications, Contract Drawings and this document. The CQA Engineer will report directly to the Project Engineer. The CQA Engineer's duties include:

- Reviewing and becoming familiar with the Contractor's CQCP and quality procedures for each definable feature of work.
- Coordinating collection and testing of CQA samples, as necessary, and shipping of test samples to off-site laboratories, as required.
- Post-dredge confirmation sampling.
- Perimeter ambient air concentration sampling and monitoring.
- Preparing samples for shipment and documenting delivery to the laboratories.
- Communicating and coordinating with the geotechnical and chemical laboratories on the status of sample shipments.
- Monitoring river turbidity and perimeter ambient air concentrations.
- Receiving and reviewing geotechnical and chemical data for completeness and that the results meet the required CQA performance criteria.
- Filing and transmitting analytical data into the project database.
- Reviewing geotechnical and chemical laboratory analytical data with the Project Engineer.
- Collecting photographs to document construction progress and CQC/CQA monitoring/testing.
- Preparing CQA sampling reports for review by the Project Engineer and Contractor, including:
    - Descriptions of CQA/CQC tests and measurements performed and any relevant observations
    - Results of CQA/CQC laboratory testing
    - Testing results that do not meet the applicable CQA criteria

The CQA Engineer for this site is Joseph Larson.

2.8 Quality Manager

The Quality Manager will report directly to the Project Manager and be responsible for ensuring that quality processes are implemented correctly and that quality objectives are being met for the project. The Quality Manager has authority to stop any work that is not in compliance with the Contract Documents and has direct access to corporate executive staff, as necessary, to resolve any CQC disputes. The Quality Manager, or a designated alternate, will be on site at all times during active construction. The Quality Manager is responsible for overall management of CQC and is responsible for auditing the implementation of the CQC program for each definable feature of work and determining conformance with corporate policies and project requirements. Duties of the Quality Manager, or designee, include:

- Performing CQC audits on various phases of the field operations.
- Reviewing and approving CQC plans and procedures.
- Providing CQC technical assistance to the Project Manager and other project staff.
- Regularly reporting on the adequacy, status, and effectiveness of the CQC program to the Off-site Project Manager.

The Quality System Manager for this site is Steve Wiskes.

2.9 Project Superintendent

The Contractor's Site Superintendent will report directly to the Field Engineer and have responsibility for dredging progress and construction quality. The Site Superintendent, or designee, will be present on site whenever work is in progress to ensure implementation of the approved Technical Specifications and Contract Drawings. The Site Superintendent's duties include:

- Assisting the Field Engineer with evaluating the progress and performance of the dredges.
- Assisting the Field Engineer with monitoring resource needs throughout the duration of the project.
- Providing construction support to the Field Engineer, as required, to address potential modifications or changes to the Technical Specifications and Contract Drawings.
- Developing and meeting ongoing task staffing requirements and schedule.
- Leading the Contractor's team at meetings, as required.
- Providing daily coordination and communication with the dredging foremen.

The Contractor's Site Superintendent for this project is To Be Determined after Contractor award of the project.

2.10 Support Staff

The Support Staff will report directly to the Field Engineer and CQA Engineer. Primary responsibilities will include: day-to-day field oversight; CQC testing; preparing, labeling, and shipping CQC samples; maintaining CQC monitoring equipment; preparing sampling and testing reports and documentation; and daily coordination and communication with the CQC team.

The Support Staff members will be determined as needed.

2.11 Laboratory

Pace Analytical Services (Pace), in Green Bay, Wisconsin and STAT Analysis Corporation (STAT) in Chicago, Illinois were previously approved by USEPA to provide analytical laboratory services during the RI activities. Pace will analyze turbidity and TSS of river water samples, wastewater treatment discharges per the WPDES permit requirements and post-dredge sediment samples for PAHs and PCBs, and if required, chemical and geotechnical analyses of imported general fill, sand, and gravel backfill materials. STAT will analyze air samples to assess ambient air during the remedial action.

The laboratories roles and responsibilities are defined in the RI/FS Multi-Site QAPP – Revision 2 (September 4, 2007).

3 SAMPLE MANAGEMENT, DOCUMENTATION AND RECORD KEEPING

The Field Engineer or Support Staff will collect samples throughout the duration of the project for such purposes as monitoring turbidity, post-dredge sediment samples, and fugitive air emission samples. The procedures for managing and documenting the sampling and analysis are described in this section. All sampling will be conducted by NRT, with possible support of a subcontractor under NRT direction.

3.1 Special Training Requirements/Certification

This section addresses any specialized or non-routine training requirements necessary for completion of sampling. Sufficient information will be provided to ensure that special training skills can be verified, documented, and updated as necessary.

3.1.1 Training

All team members who will be collecting samples will have had training and experience in field sampling and documentation techniques required for this project. Routine sampling will be conducted according to SOP provided in the USEPA-approved Multi-Site FSP (September 8, 2008).

3.1.2 Certification

All on-site team members will have had 40-hour training for Hazardous Waste Operations and Emergency Response (HAZWOPER) and Occupational Safety and Health Administration (OSHA) 8-hour Annual HAZWOPER Refresher training in accordance with 29 CFR 1910.120. In addition, all employees entering the site are provided the Site-Specific Health and Safety Plan.

3.1.3 Laboratory Qualifications

IEG will retain Pace and STAT to perform laboratory analysis as summarized on Table 1. Both laboratories were included as an analytical laboratory in the USEPA-approved RI/FS Multi-Site QAPP – Revision 2, September 4, 2007 which included the Quality Assurance Manual (QAM) and a written QA plan to ensure that all laboratory operations are conducted in a controlled manner and in accordance with state and federal certification requirements.

3.2 Sampling Documentation and Records

This section identifies sampling documents and records to be generated throughout the project and information to be included in these documents and records. A description of the data management system and types of data that will be collected are also presented in this section.

Documentation and record-keeping related to laboratory performance and deliverables will be handled by the Quality Manager.

3.2.1 Anticipated Documents and Records

Field Documentation

Sampling performed during the project will be documented in bound, dedicated logbooks (NRT SOP 07-02-01). All entries will be made in ink and no erasures will be allowed. If an incorrect entry is made, the information will be crossed out with a single line that is initialed and dated. If pages are left intentionally blank, a diagonal line will be drawn across the page and the field team member will sign the page. The sampling team will provide a comprehensive description of sampling activities to allow reconstruction of events, review of data, and interpretation. All documents, records, photographs, and information relating to sampling activities will be maintained in the project file via electronic and/or hard copy.

Recorded sampling information will include:

- Project name
- Dates of sampling
- The names of the sampling support staff members conducting the sampling and any oversight personnel
- Climatic conditions
- Description of sample collection points
- Location of sample collection points using differential global positioning system (DGPS)
- A map indicating sampling locations
- Equipment and methods used
- Sample collection methods (in accordance with SOPs in the USEPA Multi-Site FSP, dated September 8, 2008)
- Any deviations from the CQAP and/or SOPs

- Equipment calibration results
- Field observations
- A description of photographs that may have been taken

Additional field forms will be used as necessary, including:

- Field sampling forms that include sample type, name, date, time, location, depth, samplers, and sampling equipment (see Appendix A for example forms).
- Sample control logs (includes sample type, date, time, analysis requested, sample depth, number of containers, identification of duplicate samples, matrix spike/matrix spike duplicates (MS/MSD), equipment rinsate blanks and trip blanks).
- Chain-of-custody forms and custody seals.

All forms will include the project name, date and time, sample location and sample number(s), and the name of the sampling support staff members completing the forms, with signature.

Photographs

Digital photographs may be taken during sampling activities, as appropriate. The digital photographs will be stored electronically with the date and time of the photograph. Field notes will describe the activity or conditions, location and direction of the photograph, and the name of the person taking the photograph.

Data Handling Records

All data generated through field activities will be reduced, verified, and validated prior to reporting.

Data Reduction

Field measurements (e.g., location data and turbidity) will be read directly in the units of final use as provided in Table 7 of the USEPA-approved Multi-Site QAPP, dated September 4, 2007. Field team members are responsible for monitoring the collection and reporting of field data. Field team members will review field measurements at the time of measurement and may re-measure a parameter, as necessary, to ensure accuracy and precision are maintained. Results of laboratory analyses will be reported in units of final use as provided in Table 7 of the USEPA-approved Multi-Site QAPP, dated September 4, 2007. Laboratory calculations will be performed in conformance with acceptable laboratory and method standards.

Data Verification

The Quality Manager, or designee, will review field procedures and compare field data to previous measurement to verify comparability and accuracy of the field data measurements.

Data Validation

Field data will be validated by performing the sampling/monitoring according to the USEPA-approved Multi-site FSP (September 8, 2008) SOPs. Responsibilities of the Field Engineer and/or Quality Manager will include the performance of all field activities, calibration checks on all field instruments at the beginning and end of each day of use, manual checks of field calculations, checks for transcription errors, and review of field log books.

3.2.2 Data Reporting Package Format and Documentation Control

Field screening or monitoring data to be generated by the Contractor will consist of "results only" field data and will not generate or require extensive supporting documentation. Field data will be reported in the Daily Report in standard figures and tables of a format acceptable to the Project Manager. Information such as field instrument calibration, sampling narrative, and field notes will be maintained in the project logbooks and files.

3.2.3 Data Reporting Package Archiving and Retrieval

All project sampling documents will be accounted for when they are completed. Accountable documents include items such as field notebooks, sample logs, field data records, photographs, data packages, computer storage devices, and reports. Field screening and monitoring results may be incorporated into reports as data tables, maps showing sampling locations and screening results, and supporting text.

All project data and reports will be stored in project files and made available to the Agency upon request. Files and analytical data will be maintained by NRT in hard copy and electronic format on site, and in electronic format at the NRT's offices in Pewaukee, WI.

3.3 Decontamination of Equipment/Sample Containers

3.3.1 Equipment Decontamination

Equipment decontamination procedures will be kept to a minimum through the use of either dedicated or disposable sampling equipment. Nevertheless, some sampling equipment will require decontamination, including equipment made of glass, metals, Teflon™, and other plastic materials. Additionally, some devices are non-disposable and are necessary for completion of the various sampling activities, including instruments used to measure field parameters, grab samplers for water sampling, and other similar devices that are used repeatedly at more than one sampling location. In general, sediment sampling equipment and tools (e.g., core tubes, caps, and nut drivers) will not require decontamination between sampling locations because they are either single use or do not directly come into contact with the sediment.

Equipment decontamination procedures are described in the USEPA-approved Multi-site FSP (dated September 8, 2008) SOP SAS-04-04.

3.3.2 Sample Container Decontamination

Contaminant-free sample containers will be purchased from an approved vendor or prepared by the subcontracted laboratory.

3.4 Inspection and Acceptance Requirements for Supplies/Sample Containers

Sample containers will be provided by the laboratory. The general condition of the containers will be reviewed upon receipt to ensure that the containers are intact and their integrity is unquestionable. Containers found to be of questionable integrity will be returned to the laboratory for new containers. Example integrity issues that have been experienced in the past include, but are not limited to, the following:

- The lid of sample containers containing liquid preservative(s) are not securely tightened causing preservative to leak onto the outside of the container. This reduces the quantity of preservative available for a sample and can result in poor preservation (e.g., not enough nitric acid in a metals sample to lower the pH to 2 standard units (s.u.) or less).
- The containers or lids are cracked or broken.
- The wrong container(s) or preservative(s) have been provided by the laboratory for the planned sampling.

The sample containers will only be accepted and used if there are no integrity issues following inspection.

Similarly, all other supplies and sampling devices that are used for completing the activities described in this CQAP will be inspected prior to use on the site. Examples of the equipment and supplies that will be inspected prior to use include, but are not limited to, the following:

- Core liners
- Surface water sampling device
- Water sampling materials

Similar to the laboratory-provided containers, equipment and supplies will be inspected and used only if there are no questions regarding their integrity.

Labels indicating the following information on receipt and testing are to be used for critical supplies and consumables.

3.5 Sample Collection, Handling and Custody Requirements

Section 2.3 of the USEPA-approved Multi-Site QAPP, September 4, 2007, provides details on sample collection, handling and custody requirements. The following section describes the sample handling and custody requirements.

3.5.1 Sample Collection and Handling

Sample Identification

A unique nine-digit code will be applied to each sample in the format presented in the USEPA-approved FSP, September 8, 2008, SOP SAS-03-01.

Sample Delivery

Transportation of the samples will occur through the use of the laboratory courier service whenever possible. If a courier service is not available, the samples will be delivered to the laboratory, under chain-of-custody, via an overnight carrier such as FedEx. All samples will be transported in accordance with the *Final National Guidance Package for Compliance with Department of Transport Regulations in the Shipment of Environmental Sample*.

Sample Container, Volume, Preservation and Holding Times

The media to be sampled at the site will include air, concrete, sediment, soil and water. The sample containers, volumes, preservatives, and holding times for air, concrete, sediment, soil and water samples are listed in Table 1.

3.5.2 Sample Custody

Chain-of-custody procedures will be used to control and maintain sample custody, whereby the sample possession and handling will be tracked from the field (i.e., sample source) to final disposition at the laboratory. A sample is considered to be in a person's custody if one of the following conditions apply:

- The sample is in the person's possession.
- The sample is in the person's view after being in his or her possession.
- The sample was in the person's possession and that person has secured it in a vehicle or room.

Chain-of-custody will be maintained according to Section 9.2.2.7 of *Test Methods for Evaluating Solid Waste, Physical/Chemical Method* (USEPA, 1996), and as described in USEPA-approved FSP, September 8, 2008, SOP SAS-03-02.

Documentation

Documentation requirements for recording day-to-day sample and data collection activities during the remediation is discussed in Section 5.1 and example forms to be completed are provided in Appendix A.

Laboratory Custody Procedures and Documentation

Laboratory custody procedures and documentation will be in accordance with the Section 2.3 of the USEPA-Multi-site QAPP (September 4, 2007) and the laboratory's Quality Management Plan.

3.5.3 Final Evidence Files

The central repository for all documents related to the site (final data, field notes, and other pertinent documents produced by or delivered to NRT) discussed herein will be NRT's project-specific file. A summary of documents to be maintained in the files include the following:

- Correspondence, reports, memoranda, etc., either issued or received by NRT.
- Data collected in the field during the project.
- Data provided to NRT from outside sources (e.g., laboratory reports, survey data, etc.).

3.6 Equipment Maintenance, Testing, and Inspection Requirements

Section 2.3 of the USEPA-Multi-site QAPP (September 4, 2007) discusses instrument/equipment calibration, testing, inspection and maintenance requirements. All equipment to be used for testing and inspections (e.g., turbidity monitors, DGPS, bathymetric survey equipment, cameras, etc.) to gather field data will be calibrated, maintained, and checked according to the manufacturer's directions to ensure proper maintenance and performance. All maintenance, testing, and inspections performed for monitoring equipment will be logged in site log books and/or maintenance logs.

4 QUALITY PROGRAM

This section discusses the methodology that will be used to confirm the remedial design is being implemented to meet the design criteria as specified in the plans and specifications. This section includes the specific performance objectives and criteria, the measurements or inspections that will be performed to verify compliance with the objectives and criteria, and contingency or response actions if the objectives and criteria are not met.

Table 2 summarizes the following:

- Design element
- Specific performance objective and criteria
- Required monitoring or inspections to verify compliance
- Frequency of monitoring/inspection
- Contingency or response actions, if necessary

All sampling and inspection activities will be performed in accordance with the Health and Safety Plan, and the USEPA-approved RI/FS Multi-Site SOPs.

4.1 Erosion Control Measures

Erosion control measures will be installed in accordance with the WDNR Chapter NR 216 and 151. The Contractor will maintain erosion control measures to minimize to the extent practicable the amount of soil/sediment and other pollutants carried by runoff or discharged from land disturbing activities into the river. Erosion control measures will follow best management practices and will include silt fences, gravel tracking pads and on-site truck routes, and maintaining the use and storage of materials such as dewatering additives, etc. in a way to prevent their entrance into the river. In addition, the treated wastewater will be discharged in a manner that does not cause erosion of the site. Existing storm water drain inlets will be protected with a straw bale, filter fabric, or equivalent barrier.

Erosion control measures will be maintained for the duration of the project and will be visually inspected on a daily basis. The inspections will be completed on the Erosion Control Inspection Observation section of the Daily Construction Report (Appendix A). If damage to erosion control measures are observed or channelizing at the wastewater discharge point is observed, NRT will notify the Contractor's Site Superintendent so that the erosion control measures are repaired in an orderly fashion.

4.2 Site Security Fence Monitoring

A temporary site security fence will be installed around the perimeter of the upland staging area, down to the river's edge, and across the parking lot to the existing Marinette Marine fence, as shown on the project plans. The security fence will protect the public from the work zone areas. One vehicle gate and four man gates will be installed along the fence perimeter to serve as entrances and exits for authorized vehicles and project personnel. The gates will be locked during non-working hours.

The site security fence will be maintained for the duration of the project and will be visually inspected on a daily basis. The inspections will be recorded on the Site Security Fence Inspection Log Observation section of the Daily Construction Report (Appendix A). If damage to fence is observed, NRT will notify the Contractor's Site Superintendent so that the fence or gates are repaired in an orderly fashion.

4.3 Construction Access Area Existing Conditions Survey

The area that has been identified for the upland staging area is owned by the City. Prior to mobilizing contractor equipment and supplies to the construction site, a pre-conditions survey will be completed on approximately 2.7 acres of the City of Marinette Boom Landing property.

The pre-conditions survey will be performed to document existing environmental soil quality. Samples will be taken at an interval of 10 per acre, from ground surface to one foot below ground surface, which the project will be occupying. Sample locations will be evenly spaced out. Soil samples locations and elevations will be recorded with an real-time kinetic global positioning system (RTK-GPS) or total survey station by the Contractor and samples will be collected using a hand auger or shovel in accordance with USEPA-approved Multi-site FSP, September 8, 2008 SOP-06-01, by the CQA Engineer. Samples will be submitted under chain of custody to Pace Analytical Services for analysis of PAHs. Table 1 provides a sampling and analysis summary with the analytical methods, sample bottle/preservation requirements, and QA/QC samples.

Just before the security fence is scheduled for removal during the final phases of demobilization, the pre-conditions survey locations will be re-occupied (with an off-set up to 10 feet from the original location) to document any degradation to the soil quality as a result of the property being used as a construction area.

If the average pre and post soil quality results are within 20% of each other, no action will be required. If the average post soil quality results are more than 20% higher compared to the average pre soil quality results, the individual pre and post samples will be compared to determine which sample(s) is contributing to the elevated results. Then this location will be re-sampled, and step-out samples will be taken to verify the post sample result and quantify the potential area of project impact. Step out samples are four

additional samples taken on the four axes centered on the suspect location; the step-out distance will be determined based on field conditions. If the average of the re-sample and four step-out samples (average of five new post samples) is less than the pre-construction average, no further action will be needed. However, if this average post soil quality result is more than 20% higher compared to the average pre soil quality result, then with permission of the property owner six to twelve inches of soil will be removed from contiguous areas and replaced. The excavated soil will be transported and disposed at the same landfill used for the project.

4.4 Parking Lot/Roadway/Sidewalk Condition Documentation

As part of the construction activities, heavy equipment will be staged on City parking lots and may be traveling on City streets. These streets may not be able to handle the heavier equipment or truck traffic anticipated during phases of the project.

At the beginning of the project or at the beginning of a phase of the project that requires a new access route to/from the site, access routes will be surveyed to document the existing conditions in an effort to identify incremental damage that may occur. The survey will consist of the CQA Engineer driving or walking the access route to record the location of existing pot holes, excessive settling, and other stressed conditions. The CQA Engineer will take notes, photos and/or videotape, and measurements of the features to document pre-construction conditions.

On a weekly basis, the CQA Engineer will drive the non-industrial truck routes to observe for potential project-related damage that may require temporary repair. At the end of the project, a final survey will be performed on the parking lot, any non-industrial access route, and on sidewalks that were accessed during the construction activities. If incremental damage is identified, these areas will be repaired to the extent practical to pre-construction conditions following completion of the project. Depending on the area and extent of damage, if any, an alternate arrangement may also be discussed with the City.

4.5 Temporary Sheet Pile Cofferdam

The temporary sheet pile cofferdam rely on specific target elevations to ensure adequate embedment depth to maintain structural integrity in order to withstand the water and earth pressures. The target elevations and design lengths are shown on the project plans.

Prior to installing the sheet pile sections, the total length of the sheet piling will be measured to the nearest 0.1 feet to ensure they are equal to or greater than the design length of 22 feet. If the length varies, each section will be measured. The design top of the cofferdam is elevation 582 (North American Vertical Datum [NAVD88]) and the design bottom is elevation 563 (bedrock elevation). The Contractor will

number each section sequentially with paint before or immediately after it is driven, and a driving record kept of length, and actual driven top and bottom elevations. Elevations will be determined by the Contractor's RTK-GPS or conventional survey equipment. Alternatively, elevations can be referenced to the water surface, with the water surface elevation measured at benchmark BM-SG located at the east end of boat launch sheet pile, as shown on the Contract Drawings (if the water surface is used as the datum, its elevation should be checked three times throughout the day to monitor for fluctuation - e.g., start, middle, and end of day). Elevations will be recorded to the nearest 0.1 feet. The installed cofferdam's X-Y coordinates will also be determined at the shoreline beginning and ending points, as well as at the points of alignment change. Coordinates will be in the Marinette County Coordinate system, to the nearest 0.1 foot. All of the elevations and total drive depths, along with dates of installation and notes, will be recorded on the Sheet Pile Cofferdam Installation form (Appendix A).

If the target elevations are not met due to refusal during either the cofferdam installation, the geotechnical engineer will be contacted and a contingency plan will be developed.

As required in the Contract Documents, the contractor is required to monitor the temporary cofferdam for ice buildup against the temporary cofferdam. The Field Engineer will monitor the temporary cofferdam and provide daily comments of their observations.

4.6 Shoreline Sheet Pile Monitoring

The existing sheet pile walls in the dredge area will be monitored during dredging operations. These include sheet pile walls at the boat ramp and at the Nest Egg Marine. The existing sheet pile wall at the sewer outfall pipes will not be part of the monitoring plan because the outfall will be reconstructed as part of the upland barrier construction. Optical survey points will be established every 25 feet along the tops of the existing sheet pile walls. Optical surveys will be performed using real-time kinematic global positioning system (RTK-GPS) or conventional survey equipment that will permit measurement to the nearest 0.01 feet in the Marinette County Coordinate system and NAVD88 datum.

A baseline x-y-z position will be recorded at the top of wall survey points at the beginning of the project prior to dredging adjacent to the existing sheet pile walls. These measurements will serve as the standard to which subsequent measurements are compared and the need for contingency response actions to protect the structures are evaluated. Readings will be recorded on the Sheet Pile Wall Deflection Monitoring forms (Appendix A). Each location will have a separate form to easily identify potential differential measurements.

4.7 Upland Barrier Installation

The upland barrier installation will rely on specific target elevations to ensure adequate embedment and total drilled depth of sheet pile to prevent potential migration of MGP-residuals in the upland area to the river. The target elevations and design lengths are shown on the project plans.

Prior to installing the sheet pile sections, the total length of the sheet piling will be measured to the nearest 0.1 feet to ensure they are equal to or greater than the design length of 15.3 feet. If the length varies, each section will be measured. The design top of the sheet pile is elevation 579.3 (NAVD88) and the design bottom is approximately elevation 564. The Contractor will record drive length and actual driven top elevation and bottom elevations. Elevations will be determined by the Contractor's RTK-GPS or conventional survey equipment. Elevations will be recorded to the nearest 0.1 feet. The installed end corners for the upland barrier X-Y coordinates will also be determined at the shoreline beginning and ending points, as well as at the points of alignment change. Coordinates will be in the Marinette County Coordinate system, to the nearest 0.1 foot. All of the elevations and total drive depths, along with dates of installation and notes, will be recorded on the Upland Barrier Installation form (Appendix A).

4.8 Outfall Reconstruction

As part of the construction, the existing storm water and sanitary sewer outfall will be removed to install the upland barrier and re-installed per the Contract Documents.

During the concrete pour of the cast-in-place concrete the CQA Engineer will collect three test cylinders per 25 cubic yards of concrete placed each day. The molds will be tested by a geotechnical laboratory (to be determined) for compressive strength; one mold at 7-days and two at 28-days. While the pour is occurring, concrete will be sampled to determine air content and slump. Table 1 provides a sampling and analysis summary with the analytical methods, sample bottle/preservation requirements, and QA/QC samples.

4.9 Bathymetric Surveying – Dredge Volume and Backfill Placement

Bathymetric surveying will be performed to establish riverbed elevations and contours within the project area. The Contractor will perform QC bathymetric surveys for his own purposes, such as measuring daily or weekly progress. The Contractor will also perform QA bathymetric surveys, but under the observation of NRT's CQA Engineer. Pre- and post-dredge QA bathymetric surveys will be used to calculate the total volume of sediment dredged and backfill thickness placed in the project area. Progress QA bathymetric surveys will also be used to compute dredge volumes to support monthly invoicing.

The pre-dredge QA survey will likely be performed immediately before the sheet pile cofferdam is installed, and will serve to document existing conditions. NRT will compare this survey to the RI bathymetric survey performed in November 2011 for informational purposes only to determine changes that occurred in the ensuing year. There is no performance standard for this pre-dredge QA survey. Post-dredge QA surveys will be completed when a definable work area (e.g., dredge management unit) is complete. The performance standard for post-dredge QA bathymetric surveying following sediment removal is to achieve the target neat line depth of contamination design elevation within the defined work area (as specified on the project plans), with up to a six inch over-dredge allowance.

Single or multi-beam surveys may be used, with surveying transects located between 10 and 25 feet apart. If there are portions of the project area that are not accessible for the marine survey equipment to access, bathymetric measurements may be collected using conventional survey methods (e.g., a survey rod) in accordance with the USEPA-approved Multi-Site FSP, September 8, 2008) SOP SAS-07-01).

Pre- and post-dredge QA bathymetric results will be presented in a format to show the total area dredged compared to the target area, the total volume dredged, and identify areas above and below the target elevations.

If it is determined that the post-dredge QA survey has not achieved the target design elevation in 90% or more of the work area, additional dredging will be performed to reach the target elevation. If additional dredging is performed, the post-dredge QA survey will be performed again.

After it is established that the target elevation was reached, residual sand placement may be necessary depending on the post-dredge confirmation/verification sample results (discussed in Section 4.11).

In areas along the shoreline, backfill is required once dredging is considered complete to protect the existing sheet pile walls. Push cores will be used to determine if the appropriate amount of backfill has been place. Field measurements will be recorded on the Backfill Placement Sampling Form (Appendix A). In areas practical where sufficient amount of backfill has been placed, an additional bathymetric survey will be taken.

4.10 TSS and Turbidity Sampling and Monitoring

Water column monitoring will be conducted to ensure that the in-water construction operations do not cause total suspended solid (TSS) concentrations at the downstream compliance point to increase more than 70 milligrams per liter (mg/L) above the background levels (i.e., upstream sampling locations); both measurement points are outside the cofferdam. These in-water measurements are not related to compliance with the WPDES discharge permit requirements.

Prior to dredge operations, a minimum of ten surface water grab samples will be collected for laboratory turbidity and TSS analyses; a range of field-measured turbidities will be collected if possible, with a difference of at least 70 Nephelometric turbidity unit (NTU) to represent the 70 mg/L TSS criterion listed above. The turbidity measurements and analytical results will be used to develop the site specific turbidity to TSS correlation. Up to fourteen additional field surface water samples may be collected in the first week of dredging to expand the range of the initial correlation. Surface water sample locations will be recorded with a hand held DGPS unit and will be collected using a peristaltic pump or grab sampler in accordance with USEPA-approved Multi-Site FSP, September 8, 2008, SOP SAS-03-03. Samples will be submitted under chain of custody to Pace Analytical Services for analysis of TSS and turbidity. Table 1 provides a sampling and analysis summary.

It is assumed that turbidity and TSS measurements will correlate at or very near to 1:1. Therefore, for a TSS action level of 70 mg/L above background, the equivalent turbidity action level will be 70 NTU based on an initial assumed site-specific 1:1 correlation. The turbidity criterion of 70 NTU may be adjusted if necessary based the actual correlation. In addition to the action level, an advisory level equal to one-half the action level will be used as an early warning of possible dredge effects on water column suspended solids. Therefore, the advisory level will be a TSS of 35 mg/L or a turbidity of 35 NTU above background.

During dredging activities, turbidity measurements will be collected within 150 feet upstream of the cofferdam and within 500 feet downstream of the cofferdam (on the outside of the cofferdam) or from the dredge located outside of the cofferdam at 30-minute intervals with in-situ nephelometers mounted on buoys. Turbidity buoys will be moved as necessary and will be anchored in the river and turbidity measurements will be obtained automatically, and results will be transmitted to a base station in the job trailer, to be located at upland staging area. A hand-held turbidity meter will be used to check the buoy-mounted, real-time turbidity meters at least weekly. Each piece of equipment will be calibrated in accordance with the manufacturer's recommendations and the USEPA-approved SOPs. Hand-held turbidity measurements will be recorded on Turbidity Sampling (Appendix A) and will also record the continuous measurement that best represents the time that the hand-held measurement was collected.

If the average downstream turbidity over four consecutive half-hour readings (i.e., 2 hours) exceeds the advisory level of 35 NTU above upstream background, and the condition of the elevated turbidity is reasonably attributable to remedial actions and not other factors like boat propeller wash, the Contractor will be notified. Dredging will be suspended if the average downstream turbidity over four consecutive readings (i.e., 2 hours) exceeds the action level of 70 NTU above upstream background, and the condition of the elevated turbidity is reasonably attributable to remedial actions. The Contractor will then evaluate and possibly modify dredging operations to maintain dredging best management practices (BMPs). Response actions will be documented in the daily field reports. Also, two-hour average turbidity

readings above the 70 NTU action level that are determined not to be related to sediment dredging will be explained to the extent possible in the daily reports.

The turbidity of the water within the cofferdam will be measured prior to removing the cofferdam sheet pile. At the end of dredging and backfilling, before the cofferdam sheet piles are extracted from the river, the turbidity of the water within the cofferdam will be measured to confirm the turbidity is at or below the 70 NTU action level. The turbidity will be measured at five equally distributed locations within the cofferdam using a hand-held turbidity meter. If the average turbidity is above the 70 NTU action level, additional time may be allowed for the dredge residuals to settle, or water may be pumped from the cofferdam to the on-site wastewater treatment plant for treatment, while replenishing the water inside the cofferdam with river water from outside the cofferdam.

