

Ryan Huber
U.S. Army Corps of Engineers
211 North Broadway, Suite 221
Green Bay, WI 54303

Arcadis U.S., Inc.
126 North Jefferson Street
Suite 400
Milwaukee
Wisconsin 53202
Tel 414 276 7742
Fax 414 276 7603
www.arcadis.com

Subject:
Application for Wetland and Waterway Permits for Tyco Fire Products, L.P.
Ditch Interim Action Project in Marinette, Wisconsin

ENVIRONMENT

Dear Mr. Huber:

Date:
8/23/2018

On behalf of Tyco Fire Products, L.P. (Tyco), Arcadis U.S., Inc. submits the attached application for wetland and waterway permits for implementation of a ditch interim action in the city of Marinette in Marinette County, Wisconsin.

Contact:
Corey Wilcox

This complete permit application includes a Water Resources Application for Project Permits, project narrative, figures and design drawings, photographs, the Wetland Delineation Report, and threatened and endangered species and historic and cultural resources evaluations.

Phone:
414.277.6214

Thank you in advance for your quick review of this package. If you have any questions or require additional information, please do not hesitate to contact me.

Email:
corey.wilcox@arcadis.com

Sincerely,

Our ref:
WI001605.0012

Arcadis U.S., Inc.



Corey Wilcox
Technical Expert

Section 5: Pre-Application Resource Screening

Screening your project site for the presence of sensitive natural or cultural resources before applying for a permit can assist you in planning and designing your project to avoid or minimize impacts to these resources. Please identify any screening you have already completed and attach any supporting documentation to your application. If sensitive resources are identified during the permit review, it may result in delays in processing your application and/or project re-design.

Waterways: Provide the name(s) of closest waterbodies:

Unnamed Tributary to the Little River

Wetlands: Has the project site been assessed for the presence of wetlands? [X] Yes [] No

If yes, select all sources of information used and attach supporting report or documentation:

- [X] Wisconsin Wetland Inventory
[] Wetland Locator Tool - http://dnr.wi.gov/topic/wetlands/locating.html
[X] Wetland Delineation by consultant
[X] NRCS Soils Map
[] DNR Wetland Identification letter - http://dnr.wi.gov/topic/wetlands/identification.html
[] DNR Wetland Confirmation letter - http://dnr.wi.gov/topic/wetlands/identification.html
[] Army Corps of Engineers Concurrence letter
[] Other:

Are wetlands proposed to be filled, excavated or disturbed during construction or as part of this project? [X] Yes [] No

Endangered or Threatened Resources:

Has the presence of endangered or threatened resources been evaluated according to the protocols developed by the DNR Bureau of Natural Heritage Conservation (BNHC)? dnrc.wi.gov/topic/ERReview/ [X] Yes [] No

If yes, select how evaluation was completed and attach supporting report or documentation:

- [] DNR BNHC ER Review Letter
[X] Certified ER Review Letter
[] Broad Incidental Take Permit/Authorization - specify (e.g. No/Low Impact Activities, Grassland and Savanna Management, etc.)
[] Other:

Section 6: Project Information (attach additional sheets as necessary)

Duration: 10/15/2018 Anticipated Project Start Date (mm/dd/yyyy) Anticipated Project End Date (mm/dd/yyyy)

Photos: Provide photographs of the "before" condition. 7/23/2018 Date of Photographs

Project Purpose and Need: Provide a one to two paragraph description of the proposed project, including land and water alterations and intended use(s) of the project.

Please see attached project narrative for a detailed description of the project purpose and need.

Section 7: Certification and Permission

Certification: I hereby certify that I am the owner or authorized representative of the owner of the property which is the subject of this Permit Application. I certify that the information contained in this form and attachments is true and accurate. I certify that the project will be in compliance with all permit conditions. I understand that failure to comply with any or all of the provisions of the permit may result in permit revocation and a fine and/or imprisonment or forfeiture under the provisions of applicable laws.

Permission: I hereby give the Department permission to enter and inspect the property at reasonable times, to evaluate this notice and application, and to determine compliance with any resulting permit coverage.

Eric Bretz

Signature of Landowner / Authorized Representative – For Stormwater applications, signature of landowner is required. Authorized representative is not sufficient.

Aug. 20, 2018

Date Signed

ERIC BRETZ

Printed Name of Landowner / Authorized Representative

DIR OPERATIONS Marquette


Title

Tyco Fire Products, L.P.

DITCH INTERIM ACTION
TYCO FIRE TECHNOLOGY CENTER
Wetland and Waterway Permit Application

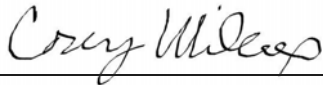
BRRTS Activity # 02-38-580694

August 2018

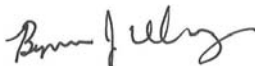


DITCH INTERIM ACTION

Wetland and Waterway Permit Application



Corey Wilcox
Technical Expert



Ben Verburg, P.E.
Principal Engineer



Michael Bedard
Project Lead

Prepared for:

Tyco Fire Products, L.P

Prepared by:

Arcadis U.S., Inc.

126 North Jefferson Street

Suite 400

Milwaukee

Wisconsin 53202

Tel 414 276 7742

Fax 414 276 7603

Our Ref.:

WI001605.0012

Date:

August 20, 2018

This document is intended only for the use of the individual or entity for which it was prepared and may contain information that is privileged, confidential and exempt from disclosure under applicable law. Any dissemination, distribution or copying of this document is strictly prohibited.

CONTENTS

1	Project Narrative	1
1.1	Project Description, Purpose, and Need.....	1
1.2	Methods, Materials, and Equipment	1
1.3	Proposed Construction Schedule and Sequence of Work	3
1.4	Description of Temporary and Permanent Erosion Control Measures.....	4
1.5	Proposed Location of Disposal Area for Dredged or Excavated Materials	5
1.6	Summary of Wetland and Waterways	5
1.7	Description of Disturbances or Fill.....	5
1.8	Avoidance, Minimization, and Mitigation of Impacts to Wetlands and Waterways.....	5
2	Riparian Property Owner Information	7
3	Threatened and Endangered Species	8
3.1	Wisconsin Department of Natural Resources – Endangered Resources Review.....	8
3.2	USFWS – Official Species List	8
4	Historical and Cultural Resources.....	10

APPENDICES

- A Ditch Interim Action Design Drawings
- B Photographic Log
- C Wetland and Waterbody Delineation Report
- D ERR Log #18-576
- E USFWS Office Species List

1 PROJECT NARRATIVE

1.1 Project Description, Purpose, and Need

Tyco Fire Products, L.P. (Tyco) is conducting a site investigation to assess the nature and extent of per- and poly-fluoroalkyl substances (PFAS) related to the Ansul Fire Technology Center (Site) located at 2700 Industrial Parkway South, Marinette, Wisconsin (Appendix A, Sheet C1). Due to the discovery of PFAS in surface waters during site investigation, Tyco is proposing to implement an interim action on its property at a location referred to as Site A in the city of Marinette in Marinette County, Wisconsin. Site A is located on an unnamed tributary to the Little River at approximately 45.07084° Latitude and -87.64212° Longitude in Section 13 of Township 30 North and Range 23 East. Photographs of the site are available in Appendix B.

Two PFAS compounds are the primary focus for the interim action: perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) and are collectively referred to in this document as “PFAS.”

Per ch. Natural Resources (NR) 708.11 Wis. Admin. Code, Tyco evaluated the surface water data and determined that an interim action was necessary to limit the discharge of PFAS in on-Site surface water to off-Site surface water and potential for surface water discharge to Lake Michigan. The interim action will be implemented in phases as access to off-Site property(ies) are obtained. Site A will focus on the removal of PFAS in surface water to off-Site surface water to the extent practicable using best available technology. Regulatory and technology considerations relative to the approach include:

- 1) There are no Wisconsin quality standards for PFAS listed in chs. NR 102, NR 104, NR 105, NR 106, NR 207, and NR 217.
- 2) There are no groundwater quality standards for PFAS listed in ch. NR 140.
- 3) Treatment of PFAS within surface waters will require impacts below the ordinary high-water mark (OHWM) of an unnamed ditch within the city of Marinette and therefore, the footprint and disturbance area for the interim action will be minimized to the extent practicable.
- 4) PFAS are resistant to most chemical and microbial treatment technology.
- 5) Mature technologies associated with petroleum cleanups (e.g., air stripper) are not effective due to low volatility of PFAS.

A detailed discussion on the Site-specific data and approach to the interim measure design are provided below.

1.2 Methods, Materials, and Equipment

PFAS is a category of emerging contaminants and ex-situ surface water treatment technologies are currently being evaluated. The Interstate Technology Regulatory Council has developed a series of technical documents based on the current science and emerging technologies to address PFAS in the environment. Activated carbon (ex-situ) and anionic exchange resins are the two most mature PFAS mitigation technologies.

DITCH INTERIM ACTION

In preparation for development of the proposed interim measures, Arcadis completed a detailed Site review utilizing preliminary hydraulic data (e.g., stream gauging), desktop research, and select analytical modeling to evaluate base flow conditions. From this data set, the base flow condition was estimated at 100 gallons per minute. Seasonal variability in flow conditions are expected (e.g., storm events); initial estimates of seasonal variability were made using United States Geological Survey Streamstats. Seasonal variability will be further assessed during the operation and maintenance of the interim action. In addition, wetland and waterway boundaries within the proposed project area was determined by conducting a wetland and waterbody delineation survey in the vicinity of the proposed project (see Section 1.6 below and the Wetland and Waterbody Delineation Report, Appendix C). Resulting wetland and waterbody boundaries were incorporated into engineering and design plans to avoid and minimize wetland and waterway impacts to the extent practicable, while still accomplishing the engineering design of the project. A summary of impacts to sensitive aquatic features is provided below in Section 1.7.

Granular activated carbon (GAC) was selected as the surface water treatment technology due to advantages in ease of operation, ability to reactivate and regenerate carbon, flexibility to modify the system in the field, and the ability to add pre-treatment unit operations in the field to address water chemistry (e.g., total organic carbon removal through hypochlorite).

Interim measures evaluated for the project included both a passive and active treatment approach utilizing GAC. Passive measures included the incorporation of GAC filter socks into a check dam structure within the ditches. However, the contact time necessary for passive measures to be effective under the base flow conditions was not sufficient to achieve adequate treatment of PFAS. An alternative passive approach involved damming of the ditches and establishment of a large backwater area with sufficient hydraulic head to push surface water through a passive membrane system. This approach was dismissed due to the potential for adverse impacts to upstream flood elevations. In addition, passive membrane systems can be subject to fouling due to natural silt deposition. Therefore, an active surface water extraction, treatment, and reintroduction system was selected as the most effective alternative. Treated water will be reintroduced immediately downstream of the inlet interim action.

The treatment system will be installed as shown in Appendix A, Sheet C2. The check dam will be placed approximately at the southern Site property boundary with construction access adjacent to the ditch through Tyco property. A temporary access road approximately 8 feet wide will be contained within the work area limits (Appendix A, Sheet C2) and cleared for piping and access. If needed, gravel may be used temporarily to allow equipment access. The surface water will be extracted and conveyed to a treatment system contained in Conex boxes (or similar structure) on the Site and conveyed and reintroduced immediately downstream of the inlet. Conveyance piping and/or flexible hose will be located above grade, adjacent to the OHWM.

A check dam will be placed perpendicular to water flow. The check dam will be permeable and constructed of Wisconsin Department of Transportation heavy rip rap ($D_{50} = 1.33$ feet). The purpose is to assist with the routing of surface water to the collection sump and is not intended to restrict surface water flow. Additional construction details are included on Appendix A, Sheet C4. Flow to the treatment system originates from the sump pump, which is installed in a sump upstream of the check dam inside the ditch (see details in Appendix A, Sheet C4). Flow in the ditch will enter the sump through a grate, which will stop any large objects from entering the sump. The pump will operate based on a level condition upstream of the check dam and will turn on or off depending on level set points. Once the water level in

DITCH INTERIM ACTION

the ditch reaches a designated set point, the pump will turn on and convey water to an equalization tank located at the treatment system (see Appendix A, Sheets M1 and P1). When the water level reaches the low set point upstream of the check dam, the sump pump will turn off. Water is conveyed from the sump to the treatment system through pipe or flexible hose.

The equalization tank will also be controlled by water level. If the water within the sump reaches a high set point, the sump pump will turn off. Water from the equalization tank will be conveyed to bag filters and GAC vessels using a feed pump controlled by a variable frequency drive (VFD). The VFD allows operators to control the speed of the pump. A flow meter, which can present total flow and instantaneous flow will be installed just downstream of the feed pump. Bag filters installed upstream of the GAC vessels will serve to remove naturally occurring particulates with the water. Pressure gauges on the upstream and downstream sides of the bag filters will allow operators to determine when they need to be replaced. Similarly, pressure gauges on the upstream and downstream sides of the GAC vessels will allow the operators to determine whether a GAC changeout is required. The activated carbon effectiveness will be further monitored through the collection of samples per the Discharge Management Plan developed for the Wisconsin Pollutant Discharge Elimination System (WPDES) General Permit for Contaminated Groundwater from Remedial Action Operations (WI-0046566) issued for the project to establish breakthrough timeframes and evaluate whether additional measures (e.g., pre-treatment) are applicable to increase treatment system efficiency. Once the water flows through the GAC vessels, it will be conveyed through pipe or flexible hose back to the downstream side of the check dam. Rip rap will be placed at the discharge point to prevent erosion caused by the discharge flow. Appendix A, Sheet P1 shows the general treatment process and equipment, and details on the construction of the check dam are provided on Appendix A, Sheet C4.

The system will contain a control panel, which will control the entirety of the system. If any alarm condition exists, the operators will be notified via a cellular modem. Power to the system will temporarily be supplied by a diesel generator, but the electrical design includes the option to connect to a power drop (shown on Appendix A, Sheet E1).

1.3 Proposed Construction Schedule and Sequence of Work

Construction of the interim action will begin upon approval of the required permits (estimated mid-October 2018). Construction is estimated to last two weeks; with the treatment system set-up taking the most time. Construction is anticipated to consist of the following general sequence/activities:

- **Clearing and Grading:** a contractor will be selected to complete the installation of stormwater best management practices prior to any ground disturbing activities. Construction will commence with removing obstacles if needed (large rocks, tree branches, brush, and logs) and grading the disturbance area to smooth any abrupt changes in ground contour as needed.
- **Excavation/Rip Rap Placement:** excavation of the trench to install pipelines, excavation to remove existing stream substrates within the stream to key-in the rip rap check dam, and placement of the pre-cast concrete sump. This step will also involve the construction of the rip rap check dams (Appendix A, Sheet C5).
- **Treatment System Installation:** sump pumps, check dams, valve, meters, pipelines, auxiliary building placement, and other appurtenance installation.

DITCH INTERIM ACTION

- Backfilling and Grade Restoration: repair and replacement of spoils within excavated trenches and removal of extra spoils from the workspaces.
- Cleanup and Restoration: disturbed areas will be graded, and debris will be properly disposed of.

Stream diversion and/or other surface water flow diversion measures are not a component of construction. Construction equipment will consist of standard construction equipment (e.g., backhoe) and local and commercially available construction materials (e.g., Wisconsin Department of Transportation (WDOT) sized heavy rip rap).

1.4 Description of Temporary and Permanent Erosion Control Measures

The project will be completed in a manner that minimizes the potential for erosion and sedimentation during the proposed construction and allows for effective restoration of disturbed areas. The total disturbance for the project will be less than one acre and therefore, it is not anticipated that a WPDES Construction Stormwater Permit will be required. However, the project will involve impacts within and adjacent to state and federally regulated aquatic resources and has been consequently designed to minimize erosion and sedimentation within these resources to the greatest extent possible. Erosion control during project activities will be accomplished through the following:

- Minimizing the quantity and duration of soil exposure.
- Protecting erodible areas (e.g., steep slope or exposed, loose sandy soil areas) during construction by reducing the velocity of and redirecting runoff.
- Installing and maintaining erosion and sediment control measures prior to earth disturbing activities.
- Stabilized construction entrance(s).
- Construction Road Stabilization (as needed).
- Disturbed areas will be finish graded, seeded, and mulched, as necessary. Seasonally-appropriate seed mixes and appropriate erosion control devices and measures will be installed and maintained until the site is successfully revegetated.
- Inspecting disturbed areas and maintaining erosion and sediment controls as necessary until final stabilization is achieved.

The main form of temporary erosion control is planned to be filter socks. This method was chosen because it does not require significant earth disturbance and is easily moved. As shown on Appendix A, Sheet C3, there are two filter sock installation methods; one for earth installation and one for pavement installation. Both provide sufficient erosion control. Specific placement of filter socks (or similar) is depicted on Appendix A, Sheet C2. Catch basin inlet protection (Appendix A, Sheet C3) will be used, as necessary, to decrease any sediment or debris from entering the catch basins. Temporary best management practices were designed in accordance with Wisconsin Department of Natural Resources (WDNR) technical standards.

Impacted areas will be restored to pre-existing contours and seeded using an appropriate seed mix, including annual ryegrass, to establish vegetative cover. Hay or similar type of mulch may be used to help seed germination.

DITCH INTERIM ACTION

No permanent surface type changes are proposed for the project and, as a result, no increase in impervious surfaces will occur. All impacts resulting from the project will be temporary and therefore post-construction stormwater management efforts will be limited to the restoration of pre-construction contours and the stabilization of soils via establishment of vegetation to prevent erosion.

1.5 Proposed Location of Disposal Area for Dredged or Excavated Materials

Sediments excavated from the stream as part of the construction of the check dam will be containerized and staged on-Site pending characterization and disposal.

1.6 Summary of Wetland and Waterways

A wetland and waterbody delineation survey was conducted by Arcadis for the proposed project on July 23, 2018. Arcadis identified three wetlands (totaling 1.44 acres) and two streams (totaling 1,725 linear feet) within the environmental survey area (ESA). The Wetland and Waterbody Delineation Report is provided in Appendix C.

The ESA at Site A contained Wetland 1, Wetland 2, Wetland 3, and Stream 1. All wetland and waterbody features appeared to be hydrologically connected to surface water systems within the vicinity of the ESA and may be considered jurisdictional by the United States Army Corp of Engineers and WDNR.

1.7 Description of Disturbances or Fill

The interim measure treatment system will be installed in an upland area at the south end of the Tyco facility. The check dam will be installed within the ditch near University Drive. Piping for the system will be laid on the ground surface between the treatment system and the check dam (Appendix A, Sheet C2). Installation of the interim measure treatment system will result in a total of approximately 1,104 square feet (0.03 acres) of temporary wetland impacts and approximately 400 square feet (0.01 acres)/33.6 cubic yards of temporary fill below the OHWM of the unnamed tributary to the Little River.

The trench fill material consists of native soil, with granular bedding class I, II, or III for all non-paved existing surfaces. For all parking lots or roadways, trench fill material consists of granular backfill class I, II, or III. Existing general fill followed by pavement will be placed above the granular backfill. In the ditch areas, WDOT heavy rip rap (D50 = 1.33 feet) will be used to create the check dam. This rip rap will also be used as erosion control at the outlet of the discharge pipe.

1.8 Avoidance, Minimization, and Mitigation of Impacts to Wetlands and Waterways

The proposed interim measures were designed to minimize impacts to sensitive aquatic resources to the extent possible. As part of project planning, wetland and waterway boundaries within the proposed project areas were determined by conducting a wetland and waterbody delineation survey in the vicinity of the proposed project (see Wetland and Waterbody Delineation Report, Appendix C). Resulting wetland and waterbody boundaries were incorporated into engineering and design plans to avoid and minimize

DITCH INTERIM ACTION

wetland and waterway impacts to the extent practicable, while still accomplishing the engineering design of the project.

Due to the nature of the project and the need to address PFAS concentrations in surface waters, a complete avoidance of impacts is not feasible. However, the proposed temporary interim measure has been designed to reduce impact footprints within the ditch and adjacent wetlands by selecting a location downstream limits of analytical detections of PFAS. Focusing on this location allows for the treatment of larger quantities of surface water with minor impacts, rather than utilizing multiple locations along the length of the ditch. The location within the ditch has been subjected to significant historical channelization and does not contain critical habitat for wildlife. Additionally, due to fluctuating flow through the year, extreme channelization, and narrow channels, this location offers limited opportunities for public interest.

The treatment system has been sited in an area that makes use of existing disturbed surfaces that do not contain sensitive aquatic resources and the pipelines that convey water to and from the ditch has been routed to avoid wetlands and waterways to the greatest extent necessary. The interim action will require the placement of piping across two wetlands (Wetlands 1 and 2); however, in the pipelines will be laid on the ground surface rather than trenched in. Wetland 3 (near University Drive) will be avoided. The narrow diameter of the proposed pipelines (6 inch or less) will result in minimal impact and it is anticipated that the existing vegetation will grow alongside and over them. This approach will preserve the wetland soil profile and seed bank such that revegetation can occur more quickly once the pipelines are removed in the future.

Lastly, the proposed interim measure is temporary by nature and will not result in permanent impacts to wetlands or waterbodies and therefore, no mitigation is proposed at this time.

2 RIPARIAN PROPERTY OWNER INFORMATION

Tyco is the owner of the property where the proposed treatment system will be installed.

3 THREATENED AND ENDANGERED SPECIES

3.1 Wisconsin Department of Natural Resources – Endangered Resources Review

Arcadis conducted a certified Endangered Resources Review (ERR) through the WDNR Bureau of Natural Heritage Conservation for each site to evaluate potential impacts of the proposed project to state-listed resources. The purpose of this section is to summarize the results of the ERRs.

WDNR ERR Log # 18-567(Appendix D) identified northern dry forest, Great Lakes beach, lake sturgeon (*Acipenser fulvescens*), and few-flowered spike-rush (*Eleocharis quinqueflora*) as resources with the potential to occur within the vicinity of the project area. Per the ERR, no actions need to be taken to comply with state and/or federal endangered species laws.

Northern dry forest is a habitat community that may occur within the project site. Natural communities may contain rare or declining species and their protection should be incorporated into project design as much as possible. Minimizing impacts to and/or incorporating buffers along the edges of northern dry forest is recommended.

Great Lakes beach is a habitat community that is not present within the project site. Therefore, no adverse impacts to Great Lakes beach are anticipated as a result of this project.

Lake sturgeon are known to occur in the Menominee River and shoal waters of Lake Michigan. The proposed project is not anticipated to result in impacts to the Menominee River or Lake Michigan and the unnamed tributary to the Little River does not provide suitable habitat for lake sturgeon due to insufficient depth and width. Therefore, no adverse impacts to lake sturgeon are anticipated as a result of this project.

Few-flowered spike-rush are found on cold coniferous poor fen mats, but also in a variety of moist meadows in calcareous areas. The project site does not contain these habitat types. Therefore, no adverse impacts to few-flowered spike-rush are anticipated as a result of this project.

Additionally, the Wisconsin Natural Heritage Inventory (NHI) database contains all current northern long-eared bat roost sites and hibernacula in Wisconsin. The NHI database contains verified survey results from WDNR, United States Fish and Wildlife Service (USFWS), and private organizations. The NHI database was consulted for this project, and per the USFWS 4(d) rule, it was determined that this project is more than 150 feet from a known maternity roost tree and is more than 0.25 miles from a known hibernaculum. This project is also not located within a rusty patched bumble bee high potential zone.

3.2 USFWS – Official Species List

Arcadis utilized the USFWS Information for Planning and Consultation tool to generate an official species list (OSL) for each site to evaluate potential impacts of the proposed project on federally-listed resources. The purpose of this section is to summarize the results of the OSLs.

The USFWS OSL (Appendix E) for the proposed project identified Canada lynx (*Lynx canadensis*), gray wolf (*Canis lupus*), northern long-eared bat (*Myotis septentrionalis*), and Kirtland's warbler (*Setophaga*

DITCH INTERIM ACTION

kirtlandii) as species that may occur within the proposed project area, and/or may be affected by the project. There are no critical habitats within the project area.

Canada lynx are found in moist boreal forests that have cold, snowy winters and a high-density snowshoe hare prey base. The predominant vegetation of boreal forests is conifer trees, primarily species of spruce and fir. In the contiguous United States, the boreal forest type transitions to deciduous temperate forest in the Great Lakes Region. The proposed project is located in deciduous woodland surrounded by urban development. Therefore, no adverse impacts to Canada lynx are anticipated as a result of this project.

Gray wolves are habitat generalists and lived throughout the northern hemisphere. They only require ungulate prey and human-caused mortality rates that are not excessive. A wolf pack's territory may cover 20 to 120 square miles. Thus, wolves require a lot of space in which to live. The proposed project is surrounded by urban development. Therefore, no adverse impacts to gray wolves are anticipated as a result of this project.

Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live trees and snags of dead trees. No caves or mines are located within the project area. Though limited tree clearing may be necessary, the proposed project is more than 150 feet from a known maternity roost tree and is more than 0.25 miles from a known hibernaculum. Therefore, no adverse impacts to northern long-eared bats are anticipated as a result of this project.

Kirtland's warblers nest in young jack pine forests. They require large stands of young, dense jack pine forest at least 80 acres in size, but prefer stands of 300 to 400 acres, or larger. The project area does not contain large stands of young, dense jack pine forest. Therefore, no adverse impacts to Kirtland's warblers are anticipated as a result of this project.

4 HISTORICAL AND CULTURAL RESOURCES

In accordance with Section 106 under the National Historic Preservation Act and the 36 Code of Federal Regulations 800 outlined by the Advisory Council on Historic Preservation, federal agencies must take into account the effects of their undertakings on historic properties. At a state level, pursuant to Wisconsin State Legislation NR 716.07(8)(d), persons identified under sub. NR 716.02(1) shall conduct a site investigation that includes “potential for impact to [...] sites or facilities of historical or archaeological significance.”

To address both federal and state level legislation, Arcadis conducted a records review and background research through the Wisconsin Historic Preservation Database in February 2018 for the Project. The purpose of this archival review was to locate, and document previously conducted cultural resources investigations and known cultural resources within a 1-mile radius of the Project. Information collected include data from the Archaeological Report Inventory, Archaeological Sites Inventory, and the Architecture and History Inventory. Results of the background research indicated that seven archaeological resources, 37 architectural and historical resources, and nine previous cultural resources surveys have been conducted within a 1-mile radius of the Project. None of these known cultural resources or surveys are located within the Project footprint.

Review of the record search results indicated that no known cultural resources have been recorded within the Project limits. Given the minimal size and nature of the Project, portions of the Project are within previously disturbed areas, Project activities are confined to the ground surface and the absence of archaeological resources with the Project limits, Arcadis recommends that the interim action installation activities associated with the Project will have no effect on historic properties.

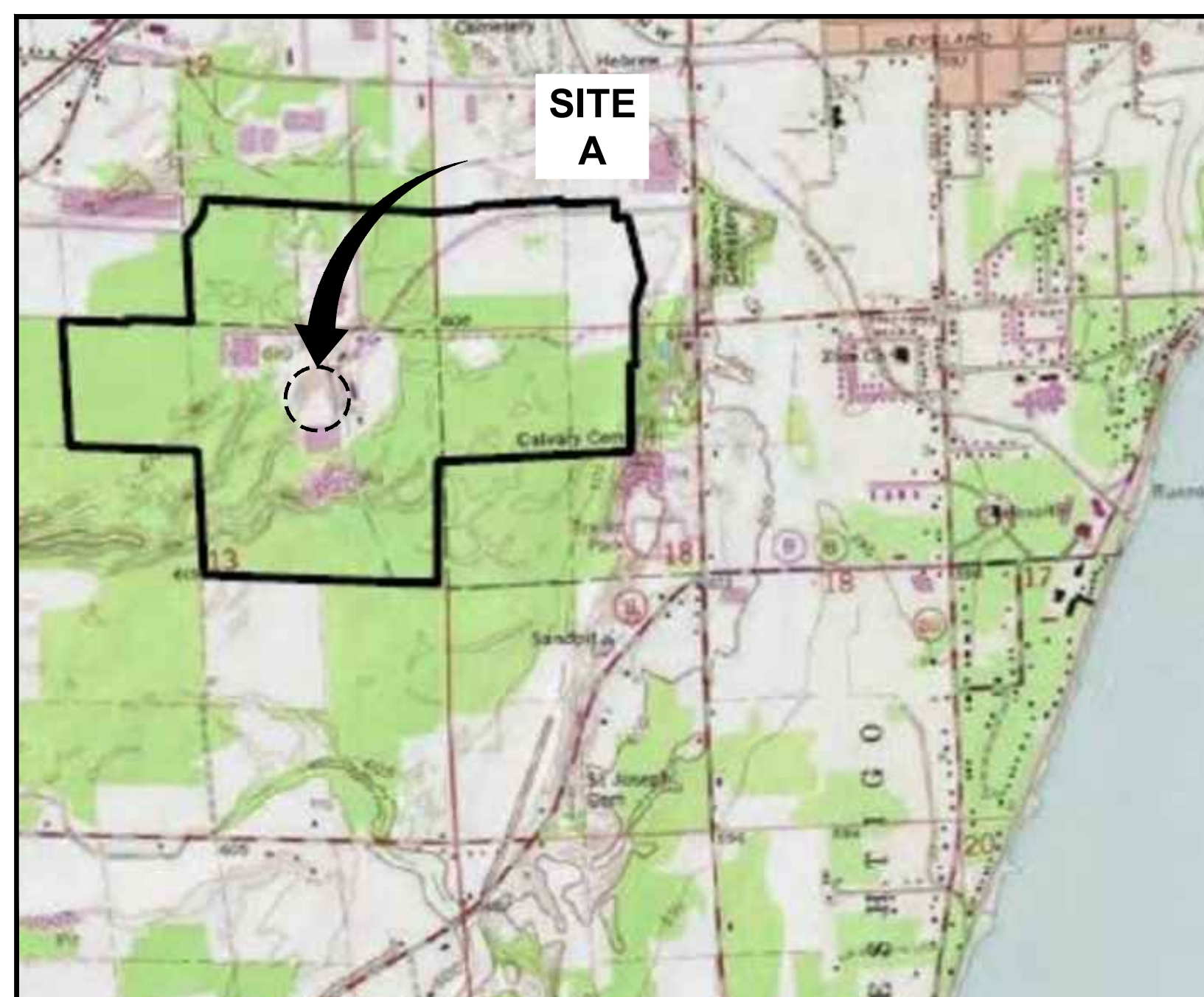
APPENDIX A

Ditch Interim Action Design Drawings



User: J:\VALLEY_Spec\ANS-NE50001 File: G:\APR\PROJECT\TYCD\W001605\ARCADIS\INTERIM ACTION\TITLE AND INDEX\INDEX.DWG Scale: 11/2 Saved: Date: 8/17/2018 Time: 09:51 Plot Date: Allen, Jonathan V., 8/20/2018, 11:59 J

DITCH INTERIM ACTION DESIGN

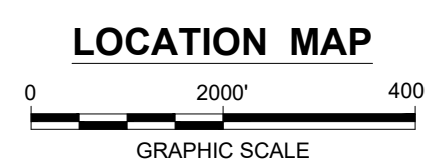


DATE ISSUED
AUGUST 20, 2018

**ANSUL FTC SITE
MARINETTE, WISCONSIN**

INDEX TO DRAWINGS

G1	TITLE AND INDEX
G2	ABBREVIATIONS AND GENERAL NOTES
G3	SPECIFICATIONS (SHEET 1 OF 5)
G4	SPECIFICATIONS (SHEET 2 OF 5)
G5	SPECIFICATIONS (SHEET 3 OF 5)
G6	SPECIFICATIONS (SHEET 4 OF 5)
G7	SPECIFICATIONS (SHEET 5 OF 5)
C1	OVERALL SITE PLAN
C2	DITCH A SITE PLAN
C3	CIVIL DETAILS
C4	CHECK DAM DETAILS
M1	GENERAL LAYOUT
P1	PIPING AND INSTRUMENTATION DIAGRAM
E1	ELECTRICAL SINGLE LINE DIAGRAM



ARCADIS U.S., INC.



LEGAL ENTITY:
ARCADIS U.S., Inc.
ARCHITECTURAL AND
ENGINEERING SERVICES, INC.

COPYRIGHT: 2015

CONSULTANTS

NO.	DATE	ISSUED FOR	BY
0	08/20/18	DESIGN PACKAGE ISSUED FOR REVIEW	EE

SEALS

**NOT
FOR
CONSTRUCTION**

DATE:	08/20/18
PROJECT NO.:	W1001605.0001
FILE NAME:	DRAFT-1_G1_BID.DOC
DESIGNED BY:	BV
DRAWN BY:	EE
CHECKED BY:	MA

MARINETTE, WI
ANSUL FTC SITE
TITLE AND INDEX
DITCH INTERIM ACTION DESIGN

ARCADIS PROJ. NO. W1001605.0001

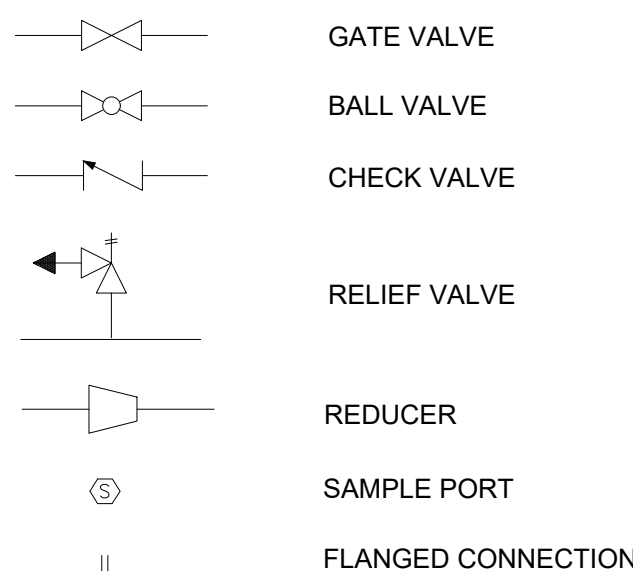
SHEET TITLE

TITLE AND INDEX

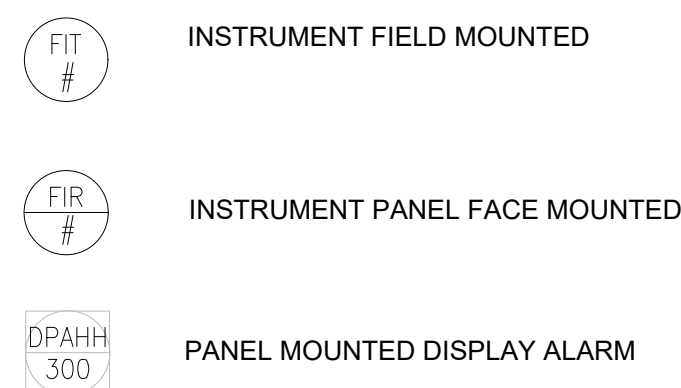
SCALE:

G1
SHEET ___ OF ___

VALVE SYMBOLS



INSTRUMENTATION SYMBOLS



INSTRUMENT IDENTIFICATION LEGEND

	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE,	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER FLAME		NOT USED	NOT USED	NOT USED
C	CONDUCTIVITY (ELECTRICAL)			CONTROL	CLOSED
D	DENSITY (MASS) OR SPECIFIC GRAVITY	DIFFERENTIAL			
E	VOLTAGE (EMF)		PRIMARY ELEMENT		
F	FLOW RATE	RATIO (FRACTION)			
G	INTRUSION		GLASS GAGE (UNCALIBRATED)		
H	HAND (MANUALLY INITIATED)				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME OR TIME SCHEDULE			CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOISTURE OR HUMIDITY				MIDDLE OR INTER-MEDIATE
N	SEQUENCE STRATEGY		NOT USED	NOT USED	NOT USED
O	NOT USED		ORIFICE (RESTRICTION)		OPEN
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)	PULSE	
Q	QUANTITY	INTEGRATE OR TOTALIZE			
R	RADIOACTIVITY		RECORD OR PRINT		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION			VALVE, DAMPER OR LOUVER	
W	WEIGHT OR FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT STATUS	Y AXIS		RELAY OR COMPUTE	
Z	POSITION			DRIVE, ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT	

CODES/STANDARDS:

- AI ASPHALT INSTITUTE
- AASHTO AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
- ACI AMERICAN CONCRETE INSTITUTE
- ANSI AMERICAN NATIONAL STANDARDS INSTITUTE
- ASCE AMERICAN SOCIETY OF CIVIL ENGINEERS
- ASTM AMERICAN SOCIETY FOR TESTING AND MATERIALS
- AWS AMERICAN WELDING SOCIETY
- AWWA AMERICAN WATER WORKS ASSOCIATION STANDARD
- IEEE INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
- ISA INTERNATIONAL SOCIETY OF AUTOMATION
- NEC NATIONAL ELECTRICAL CODE
- NEMA NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
- NESC NATIONAL ELECTRICAL SAFETY CODE
- NFPA NATIONAL FIRE PROTECTION ASSOCIATION
- OSHA OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
- UL UNDERWRITERS LABORATORY

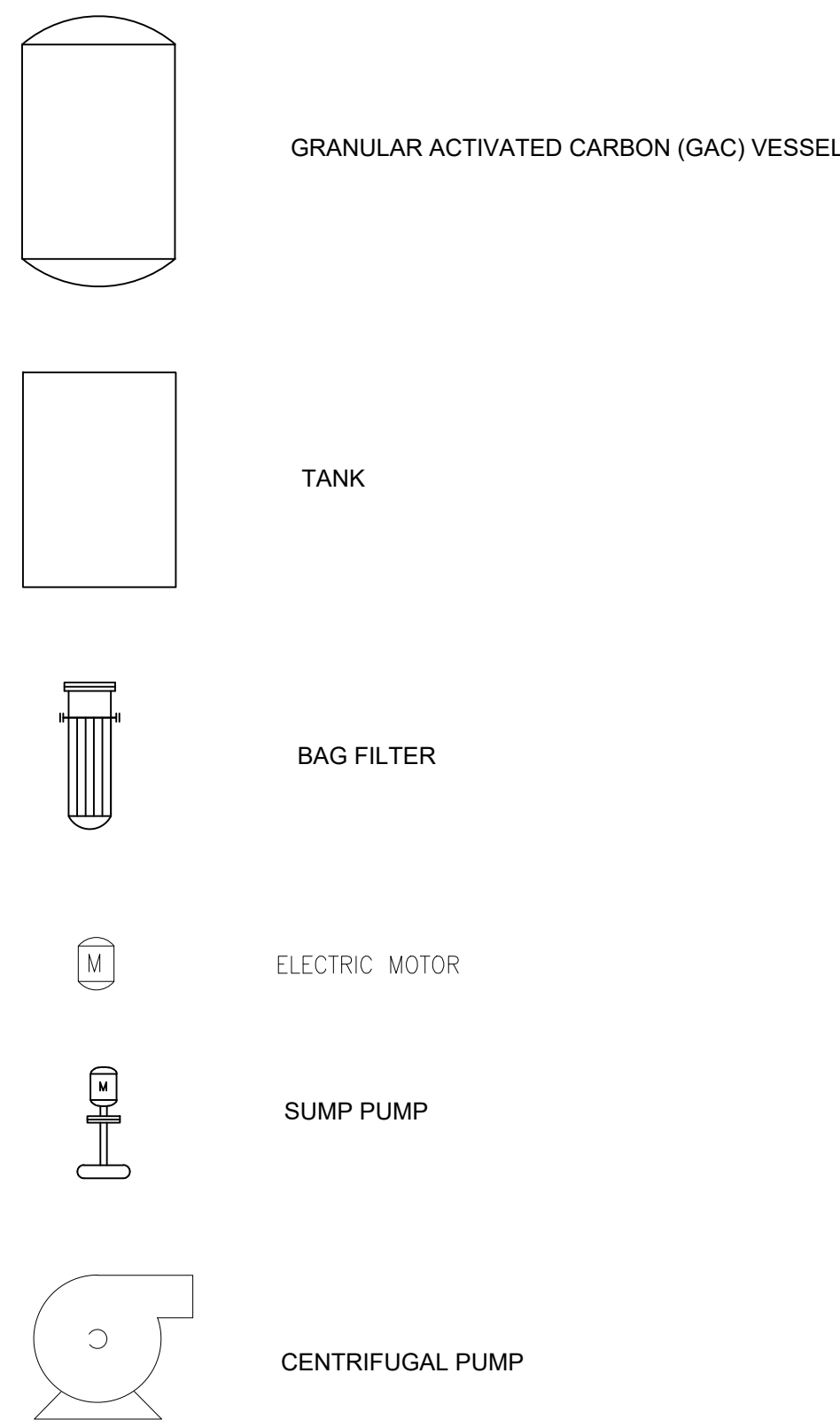
ABBREVIATIONS

- & AND
- @ AT
- 1PH SINGLE-PHASE
- 1P SINGLE-POLE
- 2/C TWO-CONDUCTOR
- 3/C THREE-CONDUCTOR
- 3PH THREE-PHASE
- 3PLY THREE-PLY
- 3W THREE-WIRE
- 4/C FOUR-CONDUCTOR
- 4OUT QUADRUPLE RECEPTACLE OUTLET
- 4PDT FOUR-POLE DOUBLE THROW
- 4PST FOUR-POLE SINGLE THROW
- 4W FOUR-WIRE
- CS CARBON STEEL
- CPVC CHLORINATED POLYVINYLCHLORIDE
- DGR DIRECTED GROUNDWATER RECIRCULATION
- EQ EQUALIZATION
- EX EXTRACTION
- GAC GRANULAR ACTIVATED CARBON
- GAL GALLONS
- GPD GALLONS PER DAY
- GPM GALLONS PER MINUTE
- HDPE HIGH DENSITY POLYETHYLENE
- HP HORSE POWER
- ID INSIDE DIAMETER
- INJ INJECTION
- IW INJECTION WELL
- MIN MINIMUM
- MAX MAXIMUM
- MCE MODULAR CONTROL EQUIPMENT
- MCP MAIN CONTROL PANEL
- MW MONITORING WELL
- NO NUMBER
- NPT NATIONAL PIPE THREAD
- NTS NOT TO SCALE
- OD OUTSIDE DIAMETER
- PB PANEL BOARD
- PVC POLYVINYLCHLORIDE
- SCH SCHEDULE
- SDR SIZE DIAMETER RATIO
- SST STAINLESS STEEL
- TYP TYPICAL
- VAC VOLTS ALTERNATING CURRENT

NOTES:

1. CONTRACTOR SHALL CLEAR TREES AS NECESSARY AND CUT STUMPS FLUSH WITH GRADE.
2. ALL ELECTRICAL WORK SHALL MEET ALL FEDERAL AND LOCAL CODES.
3. CONTRACTOR SHALL TAKE PRECAUTIONS TO PROTECT ALL UTILITIES, STRUCTURES, AND EASEMENTS PRESENT ON AND AROUND THE SITE. ANY DAMAGE TO THESE UTILITIES DUE TO WORK PERFORMED SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
4. CONTRACTOR SHALL RESTORE SITE TO THE EXISTING CONDITIONS UPON COMPLETION OF THE WORK.
5. CONTRACTOR SHALL SEED AND STRAW ONCE THE WORK IS COMPLETED IN ACCORDANCE WITH THE WDNR STORM WATER BEST PRACTICES.
6. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE PROCEDURES AND SEQUENCE TO ENSURE THE SAFETY OF THE WORK AND PERSONNEL DURING CONSTRUCTION.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE UTILITIES FOR RECOMMENDED RELOCATION, PROTECTION, AND CONTROLS.
8. CONTRACTOR SHALL MAINTAIN BENDING RADII GREATER THAN THE DEFLECTION ANGLES LESS THAN THE HDPE MANUFACTURERS RECOMMENDATIONS FOR INSTALLATION OF HORIZONTAL OR VERTICAL CURVES.
9. SIGNS, MARKERS, AND FLAGS SHALL BE INSTALLED BY THE CONTRACTOR FOR ALL UNDERGROUND UTILITIES.
10. UTILITY LOCATION WORK SHALL BE PERFORMED BY THE CONTRACTOR.
11. MAINTAIN THE SITE DRAINAGE SUCH THAT ALL SURFACE WATER WITHIN EARTH DISTURBING LIMITS IS DIVERTED THROUGH EROSION AND SEDIMENT CONTROL MEASURES.

EQUIPMENT SYMBOLS



LEGAL ENTITY:
ARCADIS U.S., Inc.
ARCHITECTURAL AND
ENGINEERING SERVICES, INC.

COPYRIGHT: 2015

CONSULTANTS

NO.	DATE	ISSUED FOR	BY
0	08/20/18	DESIGN PACKAGE ISSUED FOR REVIEW	EE

SEALS

NOT FOR CONSTRUCTION

DATE:	08/20/18
PROJECT NO.:	W001605.0001
FILE NAME:	DRAFT-2_G2 ABBREVIATIONS
DESIGNED BY:	BV
DRAWN BY:	EE
CHECKED BY:	MA

MARINETTE, WI

ANSUL FTC SITE

DITCH INTERIM ACTION DESIGN

SHEET TITLE

ABBREVIATIONS AND GENERAL NOTES

SCALE:

G2

SHEET 1 OF 1

ARCADIS PROJ. NO. W001605.0001

User: \\VALLER Spec\AUS\NCS\MOD File\G:\PROJECT\TC\W001605\CADD\DTCH\INTERIM ACTION\DTCH A ONLY PACKAGE\SUBMITTED 08/20/18_DRAFT AND PC STAMP REMOVED\DRAWING_G4-SPECIFICATIONS (SHEET 2 OF 5).DWG Scale: 1:1 Saved: 08/20/18 11:55: Layout: G4

TRENCH EXCAVATION AND BACKFILL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. SCOPE:
 1. WORK IN THIS SECTION INCLUDES TRENCHING AND BACKFILLING AND PLACEMENT OF PIPE AND MANHOLE EMBEDMENT FILL.
- B. RELATED DOCUMENTS:
 1. DRAWINGS.
 2. SYSTEM REQUIREMENTS DOCUMENT.

1.2 REFERENCES

- A. CONTRACTOR SHALL USE THE MOST RECENT VERSION OF STANDARDS AND CODES, UNLESS NOTED OTHERWISE.
- B. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).
- C. MASTER SPECIFICATIONS, WISCONSIN DEPARTMENT OF ADMINISTRATION (DOA)
- D. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM).
 1. ASTM D698 - STANDARD TEST METHODS FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT (12 400 FT-LBF/FT³ (600 KN-M/M³)).
 2. ASTM D2487 - STANDARD PRACTICE FOR CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES (UNIFIED SOIL CLASSIFICATION SYSTEM).
 3. ASTM D6913 - STANDARD TEST METHODS FOR PARTICLE-SIZE DISTRIBUTION (GRADATION) OF SOILS USING SIEVE ANALYSIS
 4. ASTM D7928 - STANDARD TEST METHOD FOR PARTICLE-SIZE DISTRIBUTION (GRADATION) OF FINE-GRAINED SOILS USING THE SEDIMENTATION (HYDROMETER) ANALYSIS

1.3 SUBMITTALS

- A. ACTION SUBMITTALS: SUBMIT THE FOLLOWING:
 1. PRODUCT DATA:
 - a. A CATALOGUE CUT SHEET FOR MARKER TAPE.
 - b. FOR EACH SOURCE OF PIPE AND MANHOLE EMBEDMENT FILL MATERIALS:
 - 1) SOURCE OF THE PIPE AND MANHOLE EMBEDMENT FILL MATERIALS.
 - 2) WRITTEN CERTIFICATION FROM THE MANUFACTURER OR SUPPLIER THAT MATERIALS CONFORM TO THE REQUIREMENTS OF THIS SECTION.
 - 3) RESULTS OF TESTING PERFORMED BY THE MANUFACTURER OR SUPPLIER THAT CONFIRM THAT MATERIALS CONFORM TO THE REQUIREMENTS OF THIS SECTION.
 - c. A 50 POUND REPRESENTATIVE SAMPLE OF THE MATERIAL FROM EACH SOURCE OF MANHOLE AND EMBEDMENT FILL MATERIAL FOR VISUAL EXAMINATION AND CONFORMANCE TESTING.
 - d. ALTERNATIVE METHODS FOR PIPE INSTALLATION MAY BE CONSIDERED BY THE CONTRACTOR, SUBJECT TO REVIEW AND APPROVAL BY THE COMPANY (INCLUDING DIRECTIONAL DRILLING). FOR ALTERNATIVE METHODS TO BE CONSIDERED A LIST OF EQUIPMENT AND MATERIALS; DESCRIPTION OF CONSTRUCTION MEANS, METHODS, AND TECHNIQUES; AND OTHER DETAILED INFORMATION NECESSARY TO FULLY DESCRIBE THE NEW ALTERNATIVE METHOD(S).
 2. INFORMATIONAL SUBMITTALS: SUBMIT THE FOLLOWING:
 1. CERTIFICATIONS:
 - a. TRENCH SHORING AND WALKWAY DESIGN SHALL BE CERTIFIED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF WISCONSIN.
 2. QUALITY CONTROL:
 - a. LIST OF EQUIPMENT AND MATERIALS; DESCRIPTION OF CONSTRUCTION MEANS, METHODS, AND TECHNIQUES; AND OTHER REQUIRED INFORMATION FOR TRENCHING AND BACKFILLING AND PLACEMENT OF PIPE AND MANHOLE EMBEDMENT FILL.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. OBTAIN BACKFILL MATERIAL FROM EXCAVATION AND TRENCHING INCLUDED IN THIS CONTRACT. ADDITIONAL MATERIAL, IF REQUIRED, SHALL BE OBTAINED FROM THE ON SITE STOCKPILES OR ON-SITE BORROW AREAS IDENTIFIED BY THE ENGINEER.
- B. FURNISH NATURAL SAND OR SAND MANUFACTURED FROM STONE FOR PIPE EMBEDMENT FILL MATERIAL.
- C. PRIOR TO USE, VERIFY WITH THE COMPANY THAT BACKFILL MATERIALS CONFORM TO THE REQUIREMENTS FOR THEIR INTENDED USE.
- D. BACKFILL MATERIAL FOR PIPES; ELECTRICAL CONDUIT; AND VALVE HOUSES AND STRUCTURES SHALL CONFORM TO THE MATERIAL REQUIREMENTS FOR FILL SPECIFIED IN THE EARTHWORK NOTES.
- E. FURNISH TRENCH SHORING AND WALKWAY MATERIALS, WHERE REQUIRED, IN ACCORDANCE WITH THE CERTIFIED TRENCH SHORING AND WALKWAY DESIGN.
- F. OBTAIN CONSTRUCTION WATER FOR MOISTURE CONDITIONING BACKFILL FROM THE ON SITE WATER FILLING STATIONS SHOWN ON THE DRAWINGS.

2.2 EQUIPMENT

- A. FURNISH EQUIPMENT TO PERFORM TRENCHING AND BACKFILLING AND PIPE AND MANHOLE EMBEDMENT FILL MATERIAL PLACEMENT IN ACCORDANCE WITH THIS SECTION.

PART 3 - EXECUTION

3.1 EXISTING CONDITIONS

- A. VERIFY EXISTING GRADES IN ACCORDANCE WITH THE SURVEYING NOTES.
- B. IF A VERTEBRATE PALEONTOLOGICAL OR ARCHAEOLOGICAL ARTIFACT DISCOVERY IS MADE DURING TRENCHING, STOP WORK IN THE AREA OF DISCOVERY AND NOTIFY THE COMPANY. WORK IN THE AREA OF DISCOVERY SHALL NOT RESUME UNTIL AUTHORIZED BY THE COMPANY.
- C. IDENTIFY AND STAKE EXISTING ABOVE AND BELOW GROUND UTILITIES IN VICINITY OF TRENCHING. STAKING AND/OR MARKING SHALL BE IN ACCORDANCE WITH THE SURVEYING NOTES AND AS APPROVED BY THE COMPANY.
- D. PROTECT EXISTING ABOVE AND BELOW GROUND UTILITIES.
- E. IN AREAS OF TRENCHING AND BACKFILLING, DO NOT INTERRUPT THE EXISTING UTILITY SERVICE UNLESS AUTHORIZED BY THE COMPANY.
- F. DO NOT DAMAGE OR DISTURB PERMANENT SURVEY MONUMENTS, FINISHED CONSTRUCTION AREAS AND STRUCTURES, EXISTING UTILITIES AND STRUCTURES. DAMAGE SHALL BE REPAIRED OR REPLACED TO THE ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
- G. PERFORM CLEARING, GRUBBING AND STRIPPING IN ACCORDANCE WITH THE CLEARING, GRUBBING, AND STRIPPING NOTES.
- H. PRIOR TO PERFORMING WORK DESCRIBED IN THIS SECTION, INSTALL AND MAINTAIN SURFACE

WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROLS IN ACCORDANCE WITH THE SURFACE WATER MANAGEMENT AND EROSION CONTROL NOTES.

- I. INSTALL CONSTRUCTION SAFETY FENCE IN ACCORDANCE WITH THE EARTHWORK NOTES.
 - J. STABILIZE DISTURBED AREAS IN ACCORDANCE WITH TEMPORARY OR PERMANENT SEEDING AND APPLY MULCH WITHIN TIME FRAMES IDENTIFIED IN THE CONTRACT DOCUMENTS AND UNDER APPLICATION CONDITIONS AS DESCRIBED IN THE ODNR STANDARDS.
 - K. IMPLEMENT DUST CONTROL.
- 3.2 TRENCHING
- A. TRENCHES FOR INSTALLATION OF PIPES, AND OTHER STRUCTURES SHALL BE TO THE DEPTHS, ELEVATIONS, AND DIMENSIONS SHOWN ON THE DRAWINGS. STOCKPILE EXCESS MATERIAL FROM TRENCHING AT LOCATIONS DESIGNATED BY THE COMPANY. STOCKPILE MATERIALS IN ACCORDANCE WITH THE EARTHWORK NOTES.
 - B. USE SHORING METHODS ACCEPTED BY THE COMPANY. SHORING SHALL CONFORM TO APPLICABLE LOCAL, STATE, AND FEDERAL REQUIREMENTS, AND SHALL BE INSTALLED IN ACCORDANCE WITH THE SHORING AND WALKWAY DESIGN CERTIFIED BY THE WISCONSIN-REGISTERED PROFESSIONAL ENGINEER. PROVIDE APPROPRIATE NON-SKID SURFACE WALKWAYS FOR ACCESS ACROSS OPEN TRENCHES, SUCH AS CONSTRUCTED WOODEN WALKWAYS. AND INSTALLED IN ACCORDANCE WITH THE DESIGN CERTIFIED BY THE WISCONSIN-REGISTERED PROFESSIONAL ENGINEER. STORE SHORING AND WALKWAY MATERIALS ON-SITE PRIOR TO BEGINNING TRENCHING ACTIVITIES. MAINTAIN THE SAFETY AND STABILITY OF EXCAVATIONS AND TRENCHES BY PROPERLY INSTALLING SUPPORTS ACCORDING TO THE CERTIFIED DESIGN AND THE MANUFACTURER'S REQUIREMENTS.
 - C. PROTECT AND MAINTAIN THE TRENCH BOTTOM. REMOVE ROCK FRAGMENTS OR RAVELED MATERIALS THAT COLLECT ON THE TRENCH BOTTOM. BACKFILL OVER-EXCAVATIONS WITH FILL IN ACCORDANCE WITH THIS SECTION AND THE EARTHWORK NOTES. EXCAVATE UNSUITABLE SOIL ENCOUNTERED AT THE TRENCH BOTTOM AND BACKFILL TO TRENCH BOTTOM ELEVATION WITH FILL IN ACCORDANCE WITH THE EARTHWORK NOTES.
 - D. WHERE TRENCHES WILL BE EXCAVATED IN FILL AREAS, PERFORM TRENCHING ONLY AFTER FILL HAS REACHED AT LEAST 24 INCHES ABOVE THE TOP OF THE PIPE DESIGN ELEVATION UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
 - E. EXCAVATE FOR STRUCTURES TO AT LEAST 6 INCHES BELOW FOUNDATION ELEVATIONS AND PLACE AGGREGATE BASE OR BACKFILL TO THE FOUNDATION ELEVATIONS SHOWN ON THE DRAWINGS. AGGREGATE BASE AND FILL SHALL BE IN ACCORDANCE WITH THE AGGREGATE BASE AND EARTHWORK NOTES.
 - F. FOR PIPE INSTALLATION, LIMIT THE MAXIMUM LENGTH OF OPEN TRENCH TO 200 FEET IN ADVANCE AND 200 FEET BEHIND PIPE UNLESS OTHERWISE AUTHORIZED BY THE COMPANY.
 - G. CONTINUOUSLY DEWATER TRENCHES WHEN WATER IS PRESENT. PERFORM DEWATERING IN ACCORDANCE WITH THE EARTHWORK NOTES.
 - H. DO NOT LEAVE THE BOTTOM OF TRENCHES ROUGH OR UNEVEN; SMOOTH OUT THE BOTTOM OF TRENCHES TO THE REQUIRED DESIGN.