The turbidity buoys will be pulled from the river when ice begins to form in the river. At this time, turbidity monitoring will be suspended for the remainder of the project.

4.11 Post-dredge Sampling

Table 1 summarizes post-dredge sampling and the necessary QA/QC samples to be collected.

This section discusses how post-dredge verification sampling will be collected within the project area and how these data will be evaluated to determine management alternatives for dealing with the new sediment surface. Post-dredge sediment sampling will be performed after the bathymetric survey confirms that the target elevation has been achieved in 90% or more of the dredge management unit (DMU). There are three DMUs; area 1, 2, and 3. Post-dredge sediment sampling will not occur in area 3. All sediment sampling will be performed in accordance with USEPA-approved RI SOP SAS-07-03 using a push core sampler. Coordinates for sediment sample locations will be randomly located within DMUs and will not be provided to the dredging contractor. The actual sediment sample locations will be recorded in accordance with SOP SAS-02-02. Sediment cores will be logged in accordance with SOP SAS 07-02.

Sediment cores will be advanced 1.5- feet into the sediment. If refusal is encountered before 1.5-feet is advanced, the core location will be offset approximately two to five feet and another attempt will be made. Up to three attempts will be made to recover 1.5-feet of sediment, and the core with the greatest recovery will be selected for analysis.

In certain areas, where dredging goes to refusal, a 1.5-feet core sample may not be obtainable due to the minimal amount of soft sediments remaining or the dredge extending to the top of bedrock or a confining unit. In the event where a core is unattainable, after three attempts at two different offsets from the initial location, a ponar sampler or dredge bucket will be utilized to collect any soft sediment still in the location of the original sample location. If after three attempts using a ponar sampler or dredge bucket there is still

no recovered soft sediment, sampling in that location will be suspended, and the area will be considered complete.

4.11.1 Verification Sampling in NAPL Areas

The objective for post-dredge sampling in the NAPL area is to verify that dredging to the target elevation no longer exhibits visual evidence of MGP-residuals in the form of oil-wetted or oil-coated sediment.

The NAPL area is 0.8 acres (refer to the Contract Drawings). To achieve a sample density of ten cores per acre, eight sediment core samples will be collected within the NAPL footprint boundary. Each core will be photographed and observations of NAPL and field screening for the presence of volatiles will be noted in the field logs. If there is none or up to six inches of disturbed visual evidence of MGP-residuals in the form of oil-wetted or oil-coated sediment in each core, the 1.5-feet core will be subdivided into a 0 to 6-inch sample and a 6 to 18-inch sample. Sample intervals will be composited and submitted to Pace for analysis of PAHs to document the sediment quality prior to backfill placement

If there is visual evidence greater than six inches of disturbed or any non-disturbed MGP-residuals in the form of oil-wetted or oil-coated sediment in a NAPL area post-dredge core, the approximate elevation will be determined and additional cores may be advanced to visually delineate the lateral extent of the MGP-residuals. After the approximate area and elevation are established, additional dredging will be performed. At the completion of the additional dredging, post-dredge sampling will be performed again in the subject area to verify that the visual evidence of MGP-residuals in the form of oil-wetted or oil-coated sediment has been removed. Then, the entire 1.5-feet section of each core will be composited and submitted to Pace for analysis of PAHs to document the sediment quality prior to backfilling as described above. The whole process for verification sampling is shown in Figure 4.

4.11.2 Verification Sampling for PAHs

The objective for post-dredge sampling in near shore areas where total PAH (13) concentrations were identified above 22.8 mg/kg is to verify the new surface sediment quality.

The PAH dredge areas inside and outside the cofferdam are approximately 0.3 acres and 0.2 acres in size, respectively (refer to the Contract Drawings).). To achieve a sample density of ten cores per acre, three sediment cores will be collected from the PAH dredge inside the cofferdam and two in the area outside the cofferdam. Each core will be advanced up to 1.5-feet core or to refusal, whichever is less and will be subdivided into a 0 to 6-inch sample and a 6 to 18-inch sample. Sample intervals will be composited and submitted to Pace for analysis of PAHs. If the PAH concentrations are below the cleanup goal discussed in Section 1.3.3 (i.e., total PAH (13) <22.8 mg/kg), dredging will be considered completed. If a PAH concentration is above the PAH cleanup goal, dredging will continue an additional 6 inches or

18-inches, depending on the interval above the goal. The re-dredge boundary will consider the concentrations of adjacent cores where the total PAH (13) concentrations below the cleanup goal. Upon completion of dredging, an additional sample will be obtained. If the total PAH (13) concentrations is > 22.8 mg/kg, the dredging process will continue. Once a post-dredge verification sample indicates the remaining total PAH(13) levels are <22.8 mg/kg or the dredge has extended to the top of bedrock or a confining unit as determined by push core refusal and/or visual inspection of the cores, dredging will be considered complete. This process is also shown in Figure 4.

4.12 Residual Sand Layer Placement Sampling

A minimum six inch residual sand layer will be placed in dredged areas where the verification sample results are above 22.8 mg/kg total PAH (13) but it is impractical to continue dredging (i.e., dredging residuals are six inches or less in thickness) to manage dredging residuals. The process for determining residual sand layer placement is depicted in Figure 4.

Push cores will be the primary method of verifying sand layer thickness. If push cores are not practical (i.e., dredging has extended to the top of the bedrock), buckets will be deployed on top of the final dredge surface prior to the sand being placed to verify the sand backfill thickness meets the objective of six inches. Bathymetric surveys will be performed to also document backfill placement. Field measurements will be recorded on the Cover Thickness Sampling Form (Appendix A).

If the sand layer is measured to be six inches thick to the target lateral extent, with a tolerance of minus 0 feet and plus 0.5 feet, then the backfill placement will be considered complete. If the sand layer is less than 0.5 feet thick, the area will be evaluated to identify locations were additional sand placement might be performed.

4.13 Sediment Stabilization, Transport, and Disposal

The dredged sediment will be loaded into scows/barges (or equivalent). Free water on top of the sediment will be pumped directly from the scow to the on-site water treatment system. After free water is pumped out, and if needed, the excavator bucket will mix the sediment with a suitable quantity of stabilization additive (e.g., Portland cement or lime kiln dust) until the sediment has no remaining free liquids and can pass a paint filter test, as well as meet certain physical requirements (e.g., unconfined compressive strength; see below).

Stabilized sediment will be loaded directly into a truck trailer, with a leak-proof gate and tarp, staged along the river adjacent to the cofferdam. Once the truck is loaded, the bed will be covered and the exterior of the trailer will be cleaned (dry brush or pressure wash, as needed) to remove visible sediment and soil.

Each truck will be placarded and given a manifest, and then will depart the site and transport sediment via established truck routes to the extent practical to an approved offsite landfill.

Table 1 summarizes the physical requirements of the sediment for disposal as “workable” solid waste.

To comply with physical disposal requirements, stabilized sediment will need to meet the following requirements:

- No free liquids.
- Be able to support its own weight.
- Support the weight of material placed over it.
- Be capable of being worked and managed by the landfills low ground pressure bulldozers.
- Minimum unconfined compressive strength 0.8 tons per square foot.
- A minimum cohesive strength of 800 pounds per square foot.
- A minimum short term friction angel of 25 degrees.
- Defined combinations of cohesive and short term frictional strength for the landfill slopes as determined through slope stability modeling at least equivalent to minimum required cohesive strengths and short term friction angel.

Prior to landfill acceptance, characterization testing of the stabilized sediment needs to done. The following tests are required for characterization;

- Percent solids/moisture content (American Society of Testing and Materials [ASTM] D2216 or D2974)
- Grain size distribution (ASTM D422)
- Liquid limit, plastic limit, and plasticity index of soils (ASTM D4318)
- Hydraulic conductivity testing (ASTM D5856 or D2434)

Even if the stabilized sediment passes the paint filter test prior to truck departure from the site, there is a potential for water to be released during transportation.

4.14 Water Treatment and Discharge into the Menominee River

Wastewater will be generated during the dredging, handling, and stabilization of sediment. Primarily, wastewater will be generated from the following sources:

- Free water on top of the sediment that is pumped out of the scow.
- Decontamination water.
- Backwash wastewater from the on-site water treatment system.
- Potentially pumping water from the cofferdam prior to cofferdam removal.

The design for the temporary on-site water treatment system is included in the Technical Specifications and Contract Drawings. The design plans and specifications contain requirements that the Contractor include the following minimum water treatment process steps, which are deemed the best available treatment technology reasonably achievable considering other successful contaminated sediment cleanup projects of a similar nature: solids settling/clarification, multi-media filtration, and granular activated carbon (GAC) filtration/polish. Polymers are likely to be used in the clarification step. The Contractor will decide whether bag filters and an oil-water separator are also needed in the process train to comply with effluent limits, to be established by the WDNR using Substantive Requirements of a WPDES Permit. The Contractor will also decide the flow capacity and operating timeframe for the water treatment system, but given the anticipated relatively small volume of water to be treated from the mechanical dredging operations, it is anticipated that batch treatment will be utilized instead of near continuous operation.

The treatment system controls and monitoring devices will include, but not limited to, the following:

- Variable speed pumps to regulate the flow through the system.
- Pressure gauges to monitor head loss across multi-media and GAC filters.
- Sampling ports to enable collection of samples of system influent and effluent, as well as at intermediate treatment steps.
- A real-time continuous-recording turbidity meter to monitor water quality of the effluent.
- A flow meter measuring volume of effluent discharged.

The WPDES Permit was not issued at the time this document was prepared. The estimated WPDES permit sampling parameters and frequencies are summarized on Tables 3 and 4.

If there are any violations of effluent standards, the WDNR will be notified and a report describing the noncompliance will be submitted which describes the cause of noncompliance, the period of noncompliance, included dates and times, the steps taken or planned to reduce, eliminate and prevent reoccurrence of the noncompliance, and if the noncompliance has not been corrected, the length of time it is expected to continue.

4.15 Air Monitoring Plan

4.15.1 Overview

Potential emissions to be managed and controlled during the course of the sediment removal include odor, fugitive respirable particulate matter, and vapor phase contaminants of concern. Potential sources of emissions include:

- Fugitive dust as part of stabilizing and loading sediment for transportation/disposal.
- MGP related vapor/odor from removal of oil-wetted or oil-coated sediment.

Air monitoring activities will be conducted by the CQA Engineer under the direction of the Field Engineer to evaluate these various sources of emissions. The air monitoring will consist of the following:

- A dedicated weather station will be established at the Site and operated to continuously monitor meteorological conditions during the remedial construction on a 24-hour, 7-day per week basis.
- Prior to initiating the sediment removal operations, background air sampling will be conducted over a period of 10 days (two weeks) to confirm baseline ambient air concentrations. Background air sampling will include 24-hour time-weighted sampling and real-time monitoring of MGP related constituents.
- During the sediment removal operations, both real-time air monitoring and 24-hour time-weighted sampling will be conducted at the Site perimeter.
- 24-hour time-weighted average MGP constituent-specific sampling will be conducted by collecting SUMMA canisters for benzene, toluene, ethylbenzene, xylene (BTEX) and naphthalene for comparison with risk-based acceptable ambient concentrations (AACs). The Technical Memorandum establishing the AACs for the Site is included in Appendix B.
- Real-time air monitoring data for total volatile organic compounds (TVOCs), benzene, and respirable particulates will be collected at regular intervals from around the perimeter of the Site.

Examples of air monitoring reports and sample collection logs for SUMMAs are provided in Appendix A. Each of these activities is discussed in the following sections.

4.15.2 Time Weighted Average (24-Hour) Perimeter Air Monitoring

The proposed air sampling strategy for 24-hour SUMMA canisters is divided into three distinct categories consisting of background monitoring, full-scale startup, and full-scale operations. Each of these categories has distinct sampling frequencies and quantity requirements for SUMMAs. Frequencies and quantities may be revised and/or reduced during the course of the full-scale operations, depending on the conditions encountered. Sampling requirements are summarized below:

- Background: For the two weeks prior to startup of the full-scale MGP-affected sediment removal operations, background air sampling and monitoring will be conducted to establish baseline concentrations for comparison with AACs. SUMMA samples will be collected once per week for analysis of BTEX and naphthalene, respectively, from the three air sampling locations around the fence line.

- Full Scale Startup: During the first two weeks of full-scale operation, SUMMA samples will be collected from the three air sampling locations. Sampling events will be conducted three times per week for BTEX and naphthalene. Priority (3-day) laboratory turnarounds will be requested for rapid assessment of the analytical results. Additional sampling may be conducted near a sensitive receptor, to be evaluated on the basis of the full scale, post-startup analytical results.

- Full Scale: During the remaining months of full scale operations, SUMMA samples will be collected from the three air sampling locations once each week for analysis of BTEX and naphthalene. Additional sampling may be conducted near a sensitive receptor, to be evaluated on the basis of the full scale, post-startup analytical results.

- With the exception of the first two weeks of full scale startup, samples will be analyzed within the 14-day holding time requirements; unless real-time monitoring results indicate that the sample analysis should be expedited to evaluate potential on-site conditions that would indicate exceedances of AACs.

- Field duplicates for the SUMMA canister samples will be collected at a frequency of one in 20 samples. Duplicates will be obtained by collecting two concurrent samples from a single location and having both analyzed by the laboratory.

Sampling methodologies and analytical requirements for the SUMMA canisters will be submitted for analysis of BTEX and naphthalene by USEPA Method TO-15.

4.15.3 Real Time Air Monitoring with Portable and Hand Held Equipment

Real-time monitoring using portable and handheld devices will be conducted prior to and during the sediment removal operations. Real time air monitoring equipment will operate 24-hours a day 7-days a week. Key requirements consist of the following:

- Monitoring for TVOCs using a photoionization detector.

- Monitoring for specific volatile organic compounds (VOCs) (i.e., benzene) using a photoionization detector calibrated for benzene when TVOC is detected above the action level.

- Continuous total suspended particulate monitoring will be conducted using portable DustTrac™ aerosol monitoring equipment, or similar, for respirable particulates (RPM_{10}) located at the three air monitoring locations around the fence line.

- Qualitative olfactory assessment of odor (e.g., naphthalene) that could indicate a concern for a public nuisance.

- Visual assessment of the presence of off-site dust due to on-site operations.

4.15.4 Assessment of Meteorological Conditions

An on-site meteorological station will be used to measure wind speed, wind direction, relative humidity, ambient air temperature, and barometric pressure. Data will be relayed to a dedicated computer that will receive continuous meteorological data and compute a 5-minute running average of the wind speed and direction. The 5-minute running average wind direction will be used to identify upwind and downwind sample locations and to monitor off-site receptors. The information will be stored electronically and included in daily reports. Average daily temperatures and barometric pressures will be used to calculate 24-hour time-weighted average air sample volumes for the SUMMA canisters. Meteorological data may also be obtained from an online weather website (e.g., wunderground.com) in the event of a malfunction of the on-site station.

4.15.5 Action Levels

Proposed Action Levels for real-time perimeter monitoring are consistent with those established in the August 24, 2004, *Health-based Guidelines for Air Management, Public Participation, and Risk Communication During the Excavation of Former Manufactured Gas Plants,* prepared by the Wisconsin Bureau of Environmental and Occupational Health, Department of Health and Family Services (DHFS). Exceedance of these Action Levels at the Site perimeter will require Contractor action to reduce vapor phase and/or fugitive dust emissions. These action levels are listed below:

Parameter	Action Level
Total Volatile Organic Compounds (TVOCs)	1.0 parts per million (ppm)
Benzene	0.5 ppm
Particulates	1.0 mg/m^3

The Action level for TVOCs reflects DHFS's recommended upper limit for initiating a response measure. Action Levels for benzene and particulates reflect DHFS recommended maximum 15 minute exposure concentrations.

4.16 Fugitive Emissions Management Plan

4.16.1 Overview

Action Levels will be used in a tiered approach to determine necessary response actions to different Site exposure conditions to fugitive air emissions. In addition to the Action Levels provided in Section 4.14.5, odor will be assessed as an Action Level on the basis of a qualitative assessment as to whether or not odors at the Site perimeter are perceived to present a concern as a public nuisance and /or there is a public complaint. Particulates, in addition to having an established numerical Action Level, will also be assessed as an Action Level on the basis of whether/or not the Site operations are causing visible off-site fugitive dust.

4.16.2 Site Conditions

Site Conditions are generally defined as follows, and are depicted on Figure 5:

- **Site Condition 1:** Normal or ambient air conditions for either TVOCs or particulates exceed the Action Level. This Site Condition 1 may also be triggered on the basis of odor at the perimeter of the Site and/or presence of off-site visible fugitive dust regardless of the TVOC or particulate readings. This condition trips a “yellow” flag.

- **Site Condition 2:** Concentrations of benzene exceeds the Action Level or particulates continue to exceed the Action Level longer than 15 minutes, and Site Condition 1 measures are ineffective. This Site Condition will also be triggered if mitigation measures for a Site Condition 1 are ineffective in reducing odors or off-site visible fugitive dust. This condition trips an initial “red” flag.

- **Site Condition 3:** Readings for any of the Action Levels are continuously exceeded at the perimeter monitoring stations for an additional sustained period of 15 minutes, and Site mitigation measures for a Condition 2 are not effective in reducing concentrations below the Action Levels. This sustained Condition 2 triggers Condition 3, which is noted as a second “red” flag.

Yellow and red flags will be relayed verbally by the CQA Engineer to the Field Engineer and Contractor for Contractor response and mitigation measures.

4.16.3 Mitigation Measures

General types of mitigation measures that will be required by the remedial Contractor are divided into the following:

- Engineering Controls: Required engineering controls will consist primarily of the use of Rusmar™ Long Duration Foam (AC-645), or equal product approved by the Field Engineer. Rusmar product specifications. The AC-645 foam will be the most commonly used type of foam to directly control work zone emissions during operation and for routine overnight and weekend vapor phase, particulate, and odor control. Application produces thick viscous foam

for immediate emission suppression. It is not specifically required for application under Site Condition 1 by the Remediation Contractor as along as perimeter air monitoring concentrations are below the Site Condition 2 Action Levels, but may be used on a discretionary basis for control of localized work zone emissions. In the event that a Site Condition 2 is identified, then the remediation Contractor will be required to apply foam as needed to reduce levels to a Site Condition 1 or lower status. The use of Rusmar AC-900 series may only be required under Site Condition 3. This type of foam provides a more extended duration life and higher level of suppression effectiveness than the Rusmar AC-645. The foam incorporates a latex emollient that following application coagulates into a relatively impermeable membrane, which is more ideal for areas or stockpiles that are not going to be disturbed for a period of time, or are posing a high level of concern for vapor phase, particulate, or odor emissions.

- Physical Controls: Physical controls represent the primary types of mitigation measures and incorporate a broad range of activities (e.g., good housekeeping practices, maintaining exclusion zones, and covering stockpiles) that the remediation Contractor will be responsible for implementing on a periodic (i.e., daily and/or weekly) basis. In the event that Site Condition 2 or 3 mitigation measures are required, modifications to the physical controls may include more aggressive activities such as daily covering of stockpiles and /or continuous use of water for dust suppression.

- Work Sequencing: Sequencing the work will limit emissions from freshly exposed dredged material and the amount of material that may require stockpiling pending further management (e.g., dewatering or stabilization). Other factors to be considered include planning the operations to avoid double-handling of impacted materials and scheduling loading and off-site hauling to minimize the duration that staged materials will need to be maintained. In the event that Site Condition 2 or 3 mitigation measures are required, modifications to the work sequencing may include reducing and/or modifying the rate of dredging or on-site processing to further reduce emissions.

- Site Layout: Requirements for site layout include planning by the remediation Contractor to locate proposed stockpile and material management areas away from potentially sensitive receptors, to the extent practicable. These requirements will also include reassessment of site layout requirements as the remedial operations progress.

5 REPORTING PROCEDURES

The Project Engineer and Quality Coordinator will establish a document control system to provide measures for issuing, distributing, storing and maintaining quality-related documents. These documents may be provided from the contractors, laboratory suppliers, vendors, disposal facilities, etc. Documents that require quality control include:

- Drawings and specifications
- Calculations
- Laboratory Reports
- Design Change Notices
- Field Change Requests

5.1 Documentation

Several forms have been developed to assist with documenting the remedial action. Examples of the following forms are provided in Appendix A:

- Daily Construction Report – This form will be used to document all daily activity overseen by the Field Engineer. Information on this form includes daily production, observations, field measurements, samples collected, results of data review, staff members present, interactions with the Contractor, and site conditions each day.
- Construction Deficiency Report – This form will be used to document deficiencies and non-conformances and follow-up actions.
- Construction Deficiency Report Log - This log will be used as document and track deficiencies and follow-up actions.
- Submittal Registry – this log will be used to track Contractor submittals, the Engineer's review, and submittal status.
- Turbidity Sampling – This form will be used to record turbidity measurements.
- Sampling Results Log – This log will be used to track field measurement and laboratory measurements for sediment and surface water.
- Post Dredge Verification Sampling Form – This form will be used to log the post dredge sampling cores.
- Residual Sand Layer Sampling Form – This form will be used to document the thickness of the cover that is placed following dredging.

Each of the forms is an example, only, and will be revised as necessary to maximize field utility. Additional field observations not included in the forms will be recorded in field logbooks maintained by the Site Engineer and Field Support.

5.2 Project Completion Report

A Project Completion Report will be prepared that includes the following or similar:

- Project summary
- Quality assurance results
- Environmental monitoring results
- Description of restorations
- All required submittals and updated submittal schedule

5.3 Storage, Maintenance, and Availability of Documents

The Project Engineer, or designee, will file, store, and maintain record documents, including completed forms, logbooks, and meeting minutes, in the field office and in electronic format at the NRT offices in Pewaukee, WI. Logbooks may also be stored in the custody of the Field Engineer/author until the logbook has been filled. Documents will be maintained in good order and in a clean, dry, legible condition, protected from deterioration and loss. Documents will be stored in such a way to provide access to project record documents for the Project Engineer's reference during normal working hours. All records will be available for inspection and audit at any time by the persons authorized by the Project Manager.

6 REFERENCES

1995 September 30, United States Army Corps of Engineers, *Construction Quality Management Guidance* (ER 1180-1-6).

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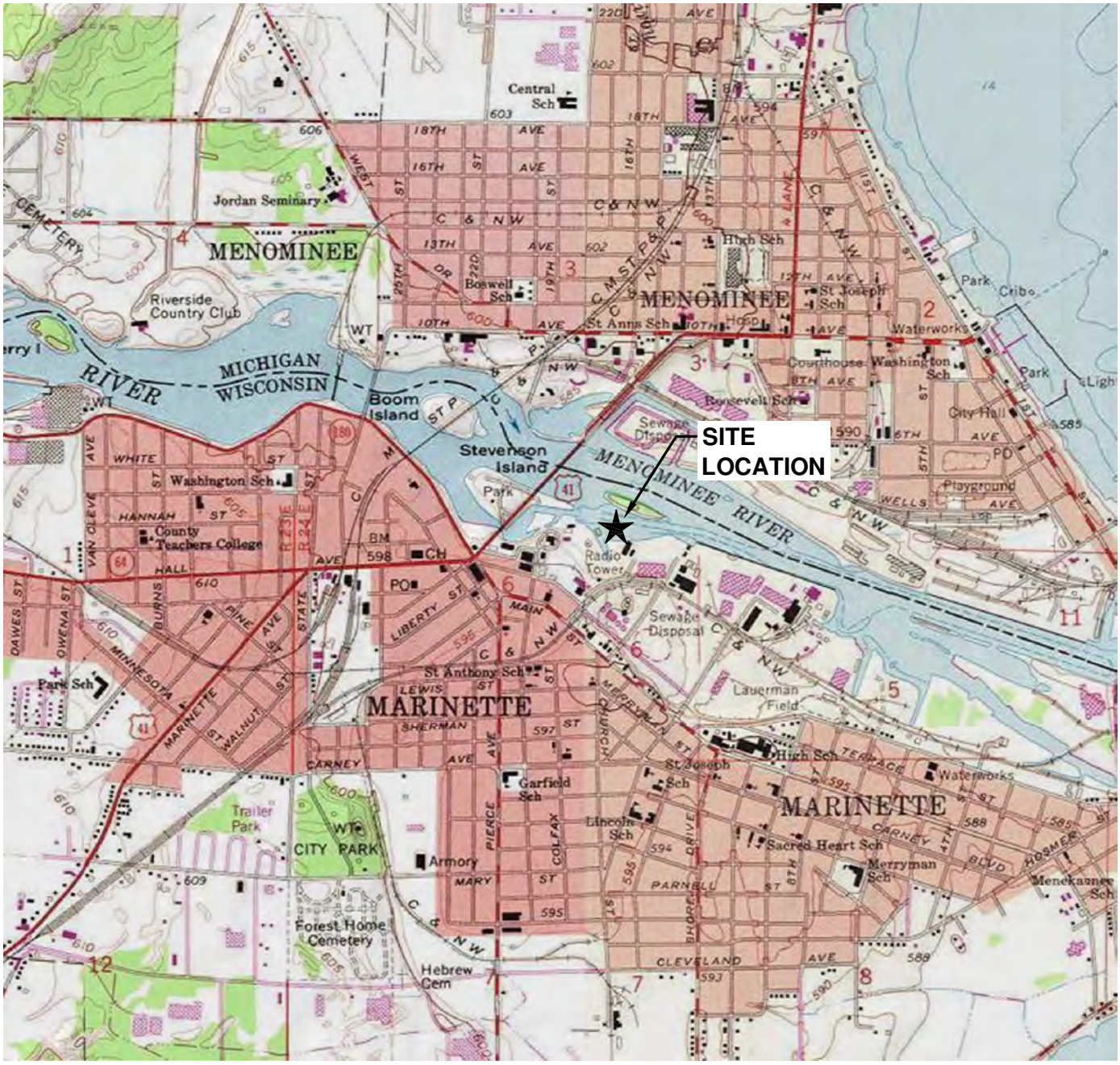
FIGURES



SOURCE NOTES:

1. NATIONAL GEOGRAPHIC TOPO. 1:24,000-SCALE MAPS FOR THE UNITED STATES. THE TOPO! MAPS ARE SEAMLESS, SCANNED IMAGES OF UNITED STATES GEOLOGICAL SURVEY (USGS) PAPER TOPOGRAPHIC MAPS. FOR MORE INFORMATION ON THIS MAP, VISIT US ONLINE AT HTTP://GOTO.ARCGISONLINE.COM/MAPS/USA_TOPO_MAPS COPYRIGHT:© 2011 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED
2. COORDINATE SYSTEM IS WISCONSIN COUNTY COORDINATE SYSTEM, MARINETTE COUNTY, US FOOT.

WISCONSIN

N

0 1000 2000

SCALE IN FEET

CONTOUR INTERVAL 10 FEET

SITE LOCATION MAP

NTC SEDIMENT REMOVAL ACTION CQAPP
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

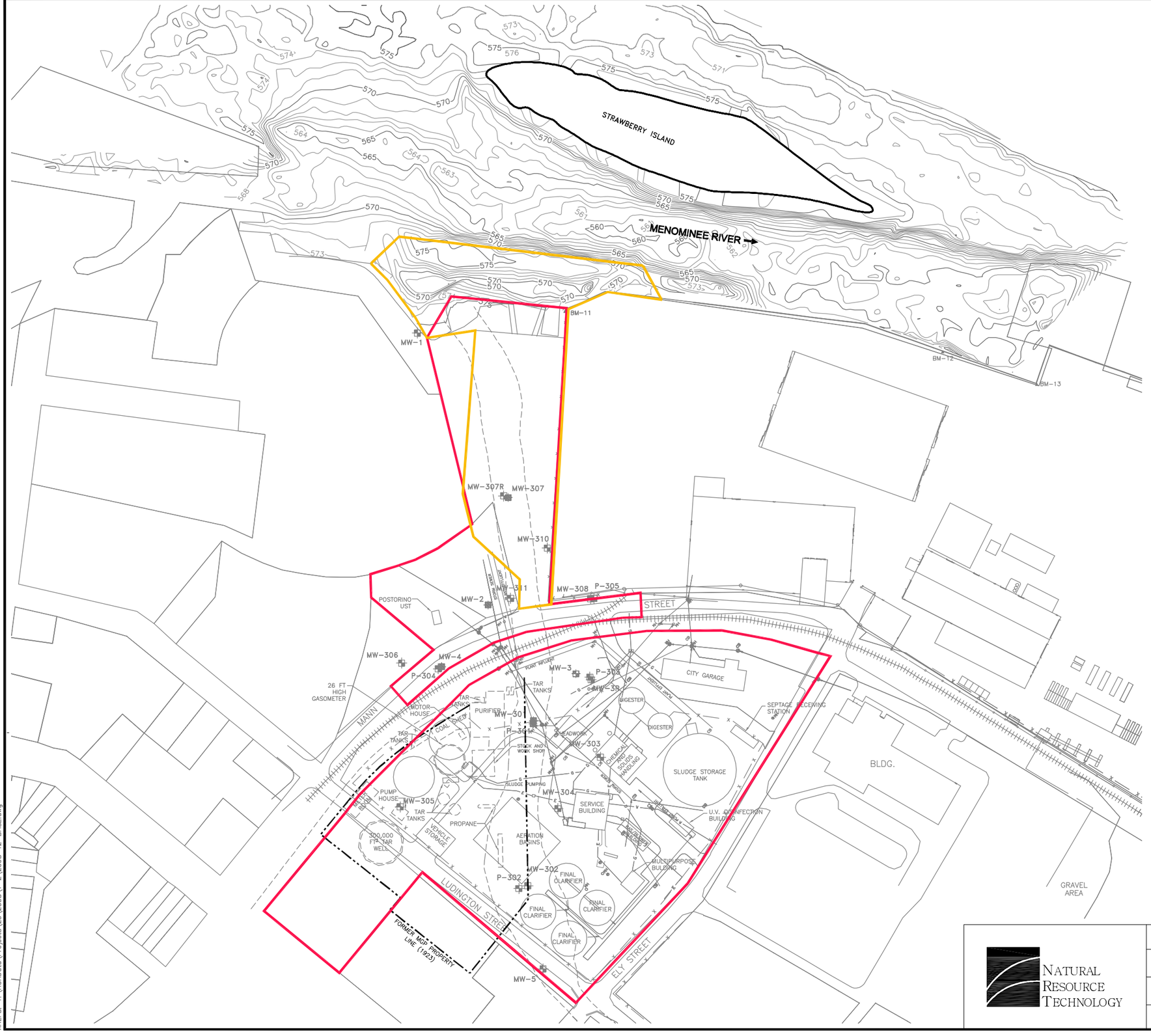
DRAWN BY: NWD 08/20/12 APP'D BY: KRM DATE: 08/30/12

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 2098/2.0

DRAWING NO. 2098-2-A01C

FIGURE NO. 1



SOURCE NOTES:

1. THIS DRAWING WAS DEVELOPED FROM A MAP BY THE CITY OF MARINETTE.
2. PORTIONS OF THE DRAWING ARE FROM A DIGITAL FILE FROM STS CONSULTANTS, LTD. CONSULTING ENGINEERS, GREEN BAY, WISCONSIN, PROJECT NUMBER 26936, REVISED JANUARY 2001. HYDROGRAPHIC SURVEY OF RIVER WAS PERFORMED BY AYRES AND ASSOCIATES ON JULY 24–26, 2001. VERTICAL CONTROL IS U.S.G.S. DATUM. BUILDING AND STREET LOCATIONS NORTH OF RAILROAD TRACKS WERE SUPPLIED BY MARINETTE MARINE CORPORATION.
3. PORTIONS OF THIS DRAWING ARE FROM HYDRO–SEARCH DRAWING.
4. EXISTING STRUCTURES AND UTILITIES FROM FOTH & VAN DYKE ENGINEERS/ARCHITECTS, GRADING PLAN, DIGITAL FILE 7m755c06.DWG, RECORD DRAWING REVISIONS 2/22/90.
5. WELL LOCATIONS FROM A SURVEY BY WPSC DATED OCTOBER 8, 2003, REVISED OCTOBER 31, 2003.
6. BRICK INTERCEPTOR SEWER REPLACEMENT TAKEN FROM DRAWING BY AYRES ASSOCIATES, GREEN BAY, WISCONSIN, JOB NO. 16–0189.10, DRAWING NO. P101, SHEET NO. 7, DATED 3/14/03.
7. MONITORING WELLS MW–2R, MW–3R, MW–307R INSTALLED OCTOBER 2004 AND MW–308, MW–310, P–305 INSTALLED JUNE 2004. SURVEYED BY WPSC IN JANUARY 2005. (NGVD88, MARINETTE COUNTY COORDINATES).

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 2098/2.0	**FORMER MGP PROPERTY AND SITE BOUNDARIES**
DRAWN BY: RLH 08/20/12	NTC SEDIMENT REMOVAL ACTION CQAPP FORMER MARINETTE MGP SITE WISCONSIN PUBLIC SERVICE CORPORATION MARINETTE, WISCONSIN
CHECKED BY: KRM 08/20/12	
APPROVED BY: KRM 08/30/12	DRAWING NO: 2098–2–B02C–BOUNDARIES REFERENCE: .
	FIGURE NO. 2

Aug 30, 2012 12:16pm PLOTTED BY: ndraskovich SAVED BY: ndraskovich
X:\ACAD\Projects\20\2098\2\2098-2-B02C-BOUNDARIES.dwg FIG_2
IMAGES:
XREFS: X:\ACAData\Projects\20\2098\1-2\2098-12-BASE.dwg

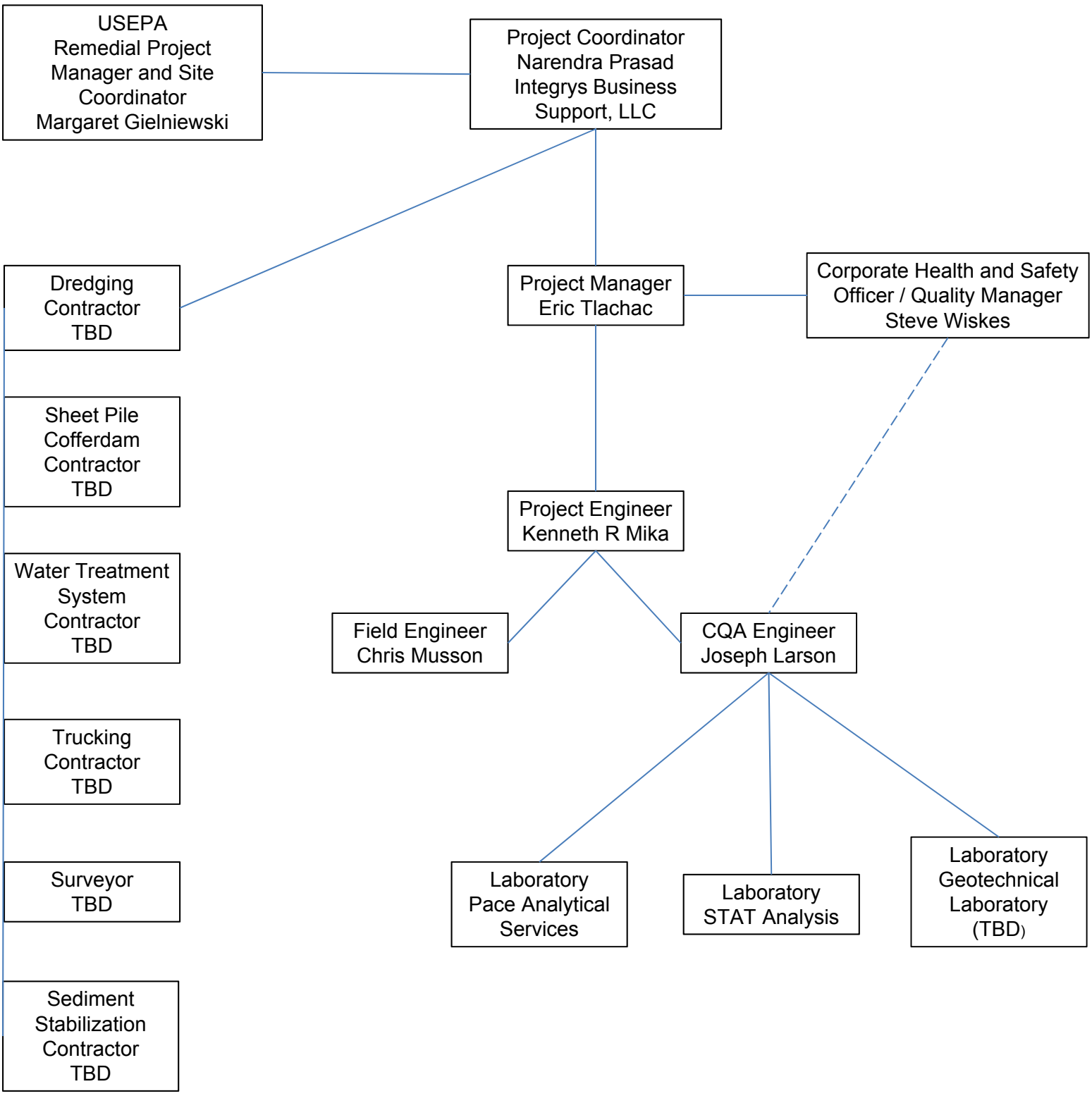


Figure 3
Focused NAPL and Sediment Removal Action
Former Marinette Manufactured Gas Plant
Wisconsin Public Service Corporation

Natural Resource Technology

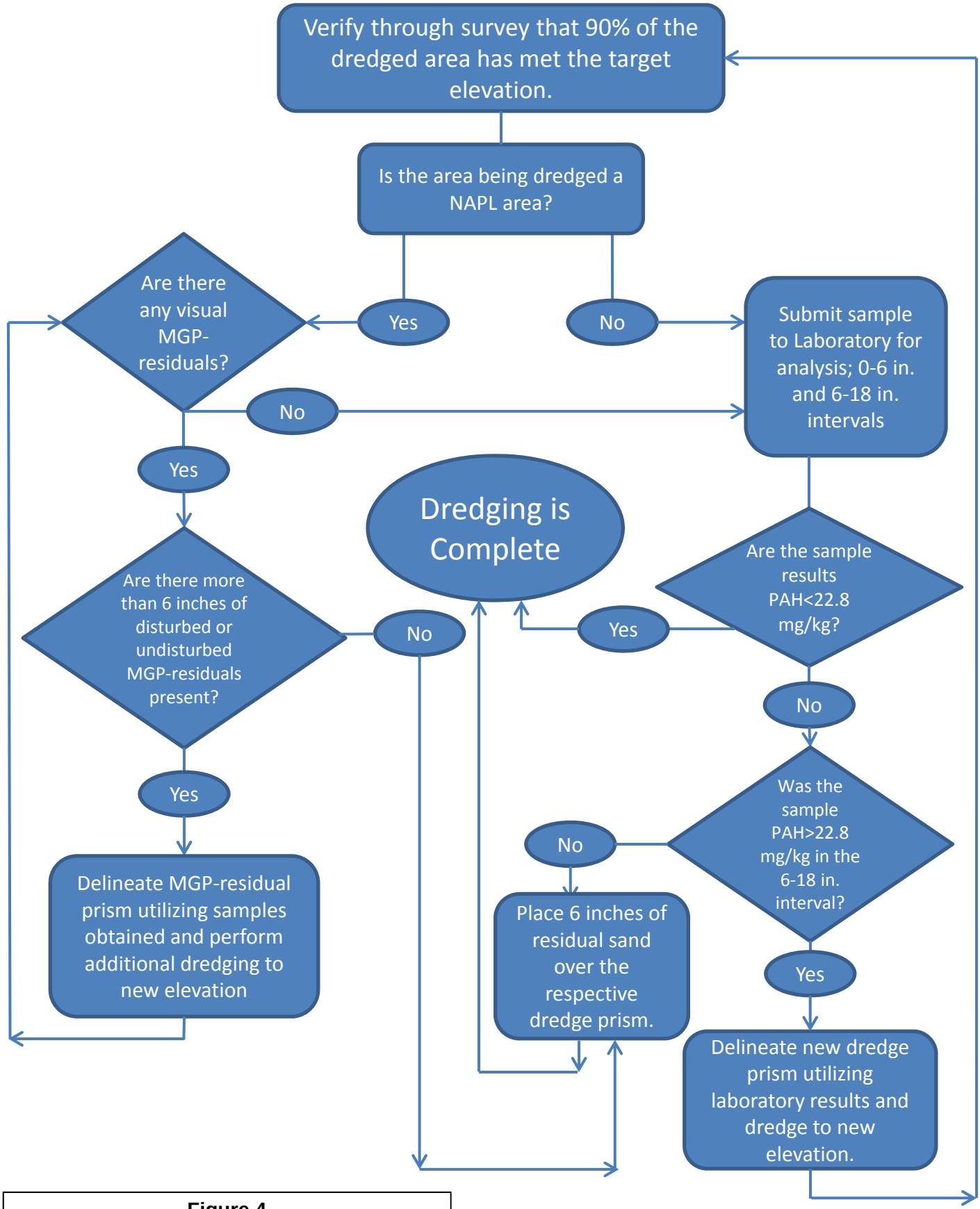


Figure 4
Focused NAPL and Sediment Removal Action
Former Marinette Manufactured Gas Plant
Wisconsin Public Service Corporation

Natural Resource Technology

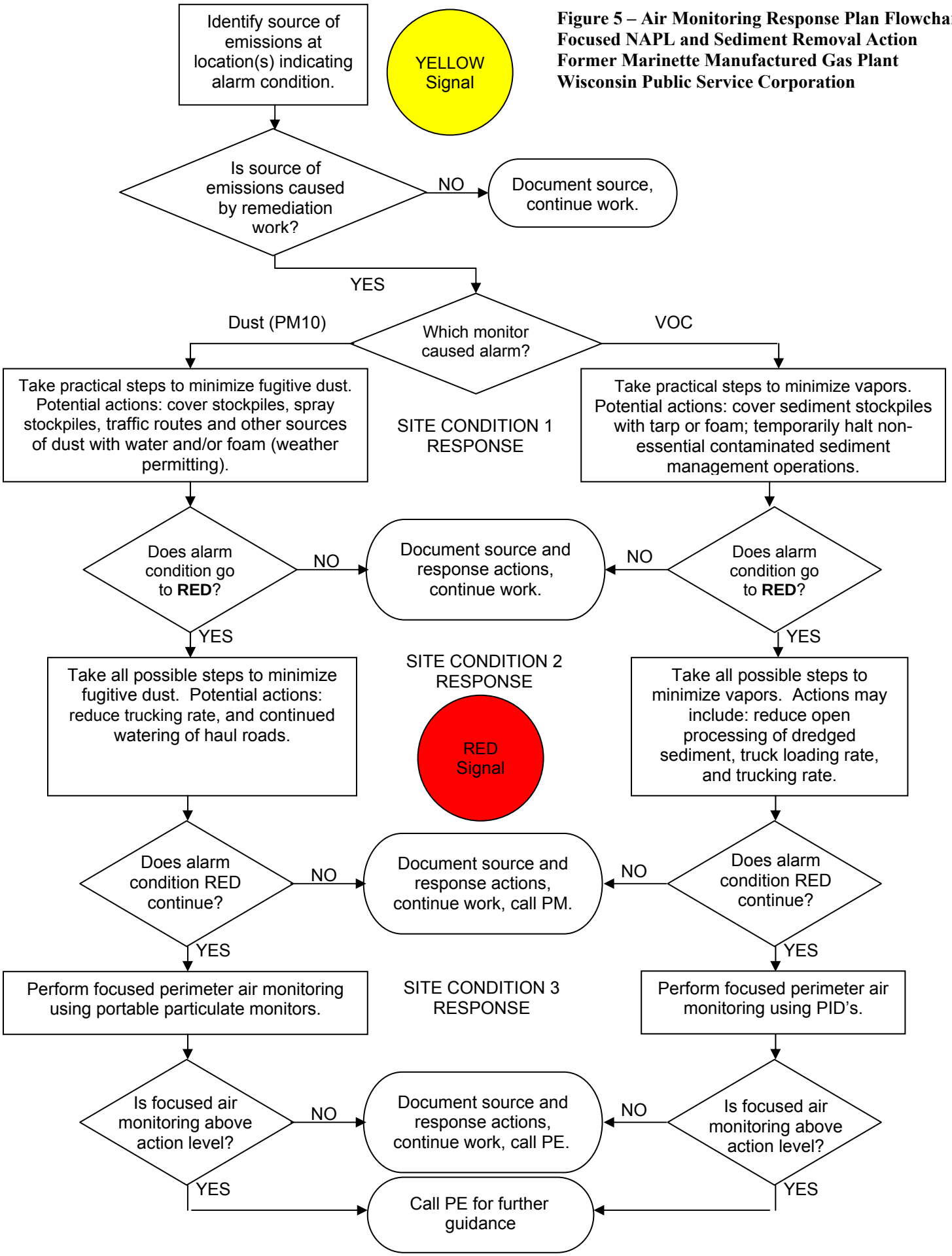


Figure 5 – Air Monitoring Response Plan Flowchart
Focused NAPL and Sediment Removal Action
Former Marinette Manufactured Gas Plant
Wisconsin Public Service Corporation

TABLES

Table 1 - Sampling and Analysis Plan Summary
Focused NAPL and Sediment Removal Action
Former Marinette Manufactured Gas Plant
Wisconsin Public Service Corporation

Sample Type/Location	Proposed Number of Sampling Locations/ Frequency	Matrix	Parameter	Method	Estimated Sample Quantity	Field Duplicates [2]	Equipment Blanks [3]	MS/MSD [4]	Field Blanks [5]	TOTAL	Container Type	Minimum Volume	Preservation (Cool to 4° ≥ 2°C All Samples)	Holding Time from Sample Date
City of Marinette Boom Landing Park Property	3 pre-& post-con (10 per acre)	soil	PAHs	8270C or 8270-SIM	3	1	0	1	0	5	amber glass	4 oz.		14 days
River Surface Water (TSS-turbidity correlation)	10	water	Total Suspended Solids	SM 2540D	10	1	0	1	0	12	plastic	100 ml	Cool to 4 °< 2°C	7 days
			Field Measured Turbidity	Field	10	0	0	0	0	10	field measured			
River Surface Water (150 ft u/s and 500 ft d/s of dredge)	continuous	water	Field Measured Turbidity	Field	continuous									
			Hand Held Turbidity Meter	Field	1/week	0	0	0	0	0	field measured			
Post Dredge Sediment Surface (0-1.5 foot core in NAPL area)	8 (10 per acre)	sediment	PAHs	8270C or 8270-SIM	8	1	0	1	0	10	amber glass	4 oz.		14/40 days
Post Dredge Sediment Surface (0-1.5 foot core in PAH area)	4 (10 per acre)	sediment	PAHs	8270C or 8270-SIM	4	1	0	1	0	6	amber glass	4 oz.		14/40 days
Sediment Disposal Strength Requirements	pre-disposal	sediment	Percent solids/moisture content	ASTM D2216 or 2974	1					1				
			Grain Size Distribution	ASTM D422	1					1				
			Liquid limit, plastic limit, and plasticity index of soils	ASTM D4318	1					1				
			Hydraulic conductivity testing	ASTM D5856 or D2434	1					1				
Cast-in-place Concrete	1 per 25 CY per Day	Concrete	Compressive Strength Test	ASTM C39	1					1	Vertical Cylinder Capping Fixture, 6 x 12 in (15.2 x 30.5 cm)			
			Slump Test	ASTM C143	1					1				
			Air Content	ASTM C231	1					1				
Water Treatment and Discharge	influent/effluent	water			TBD									
			See Tables 4 and 5											
Background Air Monitoring	3 locations 2 weeks	air	**Time Weighted Average (24-hour) 1/week**											
			BTEX and Naphthalene	TO-15	6	1	0	0	1	8	SUMMA	6L		30 days
	3 locations 2 weeks	air	**Continuous Monitoring Real Time (24-hours/day 7-days/week)**											
			TVOC and PM10	PID for TVOC and DustTrak	3	0	0	0	0	3				
Full Scale Startup Air Monitoring	3 locations 2 weeks	air	**Time Weighted Average (24-hour) 3/week**											
			BTEX and Naphthalene	TO-15	18	1	0	0	1	20	SUMMA	6L		30 days
3-day turnaround time	3 locations 2 weeks	air	**Continuous Monitoring Real Time (24-hours/day 7-days/week)**											
			TVOC and PM10	PID for TVOC and DustTrak	3	0	0	0	0	3				
Full Scale Air Monitoring	3 locations 2 weeks	air	**Time Weighted Average (24-hour) 1/week**											
			BTEX and Naphthalene	TO-15	18	1	0	0	1	20	SUMMA	6L		30 days
	3 locations 2 weeks	air	**Continuous Monitoring Real Time (24-hours/day 7-days/week)**											
			TVOC and PM10	PID for TVOC and DustTrak	3	0	0	0	0	3				

Notes:
1. Field duplicates will be collected at a frequency of one per group of ten or fewer confirmation water samples and one per group of twenty or fewer confirmation sediment and air samples.
2. Equipment blanks will be collected at a frequency of one per sampling day with non-dedicated sampling equipment.
3. Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples will be collected at a frequency of one per group of twenty or fewer investigative water samples. Additional volume will be determined per laboratory requirements.

Acronyms:
PCB = Polychlorinated Biphenyl
VOCs = Volatile Organic Compounds

Table 2 - Summary of Quality Program
Focused NAPL and Sediment Removal Action
Former Marinette Manufactured Gas Plant
Wisconsin Public Service Corporation

Design Element	Specific Performance Objective and Criteria	Required Monitoring or Inspections to Verify Compliance	Frequency	Contingency or Response Action
Erosion Control	WDNR NR 151 and 216	Visual inspection	Daily	repair damage, channelizing, in an orderly fashion
Site Security Fence	Maintain fence to restrict public access	Visual inspection	Daily	repair damage in an orderly fashion
Existing Conditions Survey	Establish pre- and post- construction soil quality	Surface soil sampling	Pre and post construction	if soil quality has been negatively affected, soil may be removed
Roadway/Sidewalk/Parking Lot of Boom Landing Condition	Document existing conditions to evaluate potential damages	Travel truck routes, inspect sidewalks, and parking lot of Boom Landing that equipment has traversed	Beginning of project and weekly	Repair damage to the extent practical at completion of project
Existing Sheet Pile Wall Deflection	Deflection less than 0.5 inches	Survey points located every 25-feet at the top of the vertical barrier wall to monitor deflection	Weekly	Adjust excavation activities to minimize exposed vertical barrier wall face
Sheet Pile Cofferdam Installation & Monitoring	Document target embedment elevation is achieved and monitor water levels inside and outside of the temporary cofferdam to ensure no greater than 1 foot difference	Measure total depth of sheet pile installation. Measure water levels inside and outside the cofferdam.	Every sheet pile section location. Measure water level depths daily.	Contact Geotechnical Engineer and develop a contingency plan, if necessary
Dredge Volume and Sand Backfill Placement	Document dredged elevation and placement of cover per project plans to the target elevation at 90% or more of the plan area	Perform bathymetric survey and poling (as necessary)	Post dredge and post backfill placement	Dredge or add additional backfill until target elevation is achieved
TSS and Turbidity	Downstream total suspended solid concentrations can not increase more than 70 parts per million above the background as established in a site-specific total suspended solid to turbidity correlation curve.	Measure turbidity 150-feet upstream and 500-feet downstream of the sheet pile wall cofferdam.	Continuous	Modify dredging operations and implement dredging best management practices or draw down water and maintain an inward gradient into the cofferdam
Post Dredge Sampling	Removal of visual MGP-residuals in the form of oil-wetted or oil-coated sediment, total PAH concentrations less than 22.8 mg/kg	Collect post dredge 1.5 foot cores to evaluate PAH levels	Ten cores per acre; minimum of two cores per area	Document remaining sediment quality and evaluate need for backfill
Backfill Placement	Target backfill thickness is placed per the plan (lateral and vertical) or the post-dredge sampling results	Post backfill bathymetry, small sample buckets	Post backfill bathymetry, 5 small sample buckets per acre following backfill placement	Place additional backfill to establish target thickness and extent
Sediment Stabilization and Disposal	Pass the paint filter test for stabilization and meet the landfill requirements for acceptance	No free water. Refer to Table 3	Refer to Table 3	Additional handling may be required by the landfill if the material is deemed unworkable.
Water Treatment and Discharge to Menominee River	Per WPDES permit	Refer to Tables 4 and 5	Refer to Tables 4 and 5	Report noncompliance to WDNR, take steps to prevent reoccurrence of noncompliance.
Fugitive Emissions	Manage fugitive emissions during the remediation	Refer to Section 4.15	Refer to Section 4.15	Implement Control Measures as described in Section 4.15

Table 3 - Water Treatment Monitoring Requirements and Limitations
Focused NAPL and Sediment Removal Action
Former Marinette Manufactured Gas Plant
Wisconsin Public Service Corporation

Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	WPDES Standards	Notes
INFLUENT						
PCB Total		µg/L	Daily	Grab		
Mercury, Total Recoverable		ng/L	1 / 2 Weeks	Grab		
Suspended Solids, Total		µg/L	Daily	Grab		
EFFLUENT						
Flow Rate		MGD	Daily	Continuous		
Oil and Grease	Daily Maximum	15 mg/L	Monthly	Grab	<15 mg/L	
BOD_5, Total	Monthly Average	10 mg/L	1 per 2 Weeks	24-Hr Comp	< 10 mg/L	BOD_5 is 2 times/week for the first month after full scale discharge begins and 1 time per week thereafter
Suspended Solids, Total	Daily Maximum	10 mg/L	Daily	24-Hr Comp	< 10 mg/L	
Suspended Solids, Total	Monthly Average	5.0 mg/L	Daily	24-Hr Comp	< 5 mg/L	
PCB Total	Daily Maximum	0.2-0.5 µg/L	Daily	24-Hr Comp	<0.2-0.5 µg/L	Limit for Total PCBs is non-detectable using SW846 8081 method with expected detection levels of 0.2 to 0.5 µg/L.
Mercury, Total Recoverable		0.2-0.5 ng/L	1 per 2 Weeks	Grab	0.2 to 0.5 ng/L 1.3 ng/L	Daily Monthly Average
pH Field		s.u.	Monthly	Grab		
Acute WET[A]		TU_a	Once	24-Hr Flow Prop Comp	<1TUa	Acute WET Test shall be conducted within first week after full scale discharge begins.

Notes:
A: The analyticals and values listed may be changed per WDNR issuance of substantive requirements of a WPDES permit.

WPDES: Wisconsin Pollution Discharge Elimination System
PCB: polychlorinated biphenyls
BOD_5: biological oxygen demand
WET: whole effluent toxicity
µg/L: micrograms per liter
ng/L: nanograms per liter
MGD: million gallons per day
mg/L: milligrams per liter
TU_a: Toxic Unit – Acute.

Table 4 - Water Treatment Effluent Limits Corresponding to Criteria (All values µg/L unless noted)[A]
Focused NAPL and Sediment Removal Action
Former Marinette Manufactured Gas Plant
Wisconsin Public Service Corporation

Parameter	ATC Daily Maximum	CTC Weekly Average	WC Monthly Average	HTC Monthly Average	HCC Monthly Average
Arsenic, Total Recoverable	680	486			50
Cadmium, Total Recoverable	76	12.2		160	
Hexavalent Chromium	32	35.07		2,236	
Copper, Total Recoverable	89	100.8			
Manganaese, Total Recoverable					
Chlordane					0.00192
Dieldrin	0.48	0.176		0.00271	4.31×10^{-5}
Endrin	0.172	0.23			
4,4'-DDT			5.85×10^{-5}	1.41×10^{-2}	1.04×10^{-3}
4,4'-DDD			5.85×10^{-5}		
4,4'-DDE			5.85×10^{-5}		
Nitrogen, Ammonia (NH3-N) Total	11.2 mg/L[B]				
Benzo(a)pyrene (See Value)	0.76	0.064		55 ng/L	
Fluoranthene (See Value)	15.8	7.35			
Phenanthrene (See Value)	76	6.71			
Fluorene (See Value)	116	10.2		1,050	
Naphthalene (See Value)	688	61.1		6,970	
Pyrene (See Value)	180	24.9		2,010	

Notes:
Refer to Wisconsin Department of Natural Resources Chapter NR 106.
A: Continued effluent monitoring shall be conducted once every two weeks for parameters that have detectable results greater than one fifth (1/5) of the lowest limit presented in the table.
B: For estimated effluent pH of 8.2 s.u. (varies with pH).
C: The analyticals and values listed may be changed per WDNR issuance of substantive requirements of a WPDES permit.

µg/L: micrograms per liter
ng/L: nanograms per liter
mg/L: milligrams per liter
ATC: acute toxicity criteria
CTC: chronic toxicity criteria
HTC: human threshold criteria
HCC: human cancer criteria

APPENDIX A

EXAMPLE DOCUMENTATION FORMS

NATURAL RESOURCE TECHNOLOGY, INC.
23713 WEST PAUL ROAD, UNIT D
PEWAUKEE, WI 53072
TEL: 262.523.9000

Construction Deficiency Report Log (Example)

DATE:

Contractor:

PAGE: 1 **OF** 1

Project Name: Focused NAPL and Sediment Removal Action
Former Marinette Manufactured Gas Plant

Project #: 2098

Item No.	Construction Deficiency Description	Originator	Date Recorded	Date to Contractor	Proposed Corrective Action By Contractor	Proposed Approved by Engineer	Corrective Action Date	Disposition Verification By

CONSTRUCTION DEFICIENCY REPORT (EXAMPLE)

Project: **Focused NAPL and Sediment Removal Action**
Former Marinette Manufactured Gas Plant Site Project No: **2098**

Client: **Integrys Business Support, LLC** Location: **Marinette, WI**

Contractor: _____ Day-Date: _____

Report No: _____ Item: _____

Description of Construction Deficiency:
Proposed Construction Action: ☐ Use as is ☐ Rework ☐ Repair
Signed: Date:
Field Engineer
Corrective Action Taken
Description of proposed corrective action:
Signed: Date:
Contractor
Corrective Action Approval
Recommendation and Remarks
Proposed corrective action status: ☐ Approved ☐ Rejected
Signed: Date:
CQA Team Leader

Cover Thickness Sampling Form

Form #_____

General Information

Project Name/Site : Focused NAPL and Sediment Removal Action, Former Marinette Manufactured Gas Plant

Project # : 2098

Task # : _____

Date : _____

Samplers : _____

Sampling Equipment: _____

Coordinate System: _____

Datum: _____

Weather: _____

River Section/DMU: _____

Sample Location (ID)	Time (military)	Sample Type	Water Elevation[1]	Water Depth (ft)	Mix Layer Thickness (in)	Sand/Gravel Thickness (in)	Push Depth (in)	Sample Location (Northing)[2] Field Reading/Post Processed Reading	Sample Location (Easting)[2] Field Reading/Post Processed Reading	Sample Notes

Additional Comments: _____

Staff Gauge Readings: **Time:** _____ **Readings:** _____ **ft** GPS File Name: _____

Notes: (1) Water Elevation = Staff Gauge Elevation - Staff Gauge Reading, Calculated at end of day, based on a minimum of 2 staff gauge readings or direct reading by RTK equipment.

(2) Sample coordinates will be recorded after being post processed, when applicable.

n/a : Not Applicable

COC: Chain of Custody

Sampling/Processing Personnel Signature: _____

Natural Resource Technology

NATURAL RESOURCE TECHNOLOGY

Daily Construction Report

Daily Report

Project: Focused NAPL and Sediment Removal Action, Former Marinette Manufactured Gas Plant

Client: IBS

Report Name:

Start Date:

Project Code: 2098

Date	Cal. Wk #	Proj. Prod. Wk #

General Information:

Project Manager: _____
Quality Manager: _____
Site Engineer: _____
Field Support: _____
_____

Coordinate System: _____
Datum: _____
River Conditions: _____
Average Temp: _____
Average Current Speed: _____

Weather Description: _____
High Temperature: _____
Low Temperature: _____
Highest Wind Speed: _____
Average Wind Speed: _____
Precipitation Total: _____

Observations

Erosion Control Inspection Observations

Site Security Fence Inspection Observations

Completion Inspections Today

Observations of Deviations from Plans or SOPs:

Observed Deviations: _____

Action(s) Taken: _____

VOC FIELD DATA LOG (Example Form)
Focused NAPL and Sediment Removal Action
Former Marinette Manufactured Gas Plant Site

Weather Conditions at Sample Set-Up:

		Start	Check	End
Operator:	**Wind:**			
	Visibility:			
	Sky:			
Date	**Humidity:**			

$\overline{P_a}$ – _____ mm Hg $\overline{T_a}$ – _____ °C = _____ °K

Station #:	A01	A02	A03	A04
Cannister #:				
Controller #				
Start Date:				
Military Time$_i$ (hr):				
1 in.Hg				
2 in.Hg				
F in.Hg				
Military Time$_i$ (hr):				
Stop date:	1/1/1900	1/1/1900	1/1/1900	1/1/1900
Sample Number:	A01-summa-	A02-summa-	A03-summa-	A04-summa-

SAMPLE PROCEDURE -
*Fill out field form recording cannister, controller and sample ids;
*START SAMPLING - open controller valve, take initial vacum reading using controller gauge, record time (military);
*MIDPOINT CHECK - take vacum reading from controller gauge;
*END SAMPLE - take vacum reading using controller gauge, close controller valve, record time (military).