3.3 BACKFILLING

- A. GENERAL:
 1. DO NOT BACKFILL WITH FROZEN OR SATURATED MATERIAL.
 2. DO NOT BACKFILL OVER FROZEN, WET, OR SOFT TRENCH BOTTOM OR SIDE SLOPES. REMOVE MATERIALS THAT ARE FROZEN, WET, OR SOFT AS SPECIFIED IN THIS SECTION.
 3. DO NOT DISTURB OR DAMAGE PIPING, OR STRUCTURES DURING BACKFILLING; DAMAGED MATERIALS SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
 4. DO NOT USE COMPACTION EQUIPMENT THAT EXERTS GREATER THAN 10 POUNDS PER SQUARE INCH (PSI) GROUND PRESSURE OVER PIPING THAT IS COVERED BY LESS THAN 12 INCHES OF BACKFILL MATERIAL.
- C. PLACEMENT OF PIPE EMBEDMENT FILL FOR PIPES:
 1. PLACE PIPE EMBEDMENT FILL IN MAXIMUM 6-INCH THICK LOOSE LIFTS AND COMPACT EACH LIFT TO THE ELEVATION OF THE BOTTOM OF THE PIPE.
 2. COMPACT EACH LIFT OF PIPE EMBEDMENT FILL WITH A MINIMUM OF FOUR PASSES WITH VIBRATORY HAND COMPACTION EQUIPMENT.
 3. GRADE THE PIPE EMBEDMENT FILL TO THE BOTTOM OF THE PIPE DESIGN ELEVATION PRIOR TO PLACING PIPE.
 4. PLACE PIPE ON TOP OF THE COMPACTED AND GRADED PIPE EMBEDMENT FILL.
 5. PLACE PIPE EMBEDMENT FILL IN MAXIMUM 6-INCH-THICK LOOSE LIFTS TO THE DEPTH SHOWN ON THE DRAWINGS. COMPACT EACH LIFT WITH A MINIMUM OF FOUR PASSES WITH VIBRATORY HAND COMPACTION EQUIPMENT, OR BY OTHER MEANS, METHODS, AND TECHNIQUES SUCH THAT INTIMATE CONTACT WITH THE PIPE IS MAINTAINED.
- D. PLACEMENT OF BACKFILL MATERIAL FOR PIPES:
 1. AFTER PLACEMENT AND COMPACTION OF PIPE EMBEDMENT FILL TO THE LIMITS SHOWN ON THE DRAWINGS, PLACE BACKFILL MATERIAL IN MAXIMUM 4 INCH THICK LOOSE LIFTS TO A MINIMUM DEPTH OF 12-INCHES ABOVE THE PIPE. AFTER 12-INCHES OF MATERIAL HAS BEEN PLACED ABOVE THE PIPE, PLACE BACKFILL MATERIAL IN MAXIMUM 8 INCH THICK LOOSE LIFTS.
 2. COMPACT THE BACKFILL MATERIAL IN EACH LIFT TO THE SPECIFICATIONS FOR FILL MATERIAL SPECIFIED IN THE EARTHWORK NOTES TO A MINIMUM ELEVATION OF 3 FEET ABOVE THE TOP OF PIPE USING A WALK-BEHIND PAD-FOOT COMPACTOR, HAND TAMPER, OR VIBRATORY PLATE COMPACTOR, OR BY OTHER MEANS, METHODS, AND TECHNIQUES.
 3. CONSTRUCTION EQUIPMENT SHALL NOT BE ALLOWED OVER THE TOP OF PIPES UNTIL A MINIMUM OF 3 FEET OF BACKFILL MATERIAL HAS BEEN PLACED AND COMPACTED ABOVE THE TOP OF PIPES UNLESS OTHERWISE APPROVED BY THE ENGINEER.
- E. PLACE MARKER TAPE IN BACKFILL BELOW FINISHED ELEVATION ABOVE UNDERGROUND PIPES, CONTROL CABLES, AND ELECTRICAL CONDUITS AS SHOWN ON THE DRAWINGS. PLACE MARKER TAPE TO THE DEPTH SHOWN ON THE DRAWINGS.

3.4 FIELD QUALITY CONTROL/ACCEPTANCE CRITERIA

- A. CQC SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND THE CQA PROJECT PLAN.
- B. CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES THROUGH THE COMPANY TO ACCOMMODATE THE ACTIVITIES REQUIRED OF THE CQC CONTRACTOR.
- C. CQC CONTRACTOR WILL MONITOR TRENCHING AND BACKFILLING AS SPECIFIED IN THIS SECTION AND THE CQA PROJECT PLAN.
- D. CQC CONTRACTOR WILL PERFORM PERFORMANCE TESTING ON THE PIPE EMBEDMENT FILL AND BACKFILL PLACEMENT TO CONFIRM COMPLIANCE WITH THIS SECTION AND THE CQA PROJECT PLAN. CONTRACTOR SHALL PROVIDE EQUIPMENT, SUCH AS SHOVELS, HAND AUGERS, AND BACKHOES, AND LABOR TO ASSIST CQC CONTRACTOR IN OBTAINING SAMPLES FROM EXCAVATIONS, TRENCHING, STOCKPILES, AND BORROW AREAS. THE PERFORMANCE TESTING TO BE PERFORMED AND TESTING FREQUENCIES SHALL BE IN ACCORDANCE WITH THE CQA PROJECT PLAN AND THE EARTHWORK NOTES.
- E. CQC CONTRACTOR AND COMPANY WILL REVIEW AND VERIFY AS-BUILT BOTTOM OF TRENCH ELEVATIONS PRIOR TO BACKFILLING.

F. TOLERANCES:

1. TOP OF PIPE AND EMBEDMENT FILL MATERIAL SHALL BE PLACED WITHIN 0.0 TO +0.2 FEET OF THE MINIMUM THICKNESS SHOWN ON THE DRAWINGS.
2. BACKFILL MATERIAL SHALL BE PLACED WITHIN 0.0 TO +0.1 FEET OF THE EXISTING GROUND OR FINISHED ELEVATION SHOWN ON THE DRAWINGS.

G. BASIS OF ACCEPTANCE: THE COMPANY WILL APPROVE THE WORK WHEN THE CONTRACTOR HAS THOROUGHLY DEMONSTRATED THAT THE WORK IS COMPLETE AND SATISFACTORY TO THE ENGINEER.

3.5 SURVEY CONTROL

- A. SURVEY THE LOCATIONS, LIMITS, AND ELEVATIONS OF THE PIPE AND MANHOLE EMBEDMENT FILL AND BACKFILL IN ACCORDANCE WITH THE SURVEYING NOTES.
- B. SURVEY THE LOCATIONS, LIMITS, AND ELEVATIONS OF STRUCTURES AND PIPES, INCLUDING INVERT ELEVATIONS, IN ACCORDANCE WITH THE SURVEYING NOTES.

AGGREGATE BASE

PART 1- GENERAL

1.1 DESCRIPTION

- A. SCOPE:
 1. WORK IN THIS SECTION INCLUDES MATERIAL AND PLACEMENT REQUIREMENTS FOR HEAVY DUTY AGGREGATE SURFACING FOR ROADS AND AGGREGATE SURFACES AS SHOWN ON THE DRAWINGS.
- B. RELATED DOCUMENTS:
 1. DRAWINGS.
 2. SYSTEM REQUIREMENTS DOCUMENT.

1.2 REFERENCES

- A. CONTRACTOR SHALL USE THE MOST RECENT VERSION OF STANDARDS AND CODES, UNLESS NOTED OTHERWISE.
- B. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).
- C. MASTER SPECIFICATIONS, WISCONSIN DEPARTMENT OF ADMINISTRATION (DOA).
- D. ASTM D6913 - STANDARD TEST METHODS FOR PARTICLE-SIZE DISTRIBUTION (GRADATION) OF SOILS USING SIEVE ANALYSIS

1.3 SUBMITTALS

- A. FOR EACH SOURCE OF AGGREGATE BASE MATERIAL, SUBMIT THE FOLLOWING TO THE ENGINEER IN ACCORDANCE WITH THE CONTRACT DOCUMENTS:
 1. SOURCE OF THE MATERIAL ALONG WITH WRITTEN CERTIFICATION FROM THE SUPPLIER THAT THE AGGREGATE BASE MATERIAL CONFORM TO THE REQUIREMENTS OF WISCONSIN DOA MASTER SPECIFICATIONS AND THIS SECTION; AND
 2. TEST RESULTS AS REQUIRED BY WISCONSIN DOA DEMONSTRATING THAT THE AGGREGATE BASE MATERIAL CONFORMS TO THE REQUIREMENTS OF WISCONSIN DOA AND THIS SECTION.
- B. PRIOR TO COMMENCEMENT OF WORK DESCRIBED IN THIS SECTION, SUBMIT TO THE ENGINEER IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, A LIST OF EQUIPMENT AND MATERIALS; DESCRIPTION OF CONSTRUCTION MEANS, METHODS, AND TECHNIQUES.
- C. PRIOR TO COMMENCEMENT OF WORK DESCRIBED IN THIS SECTION, SUBMIT TO THE ENGINEER IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, A TRAFFIC CONTROL PLAN, INCLUDING ROAD SIGNS, OTHER TRAFFIC CONTROL DEVICES AND FLAGGING REQUIREMENTS, IN ACCORDANCE WITH WISCONSIN DOA.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. PACKING, SHIPPING, HANDLING AND UNLOADING:
 1. DELIVER MATERIALS TO THE SITE TO ENSURE UNINTERRUPTED PROGRESS OF THE WORK. DELIVER AGGREGATE BASE IN AMPLE TIME TO PREVENT DELAY OF THE WORK.
- B. ACCEPTANCE AT SITE:
 1. ALL BOXES, CRATES AND PACKAGES SHALL BE INSPECTED BY CONTRACTOR UPON DELIVERY TO THE SITE. CONTRACTOR SHALL NOTIFY THE ENGINEER, IN WRITING, IF ANY LOSS OR DAMAGE EXISTS TO EQUIPMENT OR COMPONENTS.

PART 2- PRODUCTS

2.1 MATERIALS

- A. FURNISH AGGREGATE BASE MATERIAL CONFORMING TO THE REQUIREMENTS OF WISCONSIN DOA MASTER SPECIFICATIONS.
- B. OBTAIN MATERIAL FOR FILL IN ACCORDANCE WITH THE EARTHWORK NOTES.

2.2 EQUIPMENT

- A. FURNISH EQUIPMENT FOR PLACEMENT OF AGGREGATE BASE IN ACCORDANCE WITH THIS SECTION.

PART 3- EXECUTION

3.1 EXISTING CONDITIONS

- A. VERIFY EXISTING CONDITIONS AND SUBGRADE ELEVATIONS IN ACCORDANCE WITH THE SURVEYING NOTES, PRIOR TO PLACEMENT OF AGGREGATE BASE.
- B. PRIOR TO PERFORMING WORK DESCRIBED IN THIS SECTION, INSTALL AND MAINTAIN SURFACE WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROLS IN ACCORDANCE WITH THE SURFACE WATER MANAGEMENT AND EROSION CONTROL NOTES.
- C. PLACE AGGREGATE BASE AFTER COMPLETION OF THE FOLLOWING:
 1. WRITTEN CONFIRMATION OF COMPLIANCE OF AGGREGATE BASE MATERIAL BY THE ENGINEER.
 2. WRITTEN CONFIRMATION OF COMPLIANCE OF UNDERLYING LAYERS, INCLUDING ACCEPTANCE OF SURVEY RESULTS FOR SUBGRADE, BY THE ENGINEER.
- D. STOCKPILE MATERIALS IN ACCORDANCE WITH THE EARTHWORK NOTES.
- E. IMPLEMENT DUST CONTROL.

3.2 SUBGRADE PREPARATION

- A. PREPARE THE SUBGRADE IN ACCORDANCE WITH THE EARTHWORK NOTES PRIOR TO PLACEMENT OF AGGREGATE BASE.

3.3 AGGREGATE BASE

- A. CONSTRUCT THE AGGREGATE BASE LAYER TO THE THICKNESS, ELEVATIONS, AND LIMITS SHOWN ON THE DRAWINGS.
- B. AGGREGATE BASE SHALL BE FREE OF DEBRIS, FOREIGN OBJECTS, ORGANICS, AND OTHER DELETERIOUS MATERIALS.
- C. SPREAD AND PLACE THE AGGREGATE BASE IN ACCORDANCE WITH WISCONSIN DOA MASTER SPECIFICATIONS.
- D. COMPACT THE AGGREGATE BASE IN ACCORDANCE WITH OHIO C&MS ITEM 304.05.

3.4 FIELD QUALITY CONTROL/ACCEPTANCE CRITERIA

- A. CONSTRUCTION QUALITY CONTROL (CQC) SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND THE CQA PROJECT PLAN.
- B. CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES THROUGH THE ENGINEER TO ACCOMMODATE THE ACTIVITIES REQUIRED OF THE CQC CONTRACTOR.
- C. CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO PLACEMENT OF AGGREGATE BASE MATERIAL IN NEW LOCATIONS.
- D. CQC CONTRACTOR WILL PERFORM PERFORMANCE TESTING ON AGGREGATE BASE TO ESTABLISH COMPLIANCE WITH THIS SECTION AND OHIO C&MS REQUIREMENTS. THE PERFORMANCE TESTING TO BE PERFORMED AND TESTING FREQUENCIES SHALL BE IN ACCORDANCE WITH THE CQA PROJECT PLAN.
- E. TOLERANCES:
 1. ROAD ALIGNMENTS, SHALL BE WITHIN ±0.1 FEET OF THE LOCATIONS SHOWN ON THE DRAWINGS. TEMPORARY CONSTRUCTION ACCESS ALIGNMENT SHALL BE WITHIN ±0.3 FEET OF THE LOCATIONS SHOWN ON THE DRAWINGS.
 2. PLACE AGGREGATE BASE TO WITHIN ±0.1 FEET OF THE THICKNESS SHOWN ON THE DRAWINGS.
 3. PLACE AGGREGATE BASE TO WITHIN ±0.1 FEET OF THE ELEVATIONS SHOWN ON THE DRAWINGS.
 4. PLACE AGGREGATE BASE FOR TEMPORARY CONSTRUCTION ACCESS AND OTHER AREAS WITHIN ±0.2 FEET OF THE ELEVATIONS SHOWN ON THE DRAWINGS.
- F. BASIS OF ACCEPTANCE: THE ENGINEER WILL APPROVE THE WORK WHEN THE CONTRACTOR HAS THOROUGHLY DEMONSTRATED THAT THE WORK IS COMPLETE AND SATISFACTORY TO THE ENGINEER.

3.5 SURVEY CONTROL

- A. SURVEY ALIGNMENT, LOCATIONS, AND ELEVATIONS FOR AGGREGATE BASE IN ACCORDANCE WITH THE SURVEYING NOTES.



LEGAL ENTITY: ARCADIS U.S. Inc. ARCHITECTURAL AND ENGINEERING SERVICES, INC. COPYRIGHT: 2015

NO.	DATE	ISSUED FOR	BY
0	08/20/18	DESIGN PACKAGE ISSUED FOR REVIEW	EE

NO.	DATE	ISSUED FOR	BY

DATE:	08/20/18
PROJECT NO.:	WI001605.0001
FILE NAME:	DRAFT-4_G4-SPECIFICATIONS (SHEET 2 OF 5)
DESIGNED BY:	BV
DRAWN BY:	EE
CHECKED BY:	MA

MARINETTE, WI
 ANSUL FTC SITE
 DITCH INTERIM ACTION DESIGN
 ARCADIS PROJ. NO. WI001605.0001

SHEET TITLE	SPECIFICATIONS (SHEET 2 OF 5)
SCALE:	G4
SHEET	___ OF ___

User: \\VALLEN Spec: AUS--NCSMOD File G: \PROJECT\TYCO\W001605\CADD\DITCH_INTERIM ACTION\DITCH A ONLY PACKAGE\SUBMITTED 09/20/2018_DRAFT AND PG STAMP REMOVED\09202018_DRAFT--6_G7--SPECIFICATIONS (SHEET 4 OF 5).DWG Scale: 1:1 SavedDate: 9/17/2018 Time: 11:52 Plot Date: Allen, Jonathan V.; 8/20/2018; 11:52 ; Layout

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

A. INSULATED CABLE IN RACEWAYS:

1. APPLICATION: USE FOR CIRCUITS LOCATED INDOORS AND OUTDOORS.
2. MATERIAL: SINGLE CONDUCTOR COPPER CABLE COMPLYING WITH ASTM B3 AND ASTM B8 WITH FLAME-RETARDANT, MOISTURE- AND HEAT-RESISTANT INSULATION RATED FOR 90 DEGREES C IN DRY OR WET LOCATIONS, LISTED BY UL AS TYPE XHHW-2 COMPLYING WITH UL 44.
3. WIRE SIZES: NOT SMALLER THAN NO. 12 AWG FOR POWER AND LIGHTING AND NO. 14 AWG FOR 120-VOLT CONTROL CIRCUITS.
4. SOUTHWIRE, GENERAL CABLE, AMERICAN INSULATED WIRE, THE OKONITE COMPANY, OR APPROVED EQUAL

B. CABLE CONNECTORS, SOLDERLESS TYPE:

1. FOR WIRE SIZES NO. 4 AWG AND ABOVE, USE EITHER COMPRESSION TYPE OR BOLTED TYPE WITH SILVER-PLATED CONTACT FACES.
2. FOR WIRE SIZES UP TO AND INCLUDING NO. 6 AWG, USE COMPRESSION TYPE. ALARM AND CONTROL WIRE SHALL BE TERMINATED USING FORKED TYPE CONNECTORS AT TERMINAL BOARDS.
3. FOR WIRE SIZES NO. 250 KCMIL AND LARGER, USE CONNECTORS WITH AT LEAST TWO CABLE CLAMPING ELEMENTS OR COMPRESSION INDENTS AND PROVISION FOR AT LEAST TWO BOLTS FOR JOINING TO APPARATUS TERMINAL.
4. PROPERLY SIZE CONNECTORS TO FIT FASTENING DEVICE AND WIRE SIZE. CONNECTORS SHALL BE RATED FOR 90 DEGREE C, 600 VOLTS.
5. T&B STA-KON, BURNDY HYLUG, OR APPROVED EQUAL.

C. CABLE SPLICES:

1. FOR WIRE SIZES NO. 8 AWG AND LARGER, SPLICES SHALL BE MADE UP WITH COMPRESSION TYPE COPPER SPLICE FITTINGS. SPLICES SHALL BE TAPED AND COVERED WITH MATERIALS RECOMMENDED BY CABLE MANUFACTURER TO PROVIDE INSULATION EQUAL TO THAT ON CONDUCTORS.
2. FOR WIRE SIZES NO. 10 AWG AND SMALLER, SPLICES MAY BE MADE UP WITH PRE-INSULATED SPRING CONNECTORS.
3. FOR WET LOCATIONS, SPLICES SHALL BE WATERPROOF. COMPRESSION TYPE SPLICES SHALL BE WATERPROOFED BY SEALANT-FILLED, THICK WALL, HEAT SHRINKABLE, THERMOSETTING TUBING OR BY POURING THERMOSETTING RESIN INTO MOLD THAT SURROUNDS THE JOINED CONDUCTOR. SPRING CONNECTOR SPLICES SHALL BE WATERPROOFED WITH SEALANT FILLER.
4. SPLICES SHALL BE SUITABLY SIZED FOR CABLE, RATED 90 DEGREES C, AND 600 VOLTS.
5. COMPRESSION-TYPE SPLICES: BURNDY HYLINK, T&B COLOR-KEYED COMPRESSION CONNECTORS, OR APPROVED EQUAL.
6. SPRING CONNECTORS: BUCHANAN B-CAP, T&B WIRE CONNECTOR, OR APPROVED EQUAL.

INSTRUMENTATION AND COMMUNICATION CABLE

A. SINGLE-PAIR SHIELDED INSTRUMENT CABLES:

1. TINNED COPPER, XLPE-INSULATED STRANDED CONDUCTORS, NOT LESS THAN NO.16 AWG, TWISTED PAIR, WITH OVERALL PVC OR CPE JACKET. RATED FOR NOT LESS THAN 600 VOLTS AND COMPLYING WITH UL 1581.
2. BELDEN COMPANY, OKONITE COMPANY, OR APPROVED EQUAL.

B. ETHERNET CATEGORY 6 CABLE:

1. CATEGORY 6 SHIELDED TWISTED PAIR SOLID CABLE WITH PVC JACKET AND SHIELDED 8P8C MODULAR CONNECTORS. FACTORY TERMINATED CABLE IS REQUIRED.

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

A. STRUT, FITTINGS, AND ACCESSORIES:

1. GENERAL
 - a. UNLESS OTHERWISE SHOWN OR INDICATED, STRUT SHALL BE 1-5/8 INCHES BY 1-5/8 INCHES. DOUBLE STRUTS SHALL BE TWO PIECES OF THE SAME STRUT, WELDED BACK-TO-BACK AT THE FACTORY.
 - b. ATTACHMENT HOLES, WHEN REQUIRED, SHALL BE FACTORY-PUNCHED ON HOLE CENTERS APPROXIMATELY EQUAL TO THE CROSS-SECTIONAL WIDTH AND SHALL BE 9/16-INCH DIAMETER.
 - c. FITTINGS, BRACES, BRACKETS, HARDWARE, AND ACCESSORIES SHALL BE TYPE 316 STAINLESS STEEL.
 - d. STRUT NUTS SHALL BE SPRING CAPTURED TYPE 316 STAINLESS STEEL.
 - e. SQUARE AND ROUND WASHERS SHALL BE TYPE 316 STAINLESS STEEL.
2. STRUT MATERIALS SHALL BE SUITABLE FOR WET LOCATIONS. STRUT SHALL BE 12-GAGE TYPE 316 STAINLESS STEEL.

B. HANGER RODS:

1. STAINLESS STEEL, NOT LESS THAN 3/8-INCH DIAMETER, UNLESS OTHERWISE SHOWN ON THE DRAWINGS OR SPECIFIED.

C. MISCELLANEOUS HARDWARE:

1. BOLTS, SCREWS, AND WASHERS SHALL BE STAINLESS STEEL.
2. HEX NUTS: SHALL BE STAINLESS STEEL AND INCLUDE NYLON INSERTS.

RIGID CONDUITS

A. PVC-COATED RIGID STEEL CONDUIT, ELBOWS, COUPLINGS, FITTINGS AND OUTLET BODIES:

1. MATERIAL: RIGID, HEAVY-WALL, MILD STEEL, HOT-DIP GALVANIZED, SMOOTH URETHANE INTERIOR COATING, TAPERED THREADS, CAREFULLY REAMED ENDS, 3/4-INCH NPS MINIMUM SIZE WITH FACTORY EXTERIOR COATING OF 40-MIL THICK PVC.
2. COLOR: COLOR OF COATING SHALL BE THE SAME ON ALL CONDUIT AND FITTINGS.
3. ROBROY INDUSTRIES, PERMA-COTE INDUSTRIES, OR APPROVED EQUAL

B. SEALING BUSHING

1. FOR CONDUITS PASSING THROUGH EXTERIOR MASONRY BLOCK WALLS OR THROUGH CORE-DRILLED HOLES IN EXTERIOR SUBSURFACE WALLS, EXTERIOR CONCRETE WALLS, FLOOR SLABS, ROOF SLABS, AND FOR CONDUIT PASSING THROUGH INTERIOR CONCRETE WALLS OR FLOORS AND INTERIOR MASONRY BLOCK WALLS.
2. CSMI SEALING BUSHING AT THE INSIDE OF THE STRUCTURE AND TYPE CSMC SEALING BUSHING AT THE OUTSIDE OF THE STRUCTURE BY O-ZIGEDNEY, OR APPROVED EQUAL.

FLEXIBLE CONDUIT AND FITTINGS

A. FLEXIBLE CONDUIT (NON-HAZARDOUS CLASS I, DIVISION 2 HAZARDOUS AREAS)

1. MATERIAL: FLEXIBLE GALVANIZED STEEL CORE WITH SMOOTH, ABRASION-RESISTANT, LIQUID-TIGHT, POLYVINYL CHLORIDE COVER, CONTINUOUS COPPER GROUND BUILT IN FOR SIZES 3/4-INCH THROUGH 1.25-INCH. MATERIAL SHALL BE UL LISTED.

2. ANACONDA SEALTITE TYPE UA BY ANAMET ELECTRICAL, INC., LIQUATITE TYPE L.A. BY ELECTRIC-FLEX COMPANY, OR APPROVED EQUAL.

B. PVC-COATED CONDUIT FITTINGS

1. MATERIAL AND CONSTRUCTION: MALLEABLE IRON WITH STANDARD FINISH AND 40-MIL PVC EXTERIOR COATING. FITTINGS SHALL ADAPT THE CONDUIT TO STANDARD THREADED CONNECTIONS, AND SHALL HAVE AN INSIDE DIAMETER NOT LESS THAN THAT OF THE CORRESPONDING STANDARD CONDUIT SIZE.
2. ROBROY INDUSTRIES, PERMACOTE INDUSTRIES, OCAL, INC, OR APPROVED EQUAL.

PULL, JUNCTION, AND TERMINAL BOXES

A. GENERAL

1. PULL, JUNCTION, AND TERMINAL BOXES RATED AT NEMA 4X. BOXES SHALL BE APPROPRIATE FOR EACH LOCATION IN ACCORDANCE WITH NEMA REQUIREMENTS AND AS REQUIRED FOR AREA CLASSIFICATIONS.
2. TERMINAL STRIPS AND TERMINAL BLOCKS IN TERMINAL BOXES SHALL BE MOUNTED ON TERMINAL BOX SUB-PANELS.

B. MATERIALS AND CONSTRUCTION - WET, CORROSIVE, OR HAZARDOUS LOCATIONS:

1. PULL BOXES IN WET, CORROSIVE, OR OUTDOOR AREAS SHALL BE NEMA 4X.
2. BOXES FOR AREAS CLASSIFIED AS HAZARDOUS LOCATIONS, WHERE REQUIRED BY NEC, SHALL BE EXPLOSION-PROOF AND COMPLY WITH UL 886.
3. MATERIAL:
 - a. IN CORROSIVE LOCATIONS, WHERE CONDUIT SYSTEM IS PVC-COATED, BOXES SHALL BE CAST METAL WITH FACTORY-APPLIED 40-MIL PVC COATING, TYPE 316 STAINLESS STEEL, OR NON-METALLIC THERMOPLASTIC OR FIBERGLASS REINFORCED PLASTIC MATERIAL.
4. GASKET:
 - a. PROVIDE NEOPRENE GASKETS FOR WET AND CORROSIVE LOCATIONS.
 - b. GASKETS SHALL BE AN APPROVED TYPE DESIGNED FOR THE PURPOSE. IMPROVISED GASKETS ARE NOT ACCEPTABLE.
5. ACCESS: STAINLESS STEEL COVER BOLTS.
6. FEATURES:
 - a. EXTERNAL MOUNTING LUGS.
 - b. DRILLED AND TAPPED CONDUIT HOLES.
 - c. BOXES WHERE CONDUITS ENTER BUILDING OR STRUCTURE BELOW GRADE SHALL HAVE 1/4-INCH DRAIN HOLE AT BOTTOM OF THE BOX.