Field Comments:

= Information that may need to be changed - see side bar
= Formula, do not change

Post-Dredge Verification Sampling Form

Form #_____

General Information

Project Name/Site : Focused NAPL and Sediment Removal Action, Former Marinette MGP Site
Project # : 2098
Task # : _____
Date : _____
Samplers : _____

Sampling Equipment: _____
Coordinate System: _____
Datum: _____
Weather: _____
River Section/DMU: _____

Sample Location (ID)	Time (military)	Water Elevation[1]	Water Depth (ft)	Penetration (ft)	Sediment Recovered (ft)	% Recovery	Sample Location (Northing)[2] Field Reading/Post Processed Reading	Sample Location (Easting)[2] Field Reading/Post Processed Reading	Sample Notes

Sample Intervals (in)	Sample Description	Date Processed	Sample Intervals (in) TOP	Sample Intervals (in) BOTTOM	COC Sample ID Number

Additional Comments: _____

Staff Gauge Readings: **Time:** _____ **Readings:** _____ **ft** GPS File Name: _____

Notes: (1) Water Elevation = Staff Gauge Elevation - Staff Gauge Reading, Calculated at end of day, based on a minimum of 2 staff gauge readings or direct reading by RTK equipment.
(2) Sample coordinates will be recorded after being post processed, when applicable.

n/a : **Not Applicable**
COC: Chain of Custody

Sampling/Processing Personnel Signature: _____

Natural Resource Technology

Submittal Register | NRT Project No.: 2098 | **8/30/2012**

NATURAL RESOURCE TECHNOLOGY, INC.
23713 WEST PAUL ROAD, UNIT D
PEWAUKEE, WI 53072
TEL: 262.523.9000

Project Title and Location:
Focused NAPL and Sediment Removal Action
Former Marinette Manufactured Gas Plant

					Subcontractor Action			**Approving Authority Action (NRT)**					
Submittal Item Number	Type of Submittal, Material or Product	Prov./Spec. Para. No.	Approval by NRT	Scheduled Submittal Date	Action Code	Date of Action	Date Fwd to NRT/ Date Rcvd from Contr.	Date Fwd to Other Reviewer	Date Rcvd from Other Reviewer	Act. Co.	Date of Action	Mailed to Subcontr./ Rcvd. from Appr. Auth.	Remarks

Approval Authority: Engineer/Owner:
Natural Resource Technology
Integrys Business Support, LLC

Submittal Codes:
D - FWD to Engineer/Action
E - FWD to Engineer/Record Purpose

Action Codes: A - Approved; B - Approved as Noted
C - Approved as Noted, resubmittal required
F - Disapproved; R - Received; N - No Action
FOI - For information only

SURFACE WATER SAMPLING FIELD FORM

Form #_____

General Information

Site : Focused NAPL and Sediment Removal Action, Former Marinette MGP Site
Project # : 2098
Task # : _____
Date : _____
Samplers : _____

Sampling Equipment: _____
Coordinate System: _____
Datum: _____
Weather: _____
River Section/DMU: _____

Sample/Location ID	Time (military)	Water Elevation [1] (ft)	Depth to Sediment	Depth to Refusal	Water Sample Depth	Turbidity (NTU)	Temp (^{o}C)	Sample Location [2] (Northing) Field Reading/Post Processed Reading	Sample Location [2] (Easting) Field Reading/Post Processed Reading	Sample Notes

Notes: (1) Water Elevation = Staff Gauge Elevation - Staff Gauge Reading, Calculated at end of day, based on a minimum of 2 staff gauge readings or direct reading by RTK equipment.
(2) Sample coordinates will be recorded after being post processed, when applicable.

Equipment Calibration: Equipment: _____ Date Checked: _____ Reading: _____ PASS or FAIL
Equipment: _____ Date Checked: _____ Reading: _____ PASS or FAIL

Additional Comments: _____

Staff Gauge Readings: **Time:** _____ **Reading:** _____ **ft** **GPS File Name:** _____

n/a : **Not Applicable**

Sampling Personnel Signature: _____

Sheet Pile Cofferdam and Vertical Barrier Wall Bracing System Installation

Project: Focused NAPL and Sediment Removal Action, Former Marinette MGP Site
Location: Marinette, WI
Project Number: 2098

Coordinate System:
Datum:

Date	Drilled Shaft Number or Sheet Pile Section Number	Coordinate X	Coordinate Y	Existing Ground/Sediment Surface Elevation	Total Depth of Shaft or Depth Pile was Driven, feet	Bottom of Shaft/Pile Elevation	Target Bottom of Shaft/Pile Elevation	Did Shaft/Pile Meet Target Bottom of Elevation?

Notes:

APPENDIX B

SITE-SPECIFIC SEDIMENT REMEDIATION PERIMETER AIR MONITORING ACCEPTABLE AIR CONCENTRATIONS – TECHNICAL MEMORANDUM

Exponent®
1800 Diagonal Road, Suite 500
Alexandria, VA 22314

Technical Memorandum
August 23, 2012

Site-Specific Sediment Removal Action, Perimeter Air Monitoring, Acceptable Air Concentrations

As part of the focused sediment removal action project to be performed at the Wisconsin Public Service Corporation's former Marinette Manufactured Gas Plant (MGP) (Site) in Marinette, Wisconsin, air monitoring will be conducted to measure the concentrations of MGP-related constituents associated with the sediment removal action. Two types of air monitoring will be conducted during the project.

The first type will be real-time air monitoring of specific constituents (total volatile organic compounds [TVOCs], particulate matter less than 10 μm in size [PM_{10}]), to be conducted with stationary air monitoring instruments as described in the air monitoring plan (AMP) presented in the *Construction Quality Assurance Project Plan* (CQAPP) developed by Natural Resource Technology, Inc. The real-time air monitoring stations will be located at the perimeter of the Site. These real-time measurements will be collected using automated air sampling and analysis devices at a specified sampling interval (e.g., every 15 minutes) over the entire day and compared in real time to the perimeter action levels presented in the AMP. Any exceedance of the action levels will require specific response measures by the sediment removal action contractor to reduce the vapor and/or particulate phase emissions.

The second type of air monitoring will be done using stationary sampling devices that take integrated air samples over a 24-hour period to measure the concentrations of MGP-related constituents at the Site perimeter (i.e., the fence line). These samples are then sent to an offsite laboratory for analysis. These air concentrations will be compared to the acceptable air concentrations (AACs) developed to be protective of public health, as described in this technical memorandum. The goal of the air monitoring program is to maintain air concentrations at the secured perimeter of the Site, as measured in the integrated 24-hour samples, at levels below applicable AACs.

Exponent was requested by Integrys Business Support, LLC (IBS), to develop AACs for the sediment removal action project. The AACs were developed to be protective of the residents living nearby, because they are the most sensitive population in the Site area. The AACs were developed using U.S. Environmental Protection Agency (EPA) risk assessment methods, the most current available toxicity data, and physical parameter information, and by applying site-specific exposure parameters that consider the nature of the sediment removal project (U.S. EPA 2009a–d, 2012a,b). These site-specific AACs were developed based on the fact that the only potential exposure pathway for nearby residents for chemicals associated with the sediment removal action project would be inhalation of fugitive air emissions, because the Site will remain secured with a perimeter fence. These fugitive air emissions would be in the form of dust for those MGP-related constituents that are relatively non-volatile (e.g., high-molecular-weight polycyclic aromatic hydrocarbons [PAHs]) and as chemical vapors for volatile MGP constituents (e.g., benzene and naphthalene). Because of the method used to calculate the AACs

(described below), a worker[1] and resident who were exposed for the same amount of time would have the same potential exposure. Thus, AACs calculated under a residential scenario, which assumes exposures 24 hours per day, 7 days per week, would also be protective of a worker who would be exposed for fewer hours.

The specific MGP-related constituents for which AACs were developed were those that are typically evaluated for MGP projects because of their volatility and/or toxicity, including BTEX and eight specific PAHs. In addition, the health-based value developed by EPA for dust (i.e., PM_{10}) was adopted to address health concerns associated with particulate matter or dust.

The Site is located on the southern edge of the Menominee River in a mixed-use area. Commercial and industrial areas, as well as park-district property (i.e., Boom Landing), are adjacent to the Site, with a small residential area located about 400 ft from the upland staging area, which is Boom Landing. The removal action will consist of dredging contaminated sediments from an area of the river. The main dredging activities will occur within the river adjacent to Boom Landing, which is a City-owned boat launch. The perimeter fence is the closest location to the active sediment removal project where the general public could potentially be exposed to fugitive emissions, because the general public will not have access to the Site. The AACs were developed using a conservative approach, so that if exposure to MGP-related constituents occurred at the secured perimeter over the entire duration of the sediment removal project for 24 hours per day, the exposure would not pose a health concern to the general public. As distance from the Site increases, air concentrations will be diluted and reduced relative to those measured at or near the Site. The calculations used to derive the AACs are described below, followed by the specific exposure and toxicity factors used as inputs. The resultant AACs are presented in Table 1.

Equations and Methods Used to Derive AACs

Equations

The equations used to calculate the AACs were derived from current EPA guidance for inhalation exposures, as presented in the user's guide for EPA's regional screening levels (U.S. EPA 2012a).

For this Site, the exposure terms were simplified, because the exposure duration is short (i.e., less than a year) due to the nature of the planned sediment removal action, yielding the following site-specific equations for developing the AACs. The equations differ slightly for noncarcinogenic and carcinogenic effects of a chemical. The input values and definitions of all abbreviations are provided in Table 1.

[1] The term "worker" refers to commercial/industrial workers located within the portion of the industrial area outside of the secured fence surrounding the Site. The term "worker" does not refer to remediation contractor employees located on the Site.

Noncarcinogenic

$$\text{AAC noncarc } (mg/m^3) = \frac{THQ \times AT(noncarc)}{EF \times ET \times (1\ day/24\ hrs) \times (1/RfC)}$$

Carcinogenic

$$\text{AAC carc } (mg/m^3) = \frac{TR \times AT(carc)}{EF \times ET \times (1\ day/24\ hrs) \times IUR \times 1000}$$

For noncarcinogens, a target hazard quotient of 1 was used to estimate the AACs. For carcinogens, AACs were calculated using three different target risk levels of 1×10^{-4}, 1×10^{-5}, and 1×10^{-6}, so that values could be developed that spanned the risk range typically considered when assessing cancer risks at Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) sites. Cumulative risks within the risk range are considered potentially acceptable depending on site-specific circumstances that are evaluated by EPA. Cumulative risks above 1×10^{-4} are not typically considered acceptable. The goal will be to manage fugitive air emissions during the sediment removal action such that air concentrations are as low as practically possible. Thus, on average, the goal will be to meet AACs that are at the lower end of the risk range, and if possible, below the range presented in Table 1.

For chemicals for which both cancer- and noncancer-based toxicity values are available (i.e., benzene, ethylbenzene, and naphthalene), the AACs were calculated using both sets of toxicity values. When the noncancer-based AAC was lower than the cancer-based AAC (for a particular risk level), the noncancer-based AAC was selected to be health protective, and is indicated with a box in Table 1. Typically, at the 1×10^{-6} risk level, the cancer-based values are lower than the noncancer-based values, but as the target risk level for carcinogens is increased (i.e., from 1×10^{-6}, to 1×10^{-5}, to 1×10^{-4}), the noncancer-based AAC may be lower than the cancer-based value. This situation occurs for benzene and naphthalene at the 1×10^{-4} and the 1×10^{-5} risk levels and for ethylbenzene at the 1×10^{-4} risk level, indicating the noncancer-based value is more health protective in these instances and should be used as the AAC.

Exposure Factors

The following section explains the basis for the site-specific exposure factors used to develop the AACs for the residential population near the Site. The toxicity values addressed later in this document were developed in a conservative manner to be health protective for sensitive human populations, including children, and were used following the most current inhalation dosimetry method, and thus do not require normalization to body weight and daily inhalation rate (U.S. EPA 2009e).

Exposure Frequency and Exposure Time

The duration of the sediment removal action is planned to be approximately 14 weeks, with activities that could potentially lead to fugitive emissions (e.g., active excavation of sediment

and amendment of contaminated sediment) potentially occurring during a total of 9 weeks during this 14-week period. Because this remediation project is a wet sediment dredging operation rather than a soil removal action, any contaminated sediments that are exposed prior to removal will be covered with water, which prevents fugitive emissions from occurring until they are exposed to air. Once sediments are removed from the river, they will be placed on land in a staging area inside the secured perimeter and stabilized with an amendment (e.g., Portland cement or lime). As soon as the sediments are appropriately stabilized, they will be loaded onto trucks and taken offsite so that staging of sediment stockpiles will be kept to a minimum. Stockpiles left during non-working hours will be covered with a vapor-phase suppressant foam and/or a tarp to minimize fugitive air emissions. If necessary, additional engineering controls, such as a misting system or fan, will be used to control fugitive emissions from the Site.

Work at this Site is expected to occur 10 hours per day for 5 days a week. However, the AACs were developed conservatively, using the assumption that emissions could occur 24 hours per day, 7 days per week during the entire year-long duration of the project (Table 1). These exposure assumptions also correspond to the air monitoring period (24 hours/day) that will be used for collecting the integrated air samples.

Averaging Time

For carcinogens, the averaging time is the full lifetime of an individual, assumed to be 70 years (equivalent to 25,550 days) based on EPA risk assessment guidelines (U.S. EPA 1989).

For noncarcinogens, the averaging time is limited to the duration over which exposure may occur based on the same EPA risk assessment guidelines (U.S. EPA 1989). For this site-specific scenario, the sediment removal action is expected to occur intermittently over the 14-week project period, so the averaging time for noncarcinogens is 98 days (14 weeks × 7 days/week). While exposure is expected to occur for only 63 days (i.e., equivalent to 9 weeks of exposure) during the project period (14 weeks), the exposure is averaged over the entire period of the project, because potential exposures will occur intermittently throughout the project period.

Toxicity Values

Toxicity values used are presented in Table 1. Values used were obtained from EPA's Integrated Risk Information System (IRIS, U.S. EPA 2012b), EPA's provisional peer-reviewed toxicity values (PPRTVs, U.S. EPA 2009a-d), and the California Environmental Protection Agency (Cal-EPA 2009). For noncarcinogenic effects of chemicals, reference concentrations (RfCs) were used to assess the toxicity of the MGP-related constituents. RfCs are available for BTEX and naphthalene. For carcinogenic effects, inhalation unit risk (IUR) factors were used to assess the MGP-related constituents. There are IUR values for benzene, ethylbenzene, and the eight PAHs.

For noncarcinogens, subchronic rather than chronic toxicity values were used. EPA defines a subchronic exposure duration as one lasting more than 30 days up to 10% of a lifetime in humans, which would be 7 years (U.S. EPA 2011). Thus, the 14-week total duration of this project is more appropriately considered a subchronic exposure period, rather than a chronic

exposure period. EPA provides PPRTVs for subchronic exposures for benzene, ethylbenzene, and xylenes, which were used in Table 1 (U.S. EPA 2009a–c). For toluene, the PPRTV document recommends the use of the chronic value for subchronic exposures (U.S. EPA 2009d).

For naphthalene, there are no subchronic inhalation toxicity values. The EPA chronic RfC for naphthalene is based on a 2-year mouse study in which nasal inflammation was observed in mice chronically exposed to naphthalene. EPA did not note additional adverse effects at or near the dose level used to derive the RfC. Nasal inflammation is a reversible effect, meaning that once exposure ends, the inflammation will subside. The estimated human equivalent concentration of naphthalene that would cause the nasal inflammation based on this study was 9 mg/m^3 (U.S. EPA 1998, 2012b). This human equivalent concentration was used by EPA with an uncertainty factor of 3,000 to derive the chronic naphthalene RfC of 0.003 mg/m^3. The 3,000-fold uncertainty factor is based on the following:

- A 10-fold factor for extrapolation from an adverse-effect level to a no-adverse-effect level
- A 10-fold interspecies extrapolation factor to account for the differential sensitivity of humans compared to other animals (e.g., mice)
- A 10-fold intraspecies extrapolation factor to account for the difference in sensitivity among humans
- An additional 3-fold factor was included because there were deficiencies in the toxicology data available (e.g., lack of reproductive data).

Because the period of exposure for this short-term project will be clearly subchronic in nature, a subchronic RfC was desired to more closely match the short-term exposure period. To estimate a subchronic inhalation toxicity value for naphthalene, EPA's chronic RfC (0.003 mg/m^3) was multiplied by a 10-fold factor to adjust from a no-adverse-effect level over a *chronic* period of exposure to a no-adverse-effect level over a *subchronic* exposure period (i.e., 0.03 mg/m^3).

The seven PAHs listed in the attached table, other than naphthalene, are compounds that have been classified by EPA as probable human carcinogens for decades and are normally evaluated as such. Benzene is classified as a known human carcinogen, and there is an IUR available for it in IRIS. However, only oral cancer-based toxicity values (i.e., slope factors) have been developed for these seven PAHs by EPA. The oral cancer slope factor for benzo[a]pyrene is presented in IRIS, while the values for the other six PAHs are based on a potency factor relative to benzo[a]pyrene (U.S. EPA 1993). However, Cal-EPA has developed inhalation toxicity values for these seven PAHs, which were used in calculating the AACs. The classification of naphthalene and ethylbenzene as to whether they are considered carcinogens is currently under review by EPA (U.S. EPA 2004, 2012b). However, Cal-EPA has developed cancer-based inhalation toxicity values for these two compounds. AACs for naphthalene and ethylbenzene were developed using both cancer and noncancer toxicity values, with the lowest value being selected as the AAC.

Estimated AACs and Application of AACs

The estimated AACs are presented in Table 1. Integrated air sample results collected over a 24-hour period will be compared to the AACs in Table 1 for each of the volatile constituents (i.e., BTEX and naphthalene). While naphthalene is a volatile PAH that will be present in the vapor phase in air, the other seven PAHs for which AACs were developed (i.e., benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]-anthracene, and indeno[1,2,3-cd]pyrene) are relatively non-volatile. These seven non-volatile PAHs are bound on the particulate matter or dust generated during the sediment removal process, rather than being present as a vapor (like naphthalene) in air. For these seven PAHs, real-time air sampling of dust using a DustTrak monitor will be used to indirectly evaluate compliance with these seven PAH AACs in Table 1. In addition, the ambient air respirable dust concentration (i.e., PM_{10}) measured using the real-time DustTrak monitor over a 24-hour period will be used to directly evaluate compliance with the PM_{10} standard in Table 1.

As mentioned above, the real-time dust monitoring will be used to indirectly determine whether the AACs for the seven non-volatile PAHs are achieved when the PM_{10} standard is achieved. Based on the maximum concentrations of each of the seven non-volatile PAHs detected in sediment to be removed, the maximum air concentrations of each PAH that could be generated if the PM_{10} standard (i.e., 0.15 mg/m^3) is achieved were estimated (Table 2). The predicted maximum air concentration of each non-volatile PAH (assuming the dust concentration was equivalent to the PM_{10}) was compared to its AAC that was developed using a target cancer risk of 1×10^{-5}, which is in the middle of the acceptable target risk range (Table 2). In each case, the maximum predicted air concentration of each non-volatile PAH was much less than the selected AAC (Table 2). For this reason, as long as the PM_{10} air standard is achieved, the air concentrations of each of the seven non-volatile PAHs are predicted to be below their respective AACs based on a target risk of 1×10^{-5}.

Prior to beginning the sediment removal action, concentrations of the MGP-related constituents (BTEX, naphthalene, and PM_{10}) will be measured to evaluate baseline levels in the Site area. It is expected that the ambient or background air concentrations of the MGP-related constituents will be much lower than the AACs and will not contribute significantly to the daily air concentrations measured at the secured perimeter. If significant baseline air concentrations are detected (i.e., near the AACs), then the AACs will be reassessed to account for this contribution. Specifically, the AACs based on noncancer effects need to be achieved when considering the cumulative air emissions from both the sediment removal action and baseline ambient conditions to maintain protection of the public. For the AACs based on carcinogenic effects, the point of comparison will be the incremental increased air concentration attributable to the remedial action (i.e., the incremental air concentration measured above the baseline conditions).

Once the sediment removal action begins, the project will be managed to minimize fugitive air emissions. The first line of information used to make management decisions to control fugitive air emissions will be real-time monitoring and comparison to perimeter air action levels. These action levels are guidelines and not health-based concentration limits. The primary management goal will be to minimize fugitive air emissions to meet the AACs presented in Table 1, because the AACs are health-based concentrations.

For chemicals with only known noncarcinogenic effects (e.g., toluene and xylenes), there is a single noncarcinogenic-based AAC; thus, air concentrations above that value will be considered an exceedance of the AAC, which will require consideration of taking additional action to reduce fugitive emissions at the Site. For chemicals that are potentially carcinogenic, the daily incremental air concentrations above background will be considered acceptable if they are within the AAC target risk ranges presented within Table 1 (i.e., 1×10^{-4} to 1×10^{-6}), as long as the cancer-based AAC at a given target risk does not exceed the noncancer-based AAC (see Table 1). An incremental air concentration above background that is greater than the AAC based on a 1×10^{-4} target risk level will be considered an exceedance that requires considering additional action to reduce fugitive emissions. However, any air concentration greater than the lowest AAC for a specific analyte will be viewed by IBS and their contractors as indicating a need to review the process used to manage fugitive emissions. Because action levels will be used with real-time monitoring as the first line of defense to minimize fugitive air emissions, exceedances of the AACs will reflect a need to review action levels and the real-time monitoring program to determine if lower action levels are required, or if more focused real-time monitoring is needed to better manage fugitive emissions.

It is important to note that the AACs are representative of the average concentrations to which a residential receptor could be exposed without exceeding the target risk level over the exposure period (i.e., 14-week project duration). Therefore, cumulative averages over the duration of the project are a more appropriate comparison value than single-day measurements for meeting the overall project goal of protecting the public. While daily concentrations will be used as a guide to address the need for reviewing the fugitive emission controls, the overall goal of meeting the AACs will be based on the average concentrations achieved over the project duration. If the project duration is extended significantly because of unforeseen circumstances, AACs may need to be adjusted. However, whether adjusting the AACs is necessary will be determined based on the performance of the sediment removal action up to the time that a project extension is first anticipated. The expectation is that the average air concentrations measured during the sediment removal action will be maintained far enough below the calculated AACs that an extension of the project duration would not present any likelihood that the cumulative target risk goal (i.e., hazard quotient of 1 or within the risk range) would be exceeded. Therefore, unless this expectation is not met, the AACs should not need to be adjusted. A comparison of the integrated air monitoring data to the AACs will be part of the completion report prepared once the sediment removal action is complete.

Finally, these AAC values implicitly assume that a receptor will be near the Site for 24 hours/day during the entire project. If residents spend any of their time in a different location, actual risks will be lower.

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Table 1. Site-specific sediment removal action perimeter air monitoring acceptable air concentrations: Residential exposure scenario
Former Marinette Manufactured Gas Plant Site, Marinette, Wisconsin

Constituent	Noncancer RfC (mg/m^3)	Cancer IUR ($\mu g/m^3)^{-1}$	Basis and Source of Toxicity Values	Site-Specific Acceptable Air Concentrations: At Target Cancer Risk: 1E-04 at Target Hazard Quotient: 1 (mg/m^3)	($\mu g/m^3$)	(ppmv)	(ppbv)	At Target Cancer Risk: 1E-05 at Target Hazard Quotient: 1 (mg/m^3)	($\mu g/m^3$)	(ppmv)	(ppbv)	At Target Cancer Risk: 1E-06 at Target Hazard Quotient: 1 (mg/m^3)	($\mu g/m^3$)	(ppmv)	(ppbv)
Benzene (cancer)	--	7.8E-06	C IRIS	5.2	5,200	1.6	1,600	0.52	520	0.16	160	0.052	52	0.016	16
Benzene (noncancer, subchronic)	0.080	--	NC PPRTV	0.12	120	0.039	39	0.12	120	0.039	39	0.12	120	0.039	39
Toluene	5.0	--	NC IRIS	7.8	7,800	2.1	2,100	7.8	7,800	2.1	2,100	7.8	7,800	2.1	2,100
Ethylbenzene (cancer)[a]	--	2.5E-06	C Cal-EPA	16	16,000	3.7	3,700	1.6	1,600	0.37	370	0.16	160	0.037	37
Ethylbenzene (noncancer, subchronic)	9.0	--	NC PPRTV	14	14,000	3.2	3,200	14	14,000	3.2	3,200	14	14,000	3.2	3,200
Xylenes (subchronic)	0.40	--	NC PPRTV	0.62	620	0.14	140	0.62	620	0.14	140	0.62	620	0.14	140
Naphthalene (cancer)[a]	--	3.4E-05	C Cal-EPA	1.2	1,200	0.23	230	0.12	120	0.023	23	0.012	12	0.0023	2.3
Naphthalene (noncancer, subchronic)	0.030 [c]	--	NC IRIS[c]	0.047	47	0.0089	8.9	0.047	47	0.0089	8.9	0.047	47	0.0089	8.9
Benz[a]anthracene[b]	--	1.1E-04	C Cal-EPA	0.37	370	0.039	39	0.037	37	0.0039	3.9	0.0037	3.7	3.9E-04	0.39
Benzo[a]pyrene[b]	--	1.1E-03	C Cal-EPA	0.037	37	0.0036	3.6	0.0037	3.7	3.6E-04	0.36	3.7E-04	0.37	3.6E-05	0.036
Benzo[b]fluoranthene[b]	--	1.1E-04	C Cal-EPA	0.37	370	0.036	36	0.037	37	0.0036	3.6	0.0037	3.7	3.6E-04	0.36
Benzo[k]fluoranthene[b]	--	1.1E-04	C Cal-EPA	0.37	370	0.036	36	0.037	37	0.0036	3.6	0.0037	3.7	3.6E-04	0.36
Chrysene[b]	--	1.1E-05	C Cal-EPA	3.7	3,700	0.39	390	0.37	370	0.039	39	0.037	37	0.0039	3.9
Dibenz[a,h]anthracene[b]	--	1.2E-03	C Cal-EPA	0.034	34	0.0030	3.0	0.0034	3.4	3.0E-04	0.30	3.4E-04	0.34	3.0E-05	0.030
Indeno[1,2,3-cd]pyrene[b]	--	1.1E-04	C Cal-EPA	0.37	370	0.033	33	0.037	37	0.0033	3.3	0.0037	3.7	3.3E-04	0.33
PM_{10}	--	--	NAAQS for PM_{10}	0.15	150	--	--	0.15	150	--	--	0.15	150	--	--

Site-Specific Assumptions for Residential AAC Equations:

Averaging Time (AT) (carc)		70	years (lifetime)
	=	25,550	days
Averaging Time (AT) (noncarc)		98	days (reflects 14 weeks total duration of project)
Exposure Frequency (EF)		63	days (reflects number of days removal of contaminated material occurs and time a resident would be in area, 9 weeks × 7 days/week)
Exposure Time (ET)		24	hours/day (reflects number of hours a resident might be exposed)

Notes and Footnotes:

AAC equations, toxicity values, and sources based on EPA's regional screening levels (http://www.epa.gov/region9/superfund/prg/), which were last updated May 2012.
All AACs are rounded to two significant figures.
For noncarcinogenic effects, subchronic values were used when available. For toluene, the subchronic value was the same as the chronic value.
When both cancer-based and noncancer-based AACs were available for a particular chemical, the lowest value (for a particular risk level) was selected to be health protective, and is indicated with a box.

[a] Classification of napthalene and ethylbenzene is currently under review by EPA. Also see U.S. EPA (2004).
[b] The PM_{10} NAAQS of 150 $\mu g/m^3$ would also be protective of potential exposures to PAHs in dust.
[c] A subchronic RfC was estimated based on the chronic RfC. Refer to the text for details.

AAC – acceptable air concentration
Cal-EPA – California Environmental Protection Agency
C – AAC based on cancer endpoint
EPA – U.S. Environmental Protection Agency
IRIS – Integrated Risk Information System
IUR – inhalation unit risk
NAAQS – national ambient air quality standard
NC – AAC based on noncancer endpoint
PAH – polycyclic aromatic hydrocarbon
PM_{10} – particulate matter less than 10 µm in size
PPRTV – provisional peer-reviewed toxicity values (U.S. EPA; http://hhpprtv.ornl.gov/quickview/pprtv_papers.php)
RfC – reference concentration
THQ – target hazard quotient
TR – target risk (carcinogenic)

Air concentrations converted using the formula: (Concentration in mg/m^3) = (Concentration in ppm) × (Molecular Weight/24.45)
taken from U.S. EPA: http://www.epa.gov/iris/subst/0276.htm.
Molecular weights taken from EPA, regional screening values: http://www.epa.gov/region9/superfund/prg/.