C. TERMINAL BLOCKS:

1. ALLEN-BRADLEY COMPANY, BULLETIN, MODEL 1492, GENERAL ELECTRIC COMPANY MODEL CR151K, OR EQUAL.
2. MATERIAL AND CONSTRUCTION: NEMA-RATED NYLON MODULAR TERMINAL BLOCKS, 600-VOLT RATED, CONTROL AND ALARM CIRCUIT TERMINALS SHALL BE SCREWED TYPE WITH PERMANENTLY AFFIXED NUMERIC IDENTIFIERS BESIDE EACH CONNECTION. POWER TERMINALS SHALL BE COPPER AND RATED FOR THE CIRCUIT AMPACITY.

D. MATERIALS & CONSTRUCTION - UNDERGROUND

1. PULLBOXES UNDERGROUND SHALL BE PRECAST POLYMER CONCRETE.
2. HUBBELL QUAZITE, OR APPROVED EQUAL.

SEALED FITTINGS

A. GENERAL:

1. MATERIAL: CAST GRAY IRON ALLOY, OR CAST MALLEABLE IRON, OR COPPER FREE ALUMINUM BODIES WITH ZINC ELECTROPLATE AND LACQUER OR ENAMEL FINISH.
2. AMPLE OPENING WITH THREADED CLOSURE FOR ACCESS TO CONDUIT HUB FOR MAKING DAM.
3. IN CORROSIVE LOCATIONS, FITTINGS SHALL INCLUDE FACTORY-APPLIED 40-MIL PVC COATING.
4. CONSTRUCT FITTING TO ALLOW 40 PERCENT CROSS-SECTIONAL FILL.
5. SEALING FIBER FOR FORMING THE DAM WITHIN THE HUB AND SEALING COMPOUND SHALL BE SUITABLE FOR USE WITH FITTINGS FURNISHED, AND SHALL BE PRODUCTS OF FITTING MANUFACTURER.
6. SEALING FITTING, FIBER, AND SEALING COMPOUND SHALL CONFORM TO UL 886.
7. CROUSE HINDS COMPANY, APPLETON ELECTRIC COMPANY, OR APPROVED EQUAL

DISCONNECT SWITCHES

A. SINGLE THROW, CIRCUIT DISCONNECT SWITCHES:

1. TYPE: FUSED OR UNFUSED, HORSEPOWER RATED, HEAVY-DUTY, SINGLE THROW, QUICK-MAKE, QUICK-BREAK MECHANISM, VISIBLE BLADES IN THE "OFF" POSITION AND SAFETY HANDLE.
2. RATING: VOLTAGE AND CURRENT RATINGS AND NUMBER OF POLES AS REQUIRED FOR MOTOR OR EQUIPMENT CIRCUITS BEING DISCONNECTED. SWITCHES SHALL BEAR A UL LABEL AND SHALL COMPLY WITH THE REQUIREMENTS OF UL 98, NEMA KS 1, AND NEMA 250.
3. SQUARE-D COMPANY, CUTLER-HAMMER, GENERAL ELECTRIC COMPANY, SIEMENS, OR APPROVED EQUAL.
4. ENCLOSURE: NEMA 4X.

MANUAL TRANSFER SWITCH

A. DOUBLE THROW, CIRCUIT DISCONNECT SWITCHES:

1. TYPE: UNFUSED, HEAVY-DUTY, QUICK-MAKE, QUICK-BREAK MECHANISM, VISIBLE BLADES IN THE "OFF" POSITION AND SAFETY HANDLE.
2. RATING: VOLTAGE AND CURRENT RATINGS AND NUMBER OF POLES AS REQUIRED FOR MOTOR OR EQUIPMENT CIRCUITS BEING DISCONNECTED. SWITCHES SHALL BEAR A UL LABEL AND SHALL COMPLY WITH THE REQUIREMENTS OF UL 98, NEMA KS 1, AND NEMA 250.
3. SQUARE-D COMPANY, CUTLER-HAMMER, GENERAL ELECTRIC COMPANY, SIEMENS, OR APPROVED EQUAL.
4. ENCLOSURE: NEMA 4X

GENERATOR RECEPTACLE

A. POWER RECEPTACLES:

1. 480V INTERLOCKED RECEPTACLE WITH ENCLOSED SAFETY SWITCH SERVICE OUTLET. PROVIDE SERVICE OUTLETS, QUANTITY AS SHOWN OR INDICATED, FOR PORTABLE EQUIPMENT.
2. MATERIAL: COPPER-FREE ALUMINUM ENCLOSURES WITH OPERATING HANDLE NEMA 4, WITH GASKETED, HINGED DOOR.
3. SWITCH: HEAVY DUTY, THREE-POLE, WITH VISIBLE BLADES, QUICK MAKE-A-BREAK MECHANISM WITH REINFORCED, POSITIVE-PRESSURE-TYPE BLADE AND FUSE CLIPS. SWITCH SHALL BE MECHANICALLY INTERLOCKED WITH RECEPTACLE. SWITCH CANNOT BE CLOSED UNTIL PLUG IS FULLY INSERTED AND PLUG CANNOT BE WITHDRAWN OR INSERTED UNLESS SWITCH IS OPEN.
4. RECEPTACLE: SINGLE GROUND RECEPTACLE, THREE WIRE, FOUR-POLE, 600-VOLT. PROVIDE MATCHING PLUGS
5. APPLETON, TYPE WSR, AND TYPE APS PLUGS BY CROUSE-HINDS, OR APPROVED EQUAL.
6. ENCLOSURE: NEMA 4X.

LOW VOLTAGE RECEPTACLES

A. GROUND FAULT INTERRUPTING RECEPTACLES:

1. DUPLEX GROUNDING RECEPTACLE, TWO-POLE, THREE-WIRE, NEMA 5-20R CONFIGURATION, 125-VOLT AC, 20 AMPERES, GRAY COLOR WITH GROUND FAULT CIRCUIT INTERRUPTING (GFCI) PROTECTION.
2. GROUND FAULT INTERRUPTING RECEPTACLES SHALL COMPLY WITH UL 943.
3. PROVIDE TYPE 302 STAINLESS STEEL COVER-PLATE CONFORMING TO UL 514D. PROVIDE WEATHER-PROOF-WHILE-IN-USE COVER WHERE SHOWN ON THE DRAWINGS AS "WP" OR "WPU", AND PROVIDE WHERE LOCATED IN WET OR CORROSIVE LOCATION.
4. GFR5362SGY BY HUBBELL, INC., 2091-GRY BY PASS & SEYMOUR, OR EQUAL.
5. WEATHER-RESISTANT GROUND FAULT INTERRUPTING RECEPTACLES: 2095TRWRGRY BY PASS & SEYMOUR, OR EQUAL.

PANELBOARD

A. GENERAL

1. RATING: VOLTAGE RATING, CURRENT RATING, NUMBER OF PHASES, NUMBER OF WIRES AND NUMBER OF POLES AS SHOWN OR INDICATED ON THE DRAWINGS.
2. CIRCUIT BREAKERS: MOLDED CASE, BOLT-IN THERMAL MAGNETIC TYPE WITH NUMBER OF POLES AND TRIP RATINGS AS SHOWN OR INDICATED. WHERE INDICATED ON THE DRAWINGS, CIRCUIT BREAKERS SHALL BE GROUND FAULT CIRCUIT INTERRUPTING TYPE EQUIPPED WITH SOLID STATE SENSING AND FIVE-MILLIAMP SENSITIVITY.
3. CIRCUIT BREAKERS FOR 480-VOLT PANELBOARDS SHALL HAVE MINIMUM INTERRUPTING RATING OF 64,000 AMPERE RMS SYMMETRICAL, UNLESS OTHERWISE INDICATED ON THE DRAWINGS. CIRCUIT BREAKERS FOR OTHER PANELBOARDS SHALL HAVE MINIMUM INTERRUPTING RATING OF 22,000 AMPERE RMS SYMMETRICAL, UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
4. BUS BARS: BUS BARS SHALL BE 98 PERCENT CONDUCTIVITY COPPER. FOUR-WIRE PANELBOARDS SHALL HAVE SOLID NEUTRAL BAR. EACH PANEL SHALL HAVE GROUND BUS BAR.
5. MAIN: PANELBOARDS SHALL HAVE MAIN CIRCUIT BREAKER, UNLESS THE DRAWINGS SPECIFICALLY INDICATE MAIN LUGS ONLY.
6. CONNECT BRANCH CIRCUIT BREAKERS FOR SEQUENCE PHASING.
7. ENCLOSURES: PANEL ENCLOSURES SHALL BE NEMA 4X
8. CONSTRUCTION: CODE-GRADE STEEL, AMPLE GUTTER SPACE, FLUSH DOOR, FLUSH SNAP LATCH AND LOCK. PANELBOARDS SHALL COMPLY WITH NEMA PB 1 AND UL 67.
9. TRIM: SURFACE
10. DIRECTORY: TYPED OR COMPUTER-PRINTED CARD, WITH TRANSPARENT PROTECTIVE COVER IN FRAME ON BACK OF DOOR GIVING CIRCUIT NUMBERS AND AREA OR EQUIPMENT SERVED.
11. IDENTIFICATION: IDENTIFICATION SHALL INDICATE PANEL NUMBER AND VOLTAGE.
12. PROVIDE SURGE PROTECTION DEVICE IF INDICATED ON THE DRAWING.

B. INTEGRATED PANEL BOARD AND TRANSFORMER

1. UNIT SHALL CONSIST OF ENCAPSULATED DRY-TYPE TRANSFORMER, PRIMARY, AND SECONDARY MAIN CIRCUIT BREAKERS, AND SECONDARY PANEL BOARD ALL IN ONE ENCLOSURE.
2. TRANSFORMER RATING: KVA, PRIMARY VOLTAGE, SECONDARY VOLTAGE, FREQUENCY, AND NUMBER OF PHASES SHALL BE AS SHOWN OR INDICATED ON THE DRAWINGS.
3. BRANCH CIRCUITS: MOLDED CASE CIRCUIT BREAKERS, PLUG-IN THERMAL MAGNETIC TYPE WITH NUMBER OF POLES AND TRIP RATINGS AS SOWN OR INDICATED ON THE DRAWINGS.
4. MINI-POWER ZONE BY SQUARE D, MINI-POWER CENTER BY EATON, PANEL TRAN BY ACME ELECTRIC CORPORATION, OR EQUAL.



LEGAL ENTITY:
ARCADIS U.S., Inc.
ARCHITECTURAL AND
ENGINEERING SERVICES, INC.

COPYRIGHT: 2015

NO.	DATE	ISSUED FOR	BY
0	08/20/18	DESIGN PACKAGE ISSUED FOR REVIEW	EE

NO.	DATE	ISSUED FOR	BY

NOT FOR CONSTRUCTION

DATE:	08/20/18
PROJECT NO.:	W001605.0001
FILE NAME:	DRAFT-6_G7-SPECIFICATIONS (SHEET 4 OF 5)
DESIGNED BY:	BV
DRAWN BY:	EE
CHECKED BY:	MA

DATE:	MARINETTE, WI
PROJECT NO.:	ANSUL FTC SITE
FILE NAME:	DRAFT-6_G7-SPECIFICATIONS (SHEET 4 OF 5)
DESIGNED BY:	BV
DRAWN BY:	EE
CHECKED BY:	MA
PROJECT NO.:	ARCADIS PROJ. NO. W001605.0001

SHEET TITLE	SPECIFICATIONS (SHEET 4 OF 5)
SCALE:	G6
SHEET	4 OF 5

SITE CLEARING AND GRUBBING

- PART 1 - GENERAL**
- 1.2 DESCRIPTION**
- A. SCOPE:**
- CONTRACTOR SHALL CLEAR AND GRUB THE SITE OF ANY WOODY DEBRIS WITHIN THE AREA OF WORK PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. REMOVAL OF TREES GREATER THAN ONE (1) TO TWO (2) INCHES DIAMETER AT BREAST HEIGHT SHALL OCCUR BETWEEN OCTOBER 1 AND MARCH 31 AND WILL BE AVOIDED.
 - CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT AND INCIDENTALS REQUIRED TO COMPLETE THE NECESSARY CLEARING AND GRUBBING WORK.
- B. RELATED DOCUMENTS:**
- DRAWINGS
- PART 2 - PRODUCTS**
- 2.1 GENERAL**
- A. IMPORTED TOPSOIL SHALL MEET THE REQUIREMENTS OF OHIO DOT, ITEM 653 OR EQUAL.**
- 3.1 GENERAL**
- A. ANY CLEARING DEBRIS SHALL BE DISPOSED OF OFF-SITE AT A PERMITTED FACILITY. NO ON-SITE BURNING OF CLEARING DEBRIS WILL BE ALLOWED.**
- B. ANY WOODY DEBRIS ENCOUNTERED ON THE DAM EMBANKMENT SHALL ALSO HAVE ITS STUMP AND ROOTS REMOVED TO 2 INCHES OR LARGER. EXCAVATION RESULTING FROM THE REMOVAL OF ANY STUMPS AND/OR ROOTS SHALL BE BACKFILLED WITH MATERIAL MEETING THE CHARACTERISTICS OF THE EXISTING DAM EMBANKMENT MATERIAL. BACKFILL SHALL BE PLACED IN 12-INCH LIFTS AND COMPACTED TO A MINIMUM OF 95% OF STANDARD PROCTOR.**
- C. CONTRACTOR SHALL STRIP AND STOCKPILE TOPSOIL FROM THE AREA OF DISTURBANCE FOR REUSE UPON FINAL SITE RESTORATION.**
- D. CONTRACTOR SHALL PROVIDE ADDITIONAL TOPSOIL AS NECESSARY TO PROVIDE 6 INCHES (MINIMUM) OF TOPSOIL AT ALL DISTURBED AREA UNLESS OTHERWISE NOTED TO RECEIVE OTHER SURFACE TREATMENT.**
- CHAIN LINK FENCING**
- PART 1 - GENERAL**
- 1.1 DESCRIPTION**
- A. SCOPE:**
- CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, TOOLS, EQUIPMENT AND INCIDENTALS AS SHOWN, SPECIFIED, AND REQUIRED TO FURNISH AND INSTALL FENCING.
 - EXTENT OF FENCING IS SHOWN OR INDICATED.
- B. RELATED DOCUMENTS:**
- SEE INDEX TO DRAWINGS ON SHEET G1
- 1.2 REFERENCES**
- A. STANDARDS REFERENCED IN THIS SECTION ARE:**
- ASTM A83, SPECIFICATION FOR PIPE, STEEL, BLACK AND HOT-DIPPED ZINC-COATED, WELDED AND SEAMLESS
 - ASTM A80/A80M, TEST METHOD FOR WEIGHT (MASS) OF COATING ON IRON AND STEEL ARTICLES WITH ZINC
 - ZINCING SPECIFICATION FOR ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS
 - ASTM A575/A575M, SPECIFICATION FOR ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE
 - ASTM A428/A428M, TEST METHOD FOR WEIGHT (MASS) OF COATING ON ALUMINUM-COATED IRON OR STEEL ARTICLES
 - ASTM A991, SPECIFICATION FOR ALUMINUM-COATED STEEL CHAIN-LINK FENCE FABRIC
 - ASTM A780, SPECIFICATION FOR REPAIR OF DAMAGED AND UNCOATED AREAS OF HOT-DIP GALVANIZED COATINGS
 - ASTM A817, SPECIFICATION FOR METALLIC-COATED STEEL WIRE FOR CHAIN-LINK FENCE FABRIC
 - ASTM A1014/1011M, SPECIFICATION FOR STEEL SHEET, HOT-DIP, ON IRON, AND STRIP, HOT-ROLLED, CARBON, STRUCTURAL, HIGH-STRENGTH LOW-ALLOY, HIGH-STRENGTH LOW-ALLOY WITH IMPROVED FORMABILITY, AND ULTRA-HIGH STRENGTH
 - ASTM B6, SPECIFICATION FOR ZINC
 - ASTM F82, TERMINOLOGY RELATING TO CHAIN LINK FENCING
 - ASTM F87, PRACTICE FOR INSTALLATION OF CHAIN-LINK FENCE
 - ASTM F826, SPECIFICATION FOR FENCE FITTINGS
 - ASTM A653, SPECIFICATION FOR STEEL SHEET, ZINC-COATED (GALVANIZED) OR ZINC-IRON ALLOY-COATED (GALVANNEAL) BY THE HOT-DIP PROCESS
 - ASTM F1043, SPECIFICATION FOR STRENGTH AND PROTECTIVE COATINGS ON METAL INDUSTRIAL CHAIN LINK FENCE FRAMEWORK
 - ASTM F1083, SPECIFICATION FOR PIPE, STEEL, HOT-DIPPED ZINC-COATED (GALVANIZED) WELDED FOR FENCE STRUCTURES
 - CLFM, CLF 2445, PRODUCT MANUAL
 - CLFM, STEP-BY-STEP INSTALLATION GUIDE
- 1.3 SUBMITTALS**
- A. ACTION SUBMITTALS, SUBMIT THE FOLLOWING:**
- SHOP DRAWINGS
 - DRAWINGS AT SCALE OF 1/4"=1" EQUAL TO ONE FOOT OF TYPICAL FENCE ASSEMBLY, IDENTIFYING ALL FINISHES, DIMENSIONS, SIZES, HEIGHTS, AND FINISHES OF RAILS, POSTS, BRACES, SUPPORTS AND OTHER FENCING MATERIALS. SHOP DRAWINGS SHALL INCLUDE PLAN ELEVATIONS AND SECTIONS WITH REQUIRED INSTALLATION AND OPERATING CLEARANCES, AND DETAILS OF POST ANCHORAGE, ATTACHMENTS, AND BRACING.
 - PRODUCT DATA
 - COPIES OF MANUFACTURERS TECHNICAL, PRODUCT INFORMATION, AND SPECIFICATIONS FOR ALL FENCING COMPONENTS, INCLUDING AUXILIARY SYSTEM COMPONENTS
 - DATA SUBSTANTIATING THAT MATERIALS PROPOSED COMPLY WITH THE FOLLOWING:
 - WEIGHT OF ALUMINUM COATING ON WIRE FABRICATIONS, IN COMPLIANCE WITH ASTM A428
 - WEIGHT OF ZINC COATING ON PIPE FABRICATIONS, IN COMPLIANCE WITH ASTM A90
- B. DELIVERY, STORAGE, AND HANDLING**
- A. DELIVERY OF MATERIALS:**
- PACKAGING AND MARKING, COMPLY WITH CLFM CLF 2445
 - DELIVER MATERIALS IN MANUFACTURERS ORIGINAL, UNOPENED PACKAGING WITH ALL FACTORY-APPLIED TAGS, LABELS AND OTHER IDENTIFYING INFORMATION INTACT, LEGIBLE AND ACCURATELY REPRESENTING MATERIAL ON APPROVED SUBMITTALS
- B. STORAGE OF MATERIALS:**
- STORAGE ALL MATERIALS UNDER WEATHERPROOF COVER, OFF THE GROUND AND AWAY FROM OTHER CONSTRUCTION ACTIVITIES
 - DO NOT STORE MATERIAL IN A MANNER THAT WOULD CREATE A HUMIDITY CHAMBER. PROVIDE FOR FREE MOVEMENT OF AIR UNDER PROTECTIVE COVER AND BETWEEN COMPONENTS OF THE FENCING
- C. HANDLING OF MATERIALS:**
- HANDLE MATERIAL IN MANNER THAT IS IN COMPLIANCE WITH MANUFACTURERS RECOMMENDATIONS AND THAT AVOIDS DAMAGING COATINGS

PART 2 - PRODUCTS

- 2.1 MATERIALS**
- A. GENERAL:**
- TUBE SIZES SPECIFIED ARE NOMINAL OUTSIDE DIMENSION.
 - ROLL-FORMED SECTION SIZES ARE NOMINAL OUTSIDE DIMENSIONS.
 - WIRE GAGES SHALL CONFORM TO AMERICAN STEEL AND WIRE COMPANY GAGE.
 - HEAT-TREATING AND CHORDS BEFORE APPLYING PROTECTIVE COATINGS TO METAL.
 - SIZES SPECIFIED ARE GIVEN FOR UNCOATED METAL. PROTECTIVE COATINGS ARE IN ADDITION TO SPECIFIED METAL DIMENSIONS, GAGES, AND SIZES.
 - PROVIDE WEIGHTS OF ZINC AND ALUMINUM COATINGS ON WIRE AND PIPE FABRICATIONS IN ACCORDANCE WITH CLFM CLF 2445
 - PROVIDE THICKNESS OF PVC COATING ON WIRE AND PIPE FABRICATIONS IN ACCORDANCE WITH CLFM CLF 2445.
- B. CHAIN-LINK FENCE FABRIC:**
- ONE-PIECE FABRIC WIDTHS: FOR FENCING 12 FEET AND LESS IN HEIGHT, COMPLYING WITH CLFM CLF 2445
 - WIRE MESH SHALL BE WOVEN THROUGHOUT IN FORM OF APPROXIMATELY-UNIFORM SQUARE MESH WITH PARALLEL SIDES AND HORIZONTAL AND VERTICAL DIAGONALS OF APPROXIMATELY-UNIFORM DIMENSIONS. OF SIZE AND GAGE SPECIFIED AND IN COMPLIANCE WITH ASTM A817, TYPE 1, COLD-DRAWN CARBON STEEL WIRE WITH MINIMUM BREAKING STRENGTH OF 2.1 TO POUNDS AND FORTED WITH ALUMINIZED FINISH, AS SPECIFIED. FABRIC SHALL BE AS RECOMMENDED BY CLFM FOR THE FINISHED FABRIC.
 - POSTS, LINE POSTS, BRACE ASSEMBLIES, AND OTHER MANUFACTURERS TRADE NAME, COUNTRY OF ORIGIN, CORE LINE GAGE, AND FINISHES USED WITH MANUFACTURERS TRADE NAME.
 - FABRIC GAGE: PROVIDE THE FOLLOWING:
 - 9-GAGE WIRE
 - MESH SIZE: PROVIDE THE FOLLOWING:

ACTUAL OD (INCHES)	NPS SIZE (INCHES)	TRADE SIZE (INCHES)
1.315	1.0	1-3/8
1.660	1.3	1-5/8
1.900	1.5	2-1/2
2.375	2.0	2-1/2
3.500	3.0	3-1/2
4.000	3.5	4
6.625	6.0	6-5/8
8.625	8.0	8-5/8
 - TWO-INCH MESH
- 2.2 FRAMEWORK**
- A. GENERAL: THE FOLLOWING TABLE PRESENTS ACTUAL OD AND EQUIVALENT NOMINAL NPS SIZE AND TRADE SIZE OF ROUND MEMBERS.**
- | ACTUAL OD (INCHES) | NPS SIZE (INCHES) | TRADE SIZE (INCHES) |
|--------------------|-------------------|---------------------|
| 1.315 | 1.0 | 1-3/8 |
| 1.660 | 1.3 | 1-5/8 |
| 1.900 | 1.5 | 2-1/2 |
| 2.375 | 2.0 | 2-1/2 |
| 3.500 | 3.0 | 3-1/2 |
| 4.000 | 3.5 | 4 |
| 6.625 | 6.0 | 6-5/8 |
| 8.625 | 8.0 | 8-5/8 |

- B. PIPE SHALL BE COMMERCIAL GRADE, PLAIN-END STEEL, PIPE WITH STANDARD-WEIGHT WALLS. STEEL STRIP USED FOR MANUFACTURE OF PIPE SHALL COMPLY WITH ASTM F1083, SCHEDULE 40 PIPE WITH MINIMUM YIELD STRENGTH OF 25,000 PSI AND PROTECTED WITH ZINC, AS SPECIFIED.**
- C. FITTINGS, COMPLY WITH ASTM F826.**
- D. END, CORNER, AND PULL POSTS: PROVIDE END, CORNER, AND PULL POSTS OF FOLLOWING MINIMUM SIZES:**
- UP TO SIX FEET FABRIC HEIGHT:
 - UP TO SIX FEET FABRIC HEIGHT:
 - 2.375 INCHES OD PIPE WEIGHING 3.66 POUNDS PER LINEAR FOOT.
- E. LINE POSTS: PROVIDE LINE POSTS OF FOLLOWING MINIMUM SIZES AND WEIGHTS:**
- UP TO SIX FEET FABRIC HEIGHT:
 - 1.90 INCHES OD PIPE WEIGHING 2.72 POUNDS PER LINEAR FOOT.
- H. TOP RAIL: PROVIDE TOP RAILS, UNLESS OTHERWISE SHOWN OR INDICATED, CONFORMING TO THE FOLLOWING:**
- 1,900 INCH OD PIPE WEIGHING 2.72 POUNDS PER LINEAR FOOT.
 - PROVIDE IN MANUFACTURERS LONGEST LENGTHS, WITH EXPANSION-TYPE COUPLING 0.051-INCH THICK RAIL SLEEVES, APPROXIMATELY SEVEN INCHES LONG, FOR EACH JOINT.
 - PROVIDE MEANS FOR ATTACHING TOP RAIL SECURELY TO EACH CORNER, PULL, AND END POST.
- I. CENTER RAILS BETWEEN LINE POSTS: PROVIDE CENTER RAILS BETWEEN LINE POSTS, WHERE SHOWN, CONSISTING OF 1.660-INCH OD PIPE WEIGHING 2.27 POUNDS PER LINEAR FOOT.**
- J. ROLL-FORMED STEEL: PROVIDE ROLLED STEEL, SHAPES PRODUCED FROM STRUCTURAL-QUALITY STEEL CONFORMING TO ASTM A1011, GRADE 48, WITH MINIMUM YIELD STRENGTH OF 45,000 POUNDS PSI. PROTECTIVE COATING SYSTEM SHALL CONFORM TO ASTM F1043, AS SPECIFIED.**
- K. POST BRACE ASSEMBLY: PROVIDE BRACING ASSEMBLIES AT END AND GATE POSTS, AND AT BOTH SIDES OF CORNER AND PULL POSTS. BRACE ASSEMBLIES SHALL BE LOCATED AT MID-HEIGHT OF FABRIC AND SHALL BE SECURED TO FABRIC WITH HORIZONTAL BRACES PER LINEAR FOOT FOR HORIZONTAL BRACE AND 3/8-INCH DIAMETER ROD WITH TURNBUCKLE FOR DIAGONAL TRUSS.**
- 2.3 AUXILIARY FENCING MATERIALS AND ACCESSORIES**
- A. WIRE TIES:**
- FOR TYING FABRIC TO LINE POSTS, USE NINE-GAGE ALUMINUM ALLOY 1100-H4, PVC-COATED WIRE TIES TO MATCH FENCE FABRIC, SPACED 12 INCHES ON CENTERS.
 - FOR TYING FABRIC TO RAILS AND BRACES, USE NINE-GAGE, ALUMINUM ALLOY 1100-H4, PVC-COATED WIRE TIES TO MATCH FENCE FABRIC, SPACED TWO FEET ON CENTERS.
 - FOR TYING FABRIC TO TENSION WIRE, USE 11-GAGE ALUMINUM ALLOY 1100-H4, PVC-COATED WIRE HOG RING TIES TO MATCH FENCE FABRIC, SPACED TWO FEET ON CENTERS.
- B. TENSION WIRE: PROVIDE TENSION WIRE CONSISTING OF ALUMINIZED, SEVEN-GAGE, COILED SPRING STEEL WIRE COATED WITH 0.40-OUNCES OF ALUMINUM PER SQUARE FOOT OF WIRE SURFACE, MINIMUM, IN COMPLIANCE WITH ASTM F1664.**
- LOCATE AT BOTTOM OF FABRIC ONLY.
- C. POST CAPS: PRESSED STEEL, WROUGHT IRON, OR CAST ALUMINUM ALLOY, DESIGNED AS WEATHER-TIGHT CLOSE CAP, FOR TUBULAR POSTS. PROVIDE ONE CAP FOR EACH POST UNLESS EQUAL PROTECTION IS AFFORDED BY COMBINATION POST-TOP CAP AND BARBED WIRE SUPPORTING ARM, WHERE BARBED WIRE IS REQUIRED.**
- PROVIDE CAPS WITH OPENINGS TO ALLOW THROUGH-PASSAGE OF TOP RAIL.
 - PROVIDE CONE-TYPE CAPS FOR TERMINAL POSTS AND LOOP-TYPE CAPS FOR LINE POSTS.
- D. STRETCHER BARS: ONE-PIECE LENGTHS EQUAL TO FULL HEIGHT OF FABRIC, WITH MINIMUM CROSS SECTION OF 3/8-INCH, PROVIDE ONE STRETCHER BAR FOR EACH GATE AND END-POST, AND ONE FOR EACH CORNER, AND PULL-POST, EXCEPT WHERE FABRIC IS INTERNALLY WOVEN INTO THE POST.**