Conversion 1 ppm to	mg/m^3
Benzene	3.19
Toluene	3.77
Ethylbenzene	4.34
Xylenes	4.34
Naphthalene	5.24
Benz[a]anthracene	9.34
Benzo[a]pyrene	10.32
Benzo[b]fluoranthene	10.32
Benzo[k]fluoranthene	10.32
Chrysene	9.34
Dibenz[a,h]anthracene	11.38
Indeno[1,2,3-cd]pyrene	11.30

Noncarcinogenic

$$\text{AAC noncarc } (mg/m^3) = \frac{\text{THQ} \times \text{AT(noncarc)}}{\text{EF} \times \text{ET} \times (1\ \text{day}/24\ \text{hrs}) \times (1/\text{RfC})}$$

Carcinogenic

$$\text{AAC carc } (mg/m^3) = \frac{\text{TR} \times \text{AT(carc)}}{\text{EF} \times \text{ET} \times (1\ \text{day}/24\ \text{hrs}) \times \text{IUR} \times 1{,}000}$$

Table 2. Maximum predicted ambient concentrations in air for particulate-related constituents
Former Marinette Manufactured Gas Plant Site, Marinette, Wisconsin

Constituent	Maximum Sediment Concentration[a] (mg/kg)	Maximum Predicted Air Concentration[b] (mg/m^3)	Residential Acceptable Air Concentration[c] (mg/m^3)	Risk Ratio[d] (unitless)
Benz[a]anthracene	188	0.000028	0.037	0.00076
Benzo[a]pyrene	168	0.000025	0.0037	0.0068
Benzo[b]fluoranthene	164	0.000025	0.037	0.00066
Benzo[k]fluoranthene	126	0.000019	0.037	0.00051
Chrysene	199	0.000030	0.37	0.000081
Dibenz[a,h]anthracene	26.3	0.000004	0.0034	0.0012
Indeno[1,2,3-cd]pyrene	86.1	0.000013	0.037	0.00035

[a] Maximum sediment concentrations listed are based on the highest concentration of each constituent sampled from within the proposed excavation areas. The highest concentrations were obtained from sediment boring locations T04HH and T03A3.

[b] Based on an action level for PM_{10} of 0.15 mg/m^3 and calculated using the concentration of each constituent in sediment as the assumed concentration of the constituent in airborne respirable dust.

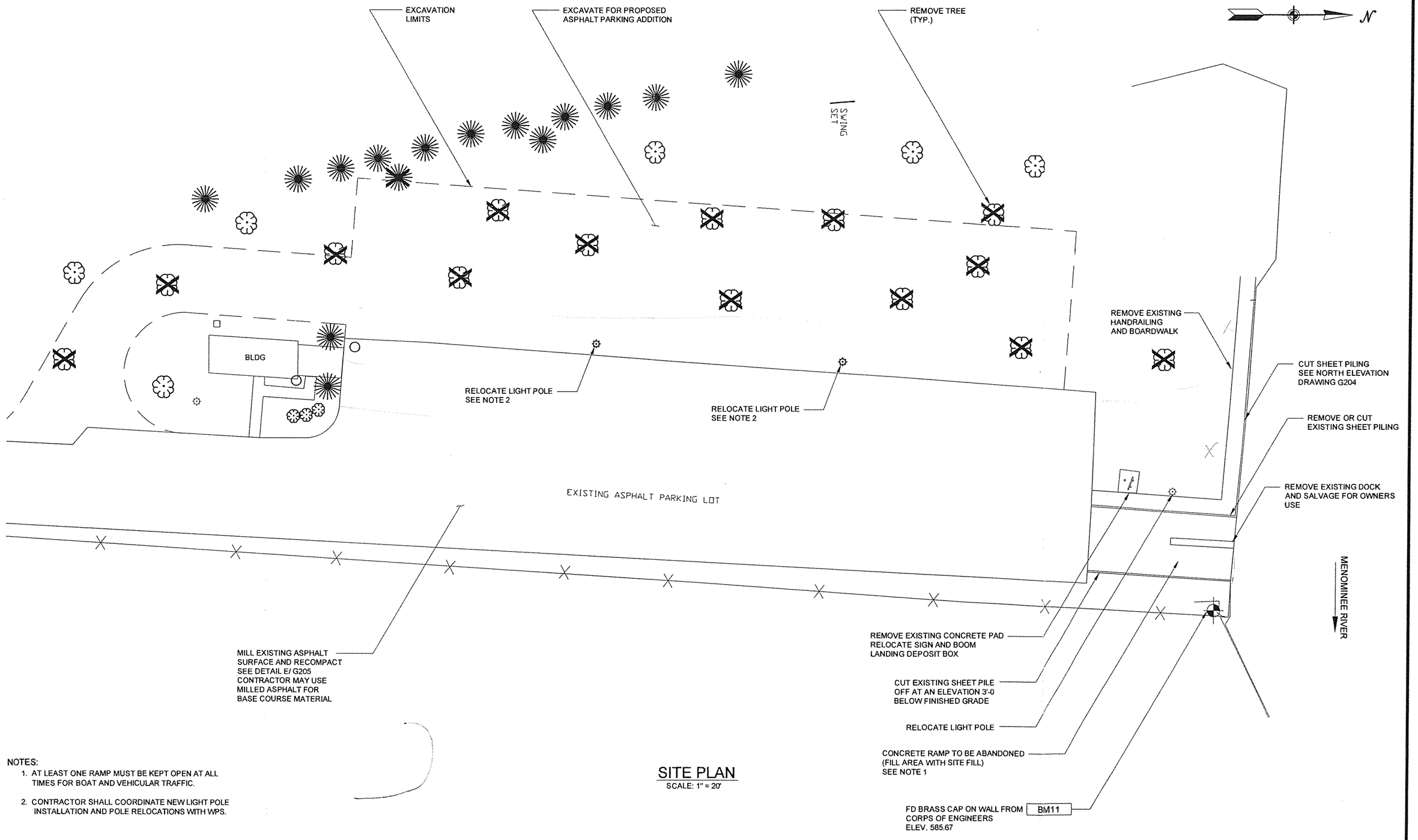
$$\text{Maximum Predicted Air Concentration } (mg/m^3) = \text{Maximum Sediment Concentration } (mg/kg) \times \frac{PM_{10} \text{ Action Level } (mg/m^3)}{} \times (1\times10^{-6}\ kg/mg)$$

[c] Acceptable air concentration (AAC) for a resident based on a 1×10^{-5} target risk (from Table 1).

[d] Risk ratio represents the ratio of the maximum predicted air concentration over the AAC. A value less than 1 represents an air concentration below the selected target risk level.

APPENDIX G

BOAT LAUNCH CONSTRUCTION DRAWINGS



NOTES:

1. AT LEAST ONE RAMP MUST BE KEPT OPEN AT ALL TIMES FOR BOAT AND VEHICULAR TRAFFIC.
2. CONTRACTOR SHALL COORDINATE NEW LIGHT POLE INSTALLATION AND POLE RELOCATIONS WITH WPS.

SITE PLAN

SCALE: 1" = 20'

THIS DRAWING REDUCED TO HALF SIZE

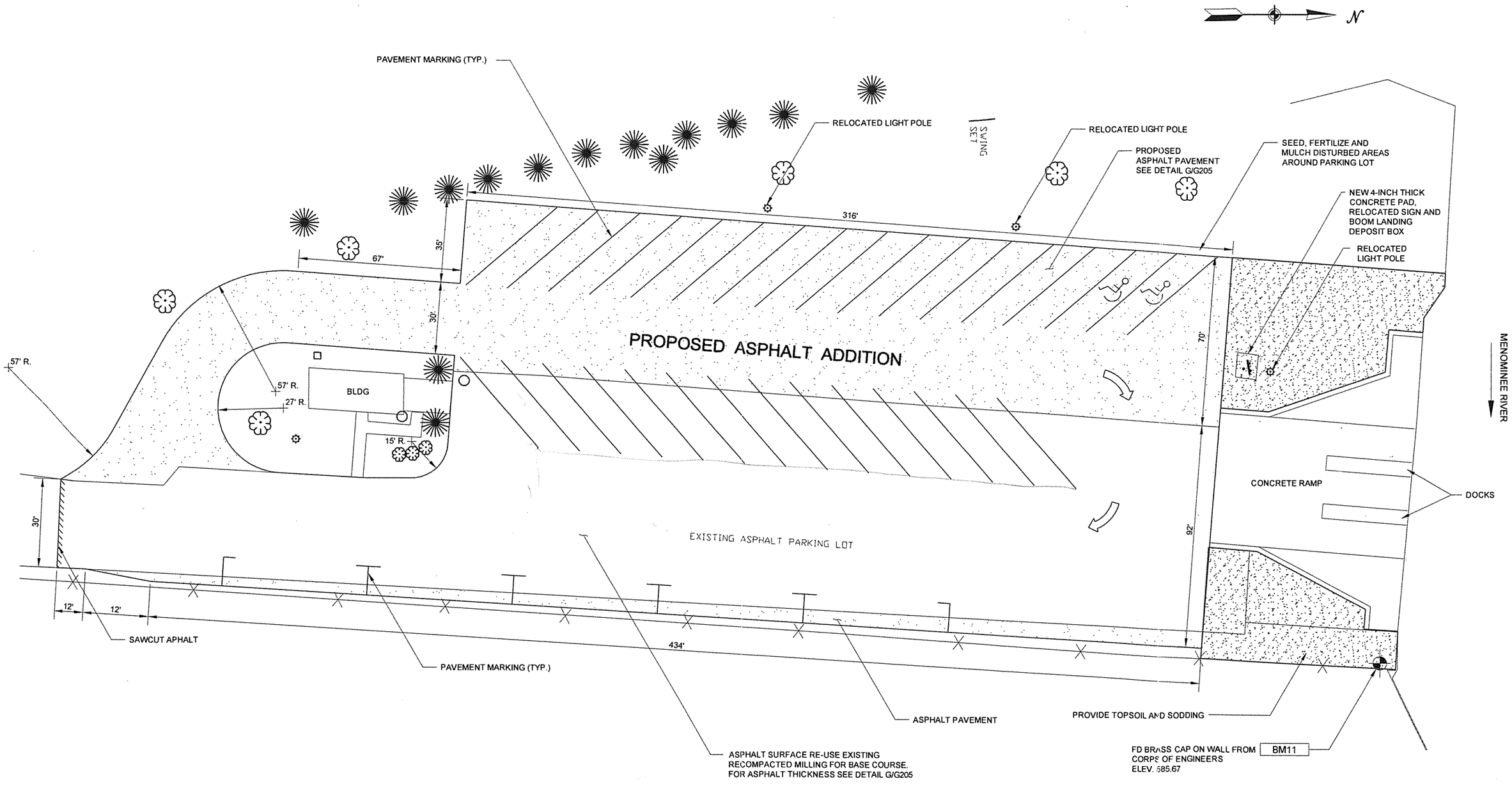
NO.	DATE	APPR	REVISION

NESTEGG MARINA AND BOOM LANDING
DOCKWALL IMPROVEMENTS
CITY OF MARINETTE, WISCONSIN

AYRES ASSOCIATES
Engineers/Scientists
Surveyors
916 Willard Dr., Suite #200
Green Bay, Wisconsin 54304

BOOM LANDING
EXISTING SITE PLAN

DR. BY R. BURSA		SHEET NO. 5
CHK. BY T. RUDOLPH	JOB NO. 16-0178.11	DRAWING NO. G201
DATE 8/14/03	SCALE 1" = 20'	



SITE PLAN

SCALE: 1" = 20'

THIS DRAWING REDUCED TO HALF SIZE

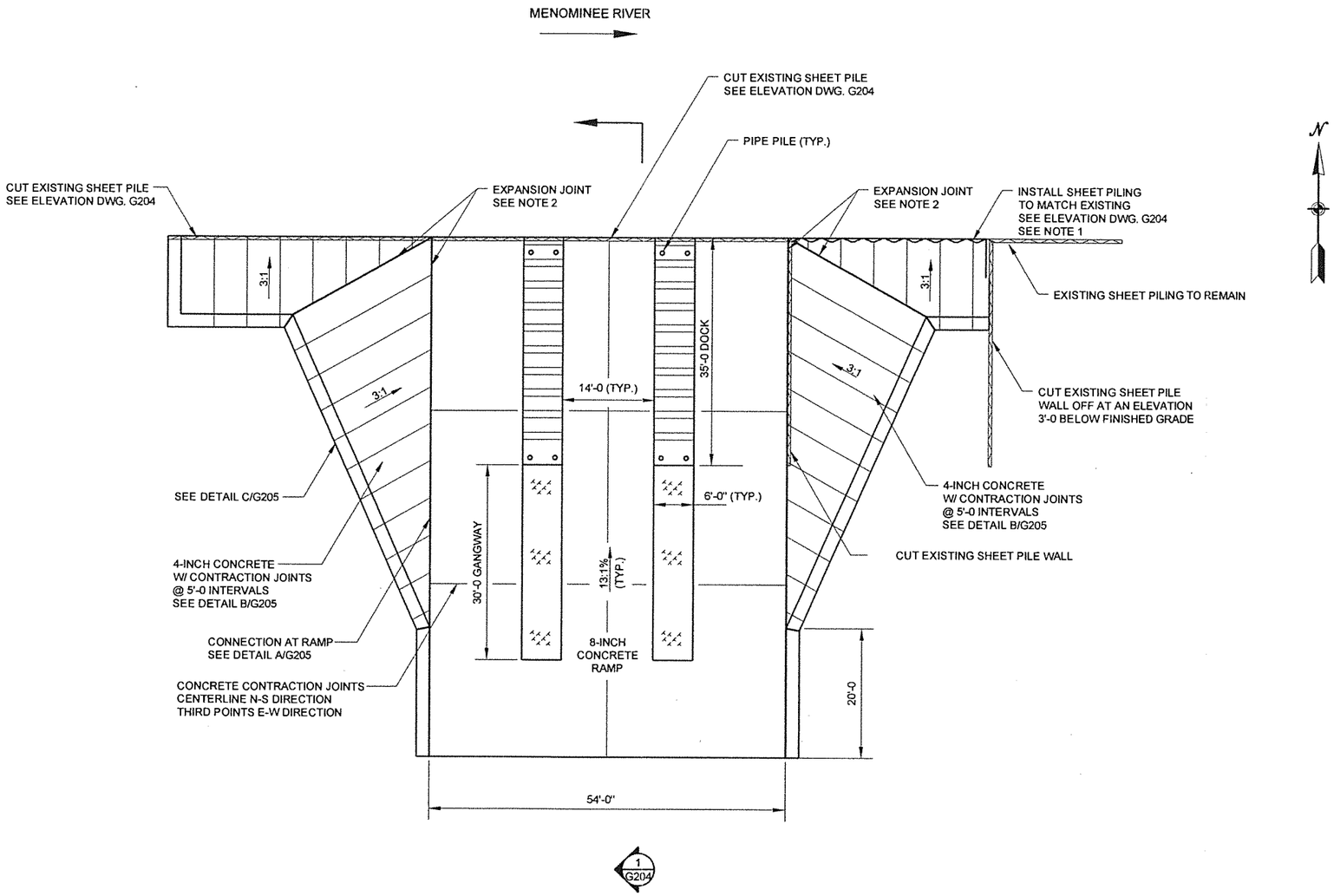
NO.	DATE	APPR	REVISION

NESTEGG MARINA AND BOOM LANDING
DOCKWALL IMPROVEMENTS
CITY OF MARINETTE, WISCONSIN

AYRES ASSOCIATES
Engineers/Scientists
Surveyors
916 Willard Dr., Suite #200
Green Bay, Wisconsin 54304

BOOM LANDING
PROPOSED SITE PLAN

DR. BY R. BURSA		SHEET NO. 6
CHK. BY T. RUDOLPH	JOB NO. 16-0178.11	DRAWING NO. G202
DATE 8/14/03	SCALE 1" = 20'	



PLAN
SCALE: 1"= 10'

NOTES:

1. CONTRACTOR MAY HAVE TO MODIFY AND WELD PROPOSED SHEET PILING WALL TO CONNECT TO THE EXISTING SHEET PILING WALL.
2. #4 REINFORCING BARS X 18-INCH LONG CENTERED WITHIN JOINT WITH 3/4" EXPANSION TUBE ON ONE END AT EXPANSION JOINTS SPACED 18" O.C.

THIS DRAWING REDUCED TO HALF SIZE

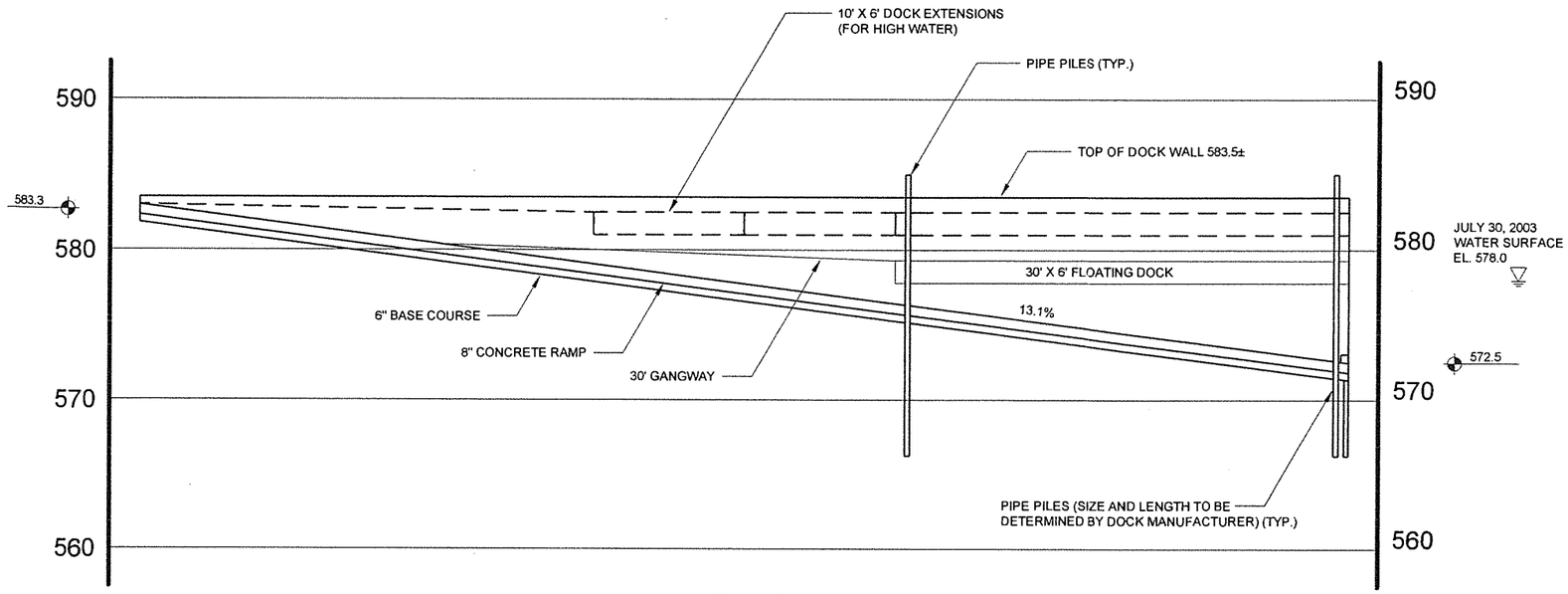
NO.	DATE	APPR	REVISION

NESTEGG MARINA AND BOOM LANDING
DOCKWALL IMPROVEMENTS
CITY OF MARINETTE, WISCONSIN

AYRES ASSOCIATES
Engineers/Scientists
Surveyors
916 Willard Dr., Suite #200
Green Bay, Wisconsin 54304

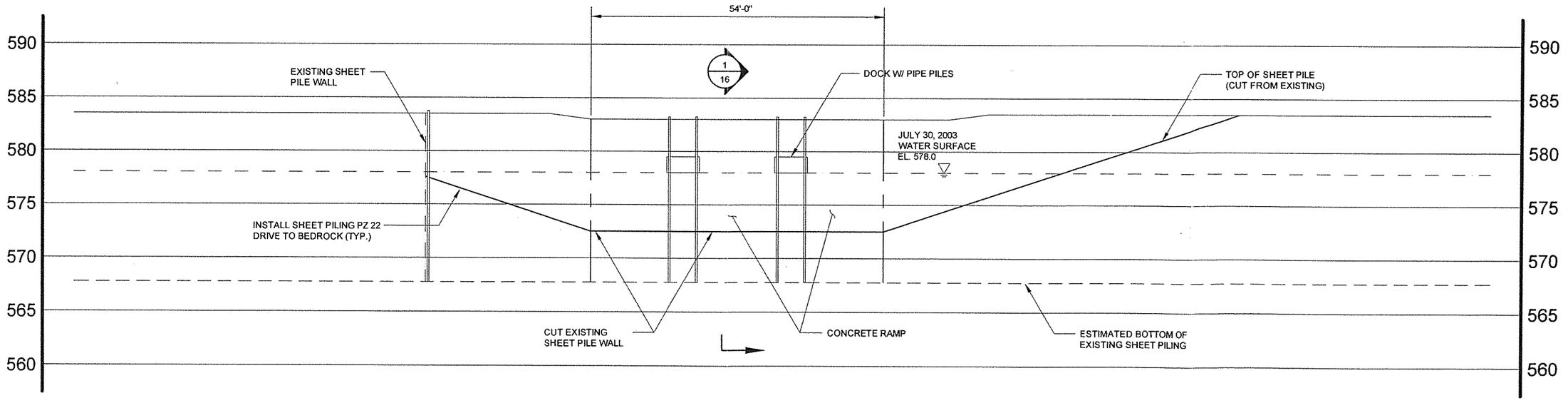
BOOM LANDING
PLAN

DR. BY	R. BURSA		SHEET NO. 7
CHK. BY	T. RUDOLPH	JOB NO. 16-0178.11	DRAWING NO. G203
DATE	8/14/03	SCALE 1" = 10'	



SECTION 1

HORIZ. SCALE: 1" = 5'
VERT. SCALE: 1" = 5'



NORTH ELEVATION

HORIZ. SCALE: 1" = 5'
VERT. SCALE: 1" = 10'

THIS DRAWING REDUCED TO HALF SIZE

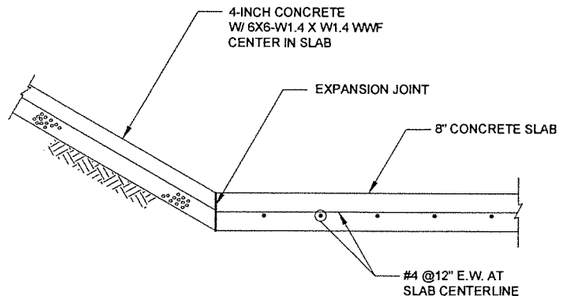
NO.	DATE	APPR	REVISION

NESTEGG MARINA AND BOOM LANDING
DOCKWALL IMPROVEMENTS
CITY OF MARINETTE, WISCONSIN

AYRES ASSOCIATES Engineers/Scientists Surveyors
916 Willard Dr., Suite #200 Green Bay, Wisconsin 54304

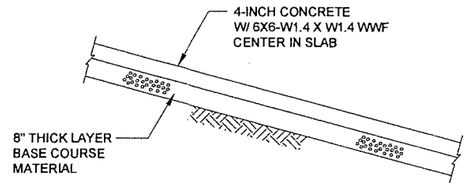
BOOM LANDING
ELEVATION AND SECTIONS

DR. BY R. BURSA		SHEET NO. 8
CHK. BY T. RUDOLPH	JOB NO. 16-0178.11	DRAWING NO. G204
DATE 8/14/03	SCALE AS NOTED	



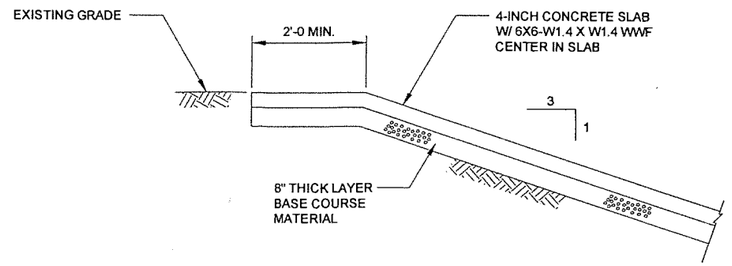
CONNECTION TO NEW RAMP DETAIL (A VAR.)

NOT TO SCALE



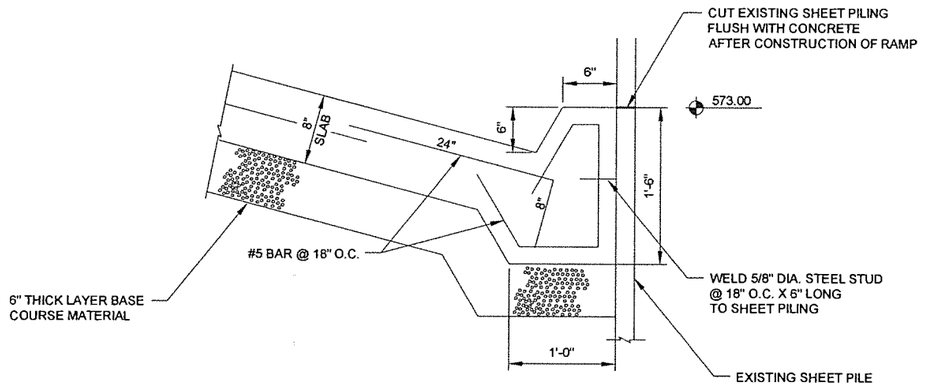
TYPICAL CONCRETE SLAB (B VAR.)

NOT TO SCALE



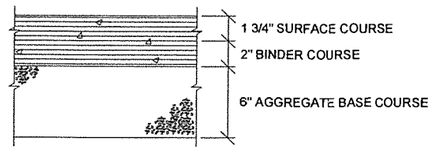
TOP OF SLOPE DETAIL (D VAR.)

NOT TO SCALE



END OF RAMP DETAIL (F VAR.)

NOT TO SCALE



ASPHALT PAVEMENT DETAIL (G VAR.)

NOT TO SCALE

THIS DRAWING REDUCED TO HALF SIZE

NO.	DATE	APPR	REVISION

NESTEGG MARINA AND BOOM LANDING
DOCKWALL IMPROVEMENTS
CITY O F MARINETTE, WISCONSIN

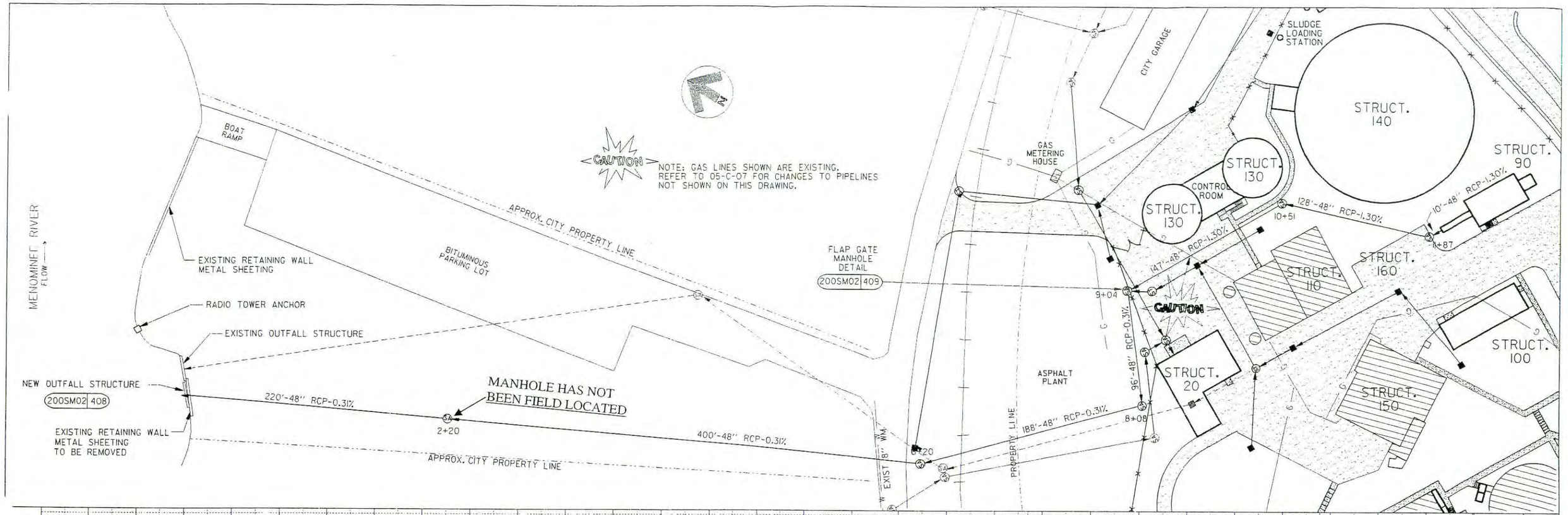
AYRES ASSOCIATES
Engineers/Scientists
Surveyors
916 Willard Dr., Suite #200
Green Bay, Wisconsin 54304

BOOM LANDING DETAILS

DR. BY: R. BURSA		SHEET NO. 9
CHK. BY: T. RUDOLPH	JOB NO. 16-0178.11	DRAWING NO. G205
DATE: 8/14/03	SCALE: NTS	

APPENDIX H

SANITARY SEWER EFFLUENT DISCHARGE PIPE PLAN AND PROFILE DRAWING



RECORD DRAWINGS OF COMPLETED CONSTRUCTION CONFORMING TO CONTRACTORS AND/OR OWNERS RECORDS DURING CONSTRUCTION.
BY:_____ DATE:_____

PROJECT REVIEW

	FOR APPROVAL		FOR BIDDING	
	DESIGN	DATE	DESIGN	DATE
	REVIEW	DATE	REVIEW	DATE
			[illegible]	1/26/89

REVISIONS			
NO.	DESCRIPTION	DATE	BY
△			
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FILE NO.	
BOOK NO.	
SURVEYED BY	
SCOPE I.D.	87M75
PRF NO.	7M7505C10
DRAWN BY	ARJA
DATE	20-JAN-1989

SCALES
0 40 80

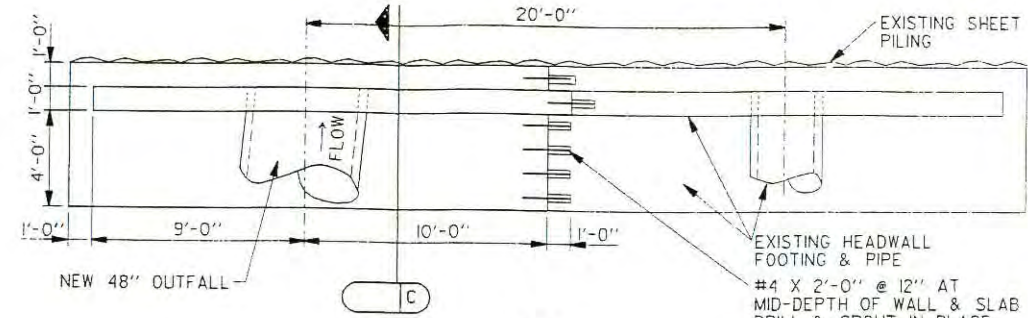
Foth & Van Dyke
Engineers / Architects

WASTEWATER TREATMENT FACILITIES
MARINETTE WASTEWATER UTILITY
CITY OF MARINETTE
MARINETTE COUNTY, WISCONSIN

PLAN AND PROFILE
OUTFALL SEWER

SHEET NO.
31
05-C-11

252:100:62:7M7505C10.DGN



PLAN

408 OUTFALL STRUCTURE DETAIL

RECORD DRAWINGS OF COMPLETED CONSTRUCTION CONFORMING TO CONTRACTORS AND/OR OWNERS RECORDS DURING CONSTRUCTION.
BY:__________ DATE:______