WALL SLEEVE AND SEAL SYSTEM:

- PART 1 - GENERAL**
- 1.1 DESCRIPTION**
- A. SCOPE:**
- PROVIDE FABRICATED CARBON STEEL WALL SLEEVE AND MECHANICAL SEAL SYSTEM AT LOCATIONS SHOWN
 - RELATED DOCUMENTS
 - DRAWINGS
- 1.2 SUBMITTALS**
- A. ACTION SUBMITTALS: SUBMIT THE FOLLOWING:**
- PRODUCT DATA, MANUFACTURERS LITERATURE, ILLUSTRATIONS, SPECIFICATIONS, AND ENGINEERING DATA INCLUDING DIMENSIONS, MATERIALS, SIZE WEIGHT AND PERFORMANCE DATA
- PART 2 - PRODUCTS**
- 2.1 WALL SLEEVE**
- A. MANUFACTURED RIGID CONDUITS, ELBOWS, COUPLINGS, FITTINGS AND OUTLET BODIES:**
- MANUFACTURED RIGID CONDUITS, ELBOWS, COUPLINGS, FITTINGS AND OUTLET BODIES, PRECAST MANHOLE
- 2.2 MECHANICAL SEAL**
- A. PROVIDE ENGINEERED MECHANICAL SEAL SYSTEM CONSISTING OF EPDM SEALANT UNITS THAT INTERLOCK AND EXPAND TO SEAL ANNULAR SPACE BETWEEN PIPE AND WALL SLEEVE. SYSTEM SHALL BE MANUFACTURED BY GPT INDUSTRIES, LINK SEAL SYSTEM OR EQUAL.**
- B. COORDINATE MECHANICAL SEAL SYSTEM BASED ON PIPE AND WALL SLEEVE DIMENSIONS.**
- PART 3 - EXECUTION**
- 3.1 INSTALLATION**
- A. INSTALL WALL SLEEVE IN ACCORDANCE WITH DETAILS AS SHOWN ON STRUCTURAL DRAWINGS.**
- B. INSTALL MECHANICAL SEAL SYSTEM PER MANUFACTURERS INSTRUCTIONS.**
- C. INSTALL NON-SHRINK GROUT SEAL AS SHOWN ON THE DRAWINGS.**
- PART 1 - GENERAL**
- 1.1 DESCRIPTION**
- A. SCOPE:**
- PROVIDE FABRICATED CARBON STEEL WALL SLEEVE AND MECHANICAL SEAL SYSTEM AT LOCATIONS SHOWN
 - RELATED DOCUMENTS
 - DRAWINGS
- 1.2 SUBMITTALS**
- A. ACTION SUBMITTALS: SUBMIT THE FOLLOWING:**
- PRODUCT DATA, MANUFACTURERS LITERATURE, ILLUSTRATIONS, SPECIFICATIONS, AND ENGINEERING DATA INCLUDING DIMENSIONS, MATERIALS, SIZE WEIGHT AND PERFORMANCE DATA
- PART 2 - PRODUCTS**
- 2.1 WALL SLEEVE**
- A. MANUFACTURED RIGID CONDUITS, ELBOWS, COUPLINGS, FITTINGS AND OUTLET BODIES:**
- MANUFACTURED RIGID CONDUITS, ELBOWS, COUPLINGS, FITTINGS AND OUTLET BODIES, PRECAST MANHOLE
- 2.2 MECHANICAL SEAL**
- A. PROVIDE ENGINEERED MECHANICAL SEAL SYSTEM CONSISTING OF EPDM SEALANT UNITS THAT INTERLOCK AND EXPAND TO SEAL ANNULAR SPACE BETWEEN PIPE AND WALL SLEEVE. SYSTEM SHALL BE MANUFACTURED BY GPT INDUSTRIES, LINK SEAL SYSTEM OR EQUAL.**
- B. COORDINATE MECHANICAL SEAL SYSTEM BASED ON PIPE AND WALL SLEEVE DIMENSIONS.**
- PART 3 - EXECUTION**
- 3.1 INSTALLATION**
- A. INSTALL WALL SLEEVE IN ACCORDANCE WITH DETAILS AS SHOWN ON STRUCTURAL DRAWINGS.**
- B. INSTALL MECHANICAL SEAL SYSTEM PER MANUFACTURERS INSTRUCTIONS.**
- C. INSTALL NON-SHRINK GROUT SEAL AS SHOWN ON THE DRAWINGS.**

- 3.2 EXECUTION**
- A. CONFORM WITH STEP-BY-STEP INSTALLATION GUIDE AND ASTM F827. DO NOT BEGIN INSTALLATION AND ERECTION OF FENCING UNTIL FINAL GRADING IS COMPLETED.**
- 3.1 INSPECTION**
- A. EXAMINE CONDITIONS UNDER WHICH THE WORK WILL BE ERRECTED AND NOTIFY ENGINEER IN WRITING OF CONDITIONS DETERMINED TO PROPER AND TIMELY COMPLETION OF THE WORK. DO NOT PROCEED WITH THE WORK UNTIL UNSATISFACTORY CONDITIONS ARE CORRECTED.**
- 2.5 SOURCE QUALITY CONTROL**
- A. FABRICATION TOLERANCES:**
- FABRIC, POSTS, RAILS, AND OTHER SUPPORTS SHALL BE STRAIGHT OR UNIFORMALLY CURVED TO PROVIDE THE PROFILES SHOWN, TO DIMENSIONAL TOLERANCE OF 1/16-INCH IN 10 FEET WITHOUT WARP OR RACK IN THE FINISHED WORK.
- PART 3 - EXECUTION**
- 3.1 INSPECTION**
- A. EXAMINE CONDITIONS UNDER WHICH THE WORK WILL BE ERRECTED AND NOTIFY ENGINEER IN WRITING OF CONDITIONS DETERMINED TO PROPER AND TIMELY COMPLETION OF THE WORK. DO NOT PROCEED WITH THE WORK UNTIL UNSATISFACTORY CONDITIONS ARE CORRECTED.**
- 3.2 EXECUTION**
- A. CONFORM WITH STEP-BY-STEP INSTALLATION GUIDE AND ASTM F827. DO NOT BEGIN INSTALLATION AND ERECTION OF FENCING UNTIL FINAL GRADING IS COMPLETED.**
- B. POSTS AND RAILS:**
- LINE POSTS: INSTALL POSTS TO CONCRETE STRUCTURE SPACED NOT MORE THAN TEN FEET ON CENTERS. PROVIDE CAPS ON TOP OF EACH POST TO EXCLUDE MOISTURE AND TO RECEIVE TOP RAIL.
 - TOP RAILS: RUN RAIL CONTINUOUSLY THROUGH POST CAPS OR EXTENSION ARMS, BENDING TO RADIUS FOR CURVED RAILS. PROVIDE EXPANSION COUPLINGS AS RECOMMENDED BY FENCING MANUFACTURER TO FORM CONTINUOUS RAIL BETWEEN TERMINAL POSTS.
 - BRACE ASSEMBLIES: INSTALL BRACES SO POSTS ARE PLUMB WHEN DIAGONAL ROD ARE UNDER PROPER TENSION. INSTALL BRACE ASSEMBLIES AT END-POSTS AND AT BOTH SIDES OF CORNER AND PULL-POST PANELS. PANELS ADJACENT TO GATES SHALL HAVE INTERMEDIATE HORIZONTAL RAILS AND DIAGONAL BRACING. DIAGONAL BRACING SHALL RUN FROM CENTER OF FIRST LINE-POST TO BOTTOM OF TERMINAL-POST.
- C. CHAIN-LINK FABRIC:**
- INSTALL FABRIC ON LAND SIDE OF FENCE, AND ANCHOR TO FRAMEWORK SO THAT FABRIC REMAINS IN TENSION AFTER PULLING FORCE IS RELEASED. FASTEN TO TERMINAL POSTS AND GATE POSTS WITH TENSION BARS. THREAD THROUGH MESH AND SECURED WITH TENSION BANDS AT MAXIMUM INTERVALS OF 14 INCHES.
 - THE TO LINE-POSTS, GATE FRAMES AND TOP AND BOTTOM RAILS WITH THE WIRES SPACED AT MAXIMUM 12 INCHES ON POSTS AND TWO FEET ON RAILS.
 - CONNECT TENSION BARS TO POSTS AND FRAMES BY MEANS OF ADJUSTABLE BOLTS AND BANDS SPACED NOT MORE THAN 14 INCHES APART.
 - LEAVE APPROXIMATELY TWO INCHES BETWEEN FINISH GROUND SURFACE AND BOTTOM SURFACE OF CHAIN-LINK FABRIC BY WEAVING A SINGLE PICKET INTO THE ENDS OF ROLL TO FORM CONTINUOUS MESH.
- D. TENSION WIRE:**
- STRETCH TENSION WIRE TAUT AND FREE OF SAG, FROM END TO END OF EACH STRETCH OF FENCE AND POSITION AT A HEIGHT THAT WILL ENABLE THE WIRE TO BE FASTENED TO CHAIN-LINK FABRIC BY SECURING WITHIN THE TOP 12 INCHES OF CHAIN-LINK FABRIC.
 - FASTEN BOTTOM TENSION WIRE WITHIN BOTTOM SIX INCHES OF CHAIN-LINK FABRIC.
 - THE TENSION WIRE TO EACH POST WITH NOT LESS THAN SIX-GAGE GALVANIZED WIRE.
- E. STRETCHER BARS: THREAD THROUGH OR CLAMP TO FABRIC FOUR INCHES ON CENTERS, AND SECURE TO POSTS WITH METAL BANDS SPACED 15 INCHES ON CENTERS.**
- F. THE WIRES: USE U-SHAPED WIRES CONFORMING TO DIAMETER OF PIPE. CLASP PIPE AND FABRIC FIRMLY WITH ENDS TWISTED AT LEAST TWO FULL TURNS. BEND ENDS OF WIRE TO MINIMIZE HAZARD TO PERSONS AND CLOTHING.**
- G. FASTENERS: INSTALL NUTS FOR TENSION BAND AND HARDWARE BOLTS ON SIDE OF FENCE OPPOSITE FABRIC SIDE. PEEN ENDS OF BOLTS OR SCORE THREADS TO PREVENT REMOVAL OF NUTS.**
- 3.3 ADJUSTMENT AND CLEANING**
- A. REPAIR COATINGS DAMAGED IN THE SHOP OR AT THE SITE BY RECOATING WITH MANUFACTURERS RECOMMENDED REPAIR COMPOUND APPLIED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS. REPAIR HOT-DIP GALVANIZED COATINGS IN ACCORDANCE WITH ASTM A90.**

- RIGID CONDUITS**
- PVC-COATED RIGID CONDUITS, ELBOWS, COUPLINGS, FITTINGS AND OUTLET BODIES.

A. MATERIAL:

 - HEAVY-WALL, MILD STEEL, HOT-DIP GALVANIZED, SMOOTH URETHANE INTERIOR COATING, TAPERED THREADS, CAREFULLY BEAMED ENDS, 3/4-INCH NPS MINIMUM SIZE WITH FACTORY EXTERIOR COATING OF 40-MIL THICK PVC.
 - COLOR:
 - COLOR OF COATING SHALL BE THE SAME ON ALL CONDUIT AND FITTINGS.
 - MANUFACTURERS:
 - ROBROY INDUSTRIES
 - PERMA-COTE INDUSTRIES
 - OR APPROVED EQUAL
- 2. SEALING BUSHING**
- A. FOR CONDUITS PASSING THROUGH EXTERIOR MASONRY BLOCK WALLS OR THROUGH CORE - DRILLED HOLES IN EXTERIOR SURFACE WALLS. EXTERIOR CONCRETE WALLS, FLOOR SLABS, ROOF SLABS, AND FOR CONDUIT PASSING THROUGH INTERIOR CONCRETE WALLS OR FLOORS AND INTERIOR MASONRY BLOCK WALLS.**
- B. GSM SEALING BUSHING AT THE INSIDE OF THE STRUCTURE AND TYPE CGMC SEALING BUSHING AT THE OUTSIDE OF THE STRUCTURE BY VOZGEDNEY, OR APPROVED EQUAL.**
- FLEXIBLE CONDUIT AND FITTINGS**
- 1. FLEXIBLE CONDUIT (NON-HAZARDOUS CLASS 1, DIVISION 2 HAZARDOUS AREAS)**
- A. MATERIAL:**
- FLEXIBLE GALVANIZED STEEL CORE WITH SMOOTH, ABRASION-RESISTANT, LIQUID-TIGHT, POLYVINYL CHLORIDE COVER, CONTINUOUS COPPER GROUND BUILT IN FOR SIZES 3/4-INCH THROUGH 1.25-INCH. MATERIAL SHALL BE UL LISTED.
- B. MANUFACTURERS:**
- AMCONDA SEAL TITE TYPE UA BY ANAMET ELECTRICAL, INC.
 - LIQUATITE TYPE LA BY ELECTRIC-FLEX COMPANY
 - OR APPROVED EQUAL.
- 2. PVC-COATED CONDUIT FITTINGS**
- A. MATERIAL AND CONSTRUCTION:**
- MALLEABLE IRON WITH STANDARD FINISH AND 40-MIL PVC EXTERIOR COATING. FITTINGS SHALL ADAPT THE CONDUIT TO STANDARD THREADED CONNECTIONS AND SHALL HAVE AN INSIDE DIAMETER NOT LESS THAN THAT OF THE CORRESPONDING STANDARD CONDUIT SIZE.
 - MANUFACTURERS:
 - ROBROY INDUSTRIES
 - PERMACOTE INDUSTRIES
 - OCAL, INC
 - OR APPROVED EQUAL.



LEGAL ENTITY:
ARCADIS U.S., Inc.
ARCHITECTURAL AND
ENGINEERING SERVICES, INC.
COPYRIGHT: 2015

CONSULTANTS

NO.	DATE
0	08/20/18

ISSUED FOR

BY	SEALS	DATE
EE	NOT FOR CONSTRUCTION	08/20/18

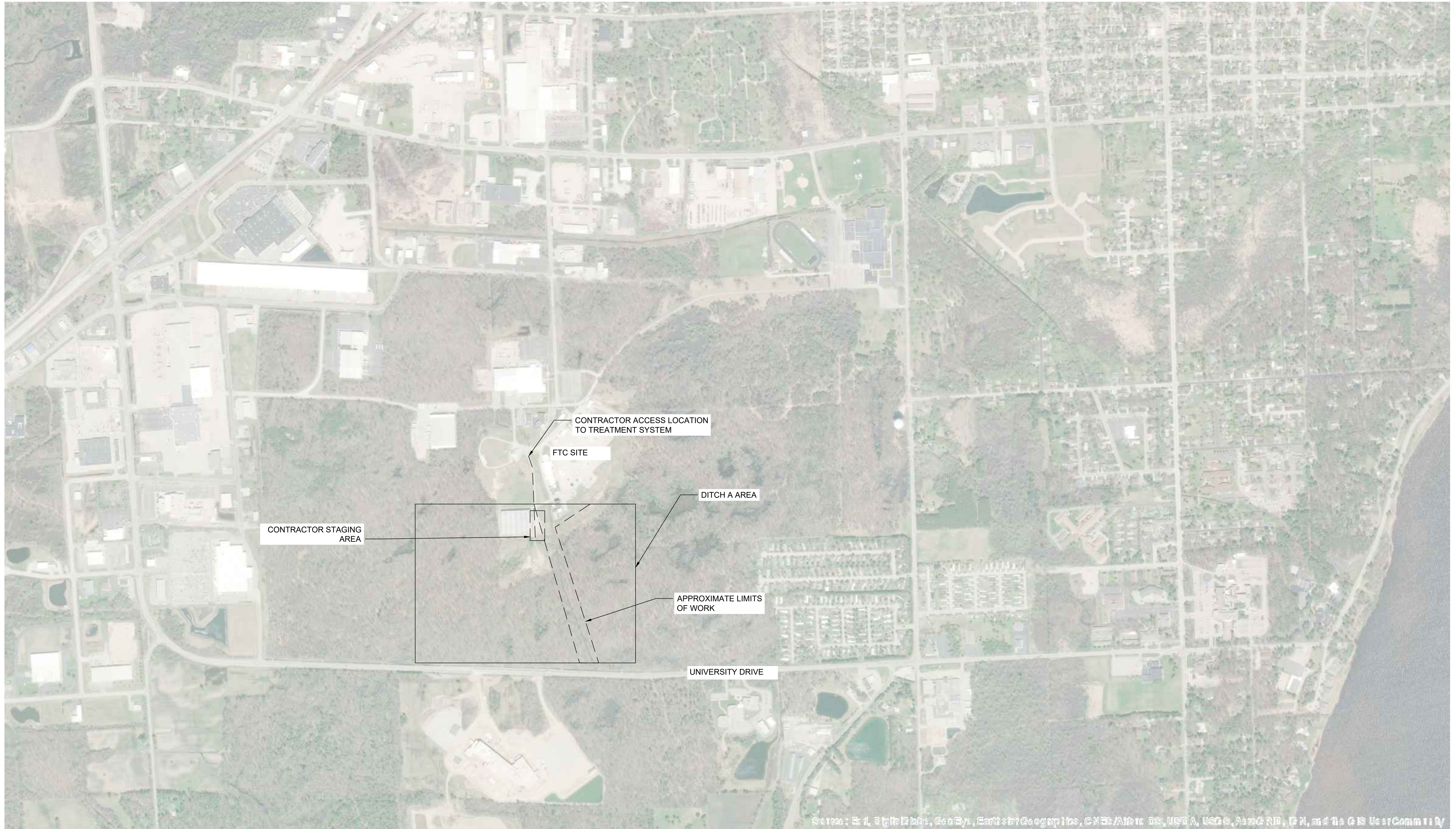
DESIGN PACKAGE ISSUED FOR REVIEW

PROJECT NO.:	FILE NAME:	DESIGNED BY:	DRAWN BY:	CHECKED BY:
W101605.0001	DRAFT-7_G8--SPECIFICATIONS	BV	EE	MA

MARINETTE, WI

SHEET TITLE	SCALE:
SPECIFICATIONS (SHEET 5 OF 5)	G7

User: EEBERT Spec: AUS-NC5MOD File: \\ARCADIS-US.COM\OFFICE\DATA\MILWAUKEE-WI\PROJECT\TYCO\W001605\CADD\DITCH INTERIM ACTION\DWG A ONLY PACKAGE SUBMITTED 08202018_DRAFT AND PC STAMP REMOVED DRAFT-8_OVERALLSITEPLAN.DWG Scale: 1:1 SaveDate: 8/20/2018 Time: 11:46 Plot Date: Ebert, Liz: 8/20/2018



ARCADIS

LEGAL ENTITY:
ARCADIS U.S., Inc.
ARCHITECTURAL AND
ENGINEERING SERVICES, INC.

COPYRIGHT: 2015

CONSULTANTS

NO.	DATE	ISSUED FOR	BY
0	08/20/18	DESIGN PACKAGE ISSUED FOR REVIEW	EE

SEALS

NOT FOR CONSTRUCTION

DATE:	08/20/18
PROJECT NO.:	W001605.0001
FILE NAME:	DRAFT-8_OVERALLSITEPLAN
DESIGNED BY:	BV
DRAWN BY:	EE
CHECKED BY:	MA

MARINETTE, WI

ANSUL FTC SITE

DITCH INTERIM ACTION DESIGN

ARCADIS PROJ. NO. W001605.0001

SHEET TITLE

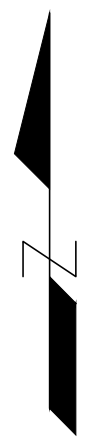
OVERALL SITE PLAN

SCALE:

C1

SHEET ___ OF 1

User: EEBERT Spec: AUS-NC5MOD File: \\ARCADIS-US.COM\OFFICEDATA\MILWAUKEE-WI\PROJECT\TYCO\W001605\CADD\DITCH INTERIM ACTION\DITCH A ONLY PACKAGE\SUBMITTED 08202018_DRAFT AND PC STAMP REMOVED DRAFT-9_SOUTH SITE AERIAL.DWG Scale: 1:1 ServedDate: 8/20/2018 Time: 11:51 Plot Date: Ebert, Liz, 8/20/2018



NOTES:

1. AERIAL IMAGE, DITCH EXTENTS, AND EQUIPMENT ASSOCIATED WITH THE TREATMENT SYSTEM ARE IN APPROXIMATE LOCATIONS.
2. CONTRACTOR SHALL PROVIDE RIP-RAP AT THE POINT OF DISCHARGE INTO THE DITCH.
3. CONTRACTOR SHALL PLACE PIPE ON A BEDDING OF STONE IN LOW AREAS ALONG WATERWAY TO ALLOW FOR RUNOFF FLOW.
4. CONTRACTOR SHALL CLEAR, GRUB, AND REMOVE TREES AS NECESSARY TO ACCESS THE CHECK DAM FROM THE NORTH.
5. CONTRACTOR SHALL SEED AND STRAW ACCORDING TO THE WDNR BEST MANAGEMENT PRACTICES. ANNUAL RYEGRASS, OR EQUAL, SHALL BE USED.
6. CONTRACTOR SHALL PROVIDE EROSION CONTROL PER THE WDNR STORMWATER BEST MANAGEMENT PRACTICES WITHIN THE LIMIT OF WORK.
7. CONTRACTOR SHALL PROVIDE 8 FT WIDE ACCESS ROAD FROM FTC SITE TO CHECK DAM USING NO. 1 STONE WHERE APPROPRIATE.

ARCADIS

LEGAL ENTITY:
ARCADIS U.S., Inc.
ARCHITECTURAL AND
ENGINEERING SERVICES, INC.
COPYRIGHT: 2015

NO.	DATE	ISSUED FOR	BY	SEALS
0	08/20/18	DESIGN PACKAGE ISSUED FOR REVIEW	EE	

NOT FOR CONSTRUCTION

DATE: 08/20/18
PROJECT NO.: W001605.0001
FILE NAME: DRAFT-9_SOUTH SITE AERIAL
DESIGNED BY: BV
DRAWN BY: EE
CHECKED BY: MA

MARINETTE, WI
ANSUL FTC SITE
DITCH INTERIM ACTION DESIGN
ARCADIS PROJ. NO. W001605.0001

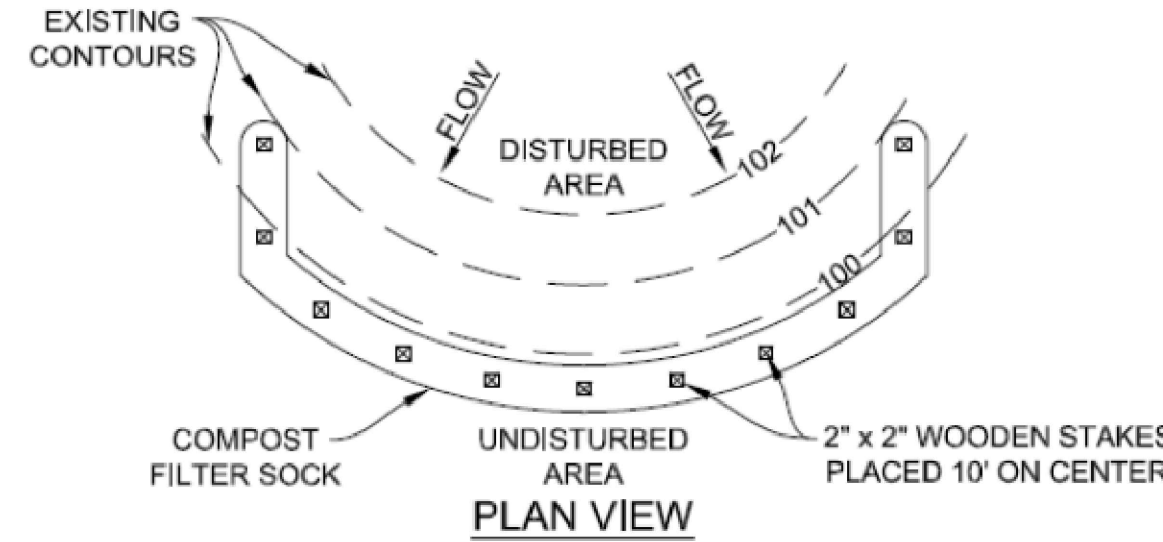
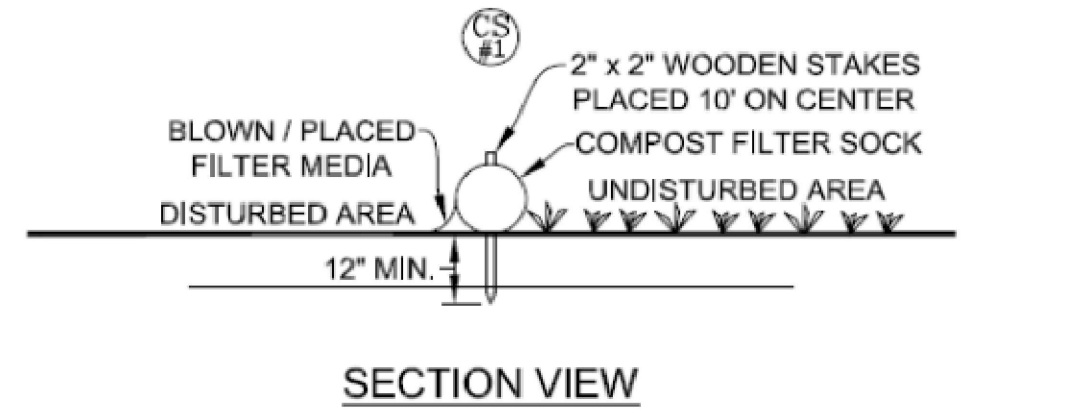
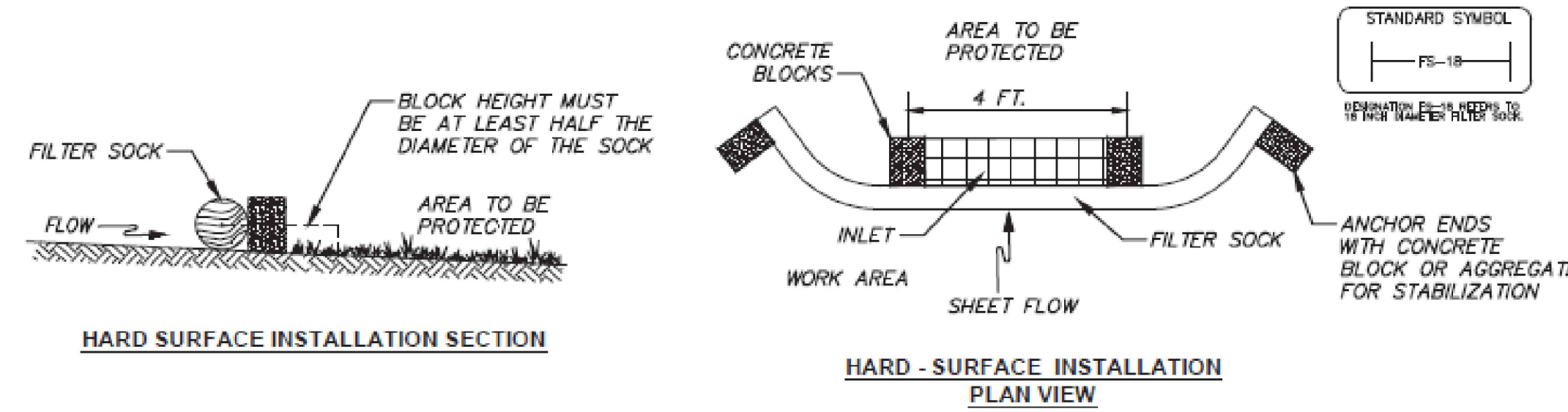
SHEET TITLE
DITCH A SITE PLAN