PROJECT REVIEW			
FOR APPROVAL		FOR BIDDING	
DESIGN	DATE	DESIGN RES	DATE 1/21/89
REVIEW	DATE	REVIEW CLB	DATE 1/24/89

REVISIONS			
NO.	DESCRIPTION	DATE	BY
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△			

FILE NO.	
BOOK NO.	
SURVEYED BY	
SCOPE I.D.	87M75
PRF NO.	7M7599SM2
DRAWN BY	KLMA
DATE	23-JAN-1989

SCALE
0

Foth & Van Dyke
Engineers / Architects

WASTEWATER TREATMENT FACILITIES
MARINETTE WASTEWATER UTILITY
CITY OF MARINETTE
MARINETTE COUNTY, WISCONSIN

MISCELLANEOUS STRUCTURES

SHEET NO.
158
200-SM-02

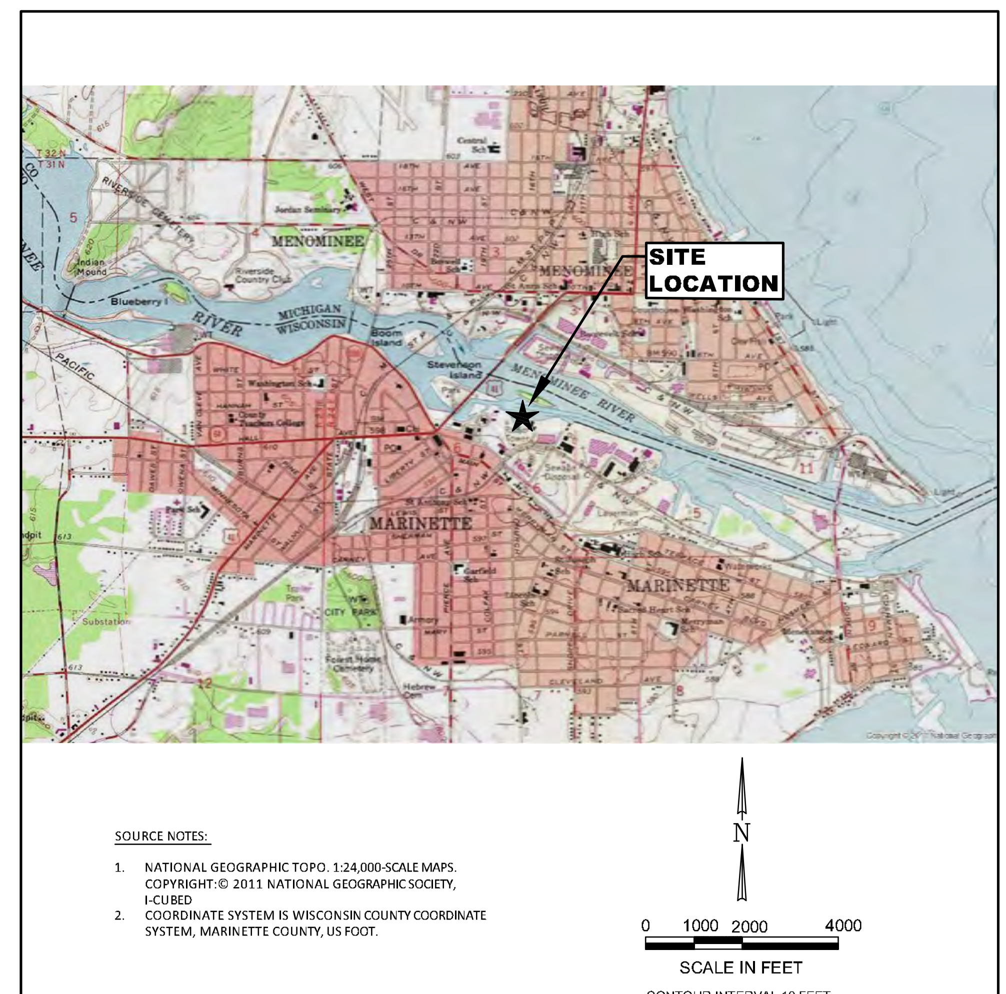
052:[O.O.15217M7599SM2.00]

DRAWINGS

FOCUSED NAPL AND SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

LIST OF DRAWINGS

WISCONSIN



SITE VICINITY

PREPARED FOR:

WISCONSIN PUBLIC SERVICE CORPORATION
700 NORTH ADAMS STREET
GREEN BAY, WISCONSIN 54307

TITLE SHEET

FOCUSED NAPL AND SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

SHEET NO. TS

DRAWING NO.: Sep 06, 2012 12:33pm PLOTTED BY: ndraskovich SAVED BY: ndraskovich Y:\ACADdata\Projects\20\2098\BID_CON\D2098-TS-01.dwg Layout1

REFERENCE: IMAGES: Y:\ACADdata\Projects\20\2098\Source\USA_Topo_Maps.tif; XREFS:

PROJECT NO. 2098/BID_CON

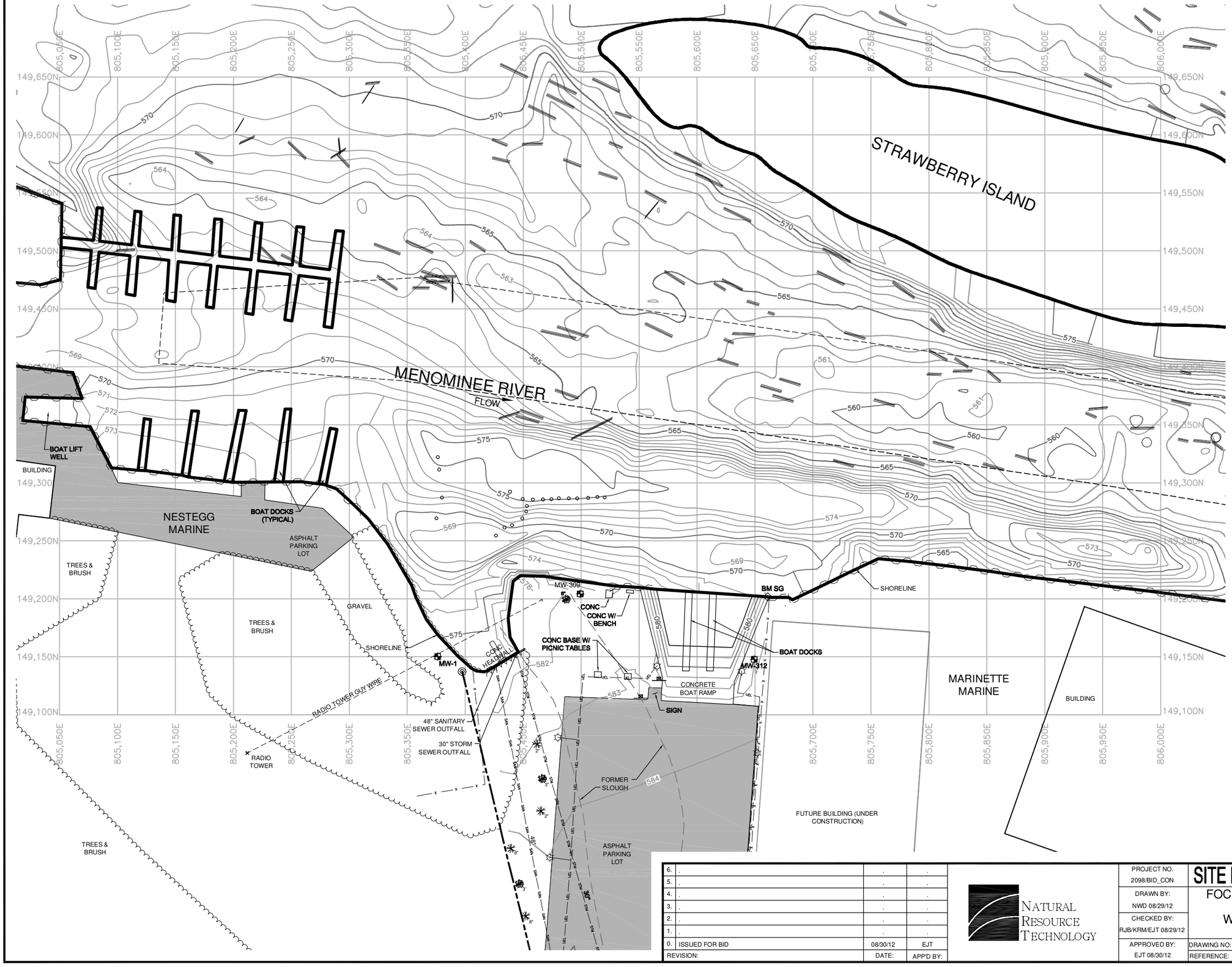
DRAWN BY: NWD 08/29/12

CHECKED BY: RJB/KRM/EJT 08/29/12

APPROVED BY: EJT 08/30/12

NATURAL RESOURCE TECHNOLOGY

REVISION:	DATE:	APP'D BY:
6.		
5.		
4.		
3.		
2.		
1. REVISED & ISSUED FOR ADDENDUM 2 TO RFP	09/06/12	EJT
0. ISSUED FOR BID	08/30/12	EJT



- PROPERTY LINE
- APPROXIMATE LOCATION OF SHORELINE
- APPROXIMATE LOCATION OF FORMER SLOUGH
- NAVIGATIONAL CHANNEL LIMITS
- FENCE
- SHEET PILE WALL
- SANITARY SEWER
- STORM SEWER
- UNDERGROUND ELECTRIC
- APPROXIMATE EDGE OF TREES & BRUSH
- GUY WIRE
- 2011 BATHYMETRIC CONTOURS
- LIGHT POLE
- PROPERTY CORNER
- SIGN
- DECIDUOUS TREE
- CONIFEROUS TREE
- BM — BENCH MARK
- MW-1 — MONITORING WELL
- SUSPECTED LOG
- SUSPECTED DEBRIS (ROCKS AND/OR LARGE OBJECTS)
- **WOOD PILINGS**
- **ASPHALT PAVEMENT**

CONTRACTOR NOTES:

1. CONTRACTOR SHALL PRESERVE AND PROTECT EXISTING FEATURES INCLUDING, BUT NOT LIMITED TO: RETAINING WALLS, FENCING/RAILINGS, UTILITIES, AND PAVEMENT THROUGHOUT THE DURATION OF THE PROJECT.
2. THE ORDINARY HIGH WATER MARK IS 578.6 FEET MSL. (NAVD88)
3. THE LAKE MICHIGAN LOW WATER DATUM IS 577.9 FEET MSL. (NAVD88)
4. THE AVERAGE FLOW OF THE 48-IN DIAMETER SANITARY EFFLUENT OUTFALL IS 1,400 GPM WITH A PEAK FLOW 3 TIMES DAILY OF 6,000 GPM.

N

0 20 40 80

SCALE IN FEET

SOURCE NOTES:

1. THIS DRAWING WAS DEVELOPED FROM A SURVEY DONE BY WISCONSIN PUBLIC SERVICE BY KJR ON 08/14/12, DRAWING "BOOM LANDING 8_12". THE CHANNEL LIMITS AND PORTIONS OF THE SHORELINE ARE FROM U.S. ARMY CORPS OF ENGINEERS DRAWING "CONDITION OF CHANNEL-SEP. 2008", SHEET 4 OF 4.
2. HORIZONTAL DATUM IS MARINETTE COUNTY COORDINATE SYSTEM, UNITS = US FOOT. VERTICAL DATUM IS NAVD88.
3. BATHYMETRIC SURVEY PERFORMED BY ENVIROSCAN, INC. NOVEMBER 15, 2011.
4. OFF-SITE UPLAND FEATURES DIGITIZED FROM BING MAPS AERIAL - © 2012 MICROSOFT CORPORATION.

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0.	ISSUED FOR BID	08/30/12	EJT
REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

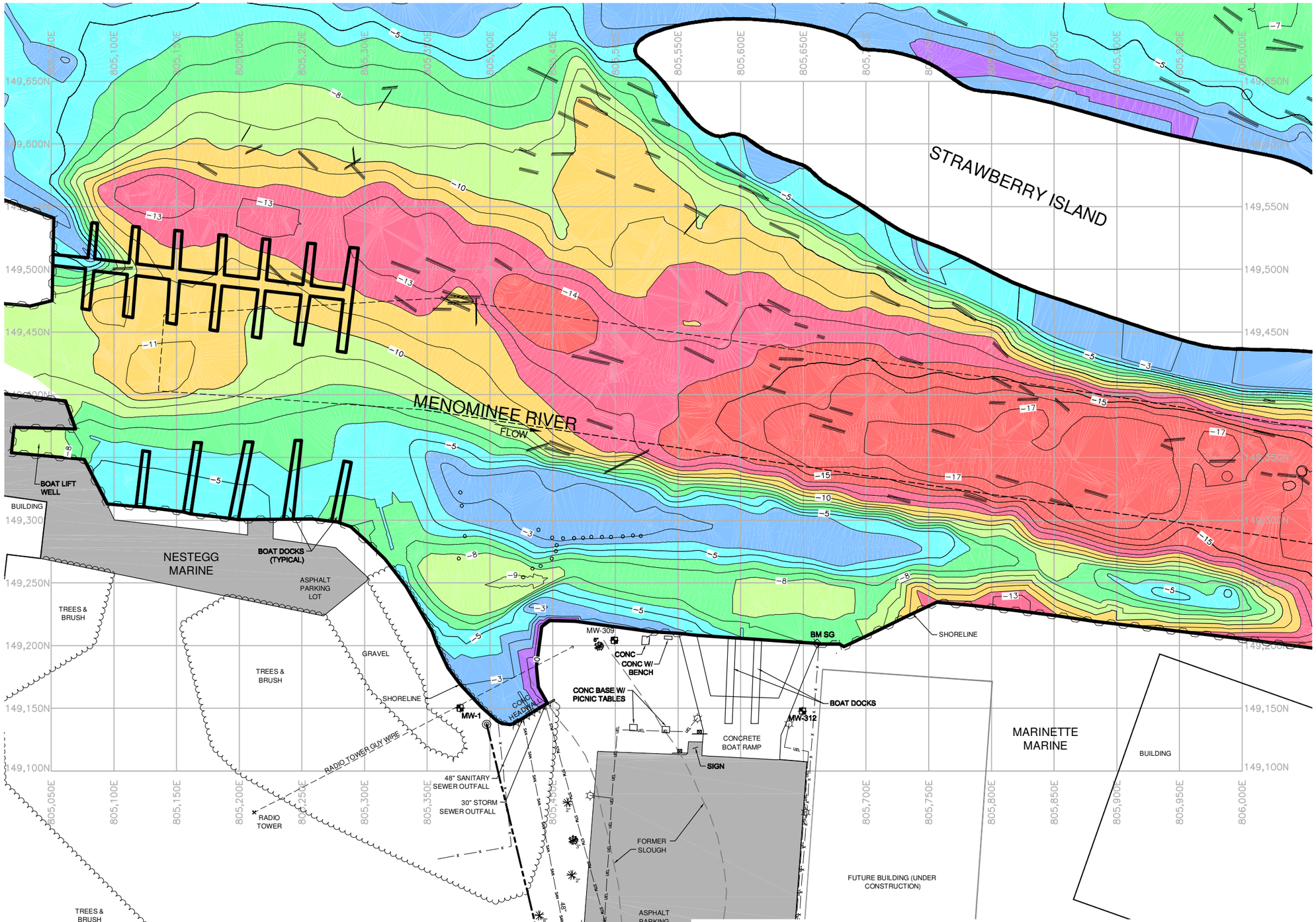
PROJECT NO.	2098/BID_CON
DRAWN BY:	NWD 08/29/12
CHECKED BY:	RJB/KRM/EJT 08/29/12
APPROVED BY:	EJT 08/30/12

SITE PLAN/PRE-CONSTRUCTION CONDITIONS

FOCUSED NAPL AND SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

DRAWING NO: Aug 30, 2012 9:10am PLOTTED BY: ndraskovich SAVED BY: ndraskovich
Y:\ACAData\Projects\20\2098\BID_CON\D2098-C010-00.dwg LAYOUT
IMAGES:
REFERENCE: XREFS: Y:\ACAData\Projects\20\2098\BID_CON\2098-BID_CON-BASE.dwg

SHEET NO. C010



- PROPERTY LINE
- APPROXIMATE LOCATION OF SHORELINE
- APPROXIMATE LOCATION OF FORMER SLOUGH
- NAVIGATIONAL CHANNEL LIMITS
- FENCE
- SHEET PILE WALL
- SANITARY SEWER
- STORM SEWER
- UNDERGROUND ELECTRIC
- APPROXIMATE EDGE OF TREES & BRUSH
- GUY WIRE
- WATER DEPTH MAJOR CONTOUR
- WATER DEPTH MINOR CONTOUR
- LIGHT POLE
- PROPERTY CORNER
- SIGN
- DECIDUOUS TREE
- CONIFEROUS TREE
- BM — BENCH MARK
- MW-1 — MONITORING WELL
- SUSPECTED LOG
- SUSPECTED DEBRIS (ROCKS AND/OR LARGE OBJECTS)
- **WOOD PILINGS**
- ASPHALT PAVEMENT

CONTRACTOR NOTES:

1. THE ORDINARY HIGH WATER MARK IS 578.6 FEET MSL. (NAVD88)
2. THE LAKE MICHIGAN LOW WATER DATUM IS 577.9 FEET MSL. (NAVD88)

DEPTH FROM LOW WATER DATUM			
NUMBER	MINIMUM DEPTH	MAXIMUM DEPTH	COLOR
1	-18	-14	
2	-14	-12	
3	-12	-10	
4	-10	-8	
5	-8	-6	
6	-6	-4	
7	-4	-2	
8	-2	0	

N

0 20 40 80

SCALE IN FEET

SOURCE NOTES:

1. THIS DRAWING WAS DEVELOPED FROM A SURVEY DONE BY WISCONSIN PUBLIC SERVICE BY KJR ON 08/14/12, DRAWING "BOOM LANDING 8_12". THE CHANNEL LIMITS AND PORTIONS OF THE SHORELINE ARE FROM U.S. ARMY CORPS OF ENGINEERS DRAWING "CONDITION OF CHANNEL–SEP. 2008", SHEET 4 OF 4.
2. HORIZONTAL DATUM IS MARINETTE COUNTY COORDINATE SYSTEM, UNITS = US FOOT. VERTICAL DATUM IS NAVD88.
3. BATHYMETRIC SURVEY PERFORMED BY ENVIROSCAN, INC. NOVEMBER 15, 2011.
4. OFF–SITE UPLAND FEATURES DIGITIZED FROM BING MAPS AERIAL – © 2012 MICROSOFT CORPORATION.

REVISION:		DATE:	APP'D BY:
0.	ISSUED FOR BID	08/30/12	EJT
1.		.	.
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NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 2098/BID_CON

DRAWN BY: NWD 08/29/12

CHECKED BY: RJB/KRM/EJT 08/29/12

APPROVED BY: EJT 08/30/12

PRE-CONSTRUCTION RIVER DEPTHS

FOCUSED NAPL AND SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

DRAWING NO: Aug 30, 2012 9:19am PLOTTED BY: ndraskovich SAVED BY: ndraskovich
Y:\ACAData\Projects\20\2098\BID_CON\D2098-C011-00.dwg LAYOUT

REFERENCE: IMAGES:
XREFS: Y:\ACAData\Projects\20\2098\BID_CON\2098-BID_CON-BASE.dwg

SHEET NO. C011

- APPROXIMATE LOCATION OF SHORELINE
- APPROXIMATE LOCATION OF FORMER SLOUGH
- NAVIGATIONAL CHANNEL LIMITS
- EXISTING FENCE
- EXISTING SHEET PILE WALL
- SANITARY SEWER
- STORM SEWER
- WATER MAIN
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- APPROXIMATE EDGE OF TREES & BRUSH
- GUY WIRE
- 2011 BATHYMETRIC CONTOURS
- MANHOLE
- CATCH BASIN
- LIGHT POLE
- UTILITY POLE
- HYDRANT
- WATER VALVE
- ELECTRIC PEDESTAL OR METER
- PROPERTY CORNER
- SIGN
- DECIDUOUS TREE
- CONIFEROUS TREE
- BENCH MARK
- MONITORING WELL
- SUSPECTED LOG
- SUSPECTED DEBRIS (ROCKS AND/OR LARGE OBJECTS)
- **WOOD PILINGS**
- TEMPORARY CHAIN LINK FENCE
- PROPOSED SILT FENCE
- TEMPORARY SHEET PILE COFFER DAM
- ASPHALT PAVEMENT

CONTRACTOR NOTES:

1. INSTALL AND MAINTAIN TEMPORARY WORK AREA FENCE (6-FT HIGH CHAIN LINK) AND GATE.
2. INSTALL AND MAINTAIN SEDIMENT AND EROSION CONTROL MEASURES IN ACCORDANCE WITH RELATED DETAILS AND SECTION 02111.
3. CONSTRUCT AND MAINTAIN TRACKING PAD AT THE TRUCK EGRESS ONSITE WITH 12-INCH THICK LAYER OF 3-INCH DIAMETER CLEAR STONE; TRACKING PAD SHALL BE A MINIMUM 50-FEET LONG.
4. CONTRACTOR SHALL PROVIDE CONSTRUCTION TRAILERS, TRUCK AND EQUIPMENT DECONTAMINATION AREA, WATER TREATMENT, SEDIMENT STABILIZATION AREA (IF NECESSARY) DURING SITE ACTIVITIES. LOCATIONS ON THIS SHEET FOR CONTRACTOR DEPLOYMENT OF CONSTRUCTION ACTIVITIES ARE SUGGESTIONS ONLY. CONTRACTOR MAY PROPOSE LOCATIONS AND PROVIDE REASONING, IF DIFFERENT FROM THIS SHEET, IN THE WORK PLAN.
5. CITY HYDRANT FOR SOURCE OF CONTRACTOR POTABLE WATER.
6. CONTRACTOR SHALL REMOVE AND STOCKPILE SHORELINE RIPRAP AS NECESSARY TO FACILITATE WORK. REUSE EXISTING MATERIALS TO THE GREATEST EXTENT PRACTICAL.
7. CONTRACTOR SHALL INSTALL TEMPORARY COFFERDAM AS SPECIFIED IN THE CONTRACT DOCUMENTS.
8. CONTRACTOR SHALL PROVIDE AND PLACE SIGNS AND/OR BUOYS OUTSIDE OF THE TEMPORARY COFFERDAM TO ALERT BOATERS OF THE TEMPORARY COFFERDAM.
9. CONTRACTOR TO PROVIDE AND PLACE OIL ABSORBENT BUOYS AROUND INSIDE OF COFFERDAM.

N

0 25 50 100

SCALE IN FEET

SOURCE NOTES:

1. THIS DRAWING WAS DEVELOPED FROM A SURVEY DONE BY WISCONSIN PUBLIC SERVICE BY KJR ON 08/14/12, DRAWING "BOOM LANDING 8_12". THE CHANNEL LIMITS AND PORTIONS OF THE SHORELINE ARE FROM U.S. ARMY CORPS OF ENGINEERS DRAWING "CONDITION OF CHANNEL-SEP. 2008", SHEET 4 OF 4.
2. HORIZONTAL DATUM IS MARINETTE COUNTY COORDINATE SYSTEM, UNITS = US FOOT. VERTICAL DATUM IS NAVD88.
3. BATHYMETRIC SURVEY PERFORMED BY ENVIROSCAN, INC. NOVEMBER 15, 2011.
4. OFF-SITE UPLAND FEATURES DIGITIZED FROM BING MAPS AERIAL - © 2012 MICROSOFT CORPORATION.

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REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 2098/BID_CON

DRAWN BY: NWD 08/29/12

CHECKED BY: RJB/KRM/EJT 08/29/12

APPROVED BY: EJT 08/30/12

SITE PREPARATION PLAN

FOCUSED NAPL AND SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

DRAWING NO: Aug 30, 2012 12:20pm PLOTTED BY: ndraskovich SAVED BY: ndraskovich
Y:\ACAData\Projects\20\2098\BID_CON\D2098-C020-00.dwg LAYOUT

REFERENCE: IMAGES:
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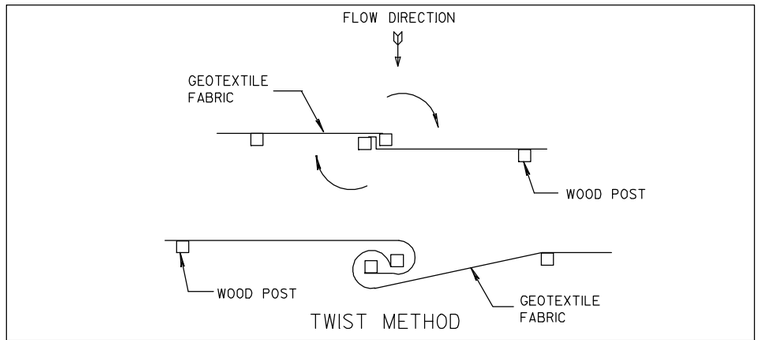
SHEET NO. C020



JOINING TWO LENGTHS OF SILT FENCE ③

SILT FENCE NOTES:

DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

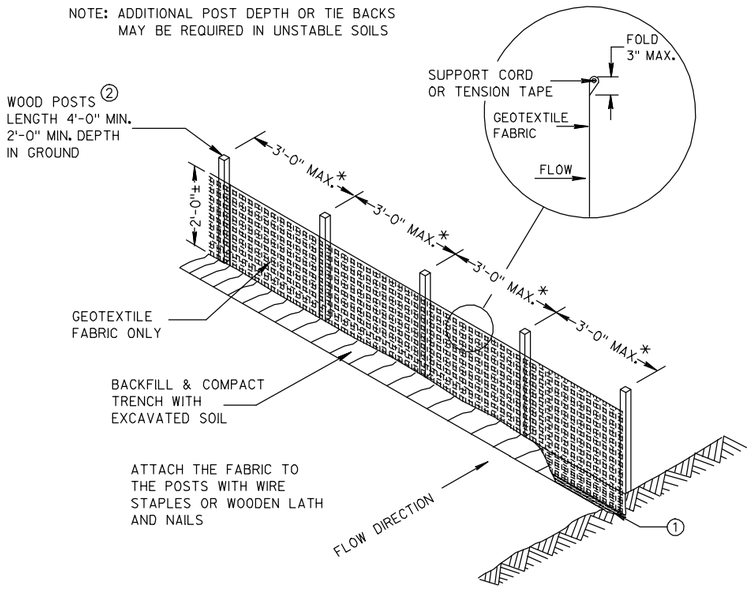
① FOR MANUAL INSTALLATIONS THE TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.

② WOOD POSTS SHALL BE A MINIMUM SIZE OF 1⅛" X 1⅛" OF OAK OR HICKORY.

③ CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE THE FOLLOWING METHOD. OVERLAP THE END POSTS AND TWIST, OR ROTATE, AT LEAST 180 DEGREES.

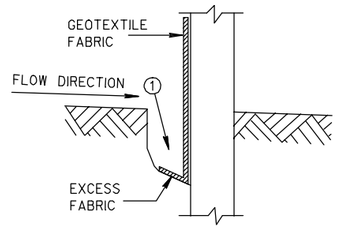
TRACKING PAD NOTES:

1. DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE SPECIFICATIONS.
2. TRACKING PAD SHALL BE INSPECTED DAILY. DEFICIENT AREAS SHALL BE REPAIRED OR REPLACED IMMEDIATELY.
3. TRACKING PAD TO BE REMOVED AFTER CONSTRUCTION IS COMPLETED.
4. TRACKING PAD SHALL BE THE FULL WIDTH OF THE EGRESS POINT.
5. SURFACE WATER MUST BE PREVENTED FROM PASSING THROUGH THE TRACKING PAD. FLOWS SHALL BE DIVERTED AWAY, AROUND OR CONVEYED UNDER THE TRACKING PAD.
6. CULVERT PIPE OR OTHER BMP USED TO DIVERT WATER AWAY, AROUND OR UNDER THE TRACKING PAD SHALL BE SIZED TO CONVEY THE 2 YEAR–24 HOUR STORM.
7. THE COST OF ADDITIONAL OR REPLACEMENT BMPS TO DIVERT WATER ARE INCIDENTAL TO THE BID.

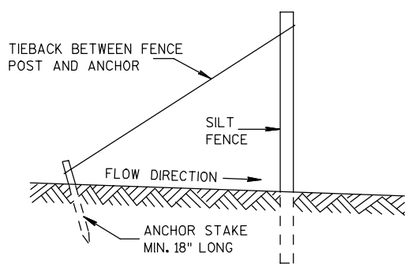


SILT FENCE

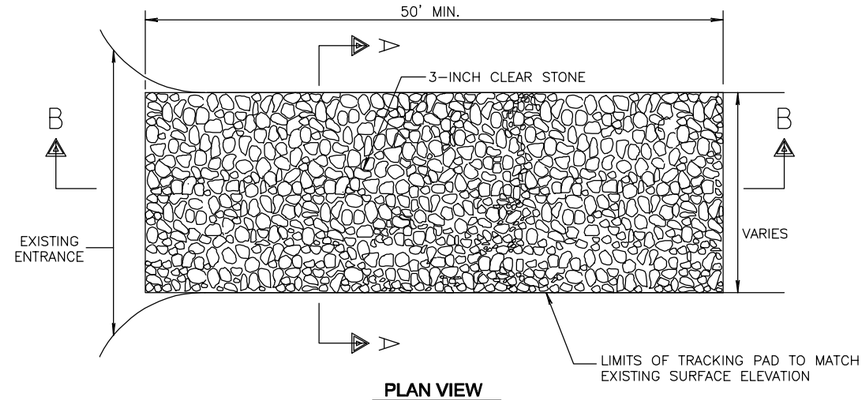
*NOTE: 8'-0" POST SPACING ALLOWED IF A WOVEN GEOTEXTILE FABRIC IS USED.