SCALE:
C2
SHEET ___ OF 1

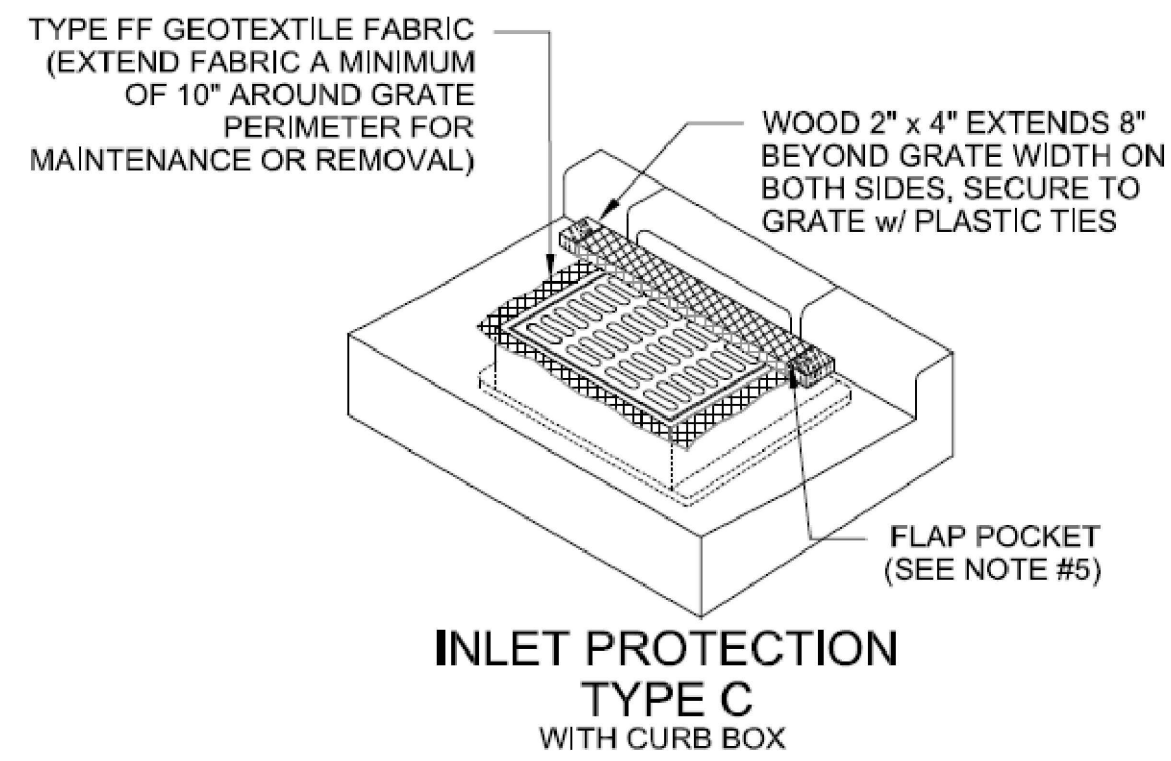
User: EBERHART Spec: AUS-NCSMOD File: \\ARCADIS-US.COM\OFFICE\DATA\MILWAUKEE-WI\PROJECT\TYCO\W1001605\CADD\ITCH INTERIM ACTION\DRAWING A ONLY PACKAGE\SUBMITTED 08/20/2018_08202018_08202018_11:54 Plot Date: Eberhart, Liz, 8/20/2018, 11:54 Scale: 1:1 Saved Date: 8/20/2018 Time: 11:54

SEDIMENT AND EROSION CONTROL GENERAL NOTES:

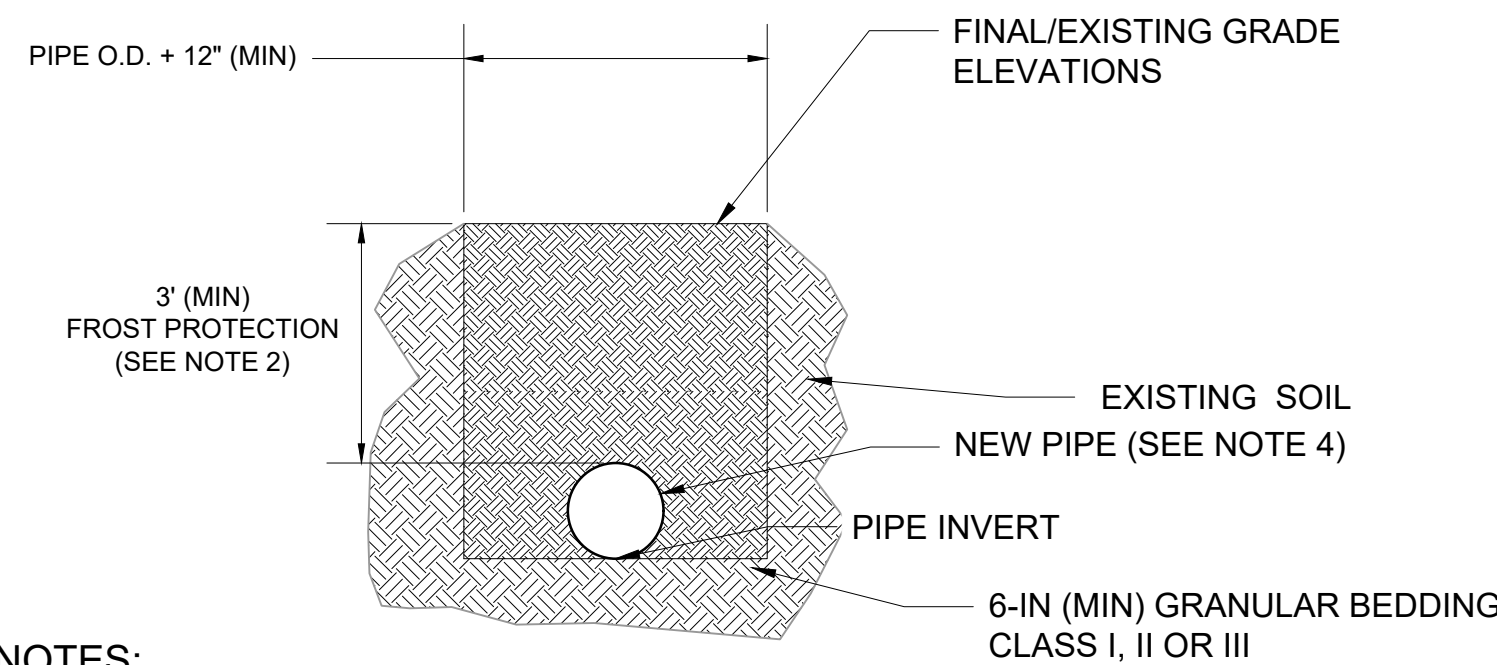
- BEST MANAGEMENT PRACTICES (BMPs) SHALL BE INSTALLED PER THE PLAN AND SPECIFICATIONS, AND APPLICABLE LOCAL, STATE, AND FEDERAL REQUIREMENTS.
- ACTIONS MUST BE TAKEN TO MINIMIZE THE TRACKING OF MUD AND SOIL FROM CONSTRUCTION AREAS ONTO PUBLIC ROADWAYS AND PLANT ACCESS DRIVES. SOIL TRACKED ONTO THE ROADWAY SHALL BE REMOVED DAILY.
- SOIL STOCKPILES SHALL BE LOCATED AWAY FROM STREAMS, PONDS, SWALES, AND CATCH BASINS. STOCKPILES SHALL BE ADEQUATELY CONTAINED THROUGH THE USE OF SILT FENCE.
- IF THE CONTROL DEVICE BECOMES INEFFECTIVE DUE TO WEATHERING, DECOMPOSING, OR DAMAGE, REPLACE THE AFFECTED SECTION IMMEDIATELY.
- SEDIMENT MUST BE REMOVED WHEN IT REACHES APPROXIMATELY 1/3 THE HEIGHT OF THE SILT FENCE OR CHECK DAM, ESPECIALLY IF HEAVY RAINS ARE EXPECTED.
- THE DRAWINGS AND SPECIFICATIONS INDICATE MINIMUM MEASURES AND BMP'S TO PROTECT AGAINST EROSION AND PROVIDE SEDIMENT CONTROL. ADDITIONAL BMP'S AND ESC MEASURES MAY BE REQUIRED BY THE CONTRACTOR TO MINIMIZE SEDIMENT FROM LEAVING THE CONSTRUCTION ZONE.
- CONTRACTOR SHALL PERFORM ALL ACTIVITIES PER THE MOST RECENT LOCAL, STATE AND FEDERAL STORM WATER MANAGEMENT PROGRAM RULES AND REGULATIONS.



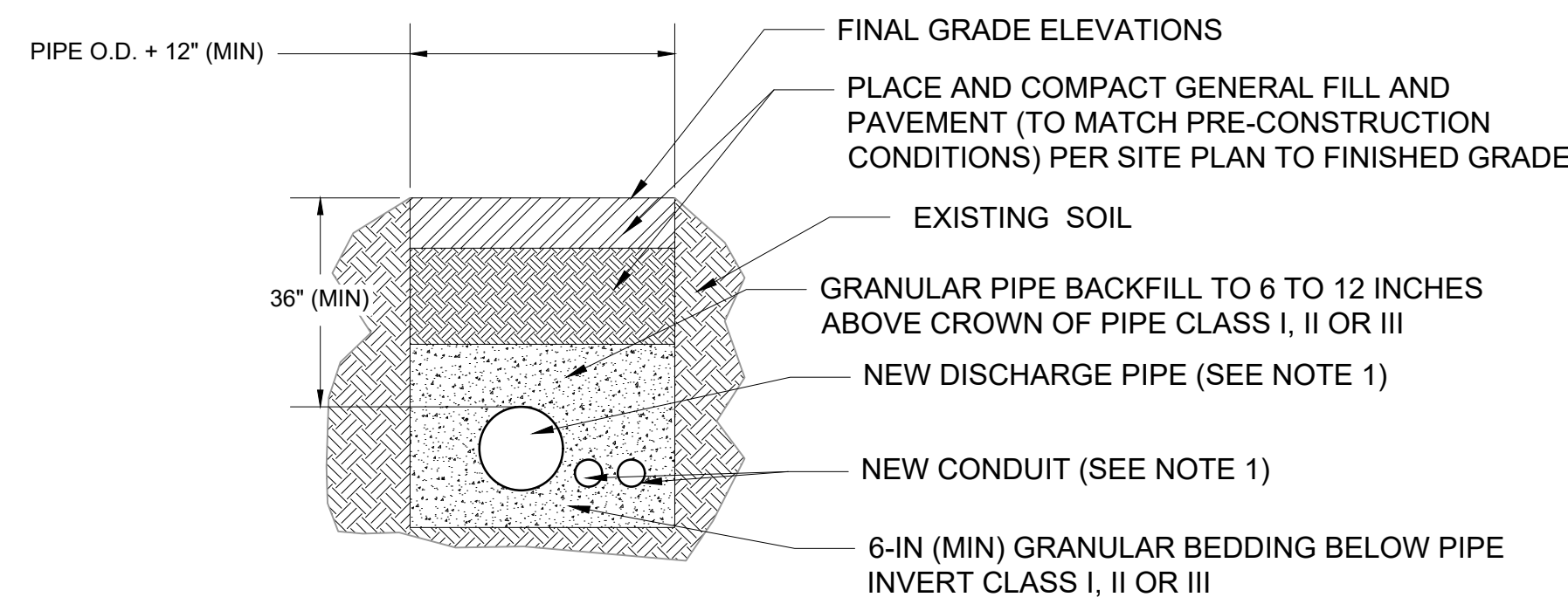
COMPOSITE FILTER SOCK NOT TO SCALE



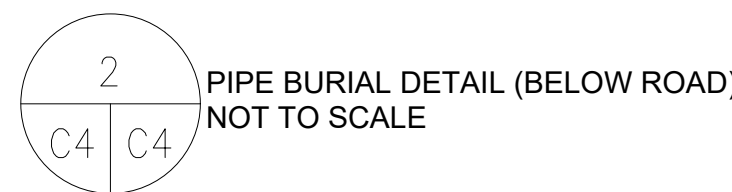
TYPICAL INLET PROTECTION NOT TO SCALE



- NOTES:
- CONSTRUCTION TRAFFIC SHALL MAINTAIN AT LEAST 10' OF SEPARATION FROM BURIED PIPES AT ALL TIMES.
 - ALL PIPES SHALL BE BURIED SO THAT THE PIPE CROWN IS A MINIMUM OF 3' BELOW FINISHED GRADE.
 - TRENCHED PIPES SHALL BE MARKED WITH FLAGS OR SIGNS AT 50' INTERVALS TO NOTIFY POTENTIAL TRAFFIC OF THE PIPE'S EXISTENCE.

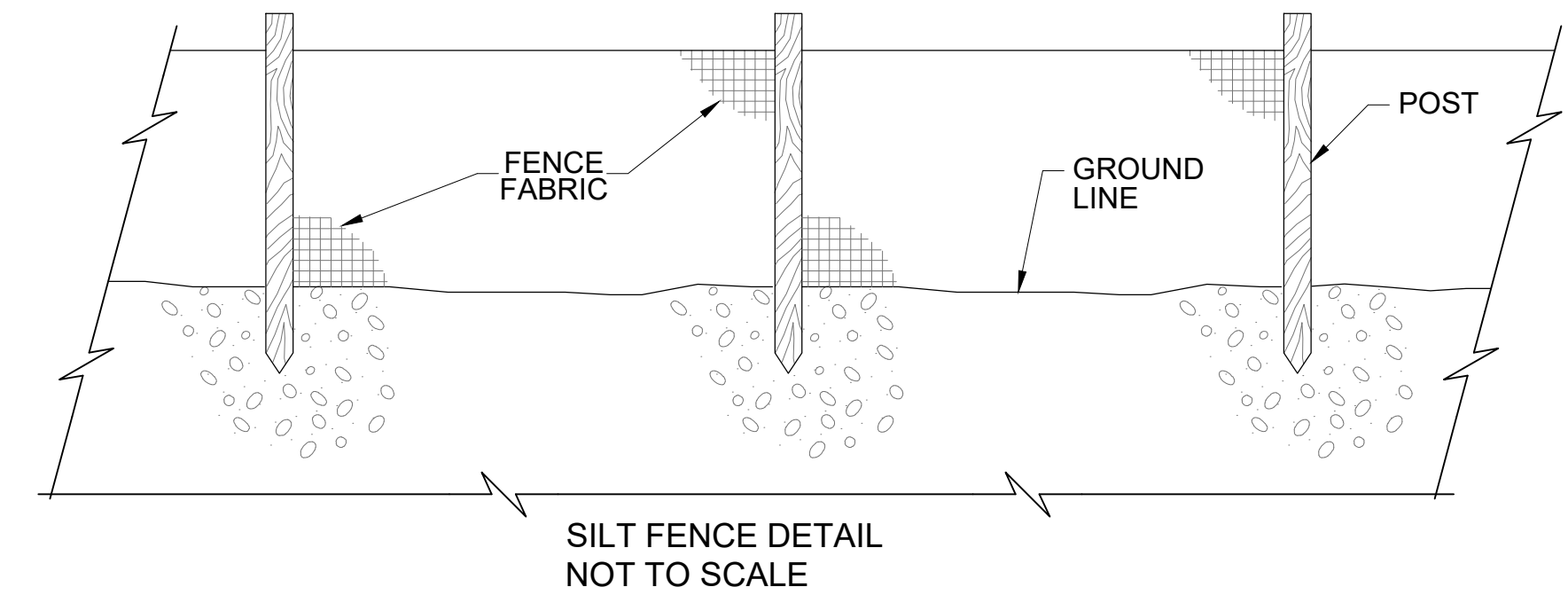


- NOTES:
- PROVIDE A MINIMUM OF 6" OF SEPARATION BETWEEN NEW PIPES.

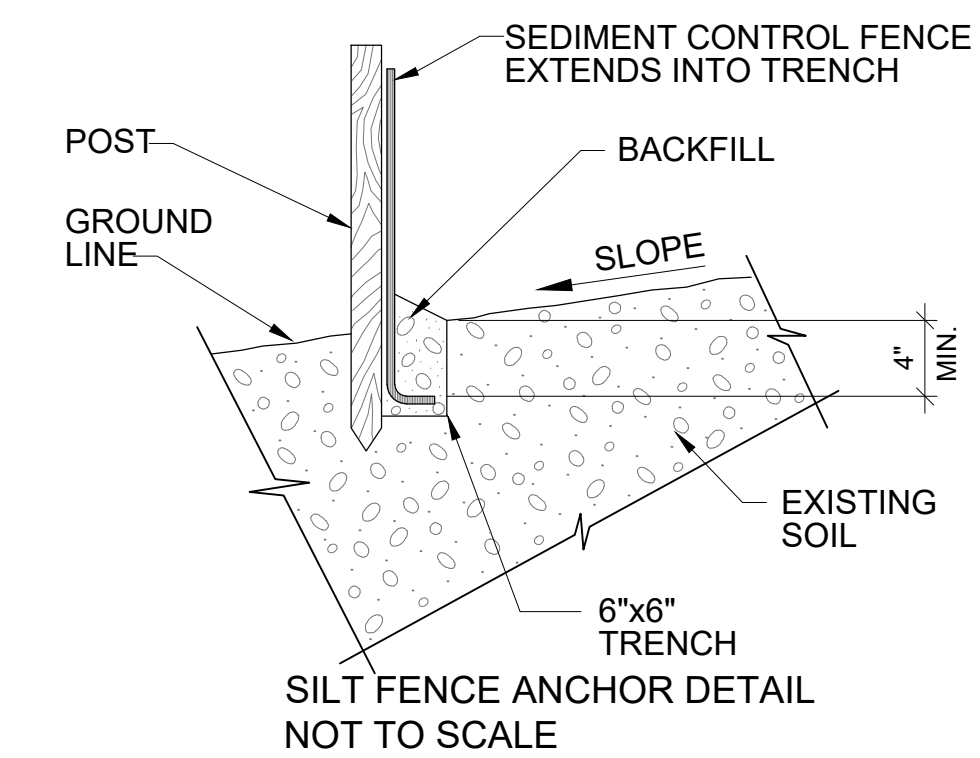


FILTER SOCK CONSTRUCTION SPECIFICATIONS

- BEFORE INSTALLING, CLEAR ALL OBSTRUCTIONS INCLUDING ROCKS, CLODS, AND DEBRIS GREATER THAN 1-INCH THAT MAY INTERFERE WITH PROPER FUNCTION OF THE FILTER SOCK.
- FILL SOCK UNIFORMLY WITH COMPOST OR ALTERNATE FILTER MEDIA TO DESIRED LENGTH, WITH ENOUGH MATERIAL THAT THE SOCKS DO NOT DEFORM.
- PLACE SOCKS ALONG CONTOURS, WITH THE ENDS TURNED UPSLOPE AT 30 TO 45 DEGREES FOR A LENGTH OF AT LEAST 5 FEET TO PREVENT RUNOFF BYPASS.
- FOR UNTRENCHED INSTALLATION, BACKFILL MULCH OR COMPOST ON THE UPSTREAM SIDE OF THE SOCK AND TAMP TO PREVENT UNDERCUTTING AND PIPING.
- ANCHORING MUST CONFORM TO THE FOLLOWING LIST: (A) MINIMUM 2-INCH SQUARE CROSS SECTION HARDWOOD; (B) DRIVEN AT LEAST 12 INCHES BELOW GRADE, OR 8 INCHES IF IN DENSE CLAY SOILS; (C) PROTRUDE ABOVE FILTER SOCKS AT LEAST 3 INCHES; (D) DRIVEN IN AT 45-DEGREE ANGLE UPSLOPE; (E) SPACED AT NO MORE THAN 4 FEET APART, OR 8 FEET APART IF THE FILTER SOCK IS ENTRENCHED 4 INCHES INTO THE GROUND.
- DO NOT USE ENTRENCHED INSTALLATION ON FILTER SOCKS SMALLER THAN 12 INCHES IN DIAMETER.
- FOR HARD SURFACE INSTALLATION, SUCH AS ON PAVEMENT, ANCHORING MAY BE NECESSARY WHERE STRAIGHT SECTIONS EXCEED 4 FEET. SEE DETAIL ABOVE. WHEN NO ANCHORING IS USED, THE PRACTICE MUST BE CHECKED DAILY, REGARDLESS OF WHETHER RAINFALL OCCURS. ANCHORED INSTALLATION IS ALWAYS PREFERRED TO NON-ANCHORED INSTALLATION, IF POSSIBLE.
- FOR AT-GRADE INLET PROTECTION, FILTER SOCKS MUST COMPLETELY ENCLOSE THE DRAIN. IF USED AS CURB INLET PROTECTION, THE EFFECTIVE HEIGHT OF THE FILTER SOCK MUST NOT BE HIGHER THAN THE HEIGHT OF THE CURB; USE 8-INCH DIAMETER FILTER SOCK FOR STANDARD HIGHWAY APPLICATIONS.
- IF MULTIPLE SECTIONS OF FILTER SOCK ARE NEEDED FOR A CONTINUOUS RUN, OVERLAP ENDS OF SEPARATE SECTIONS A MINIMUM OF 2 FEET AND STAKE ENDS.
- TO REACH TALLER HEIGHTS, IT IS POSSIBLE TO STACK FILTER SOCKS.
- REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO A DEPTH OF HALF THE EXPOSED HEIGHT OF SOCK AND REPLACE SOCK. REPLACE FILTER SOCK IF TORN. REINSTALL FILTER SOCK IF UNDERMINING OR DISLODGING OCCURS. REPLACE CLOGGED FILTER SOCKS.
- FOR VEGETATED, PERMANENT OR SEMI-PERMANENT INSTALLATIONS, MAINTAIN THE PLANTS AS IS APPROPRIATE FOR THE SPECIES USED.



SILT FENCE DETAIL NOT TO SCALE



- NOTES:
- CONTRACTOR SHALL FURNISH AND INSTALL SEDIMENT CONTROL FENCE.
 - FENCE FABRIC SHALL BE FASTENED SECURELY TO FENCE POSTS WITH TIES OR STAPLES
 - WHEN TWO SECTIONS OF FENCE FABRIC ADJOIN EACH OTHER JOIN IN ACCORDANCE WITH WDNR STORMWATER BEST MANAGEMENT PRACTICES.
 - MAINTENANCE SHALL BE PERFORMED AS REQUIRED BY THE WDNR STORMWATER BEST MANAGEMENT PRACTICES.
 - INSTALL SILT FENCE IN ACCORDANCE WITH THE WDNR STORMWATER BEST MANAGEMENT PRACTICES.



LEGAL ENTITY:
ARCADIS U.S., Inc.
ARCHITECTURAL AND
ENGINEERING SERVICES, INC.

COPYRIGHT: 2015

NO.	DATE	ISSUED FOR	BY
0	08/20/18	DESIGN PACKAGE ISSUED FOR REVIEW	EE

SEALS
NOT FOR CONSTRUCTION

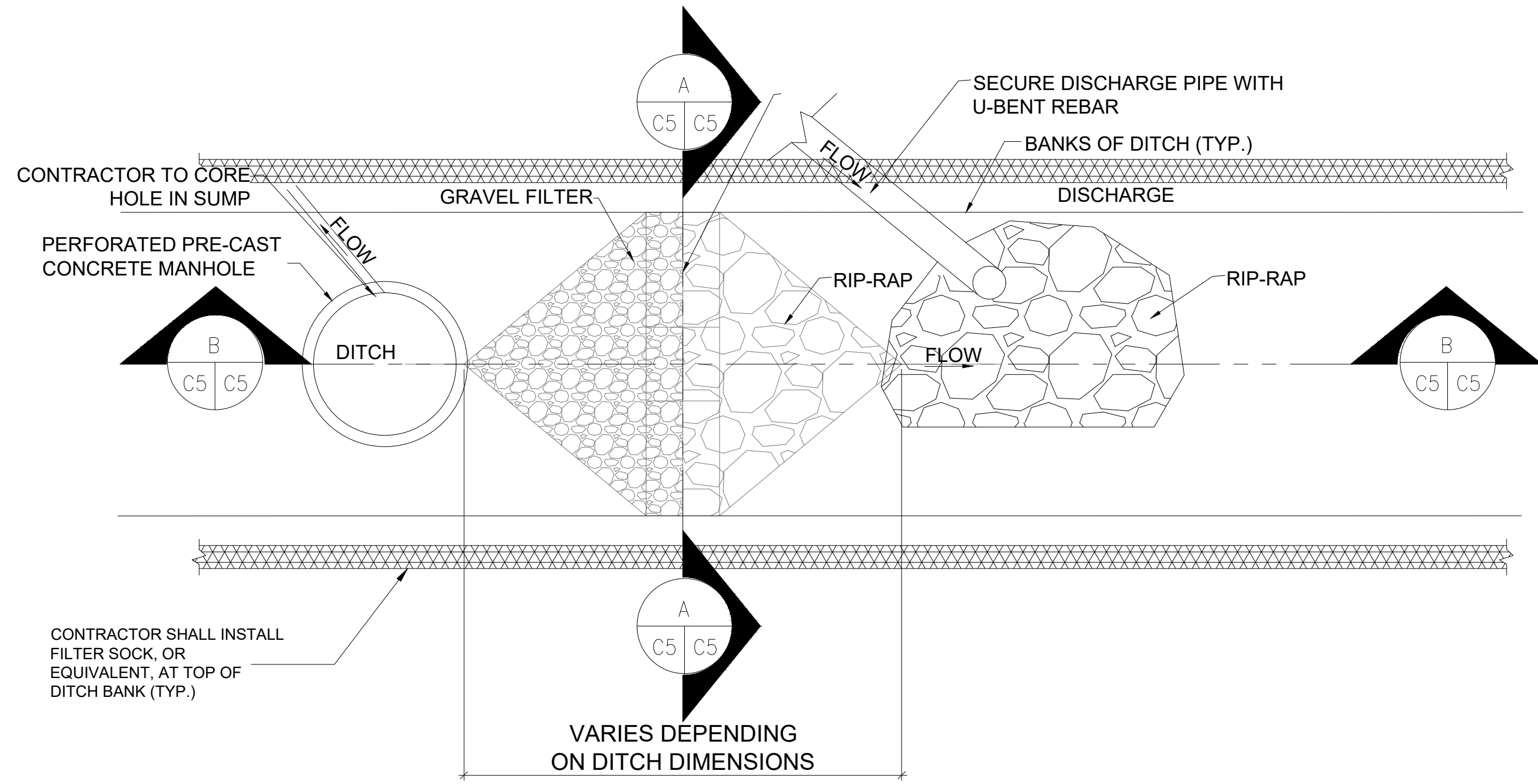
DATE: 08/20/18
PROJECT NO.: W1001605.0001
FILE NAME: DRAFT-10_CIVIL DETAILS
DESIGNED BY: BV
DRAWN BY: EE
CHECKED BY: MA

MARINETTE, WI
ANSUL FTC SITE
DITCH INTERIM ACTION DESIGN
ARCADIS PROJ. NO. W1001605.0001

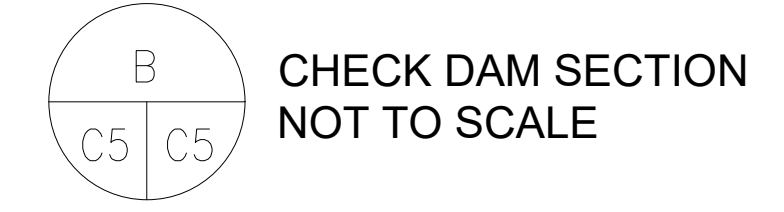
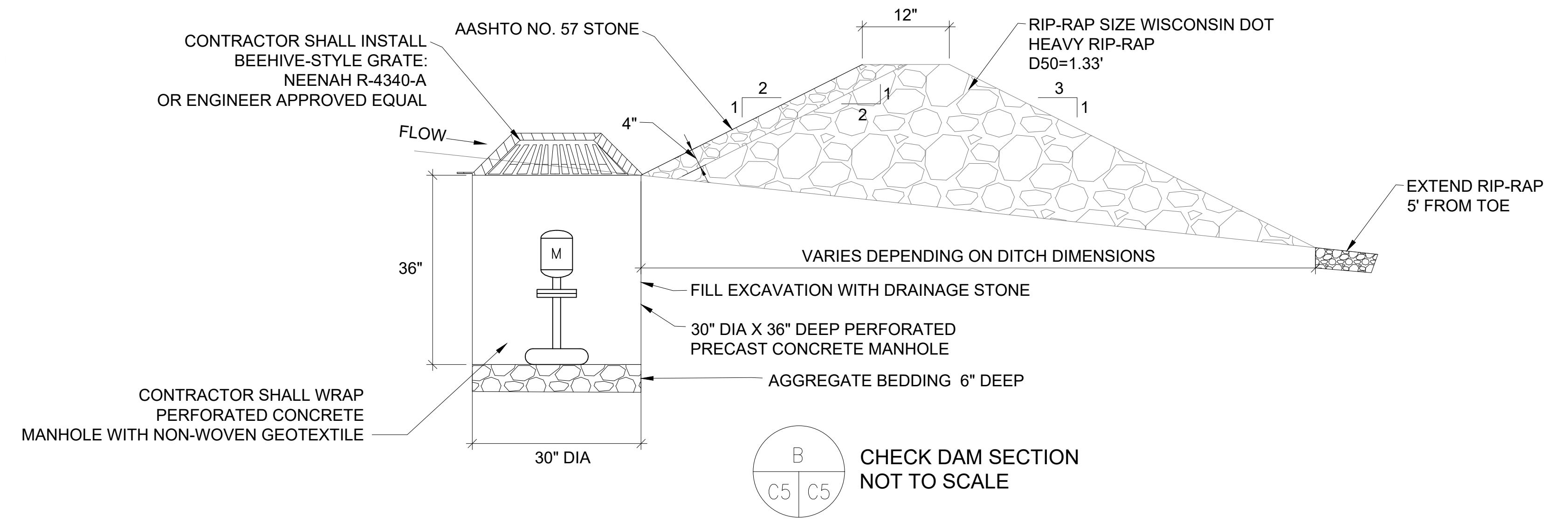
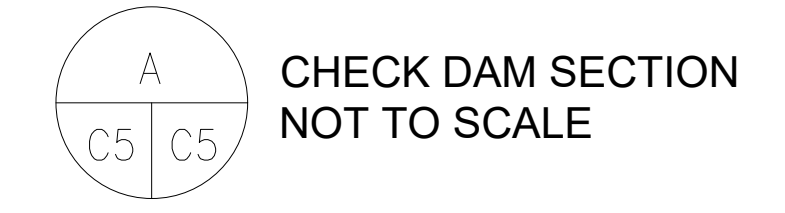
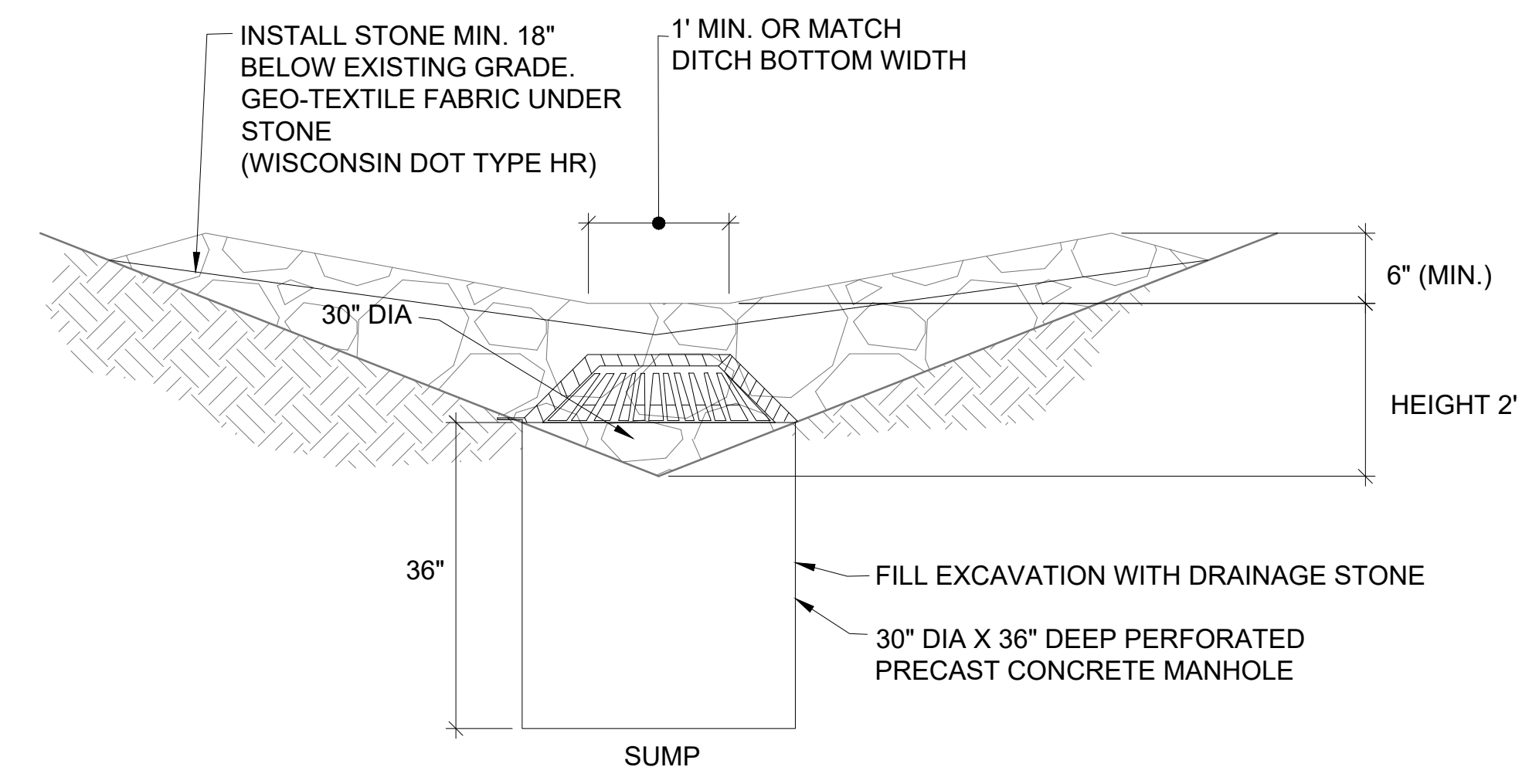
SHEET TITLE
CIVIL DETAILS
SCALE:
C3
SHEET ___ OF ___

User: EBERT Spec: AUS-NCSMOD File: \\ARCADIS-US.COM\OFFICE\DATA\MILWAUKEE-WI\PROJECT\TYCO\W001605\CADD\DITCH INTERIM ACTION\11_CHECK DAM DETAIL.DWG Scale: 1:1 Saved Date: 8/20/2018 Time: 11:58 Plot Date: Ebert, Liz: 8/20/2018

NOTES:
 1. CONTRACTOR SHALL FILL SUMP EXCAVATION WITH DRAINAGE STONE.



NOTES:
 1. CONSTRUCT STONE CHECK DAM IN ACCORDANCE WITH WDNR STORMWATER BEST PRACTICES.



LEGAL ENTITY:
 ARCADIS U.S., Inc.
 ARCHITECTURAL AND
 ENGINEERING SERVICES, INC.
 COPYRIGHT: 2015


NO.	DATE	ISSUED FOR	BY	SEALS
0	08/20/18	DESIGN PACKAGE ISSUED FOR REVIEW	EE	

NOT
FOR
CONSTRUCTION

DATE: 08/20/18
 PROJECT NO.: W001605.0001
 FILE NAME: DRAFT-11_CHECK DAM DETAIL
 DESIGNED BY: BV
 DRAWN BY: EE
 CHECKED BY: MA

MARINETTE, WI
 ANSUL FTC SITE
 DITCH INTERIM ACTION DESIGN
 ARCADIS PROJ. NO. W001605.0001

SHEET TITLE
 CHECK DAM DETAILS
 SCALE:
 C4
 SHEET ___ OF ___



LEGAL ENTITY:
ARCADIS U.S., Inc.
ARCHITECTURAL AND
ENGINEERING SERVICES, INC.
COPYRIGHT: 2015

CONSULTANTS

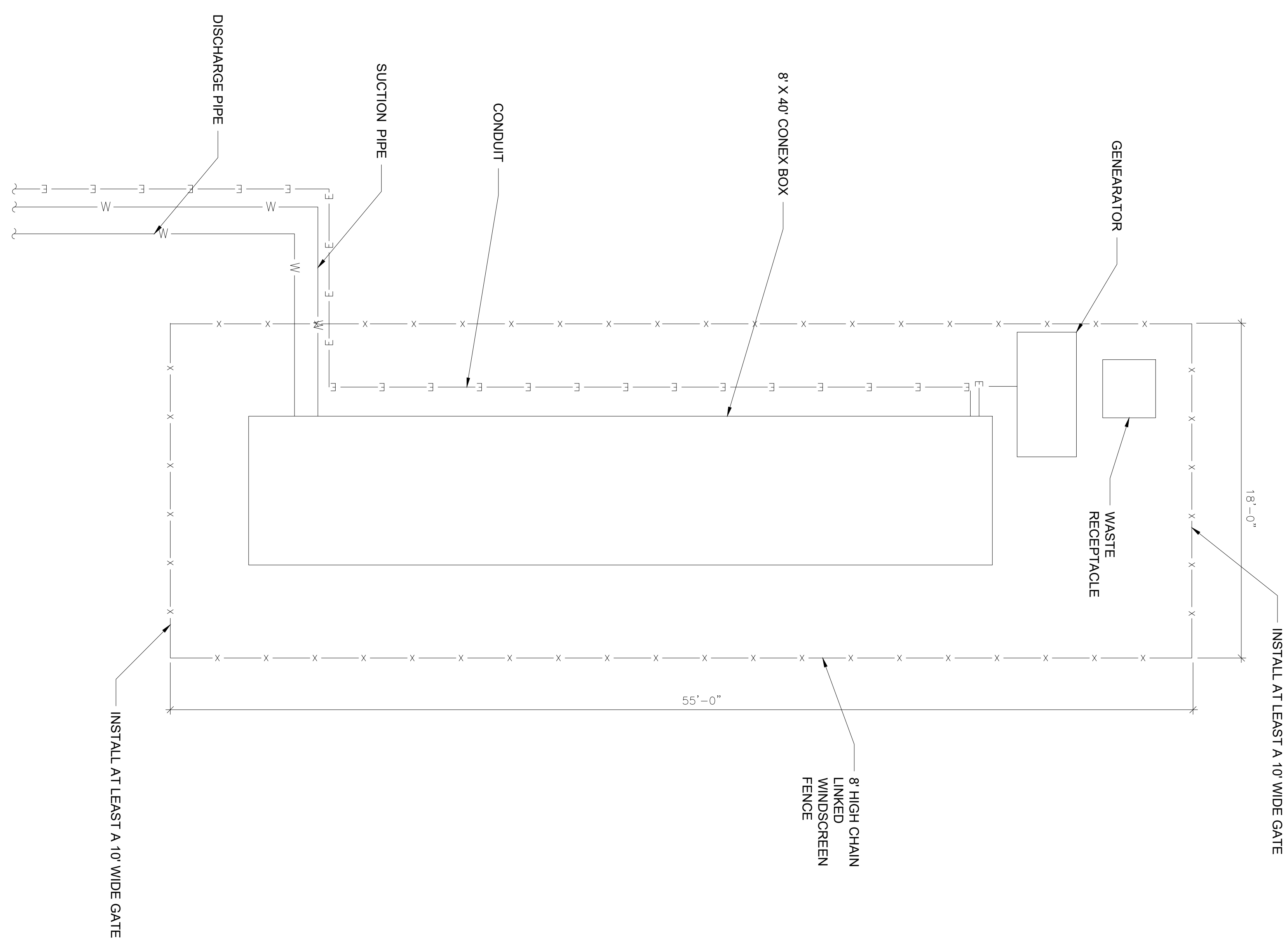
NO.	DATE	ISSUED FOR	BY	SEALS
0	08/20/18	DESIGN PACKAGE ISSUED FOR REVIEW	EE	

NO.	DATE	ISSUED FOR	BY	SEALS
0	08/20/18	DESIGN PACKAGE ISSUED FOR REVIEW	EE	

DATE:	PROJECT NO.:	FILE NAME:	DESIGNED BY:	DRAWN BY:	CHECKED BY:
08/20/18	WI001605.0001	DRAFT-12_MECHANICAL LAYOUT	MA	EE	BV

MARINETTE, WI
ANSUL FTG SITE
DITCH INTERIM ACTION DESIGN

SHEET TITLE
SYSTEM GENERAL LAYOUT



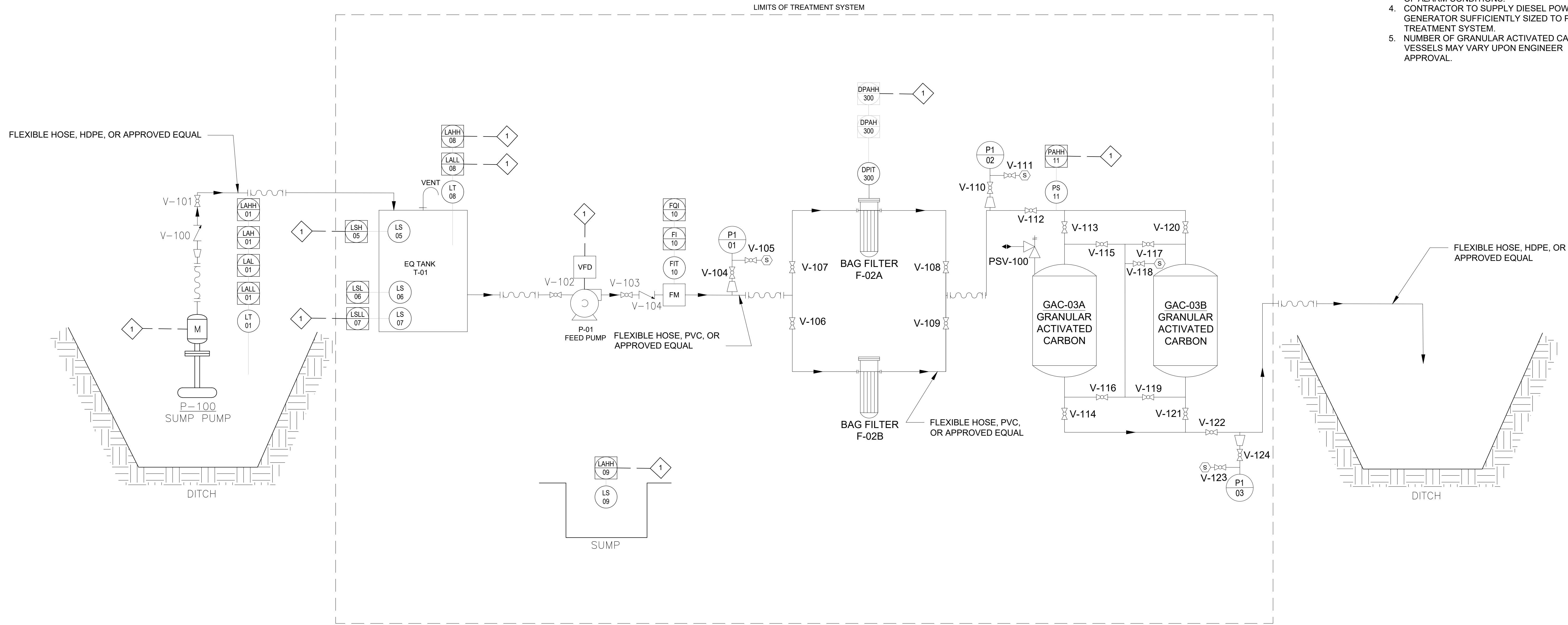
- NOTES:
1. CONTRACTOR SHALL CLEAR TREES AS NECESSARY. STUMPS SHALL BE LEVEL WITH GROUND SURFACE.
 2. ALL ELECTRICAL WORK SHALL MEET ALL FEDERAL AND LOCAL CODES.
 3. CONTRACTOR SHALL TAKE PRECAUTIONS TO PROTECT ALL UTILITIES, STRUCTURES, AND EASEMENTS PRESENT ON AND AROUND THE SITE. ANY DAMAGE TO THESE UTILITIES DUE TO WORK PERFORMED SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
 4. CONTRACTOR SHALL RESTORE SITE TO THE EXISTING CONDITIONS UPON COMPLETION OF THE WORK.

SCALE:
SHEET M1 OF 1

User: EEBERT Spc\USNS\WOOD File:\ARCADIS\US COM\OFFICE\DATA\MILWAUKEE\WI\PROJECT\TYCOW\001605\CADD\DITCH INTERIM ACTION\DITCH-A ONLY PACKAGE\ISSUED FOR REVIEW\08202018_DRAFT AND PC STAMP REMOVED\DRAWING Scale: 1:1 Saved Date: 8/17/2018 Time: 10:22 Plo Date: Eberf, Liz: 8/20/2018, 12:05 : Layout P1

	CAPACITY	TOTAL DYNAMIC HEAD (TDH) REQUIRED	PIPE SIZE	PUMP TYPE	EQ TANK	MIN. TOTAL POUNDS OF CARBON	MINIMUM EMPTY BED CONTACT TIME (EBCT)	MINIMUM HYDRAULIC LOADING
SYSTEM A	100 GPM	34 FT	4" OR APPROVED EQUAL	GRINDER, SEWAGE, OR APPROVED EQUAL	3,000 GAL POLYETHYLENE TANK	10,000 LBS	15 MIN	1.5-2.5 GPM/SQ FT

- NOTES:
1. CONTRACTOR SHALL PROVIDE ALL EQUIPMENT, INSTRUMENTATION AND ASSOCIATED ELECTRICAL WORK WITHIN THE TREATMENT SYSTEM EXTENTS AND P-100 AND ASSOCIATED CONTROLS AND VALVES.
 2. LSHH-01 SHALL CONNECT TO CONTROL PANEL AT TREATMENT SYSTEM.
 3. CONTRACTOR TO INCLUDE REMOTE ALARM NOTIFICATION DEVICE TO SEND NOTIFICATIONS OF ALARM CONDITIONS.
 4. CONTRACTOR TO SUPPLY DIESEL POWER GENERATOR SUFFICIENTLY SIZED TO POWER TREATMENT SYSTEM.
 5. NUMBER OF GRANULAR ACTIVATED CARBON VESSELS MAY VARY UPON ENGINEER APPROVAL.



LEGAL ENTITY:
ARCADIS U.S., Inc.
ARCHITECTURAL AND
ENGINEERING SERVICES, INC.
COPYRIGHT: 2015

CONSULTANTS

NO.	DATE	ISSUED FOR	BY
0	08/20/18	DESIGN PACKAGE ISSUED FOR REVIEW	EE

SEALS

NOT FOR CONSTRUCTION

DATE: 08/20/18
PROJECT NO.: W1006105.0001
FILE NAME: DRAFT-13_PIPING AND INSTRUMENTATION
DESIGNED BY: BV
DRAWN BY: JA
CHECKED BY: MA

MARINETTE, WI
ANSUL FTC SITE
DITCH INTERIM ACTION DESIGN

SHEET TITLE
PIPING AND INSTRUMENTATION DIAGRAM

SCALE:

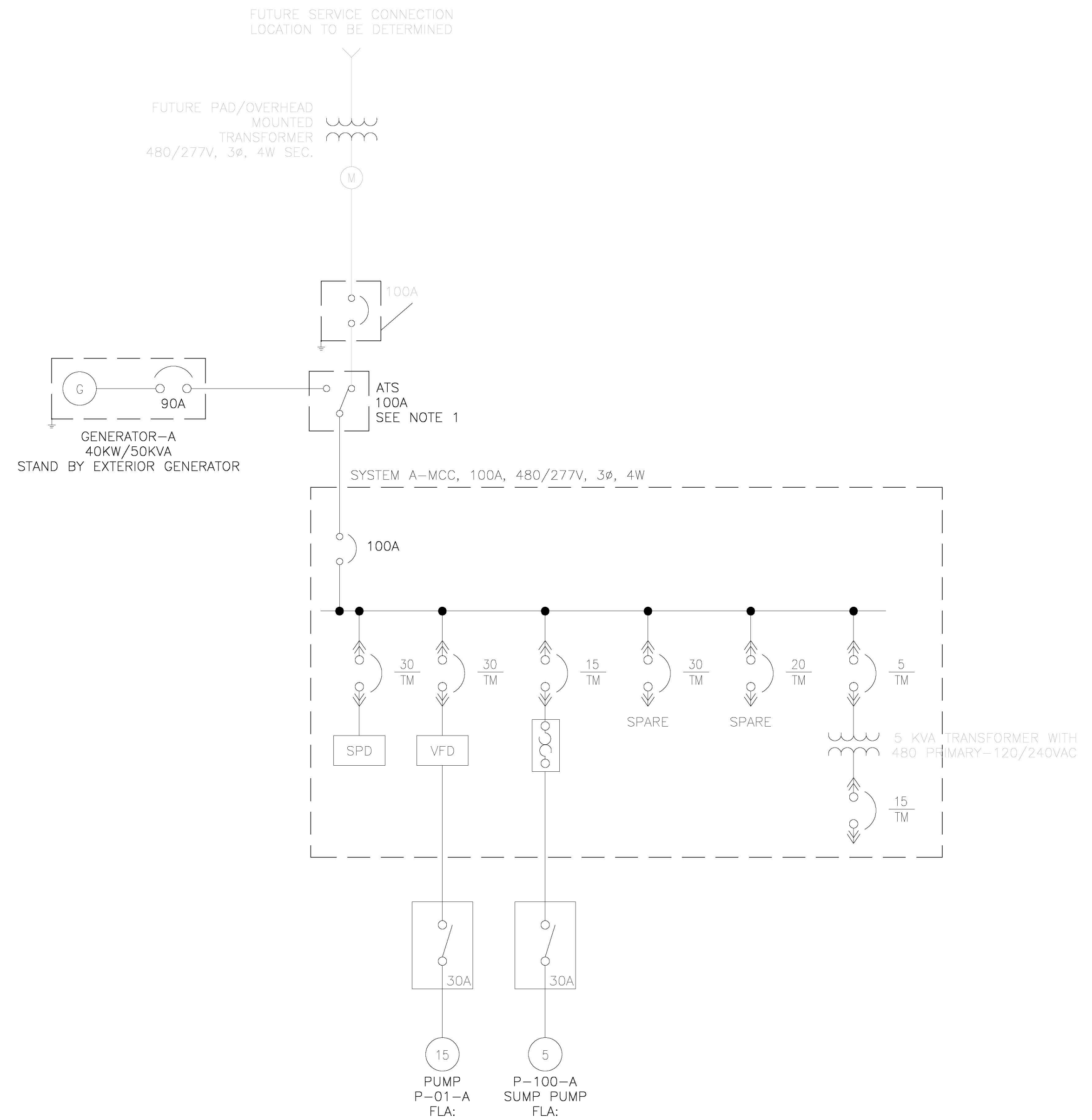
P1
SHEET ___ OF 1

ARCADIS PROJ. NO. W1001605.0001

User:EBERT Spec:US-NGS00D File: \\ARCADIS-US.COM\OFFICE\DATA\MILWAUKEE-WI\PROJECT\TY001605\CADD\DITCH INTERIM ACTION\DITCH A ONLY PACKAGE\SUBMITTED 08/20/2018 DRAFT AND PC STAMP REMOVED\DRAWING-14_SINGLE LINE.DWG Scale:1:1 Saved:08/20/2018 Time:12:04 Plot Date: Ebert, Liz, 8/20/2018, 12:05

NOTES:

1. ALL EQUIPMENT/SERVICE CONNECTED UPSTREAM OF ATS SHALL BE INSTALLED AT A LATER DATE.



SYSTEM A-MCC (480 VAC)										
DEVICE	VOLTAGE	PHASE	HP	DUTY FACTOR	BREAKER SIZE (AMPS)	CONNECT LOAD - 480V (AMPS)**	DEMAND LOAD - 480V (AMPS)**	KVA		
PUMP P-01-A	480	3	15.00	100.0%	30	21.00	21.00	17.44		
P-100-A SUMP PUMP	480	3	5.00	100.0%	15	7.60	7.60	6.31		
SUBTOTALS :						29	29	23.75		
								TOTAL ELECTRICAL LOAD:	28.57	CONNECTED AMPS
								28.57	DEMAND AMPS	
MAIN BREAKER INFORMATION								36	MINIMUM BREAKER SIZE	
								80	MAIN BREAKER	



LEGAL ENTITY:
ARCADIS U.S., Inc.
ARCHITECTURAL AND
ENGINEERING SERVICES, INC.
COPYRIGHT: 2015

CONSULTANTS

NO.	DATE	ISSUED FOR	BY
0	08/20/18	DESIGN PACKAGE ISSUED FOR REVIEW	ZP

SEALS

NOT FOR CONSTRUCTION

DATE: 08/20/18
PROJECT NO.: W1001605.0001
FILE NAME: DRAFT-14_SINGLE LINE
DESIGNED BY: JS
DRAWN BY: ZP
CHECKED BY: BV

MARINETTE, WI

ANSUL FTC SITE

DITCH INTERIM ACTION DESIGN

ARCADIS PROJ. NO. W1001605.0001

SHEET TITLE

ELECTRICAL SINGLE LINE DIAGRAM

SCALE:

E1

SHEET ___ OF 1

APPENDIX B

Photographic Log



Photo No. 01	Date: 7/23/2018	
Direction Photo Taken: East		
Description: S01 located at Site A.		

Photo No. 02	Date: 7/23/2018	
Direction Photo Taken: South		
Description: Wetland data point A-DP01 located in W01 at Site A.		

Photo No. 03	Date: 7/23/2018
Direction Photo Taken: North	
Description: Upland data point A-DP02 at Site A.	

A photograph showing a forest floor covered in green ferns and other vegetation. Several tree trunks are visible in the background, and the ground is a mix of green plants and brown leaf litter.

Photo No. 04	Date: 7/23/2018
Direction Photo Taken: North	
Description: Upland data point A-DP03 at Site A.	

A photograph of a forest interior with many thin, vertical tree trunks. The ground is covered in green plants and brown leaf litter. The trees are densely packed, and the lighting is dappled.

Photo No. 05	Date: 7/23/2018
Direction Photo Taken: North	
Description: Wetland data point A-DP04 (PEM) located within W02 at Site A.	



Photo No. 06	Date: 7/23/2018
Direction Photo Taken: West	
Description: Wetland data point A-DP05 located within W02 at Site A. The subject data point is located along a tree line within wetland W02, however, dominant plant community within W02 consisted of PEM.	



Photo No. 07	Date: 7/23/2018	
Direction Photo Taken: West		
Description: Upland data point A-DP06 at Site A.		


Photo No. 08	Date: 7/23/2018	
Direction Photo Taken: East		
Description: Wetland data point A-DP07 located within W03 at Site A.		

Photo No. 09	Date: 7/23/2018
Direction Photo Taken: West	
Description: Upland data point A-DP08 at Site A.	
	

Photo No. 10	Date: 7/23/2018
Direction Photo Taken: West	
Description: Upland data point A-DP09 within mapped WWI wetland area at Site A.	
	

Photo No. 11	Date: 7/23/2018
Direction Photo Taken: South	
Description: Overview of proposed project location and wetland at Site A.	