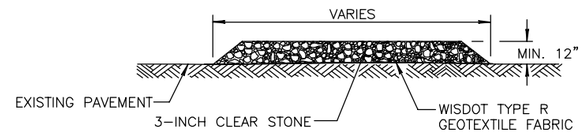
TRENCH DETAIL



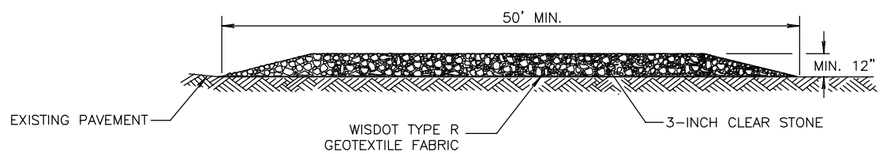
SILT FENCE TIE BACK
(WHEN REQUIRED BY THE ENGINEER)



PLAN VIEW



SECTION A-A



SECTION B-B

1 / C021 **SILT FENCE DETAIL** NOT TO SCALE

2 / C021 **TRACKING PAD DETAIL** NOT TO SCALE

SOURCE NOTES:

1. SILT FENCE DETAIL DEVELOPED FROM WISDOT S.D.D. 8 E 9–6.
2. TRACKING PAD DETAIL DEVELOPED FROM WISDOT S.D.D. 8 E 14–1

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REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.	2098/BID_CON
DRAWN BY:	NWD 08/29/12
CHECKED BY:	RJB/KRM/EJT 08/29/12
APPROVED BY:	EJT 08/30/12

SITE PREPARATION DETAILS

FOCUSED NAPL AND SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

DRAWING NO: Aug 30, 2012 9:38am PLOTTED BY: ndraskovich SAVED BY: ndraskovich
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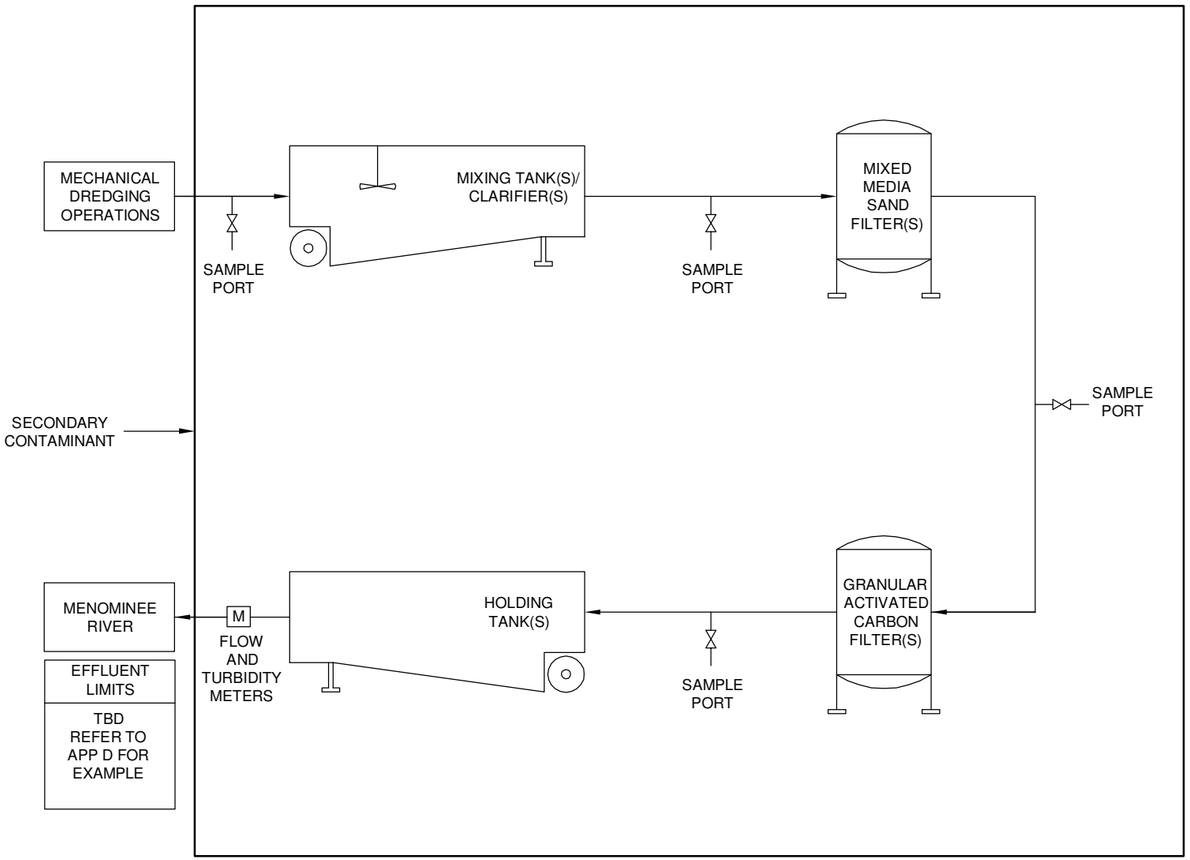
REFERENCE: IMAGES: XREFS:

SHEET NO. C021



3
C022

WATER TREATMENT PLANT PROCESS FLOW DIAGRAM AND EFFLUENT LIMITS

NOT TO SCALE

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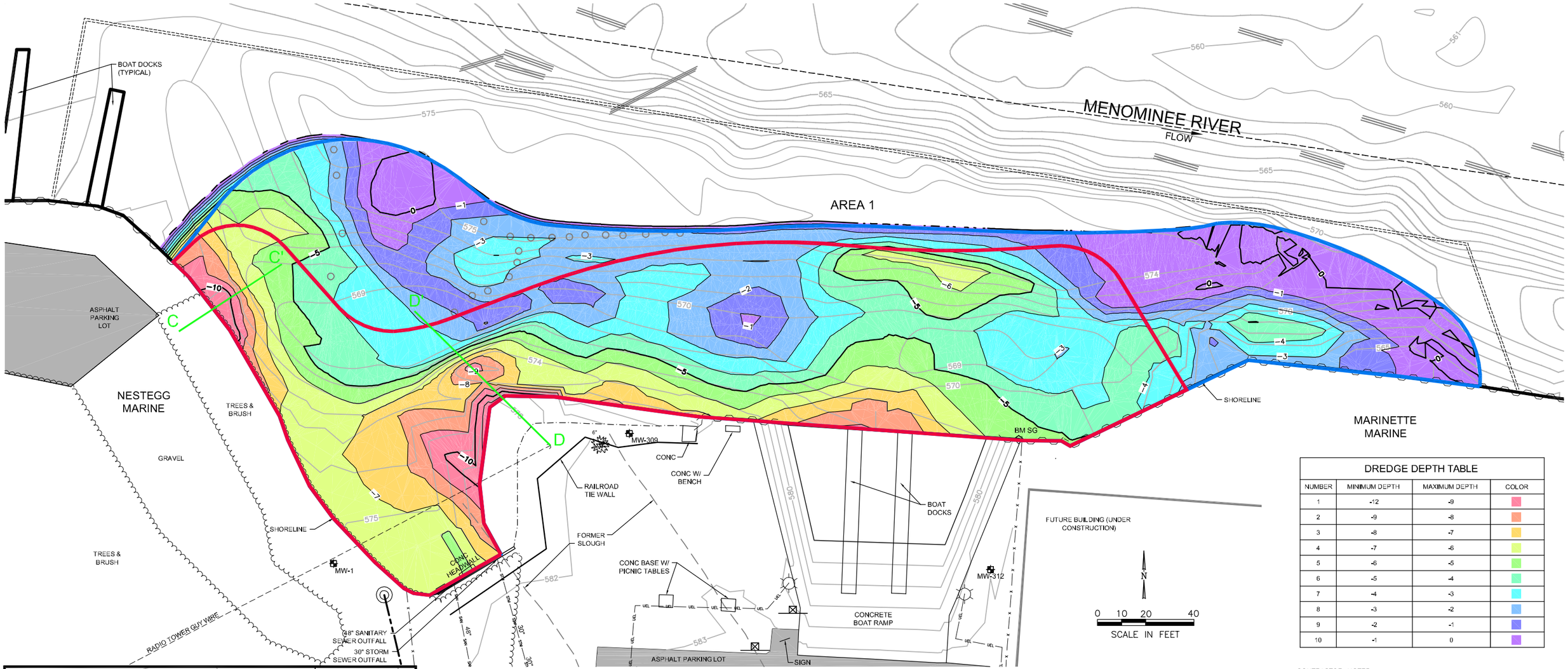
NATURAL RESOURCE TECHNOLOGY

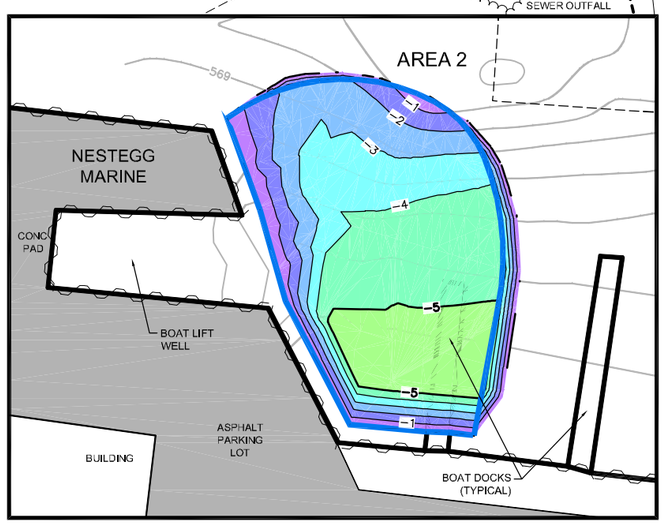
PROJECT NO.	2098/BID_CON
DRAWN BY:	NWD 08/29/12
CHECKED BY:	RJB/KRM/EJT 08/29/12
APPROVED BY:	EJT 08/30/12
DRAWING NO:	Aug 30, 2012 9:45am PLOTTED BY: ndraskovich SAVED BY: ndraskovich Y:\ACAData\Projects\20\2098\BID_CON\D2098-C022-00.dwg LAYOUT
REFERENCE:	IMAGES: XREFS:

SITE PREPARATION DETAILS

FOCUSED NAPL AND SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

SHEET NO. C022





PROPERTY LINE	APPROXIMATE EDGE OF TREES & BRUSH
APPROXIMATE LOCATION OF SHORELINE	GUY WIRE
APPROXIMATE LOCATION OF FORMER SLOUGH	2011 BATHYMETRIC CONTOURS
NAVIGATIONAL CHANNEL LIMITS	LIGHT POLE
FENCE	PROPERTY CORNER
SHEET PILE WALL	SIGN
SANITARY SEWER	DECIDUOUS TREE
STORM SEWER	BENCH MARK
UNDERGROUND ELECTRIC	MONITORING WELL
TOP OF BANK	ASPHALT PAVEMENT
SUSPECTED LOG	
WOOD PILINGS	
DREDGE DEPTH MAJOR CONTOUR (5FT INTERVAL)	
DREDGE DEPTH MINOR CONTOUR (1FT INTERVAL)	
APPROXIMATE EXTENT OF OBSERVED NAPL	
APPROXIMATE EXTENT OF PAH >22.8 mg/kg	
TEMPORARY SHEET PILE COFFER DAM	
CROSS SECTION LINE	

DREDGE DEPTH TABLE

NUMBER	MINIMUM DEPTH	MAXIMUM DEPTH	COLOR
1	-12	-9	
2	-9	-8	
3	-8	-7	
4	-7	-6	
5	-6	-5	
6	-5	-4	
7	-4	-3	
8	-3	-2	
9	-2	-1	
10	-1	0	

CONTRACTOR NOTES:

1. RADIO TOWER GUY WIRE SHALL BE PROTECTED AND NOT DISTURBED DURING DREDGING.
2. AREAS 2 SHALL BE DREDGED PRIOR TO COMPLETION OF THE TEMPORARY SHEET PILE COFFERDAM TO FACILITATE USE OF THE SEDIMENT OFFLOAD AREA AT BOOM LANDING. AREA 1 SHALL NOT BE DREDGED UNTIL COMPLETION OF THE TEMPORARY SHEET PILE COFFERDAM.
3. SEDIMENT IN AREA 1 ALONG BOAT RAMP DREDGED IN 8 FOOT WIDE CUTS, SAMPLE BY ENGINEER, THEN BACKFILL BEFORE NEXT CUT.

SOURCE NOTES:

1. THIS DRAWING WAS DEVELOPED FROM A SURVEY DONE BY WISCONSIN PUBLIC SERVICE BY KJR ON 08/14/12, DRAWING "BOOM LANDING 8_12". THE CHANNEL LIMITS AND PORTIONS OF THE SHORELINE ARE FROM U.S. ARMY CORPS OF ENGINEERS DRAWING "CONDITION OF CHANNEL-SEP. 2008", SHEET 4 OF 4.
2. HORIZONTAL DATUM IS MARINETTE COUNTY COORDINATE SYSTEM, UNITS = US FOOT, VERTICAL DATUM IS NAVD88.
3. BATHYMETRIC SURVEY PERFORMED BY ENVIROSCAN, INC. NOVEMBER 15, 2011.
4. OFF-SITE UPLAND FEATURES DIGITIZED FROM BING MAPS AERIAL - © 2012 MICROSOFT CORPORATION.

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1. REVISED & ISSUED FOR ADDENDUM 2 TO RFP	09/06/12	EJT
0. ISSUED FOR BID	08/30/12	EJT

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 2098/BID_CON

DRAWN BY: NWD 08/29/12

CHECKED BY: RJB/KRM/EJT 08/29/12

APPROVED BY: EJT 08/30/12

PAH/NAPL SEDIMENT DREDGE DEPTH OF CUT

FOCUSED NAPL AND SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

DRAWING NO: Sep 06, 2012 12:30pm PLOTTED BY: ndraskovich SAVED BY: ndraskovich
REFERENCE: I:\ACAData\Projects\20\2098\BID_CON\D2098-C030-01.dwg LAYOUT
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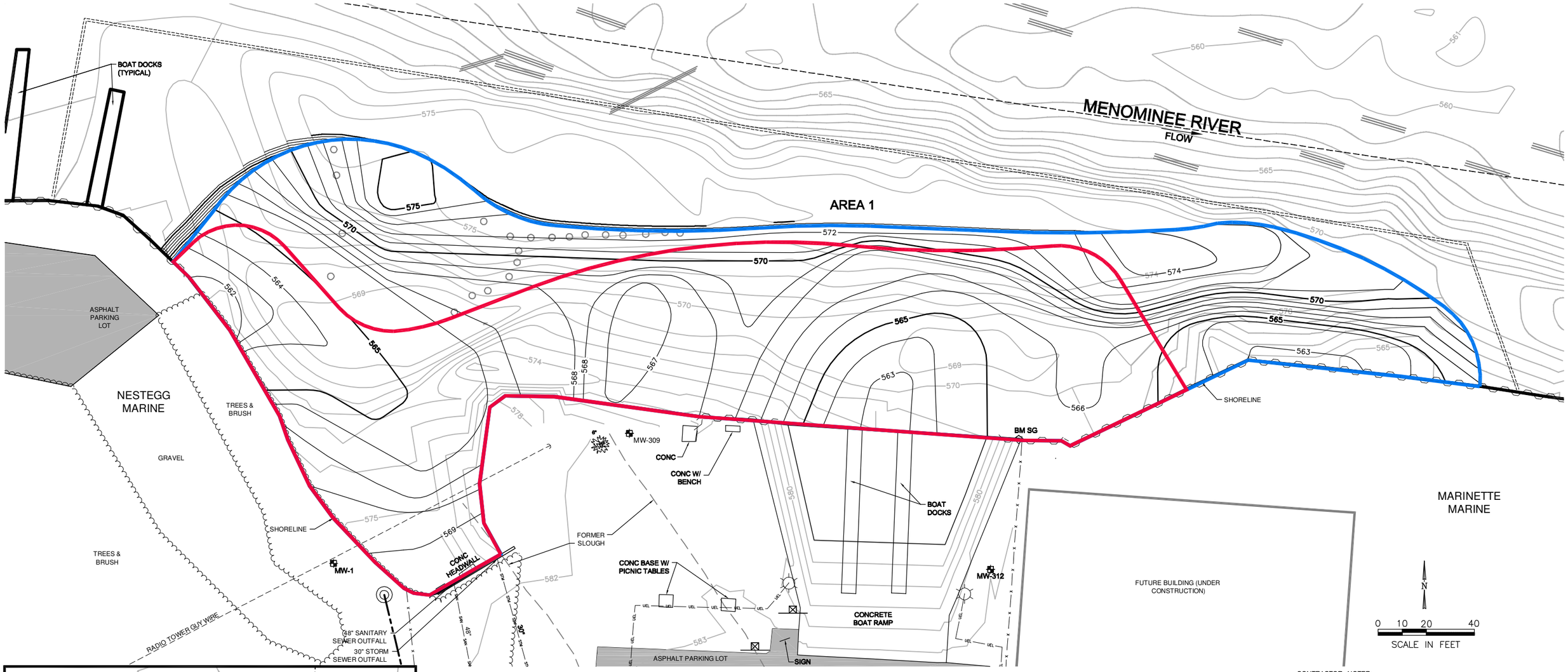
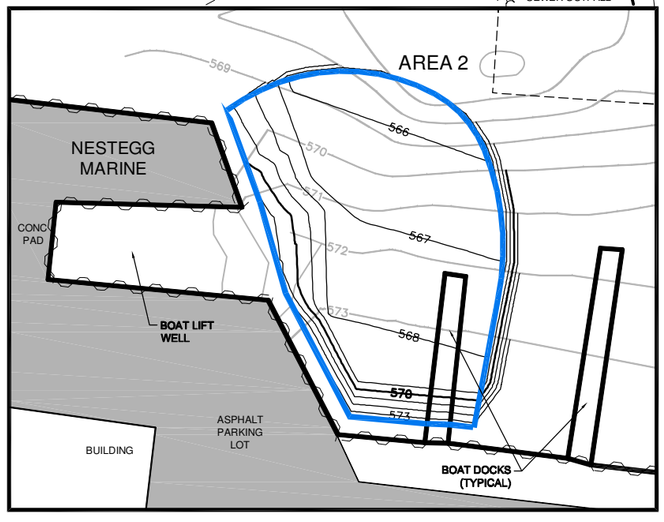
XREFS: Y:\ACAData\Projects\20\2098\BID_CON\2098-BID_CON-BASE.dwg

SHEET NO. C030





PROPERTY LINE
APPROXIMATE LOCATION OF SHORELINE
APPROXIMATE LOCATION OF FORMER SLOUGH
NAVIGATIONAL CHANNEL LIMITS
FENCE
SHEET PILE WALL
SANITARY SEWER
STORM SEWER
UNDERGROUND ELECTRIC
ASPHALT PAVEMENT
APPROXIMATE EDGE OF TREES & BRUSH
GUY WIRE
2011 BATHYMETRIC CONTOURS
LIGHT POLE
PROPERTY CORNER
SIGN
DECIDUOUS TREE
BM — BENCH MARK
MW-1 — MONITORING WELL
SUSPECTED LOG
WOOD PILINGS
570 — DREDGE MAJOR CONTOUR (5FT INTERVAL)
573 — DREDGE MINOR CONTOUR (1FT INTERVAL)
APPROXIMATE EXTENT OF OBSERVED NAPL
APPROXIMATE EXTENT OF PAH ≥22.8 mg/kg
TEMPORARY SHEET PILE COFFER DAM

CONTRACTOR NOTES:

1. RADIO TOWER GUY WIRE SHALL BE PROTECTED AND NOT DISTURBED DURING DREDGING.
2. AREAS 2 SHALL BE DREDGED PRIOR TO COMPLETION OF THE TEMPORARY SHEET PILE COFFERDAM TO FACILITATE USE OF THE SEDIMENT OFFLOAD AREA AT BOOM LANDING. AREA 1 SHALL NOT BE DREDGED UNTIL COMPLETION OF THE TEMPORARY SHEET PILE COFFERDAM.
3. SEDIMENT IN AREA 1 ALONG BOAT RAMP DREDGED IN 8 FOOT WIDE CUTS, SAMPLE BY ENGINEER, THEN BACKFILL BEFORE NEXT CUT.

SOURCE NOTES:

1. THIS DRAWING WAS DEVELOPED FROM A SURVEY DONE BY WISCONSIN PUBLIC SERVICE BY KJR ON 08/14/12, DRAWING "BOOM LANDING 8_12". THE CHANNEL LIMITS AND PORTIONS OF THE SHORELINE ARE FROM U.S. ARMY CORPS OF ENGINEERS DRAWING "CONDITION OF CHANNEL-SEP. 2008", SHEET 4 OF 4.
2. HORIZONTAL DATUM IS MARINETTE COUNTY COORDINATE SYSTEM, UNITS = US FOOT. VERTICAL DATUM IS NAVD88.
3. BATHYMETRIC SURVEY PERFORMED BY ENVIROSCAN, INC. NOVEMBER 15, 2011.
4. OFF-SITE UPLAND FEATURES DIGITIZED FROM BING MAPS AERIAL – © 2012 MICROSOFT CORPORATION.

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REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 2098/BID_CON
DRAWN BY: NWD 08/29/12
CHECKED BY: RJB/KRM/EJT 08/29/12
APPROVED BY: EJT 08/30/12

PAH/NAPL SEDIMENT DREDGE CONTOURS

FOCUSED NAPL AND SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

DRAWING NO: Aug 30, 2012 10:47am PLOTTED BY: ndraskovich SAVED BY: ndraskovich
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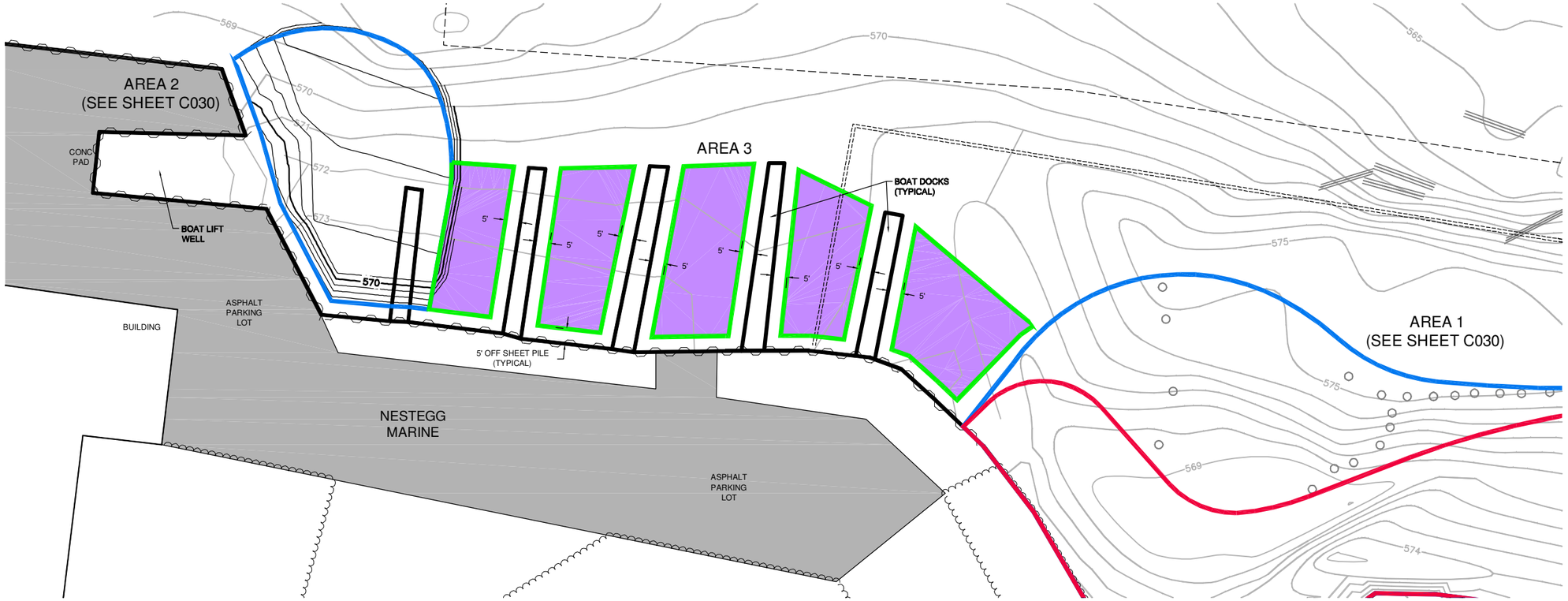

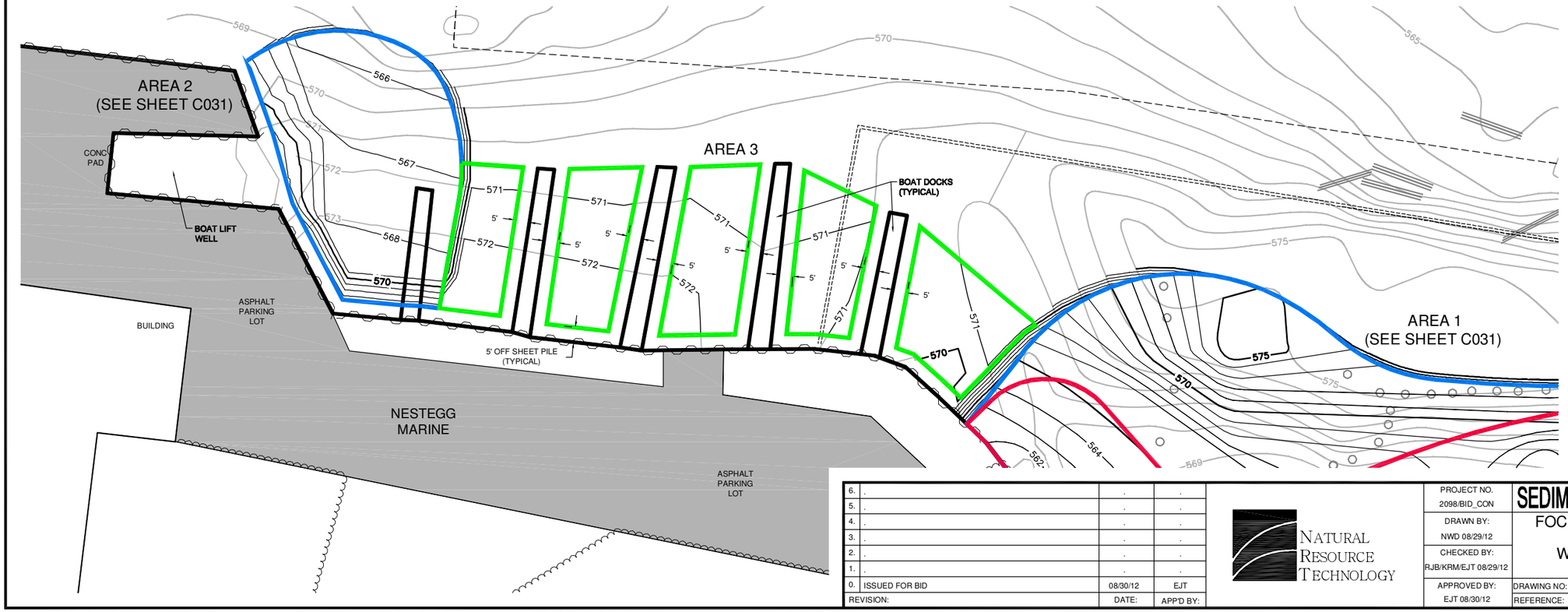

- APPROXIMATE LOCATION OF SHORELINE
- NAVIGATIONAL CHANNEL LIMITS
- SHEET PILE WALL
- APPROXIMATE EDGE OF TREES & BRUSH
- 2011 BATHYMETRIC CONTOURS
- SUSPECTED LOG
- WOOD PILINGS
- ASPHALT PAVEMENT
- DREDGE MAJOR CONTOUR (5FT INTERVAL)
- DREDGE MINOR CONTOUR (1FT INTERVAL)
- APPROXIMATE EXTENT OF OBSERVED NAPL
- APPROXIMATE EXTENT OF PAH ≥22.8 mg/kg
- APPROXIMATE EXTENT OF AREA 3 DREDGE LIMITS
- TEMPORARY SHEET PILE COFFER DAM ALIGNMENT

DREDGE DEPTH TABLE			
NUMBER	MINIMUM DEPTH	MAXIMUM DEPTH	COLOR
1	-1	-1	

N

0 10 20 40

SCALE IN FEET

CONTRACTOR NOTES:

1. AREAS 2 AND 3 SHALL BE DREDGED PRIOR TO COMPLETION OF THE TEMPORARY SHEET PILE COFFERDAM TO FACILITATE USE OF THE SEDIMENT OFFLOAD AREA AT BOOM LANDING. AREA 1 SHALL NOT BE DREDGED UNTIL COMPLETION OF THE TEMPORARY SHEET PILE COFFERDAM.

SOURCE NOTES:

1. THIS DRAWING WAS DEVELOPED FROM A SURVEY DONE BY WISCONSIN PUBLIC SERVICE BY KJR ON 08/14/12, DRAWING "BOOM LANDING 8_12". THE CHANNEL LIMITS AND PORTIONS OF THE SHORELINE ARE FROM U.S. ARMY CORPS OF ENGINEERS DRAWING "CONDITION OF CHANNEL-SEP. 2008", SHEET 4 OF 4.
2. HORIZONTAL DATUM IS MARINETTE COUNTY COORDINATE SYSTEM, UNITS = US FOOT. VERTICAL DATUM IS NAVD88.
3. BATHYMETRIC SURVEY PERFORMED BY ENVIROSCAN, INC. NOVEMBER 15, 2011.
4. OFF-SITE UPLAND FEATURES DIGITIZED FROM BING MAPS AERIAL - © 2012 MICROSOFT CORPORATION.

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REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 2098/BID_CON

DRAWN BY: NWD 08/29/12

CHECKED BY: RJB/KRM/EJT 08/29/12

APPROVED BY: EJT 08/30/12

SEDIMENT DREDGE DEPTH OF CUT AND CONTOURS

FOCUSED NAPL AND SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

DRAWING NO: Aug 30, 2012 10:48am PLOTTED BY: ndraskovich SAVED BY: ndraskovich
I:\ACAData\Projects\20\2098\BID_CON\D2098-C032-00.dwg LAYOUT

REFERENCE: IMAGES:
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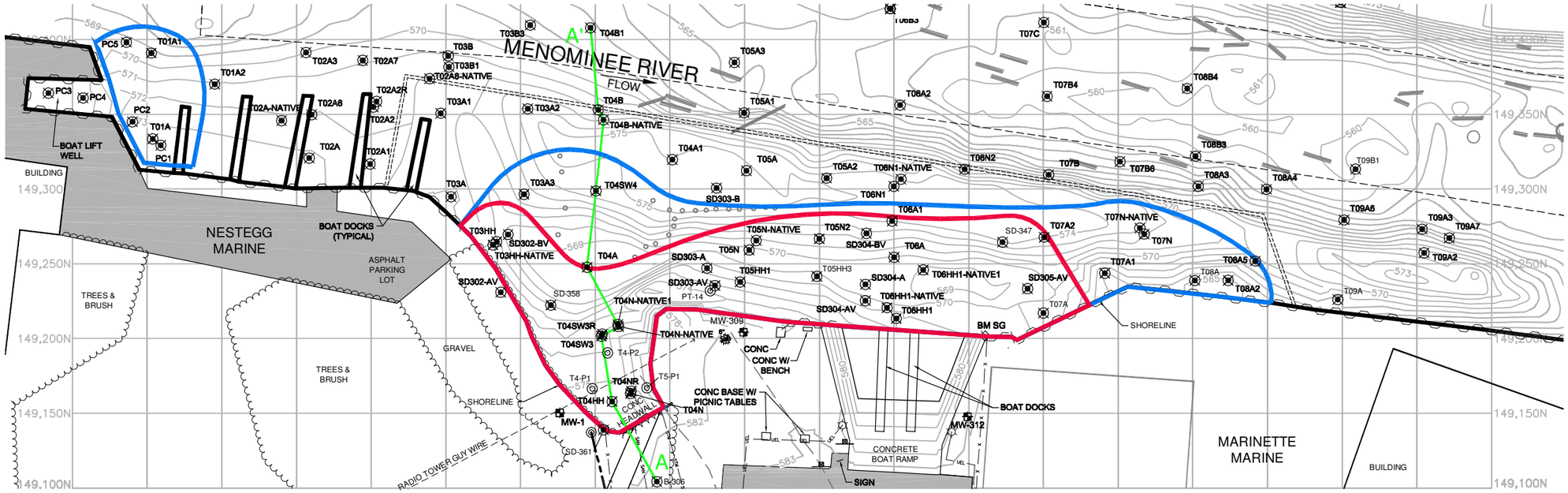
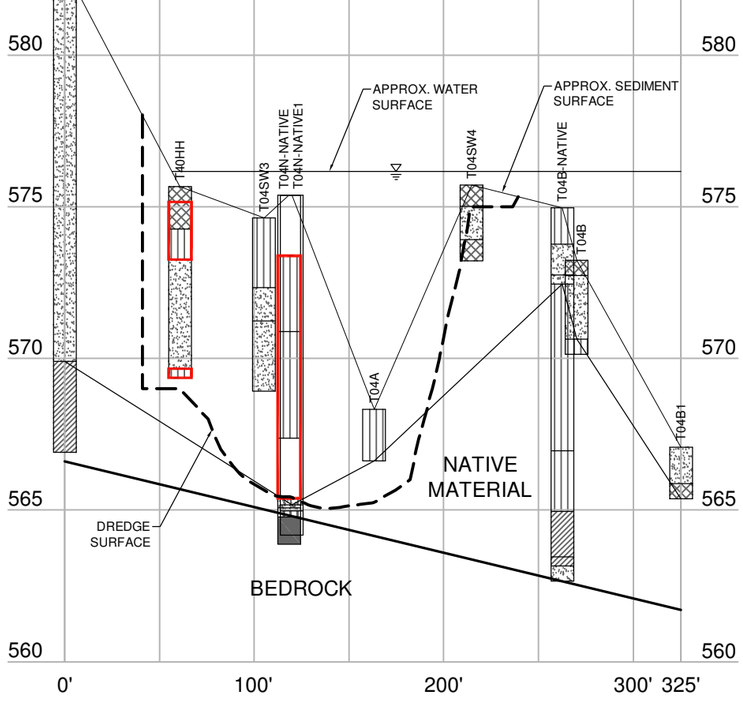
SHEET NO. C032





VERTICAL SCALE IN FEET: 5

HORIZONTAL SCALE IN FEET: 80

VERTICAL EXAGGERATION = 16

- PROPERTY LINE
- APPROXIMATE LOCATION OF SHORELINE
- APPROXIMATE LOCATION OF FORMER SLOUGH
- NAVIGATIONAL CHANNEL LIMITS
- FENCE
- SHEET PILE WALL
- SANITARY SEWER
- STORM SEWER
- UNDERGROUND ELECTRIC
- APPROXIMATE EDGE OF TREES & BRUSH
- GUY WIRE
- 2011 BATHYMETRIC CONTOURS
- LIGHT POLE
- PROPERTY CORNER
- SIGN
- DECIDUOUS TREE
- BM — BENCH MARK
- MW-1 — MONITORING WELL
- SUSPECTED LOG
- SUSPECTED DEBRIS (ROCKS AND/OR LARGE OBJECTS)
- WOOD PILINGS
- ASPHALT PAVEMENT
- APPROXIMATE EXTENT OF OBSERVED NAPL
- APPROXIMATE EXTENT OF PAH ≥22.8 mg/kg
- TEMPORARY SHEET PILE COFFER DAM
- T05D — SEDIMENT CORE SAMPLE
- SAND
- WOODY DEBRIS
- CLAY
- SILT
- LIMESTONE (BEDROCK)
- A — A' — CROSS SECTION LINE
- EMULSIFIED NAPL

N

0 20 40 80

SCALE IN FEET

SOURCE NOTES:

1. THIS DRAWING WAS DEVELOPED FROM A SURVEY DONE BY WISCONSIN PUBLIC SERVICE BY KJR ON 08/14/12, DRAWING "BOOM LANDING 8_12". THE CHANNEL LIMITS AND PORTIONS OF THE SHORELINE ARE FROM U.S. ARMY CORPS OF ENGINEERS DRAWING "CONDITION OF CHANNEL–SEP. 2008", SHEET 4 OF 4.
2. HORIZONTAL DATUM IS MARINETTE COUNTY COORDINATE SYSTEM, UNITS = US FOOT. VERTICAL DATUM IS NAVD88.
3. BATHYMETRIC SURVEY PERFORMED BY ENVIROSCAN, INC. NOVEMBER 15, 2011.
4. SEDIMENT BORING LOCATIONS PERFORMED BY NRT, APRIL 2012.
5. OFF–SITE UPLAND FEATURES DIGITIZED FROM BING MAPS AERIAL – © 2012 MICROSOFT CORPORATION.

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REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 2098/BID_CON

DRAWN BY: NWD 08/29/12

CHECKED BY: RJB/KRM/EJT 08/29/12

APPROVED BY: EJT 08/30/12

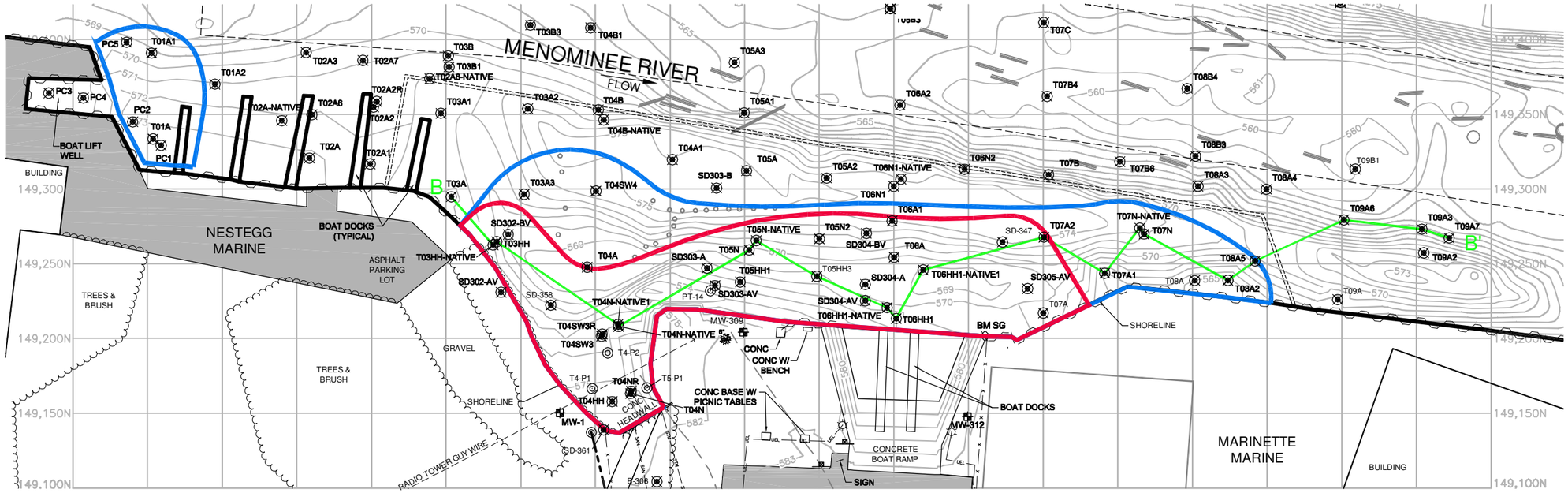
CROSS SECTIONS

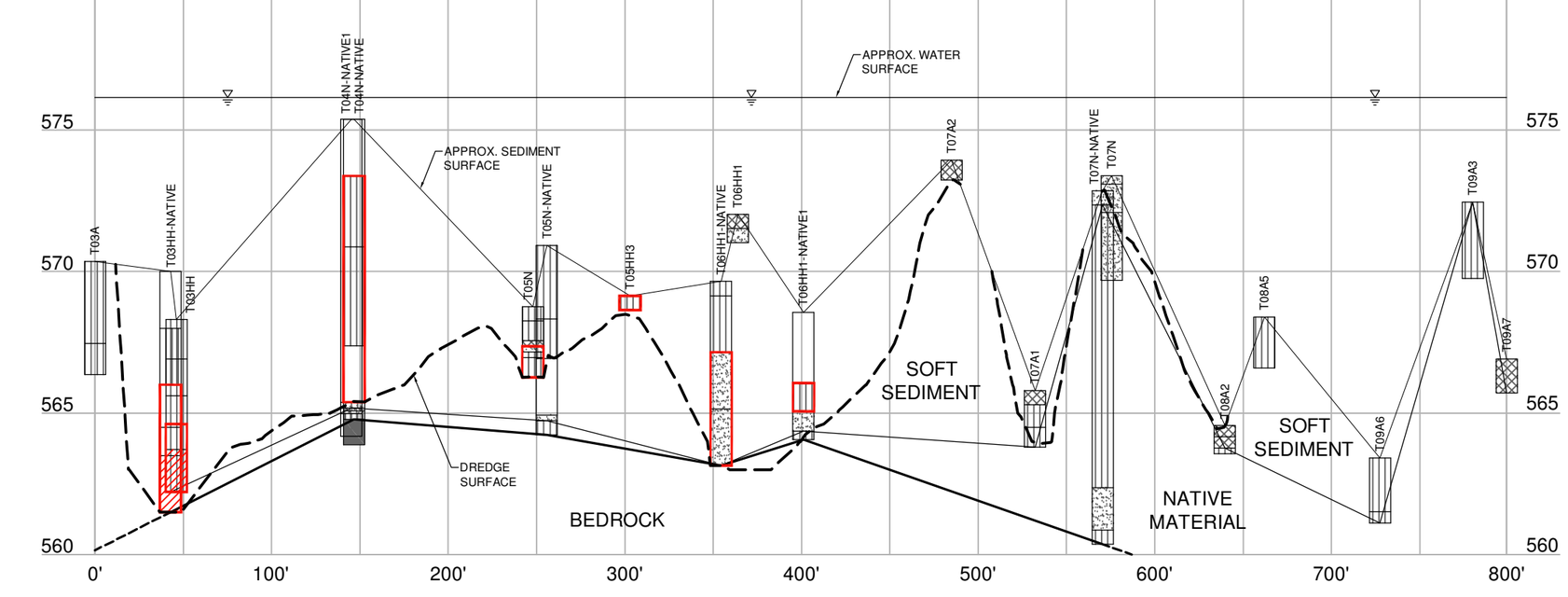
FOCUSED NAPL AND SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

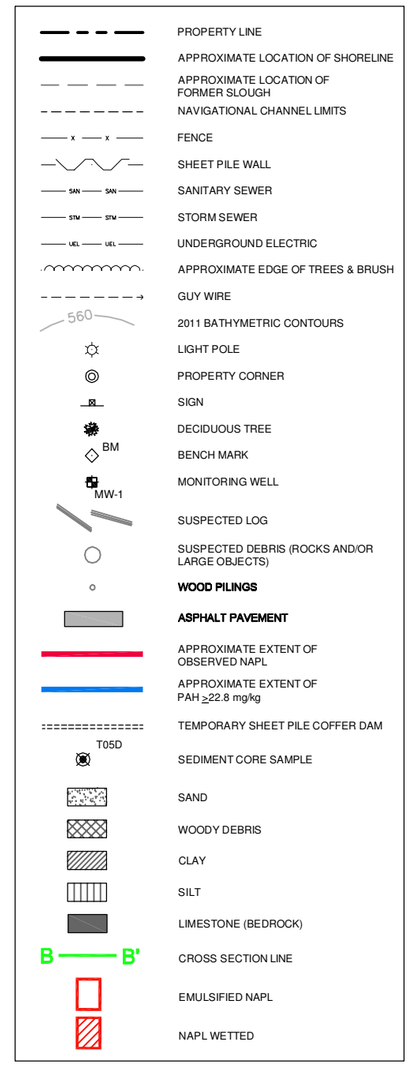
DRAWING NO: Aug 30, 2012 12:21pm PLOTTED BY: ndraskovich SAVED BY: ndraskovich
Y:\ACAData\Projects\20\2098\BID_CON\D2098-C033-00.dwg LAYOUT

REFERENCE: IMAGES:
XREFS: Y:\ACAData\Projects\20\2098\BID_CON\2098-BID_CON-BASE.dwg

SHEET NO. C033







VERTICAL SCALE IN FEET: 5 = 80

HORIZONTAL SCALE IN FEET

VERTICAL EXAGGERATION = 16

N

0 20 40 80

SCALE IN FEET

SOURCE NOTES:

1. THIS DRAWING WAS DEVELOPED FROM A SURVEY DONE BY WISCONSIN PUBLIC SERVICE BY KJR ON 08/14/12, DRAWING "BOOM LANDING 8_12". THE CHANNEL LIMITS AND PORTIONS OF THE SHORELINE ARE FROM U.S. ARMY CORPS OF ENGINEERS DRAWING "CONDITION OF CHANNEL–SEP. 2008", SHEET 4 OF 4.
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4. SEDIMENT BORING LOCATIONS PERFORMED BY NRT, APRIL 2012.
5. OFF–SITE UPLAND FEATURES DIGITIZED FROM BING MAPS AERIAL – © 2012 MICROSOFT CORPORATION.

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REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 2098/BID_CON

DRAWN BY: NWD 08/29/12

CHECKED BY: RJB/KRM/EJT 08/29/12

APPROVED BY: EJT 08/30/12

CROSS SECTIONS

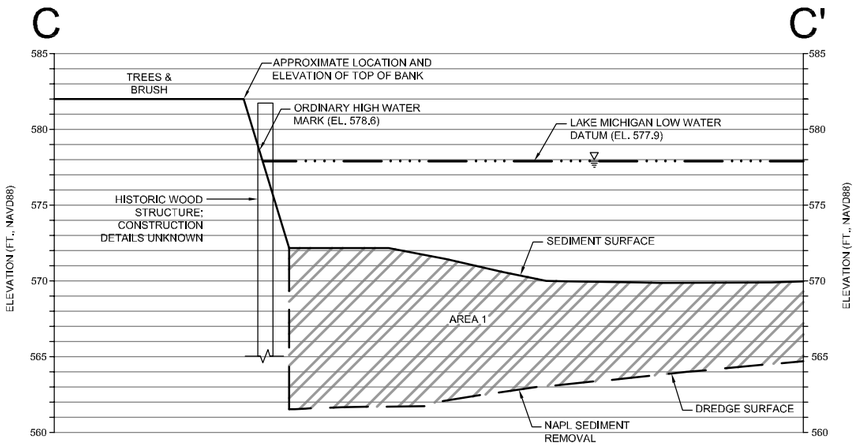
FOCUSED NAPL AND SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

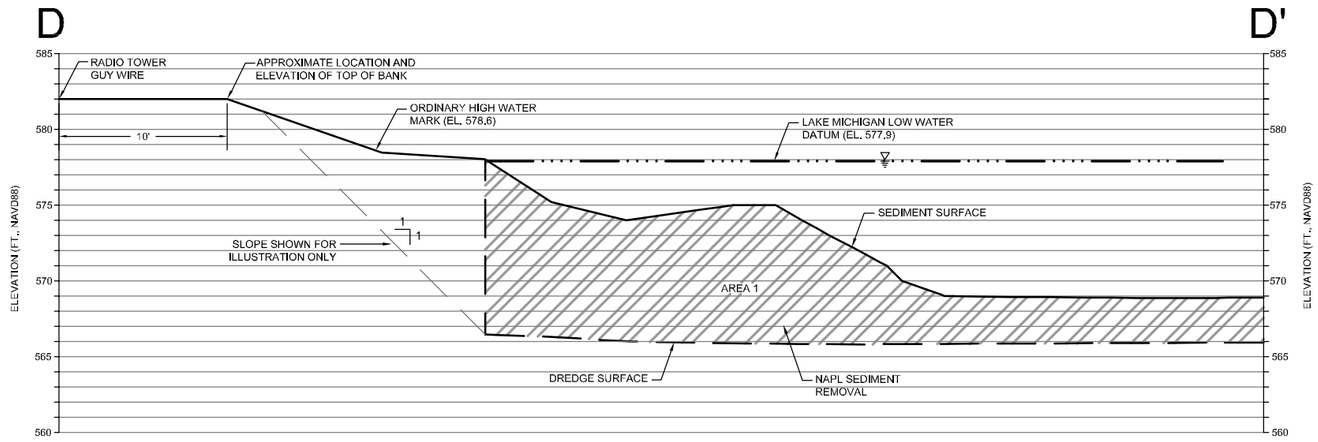
DRAWING NO: Aug 30, 2012 10:57am PLOTTED BY: ndraskovich SAVED BY: ndraskovich Y:\ACAData\Projects\20\2098\BID_CON\D2098-C034-00.dwg LAYOUT

REFERENCE: IMAGES: XREFS: Y:\ACAData\Projects\20\2098\BID_CON\2098-BID_CON-BASE.dwg

SHEET NO. C034

IMAGES:
XREFS: Y:\ACAData\Projects\20\2098\BID_CON\2098-BID_CON-BASE.dwg





1 C035 SOUTHWEST SHORELINE AT NESTEGG

CONTRACTOR NOTES:

1. REMOVAL OF WOOD STRUCTURE TO FACILITATE DREDGING SHALL BE COMPENSATED BY THE DEBRIS MANAGEMENT LINE ITEM ON BID FORM (ITEM #8).

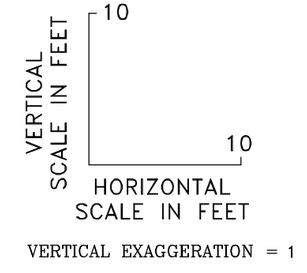
2. CONTRACTOR SHALL EXCAVATE SEDIMENT BEGINNING AT BOTTOM OF RIVER AND PROGRESSING INTO THE SHORELINE SLOPE. MAINTAIN STABLE EXCAVATION SLOPE AND RECONSTRUCT SHORELINE AS NEEDED TO RESTORE TO PRE-CONSTRUCTION CONDITIONS.

2 C035 SOUTH SHORELINE AT GUYWIRE

CONTRACTOR NOTES:

1. CONTRACTOR SHALL MAINTAIN MINIMUM 10-FT OFFSET FROM RADIO TOWER GUY WIRE ANCHOR.

2. CONTRACTOR SHALL EXCAVATE SEDIMENT BEGINNING AT BOTTOM OF RIVER AND PROGRESSING INTO THE SHORELINE SLOPE. MAINTAIN STABLE EXCAVATION SLOPE AND RECONSTRUCT SHORELINE AS NEEDED TO RESTORE TO PRE-CONSTRUCTION CONDITIONS.



VERTICAL EXAGGERATION = 1

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REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 2098/BID_CON
DRAWN BY: NWD 09/06/12
CHECKED BY: EJT 09/06/12
APPROVED BY: EJT 09/06/12

NAPL SEDIMENT DREDGE DETAILS

FOCUSED NAPL AND SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

DRAWING NO: Sep 06, 2012 1:33pm PLOTTED BY: ndraskovich SAVED BY: ndraskovich Y:\ACAData\Projects\20\2098\BID_CON\D2098-C035-00.dwg LAYOUT
REFERENCE: IMAGES: XREFS:

SHEET NO. C035

- APPROXIMATE LOCATION OF SHORELINE
- APPROXIMATE LOCATION OF FORMER SLOUGH
- NAVIGATIONAL CHANNEL LIMITS
- EXISTING FENCE
- EXISTING SHEET PILE WALL
- SANITARY SEWER
- STORM SEWER
- WATER MAIN
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- APPROXIMATE EDGE OF TREES & BRUSH
- GUY WIRE
- 2011 BATHYMETRIC & DREDGE CONTOURS
- MANHOLE
- CATCH BASIN
- LIGHT POLE
- UTILITY POLE
- HYDRANT
- WATER VALVE
- ELECTRIC PEDESTAL OR METER
- PROPERTY CORNER
- SIGN
- DECIDUOUS TREE
- CONIFEROUS TREE
- BENCH MARK
- MONITORING WELL
- SUSPECTED LOG
- SUSPECTED DEBRIS (ROCKS AND/OR LARGE OBJECTS)
- **WOOD PILINGS**
- NEW OUTFALL STRUCTURE
- BACKFILL MAJOR CONTOUR (5FT-INTERVAL)
- BACKFILL MINOR CONTOUR (1FT INTERVAL)
- RIPRAP APRON
- ASPHALT PAVEMENT

CONTRACTOR NOTES:

1. CONTRACTOR SHALL BACKFILL DREDGE AREAS 1 AND 2 AS SHOWN. FOLLOWING ACCEPTABLE RESULTS OF POST-DREDGE VERIFICATION SAMPLING, AS SPECIFIED IN THE CQAPP.
2. CONTRACTOR SHALL INSTALL NEW UPLAND BARRIER IN ACCORDANCE WITH APPENDIX E OF THE TECHNICAL SPECIFICATIONS.
3. CONTRACTOR SHALL RESTORE SHORELINES ACCORDING TO THE CONTRACT DOCUMENTS.
4. IF APPLICABLE, CONTRACTOR SHALL DECOMMISSION SEDIMENT STABILIZATION AREA. SEDIMENT STABILIZATION AREA CONSTRUCTION MATERIALS TO BE TRANSPORTED TO APPROVED LANDFILL.
5. CONTRACTOR SHALL REPLACE REMOVED OR DAMAGED PARK FEATURES.
6. CONTRACTOR SHALL REPLACE TOPSOIL, AS NECESSARY, TO RESTORE UPLAND WORK AREA. REVEGETATE WORK AREA TO EXISTING CONDITIONS.
7. CONTRACTOR SHALL REMOVE OIL-ABSORBANT BOOMS FROM COFFERDAM AREA AND DISPOSE AT APPROVED LANDFILL.
8. CONTRACTOR SHALL REMOVE TEMPORARY COFFERDAM UPON ENGINEER APPROVAL THAT PRE-REQUISITE WATER QUALITY INSIDE COFFERDAM, AS NOTED IN CONTRACT DOCUMENTS, HAS BEEN ATTAINED.
9. CONTRACTOR SHALL REMOVE SIGNS AND/OR BUOYS FROM RIVER.
10. CONTRACTOR SHALL REMOVE TRACKING PAD AND DISPOSE OF MATERIAL IN AN APPROPRIATE MANNER.
11. CONTRACTOR SHALL REMOVE TEMPORARY WORK AREA FENCE AND GATE.
12. CONTRACTOR SHALL CLEAN SIDEWALKS AND OTHER PAVED AREAS IN THE WORK AREA. CONTRACTOR SHALL REMOVE AND REPLACE FULL DEPTH OF ASPHALT PAVEMENT AND REPAIR SOFT SUBGRADE, AS NECESSARY, AND WHERE DEEMED NECESSARY BY ENGINEER AND/OR PROPERTY OWNER (CITY OF MARINETTE)
13. CONTRACTOR SHALL RESTORE SITE TO PRE-CONSTRUCTION CONDITIONS.
14. CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROLS AND DISPOSE OF MATERIALS IN AN APPROPRIATE MANNER, AS APPROVED BY ENGINEER.

SOURCE NOTES:

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REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

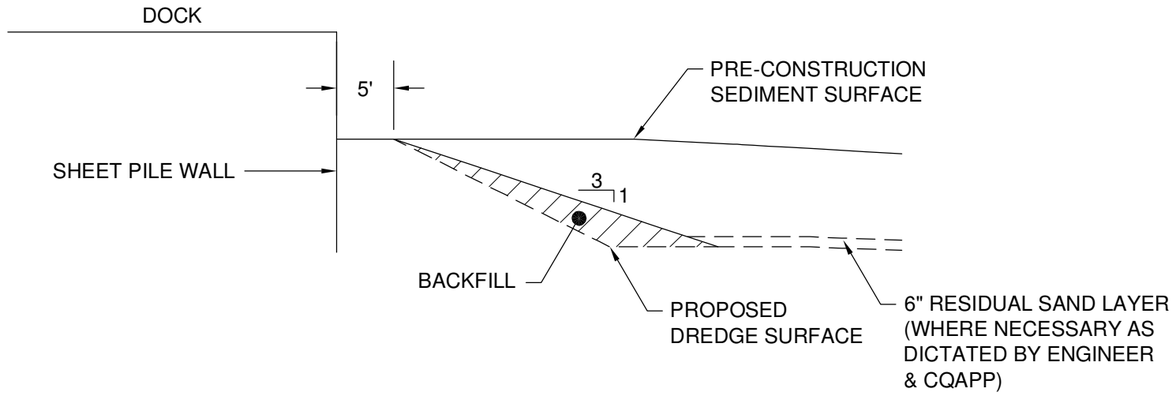
PROJECT NO.	2098/BID_CON
DRAWN BY:	NWD 08/29/12
CHECKED BY:	RJB/KRM/EJT 08/29/12
APPROVED BY:	EJT 08/30/12

SITE RESTORATION PLAN

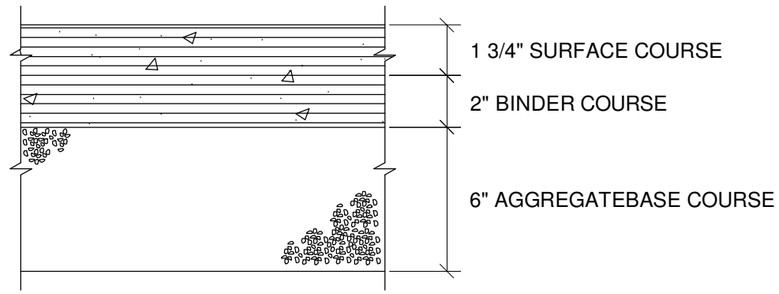
FOCUSED NAPL AND SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

DRAWING NO:	Aug 30, 2012 12:22pm PLOTTED BY: ndraskovich SAVED BY: ndraskovich Y:\ACAData\Projects\20\2098\BID_CON\D2098-C040-00.dwg LAYOUT
REFERENCE:	IMAGES: XREFS: Y:\ACAData\Projects\20\2098\BID_CON\2098-BID_CON-BASE.dwg

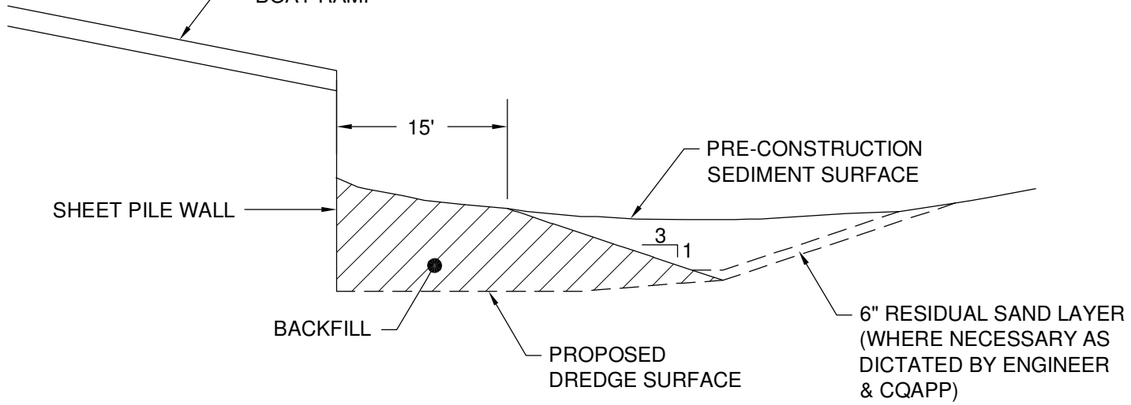
SHEET NO. C040



4 / C041 — CROSS SECTION THROUGH AREA 2
NOT TO SCALE



6 / C041 — ASPHALT PAVEMENT DETAIL
NOT TO SCALE



5 / C041 — CROSS SECTION THROUGH CENTER OF BOAT RAMP
NOT TO SCALE

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REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.	2098/BID_CON
DRAWN BY:	NWD 08/29/12
CHECKED BY:	RJB/KRM/EJT 08/29/12
APPROVED BY:	EJT 08/30/12

SITE RESTORATION DETAILS

FOCUSED NAPL AND SEDIMENT REMOVAL ACTION
FORMER MARINETTE MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MARINETTE, WISCONSIN

DRAWING NO: Aug 30, 2012 11:58am PLOTTED BY: ndraskovich SAVED BY: ndraskovich
K:\ACAData\Projects\20\2098\BID_CON\D2098-C041-00.dwg LAYOUT
REFERENCE: IMAGES: XREFS:

SHEET NO. C041