Photo No. 12	Date: 7/23/2018
Direction Photo Taken: North	
Description: View of location of proposed treatment system installation in S01 at Site A.	




Photo No. 13	Date: 7/23/2018	
Direction Photo Taken: West		
Description: View of proposed access to treatment system from University Drive at Site A.		

Photo No. NA	Date: NA	<p style="text-align: center;">This space intentionally left blank.</p>
Direction Photo Taken: NA		
Description: NA		

APPENDIX C

Wetland and Waterbody Delineation Report




Tyco Fire Products, L.P.

WETLAND AND WATERBODY DELINEATION REPORT

Ditch Investigation
Marinette County, Wisconsin

August 2018



**WETLAND AND
WATERBODY
DELINEATION REPORT**

Ditch Investigation
Marinette County, Wisconsin


Prepared for:
Tyco Fire Products, L.P.

Prepared by:
Arcadis U.S., Inc.
126 North Jefferson Street
Suite 400
Milwaukee, Wisconsin 53202

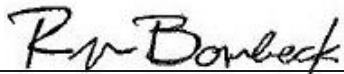
Our Ref.:
WI001605.0012

Date:
August 14, 2018

This document is intended only for the use of the individual or entity for which it was prepared and may contain information that is privileged, confidential and exempt from disclosure under applicable law. Any dissemination, distribution or copying of this document is strictly prohibited.



Stephen W. Chu, PWS
Senior Environmental Scientist



Ryan Bombeck, CWB
Staff Ecologist

CONTENTS

1	Introduction	1
2	Statement of qualification.....	2
3	Background Information.....	3
3.1	USGS Topographic Map.....	3
3.2	Contour Maps	3
3.3	Aerial Imagery.....	3
3.4	USGS NHD	4
3.5	WDNR WWI	4
3.6	FEMA Floodplain Maps	4
3.7	USDA NRCS WSS of Marinette County, Wisconsin	4
4	Methodology.....	6
5	Survey Results	7
5.1	Antecedent Precipitation.....	7
5.2	Vegetative Communities.....	7
5.3	Wetlands	7
5.4	Waterbodies.....	9
6	Conclusions.....	10
7	References.....	11

TABLES

Table 1. Soil Map Units Identified within the Environmental Survey Area	5
Table 2. Environmental Survey Area Wetland Summary	8
Table 3. Environmental Survey Area Waterbody Summary.....	9

FIGURES

1A Project Location – Site A	
1B Project Location – Site B	
2A Contour Map – Site A	
2B Contour Map – Site B	
3A Historic Aerial Imagery – Site A	
3B Historic Aerial Imagery – Site B	
4A Desktop Review – Site A	
4B Desktop Review – Site B	
5A NRCS Soils – Site A	
5B NRCS Soils – Site B	
6A Delineated Wetlands and Waterbodies – Site A	
6B Delineated Wetlands and Waterbodies – Site B	
7A Photo Locations – Site A	
7B Photo Locations – Site B	

APPENDICES

A Antecedent Precipitation Tables	
B Photographic Log	
C Wetland Determination Data Forms	

1 INTRODUCTION

This Wetland and Waterbody Delineation Report summarizes the results of a wetland and waterbody delineation survey conducted on July 23, 2018, by Arcadis U.S., Inc. (Arcadis) on behalf of Tyco Fire Products, L.P. (Tyco) for the proposed installation of interim measure water treatment systems at two locations in the city of Marinette in Marinette County, Wisconsin. Site A (**Figure 1A**) is located at approximately 45.07084° Latitude and -87.64212° Longitude in Section 13 of Township 30 North and Range 23 East. Site B (**Figure 1B**) is located at approximately 45.07277° Latitude and -87.61331° Longitude in Section 17 of Township 30 North and Range 24 East. The purpose of the wetland and waterbody delineation survey was to assess the presence or absence of wetlands and other waters that may be affected by the proposed project, and to assess general ecological conditions within the environmental survey area (ESA). Three wetlands and two streams were identified within the ESA.

2 STATEMENT OF QUALIFICATION

The wetland and waterbody delineation were performed and authored by Stephen W. Chu, Professional Wetland Scientist (PWS), Senior Environmental Scientist. Mr. Chu was the Lead Wetland Delineator for this project with assistance from Ryan Bombeck, Certified Wildlife Biologist, Staff Ecologist.

Mr. Stephen W. Chu, PWS (#1770) and Certified Senior Ecologist, earned a Master of Science degree in Natural Resources and Environmental Sciences from the University of Illinois at Urbana-Champaign. Mr. Chu has over 16 years of experience managing and completing complex ecological-related projects. His areas of expertise consist of wetland delineations, wetland mitigation design, wetland restoration, wetland and native area monitoring, habitat surveys, tree surveys, and threatened and endangered species surveys. Mr. Chu has extensive experience in fieldwork and permitting throughout the Midwest.

Ryan Bombeck has multiple professional certifications and holds a Bachelor of Science degree in Zoology - Fisheries and Wildlife Management (2007) from North Dakota State University in Fargo, North Dakota. He is currently a staff ecologist and associate project manager with Arcadis based in Milwaukee, Wisconsin.

3 BACKGROUND INFORMATION

Prior to conducting the wetland and waterbody delineation survey, Arcadis reviewed the following resources to identify the potential location and extent of wetlands and waterbodies within the ESA:

- U.S. Geological Survey (USGS) topographic map (Marinette West [Site A] and Marinette East [Site B] Quadrangles) (USGS, 2016).
- Marinette County contour data (Marinette County Land Records, 2018).
- Current aerial imagery (Bing, 2018) and historic aerial imagery (Google Earth, 2018).
- USGS National Hydrography Dataset (NHD) mapped streams (USGS, 2018).
- Wisconsin Department of Natural Resources (WDNR) Wisconsin Wetlands Inventory (WWI) dataset (WDNR, 2012).
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel 5502610001B (FEMA, 1978).
- U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Web Soil Survey (WSS) of Marinette County, Wisconsin (NRCS, 2017).

3.1 USGS Topographic Map

According to topographic mapping (**Figures 1A and 1B**), there is one blueline stream mapped within the ESA at Site A and one blueline stream mapped within the ESA at Site B.

3.2 Contour Maps

Two-foot contour data was acquired from the Marinette County Land Records department to evaluate drainage patterns within the ESA.

The maximum and minimum recorded elevations within the ESA at Site A (**Figure 2A**) are approximately 620 and 606 feet above mean sea level, respectively. In general, Site A drains from north to south along an unnamed tributary to the Little River. The maximum and minimum recorded elevations within the ESA at Site B (**Figure 2B**) are approximately 592 and 582 feet above mean sea level, respectively. In general, Site B drains from northwest to southeast along an unnamed tributary to Lake Michigan.

3.3 Aerial Imagery

A review of current aerial imagery for the ESA shows that the Site A is surrounded by the Tyco facility, forested lands, and University Drive. Site B is surrounded by the University of Wisconsin-Marinette, Runnoe Park (county park), and Lake Michigan. Aerial photography for the ESA and its vicinity is depicted in **Figures 2A and 2B**.

A review of historic aerial imagery shows no apparent changes within the ESA at Site A or Site B for the time periods available (1998 to 2013). Historic aerial imagery was reviewed for the years of 1999, 2005,

WETLAND AND WATERBODY DELINEATION REPORT

2006, 2008, 2010, and 2013 for Site A (**Figure 3A**) and 1998, 2005, 2006, 2008, 2010, and 2013 for Site B (**Figure 3B**).

3.4 USGS NHD

The USGS NHD represents the drainage network with features such as rivers, streams, canals, lakes, ponds, coastline, dams, and stream gauges. According to the NHD, one canal ditch is mapped within the ESA at Site A (**Figure 4A**) and one canal ditch is mapped within the ESA at Site B (**Figure 4B**). WDNR's Surface Water Data Viewer (WDNR, 2008) describes the canal ditch at Site A as intermittent and the canal ditch at Site B as perennial.

The ESA lies within the Little River-Frontal Lake Michigan (USGS Hydrologic Unit Code [HUC] 040301050605) subwatershed of the Peshtigo River subbasin (HUC 04030105). The closest designated traditionally navigable waterway (TNW) to the ESA is Lake Michigan, approximately 1.4 miles to the east of Site A and adjacent to Site B.

3.5 WDNR WWI

WWI maps are used as a guide, along with other data, to indicate the potential presence of wetlands. The information is not necessarily field-verified. The presence of a WWI feature is not a definitive indicator that a wetland is present. Conversely, the absence of a WWI feature is not a definitive indicator that a wetland is not present. The WWI data indicates two mapped Forested, Broad-leaved deciduous, Wet soil, Palustrine (T3K) wetlands features within the northern portion of the ESA at Site A (**Figure 4A**) and one mapped Emergent/wet meadow, persistent, Standing water, Palustrine (E1H) wetland features within the eastern portion of ESA at Site B (**Figure 4B**). These WWI features are located in forested areas along the canal ditch at Site A and beyond the shoreline of Lake Michigan at Site B.

3.6 FEMA Floodplain Maps

The identification and location of mapped FEMA flood zones within the ESA was determined by reviewing the FEMA FIRM Panel 5502610001B. No digital floodplain data is available for Marinette County, so FIRM Panel 5502610001B was digitized in the vicinity of the ESA. The extent of digitized floodplain data is depicted in **Figures 4A and 4B**.

The ESA at Site A is located entirely within the area of minimal flood hazard (Zone X). The ESA at Site B is located predominantly within Zone X and partially within the 100-year flood zone (Zone A) along the shoreline of Lake Michigan.

3.7 USDA NRCS WSS of Marinette County, Wisconsin

According to the USDA NRCS WSS for Marinette County, the four soil map units listed in **Table 1** are mapped within the ESA. The soil units mapped were listed as:

- Nonhydic – no major or minor components for the map unit are rated hydric.
- Predominantly nonhydic – no major component listed for a given map unit is rated hydric, and at least one contrasting minor component is rated hydric.

WETLAND AND WATERBODY DELINEATION REPORT

Generally, soil units identified as hydric contain soils that indicate through their color and structure that they have experienced dominantly reducing (i.e.; oxygen poor) conditions, which are a result of inundation and/or saturation by water. The location and extent of the soil units identified within the ESA are depicted in **Figures 5A and 5B**.

Table 1. Soil Map Units Identified within the Environmental Survey Area

Soil Unit Symbol	Soil Unit Name	Hydric Rating
RsB	Rousseau loamy fine sand, 1 to 6 percent slopes	Nonhydric
SfB	Shawano loamy fine sand, 2 to 6 percent slopes	Nonhydric
Ud	Udorthents, loamy, nearly level	Nonhydric
WaA	Wainola loamy fine sand, 0 to 3 percent slopes	Predominantly Nonhydric

4 METHODOLOGY

A pedestrian survey was conducted within the ESA to identify wetlands and waterbodies on July 23, 2018. Wetland boundaries were field-delineated according to Section 404 of the Clean Water Act routine onsite methodology described in the Technical Report Y-87-1 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) and subsequent guidance documents and the U.S. Army Corps of Engineers (USACE) 2012 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (Version 2.0). The ESA within the Northcentral Forests Land Resource Region (USACE, 2012). National Wetland Indicator status and taxonomic nomenclature is referenced from The National Wetland Plant List (Lichvar, 2016). Indicators of hydric soil are based on the Field Indicators of Hydric Soils in the United States guide Version 8.1 (Vasilas, L. M. et. al., 2017).

Wetland delineation data were recorded on the USACE Northcentral and Northeast Regional Supplement wetland determination data forms. In general, a representative data point was recorded for each wetland. Corresponding representative upland data points were recorded to document upland boundaries and conditions surrounding the wetlands within the ESA. Additional data points were recorded within WWI features of mapped hydric soils if wetland conditions were not observed.

Streams were identified as those waters that possessed a defined “bed and bank” or ordinary high-water mark (OHWM) indicators and lacked a dominance of upland vegetation in the channel. Channels that parallel roadways were identified as upland drainage features and were not considered to be jurisdictional unless they had an identifiable OHWM, were identified on the USGS topographic map, or represented a presumed relocation of a natural channel.

The outer boundaries of each wetland and waterbody (determined by the OHWM) were delineated and recorded using a handheld Trimble GeoXH Global positioning system receiver. As features were collected, they were given a unique feature identification (ID).

Precipitation data from approximately 90 days prior to the wetland and waterbody delineation survey were obtained from a weather station near the ESA and compared with 30-year average precipitation data obtained from a NRCS WETS Table for Marinette County to determine if antecedent hydrologic conditions at the time of the survey were normal, wetter, or drier than the normal range (Midwestern Regional Climate Center, 2018).

5 SURVEY RESULTS

5.1 Antecedent Precipitation

Prior to conducting the field visit, antecedent precipitation data were analyzed. Data were obtained from a nearby weather station (Marinette: USC00475091) and compared to data from a nearby WETS station (Oconomowoc: USC00475091). The most recent rainfall event prior to the site visit was 0.14 inches, which occurred on July 22, 2018. Precipitation for the 14 days prior to the site visit was 0.85 inches. There was no precipitation during the site visit on July 23, 2018. The precipitation data for the 90-day period prior to the field visit (**Appendix A, Table 4**) were entered into a WETS analysis worksheet (**Appendix A, Table 5**) to weight the information from each preceding month to analyze hydrologic conditions. Based on this analysis, the antecedent hydrologic conditions were considered to be within normal range, suggesting that climatic/hydrologic conditions were normal for this time of year.

5.2 Vegetative Communities

Vegetative communities observed within the ESA at Site A consisted of the existing Tyco facility, herbaceous upland and herbaceous wetland (PEM) habitat types, and forested upland and forested wetland (PFO) habitat types. Photographs of the ESA are provided in **Appendix B** and photo locations are depicted in **Figures 7A and 7B**. The Tyco facility was generally graveled or mowed/maintained. Dominant plant species in upland areas included red maple (*Acer rubrum*), quaking aspen (*Populus tremuloides*), glossy buckthorn (*Fragula alnus*), tall fescue (*Schedonorus arundinaceus*), western brackenfern (*Pteridium aquilinum*), and white snakeroot (*Ageratina altissima*). Dominant plant species in wetland areas included red maple, glossy buckthorn, western brackenfern, shining clubmoss (*Huperzia lucidula*), woolgrass (*Scirpus cyperinus*), reed canary grass (*Phalaris arundinacea*), and cattails (*Typha latifolia*).

Vegetative communities observed within the ESA at Site B consisted of the existing maintained herbaceous and forested University of Wisconsin and Runnoe Park grounds and herbaceous wetlands below the OHWM. Dominant upland species included eastern white pine (*Pinus strobus*), red pine (*Pinus resinosa*), glossy buckthorn, annual bluegrass (*Poa annua*), tall fescue, and scouringrush horsetail (*Equisetum hyemale*). Dominant wetland species included boxelder (*Acer negundo*), common buckthorn (*Rhamnus cathartica*), pin oak (*Quercus palustris*), black willow (*Salix nigra*), glossy buckthorn, field horsetail (*Equisetum arvense*), and reed canary grass.

5.3 Wetlands

As shown in **Figures 6A and 6B**, a total of three wetlands (Wetland 1 [W01], Wetland 2 [W02], and Wetland 3 [W03]) were identified as part of the delineation activities and were all located within the ESA at Site A, for a total of 1.44 acres. Wetland conditions were observed to continue beyond the boundary of the ESA for each of the wetlands. All wetlands appeared to be hydrologically connected and may be considered jurisdictional by the USACE and WDNR. It should be noted that the USACE and WDNR make the final determination of wetland hydrologic connectivity and jurisdiction. USACE Wetland Determination Data Forms are provided in **Appendix C** and wetland characteristics are summarized in **Table 2**.

WETLAND AND WATERBODY DELINEATION REPORT

Table 2. Environmental Survey Area Wetland Summary

Feature ID	Cowardin Classification	Total Approximate Area Delineated within ESA (acres) ¹	Hydrologic Connection ²	Location
W01	PFO	0.01	Connected	Site A
W02	PEM	1.11	Connected	Site A
W03	PEM	0.32	Connected	Site A

Notes:

¹The wetland may extend outside of the ESA; this acreage corresponds to the size of the feature located within the ESA.

²The determinations of hydrologic connection is based on the boundary delineations and have not been formally approved by the USACE and/or WDNR.

W01 is a forested wetland that measures approximately 0.01 acres within the ESA and is located along the fringe of the waterbody at Site A. One wetland data point (A-DP01) was taken within W01 and one upland data point (A-DP02) was taken in an adjacent upland area. W01 is comprised of a forested floodplain plant community. Dominant plant species observed at the wetland data point included red maple, glossy buckthorn, western brackenfern, shining clubmoss, and reed canary grass. This wetland was located within a slight depression and hydrology appeared to be sustained by flooding events associated with the adjacent waterbody. Wetland hydrology indicators observed at the wetland data point included moss trim lines (B16), geomorphic position (D2), and FAC-neutral test (D5). Soil textures are generally sandy loam beneath a thin layer of silt loam. Hydric soil indicators observed at the wetland data point included sandy redox (S5) and redox dark surface (F6). The wetland boundary was determined by subtle to moderate topographical changes in elevation, in addition to the boundary between hydrophytic and non-hydrophytic plant communities.

W02 is an emergent wetland that measures approximately 1.11 acres within the ESA and is located at the northern end of the ESA near the Tyco facility at Site A. Two wetland data points (A-DP04 and A-DP05) were taken within W02 and one upland data point (A-DP06) was taken in an adjacent upland area. W02 is comprised of an emergent/wet meadow plant community. Dominant plant species observed at the wetland data points included pin oak, glossy buckthorn, woolgrass, and reed canary grass. This wetland is located within a depressional area and hydrology appeared to be sustained by runoff from surrounding higher elevations. Wetland hydrology indicators observed at the wetland data points included high water table (A2), saturation (A3), geomorphic position (D2), and FAC-neutral test (D5). Soil textures are generally sandy loam beneath a thin layer of silt loam. The hydric soil indicator observed at the wetland data points was sandy redox (S5). The wetland boundary was determined by subtle to moderate topographical changes in elevation, in addition to the boundary between the presence and absence of wetland hydrology and hydric soil indicators.

W03 is an emergent wetland that measures approximately 0.32 acres within the Site A ESA and is located at the southern end of the ESA in the ditch of University Drive. One wetland data point (A-DP07) was taken within W01 and one upland data point (A-DP08) was taken in an adjacent upland area. W02 is comprised of an emergent/wet meadow plant community. Dominant plant species observed at the wetland data point included cattails and reed canary grass. This wetland is located in the depressional

WETLAND AND WATERBODY DELINEATION REPORT

road ditch and hydrology appeared to be sustained by runoff from surrounding higher elevations. Secondary wetland hydrology indicators observed at the wetland data point included geomorphic position (D2), and FAC-neutral test (D5). Soil textures are generally silt loam over sandy loam. The hydric soil indicators observed at the wetland data point were thick dark surface (A12) and redox dark surface (F6). The wetland boundary was determined by moderate topographical changes in elevation, in addition to the boundary between the presence and absence of wetland hydrology and hydric soil indicators.

Wetland characteristics observed at Site B (data points B-DP01 and B-DP03) were all located below the OHWM of the waterbody and are considered fringe wetlands.

5.4 Waterbodies

As shown in **Figures 6A and 6B**, one intermittent unnamed tributary to the Little River was identified within the ESA at Site A and one perennial unnamed tributary to Lake Michigan was identified within the ESA at Site B, for a total of approximately 1,725 linear feet. Stream 1 (S01) is located at Site A and measures approximately 1,240 linear feet within the ESA and Stream 2 (S02) is located at Site B and measures approximately 485 linear feet within the ESA. S01 flows nominally north to south and S02 flows nominally northwest to southeast. Both were classified as relatively permanent waterways (RPWs). Due to the hydrologic connection between these streams and Lake Michigan, a TNW, they may be considered jurisdictional by the USACE and WDNR. It should be noted that the USACE and WDNR make the final determination of significant nexus with a TNW. Stream characteristics are summarized in **Table 3**.

Table 3. Environmental Survey Area Waterbody Summary

Feature ID	Waterbody Name	Flow Regime ¹	Approximate Length Delineated within ESA (linear feet)	RPW or Non-RPW ²	TNW Connection	Approximate OHWM Width (feet)	Approximate Bank Width (feet)
S01	Unnamed Tributary to Little River	Intermittent	1,240	RPW	Connected	10	12
S02	Unnamed Tributary to Lake Michigan	Perennial	485	RPW	Connected	15	35

Notes:

¹Flow regime is defined as perennial, intermittent, or ephemeral. This determination was interpreted using field observations, NHD, and USGS topographic maps, as appropriate.

²Intermittent and perennial streams were recorded as RPWs. Ephemeral streams were recorded as non-RPWs.

6 CONCLUSIONS

A wetland and waterbody delineation survey was conducted by Arcadis for the proposed project on July 23, 2018. Arcadis identified three wetlands (totaling 1.44 acres) and 2 streams (totaling 1,725 linear feet) within the ESA.

The ESA at Site A contained W01, W02, W03, and S01. All wetland and waterbody features appeared to be hydrologically connected to surface water systems within the vicinity of the ESA and may be considered jurisdictional by the USACE and WDNR.

The ESA at Site B contained S02. This waterbody feature appeared to be hydrologically connected to surface water systems within the vicinity of the ESA and may be considered jurisdictional by the USACE and WDNR. Wetland characteristics observed at Site B appeared to be located below the OHWM of S02 and are considered fringe wetlands.

7 REFERENCES

Bing, 2018. Aerial basemaps. Available online at: ESRI online streaming services. Accessed: July 30, 2018.

Environmental Laboratory, 1987. 1987 USACE Wetlands Delineation Manual.

FEMA, 1978. National Flood Hazard Layer Flood Insurance Rate Map Panel 5502610001B. Available online at: <https://msc.fema.gov/portal/home>. Accessed: July 30, 2018.

Google Earth, 2018. Historic aerial imagery tool. Images from 1998, 1999, 2005, 2006, 2008, 2010, and 2013. Available online at: Google Earth streaming services. Accessed: July 30, 2018.

Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner, 2016. The National Wetland Plant List: 2016 Update of Wetland Ratings. *Phytoneuron* 2014-41: 1-42.

Marinette County Land Records, 2018. Two-foot digital contour data. Purchased: July 30, 2018.

Midwestern Regional Climate Center, 2018. cli-MATE Database. Available online at: <https://mrcc.illinois.edu/CLIMATE/>. Accessed: July 30, 2018.

NRCS, 2017. WSS of Marinette County, Wisconsin. Available online at: <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>. Accessed: July 30, 2018.

USACE, 2012. 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0).

USGS, 2016. Marinette West and Marinette East Quadrangle Maps. Available online at: <https://viewer.nationalmap.gov/advanced-viewer/>. Accessed: July 30, 2018.

USGS, 2018. NHD. Available online at: <https://viewer.nationalmap.gov/basic/?howTo=true>. Accessed: July 30, 2018.

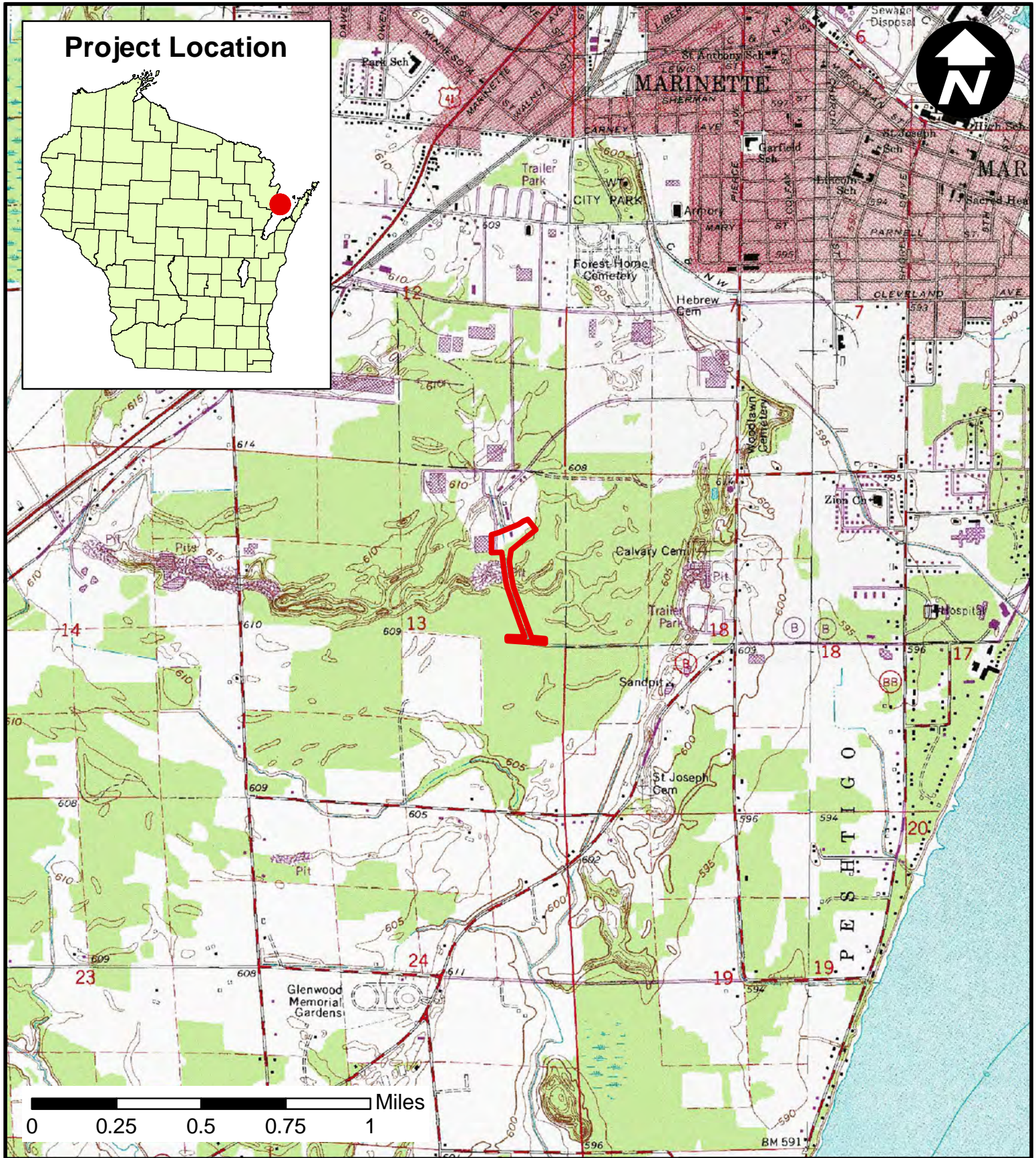
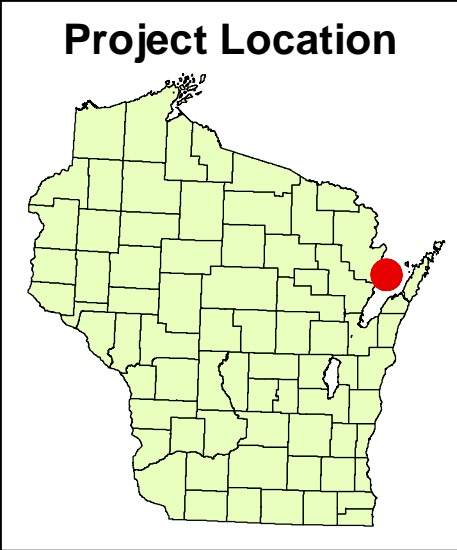
Vasilas, L.M., G.W. Hurt, and C.V. Noble, 2017. Field Indicators of Hydric Soils in the United States. USDA NRCS in cooperation with the National Technical Committee for Hydric Soils. Version 8.1.

WDNR, 2008. Surface Water Data Viewer – 24k Hydrography Streams and Rivers. Available online at: <https://dnrmaps.wi.gov/H5/?Viewer=SWDV>. Accessed: July 27, 2018.


WDNR, 2012. WWI digital data. Purchased: April 30, 2018.

FIGURES





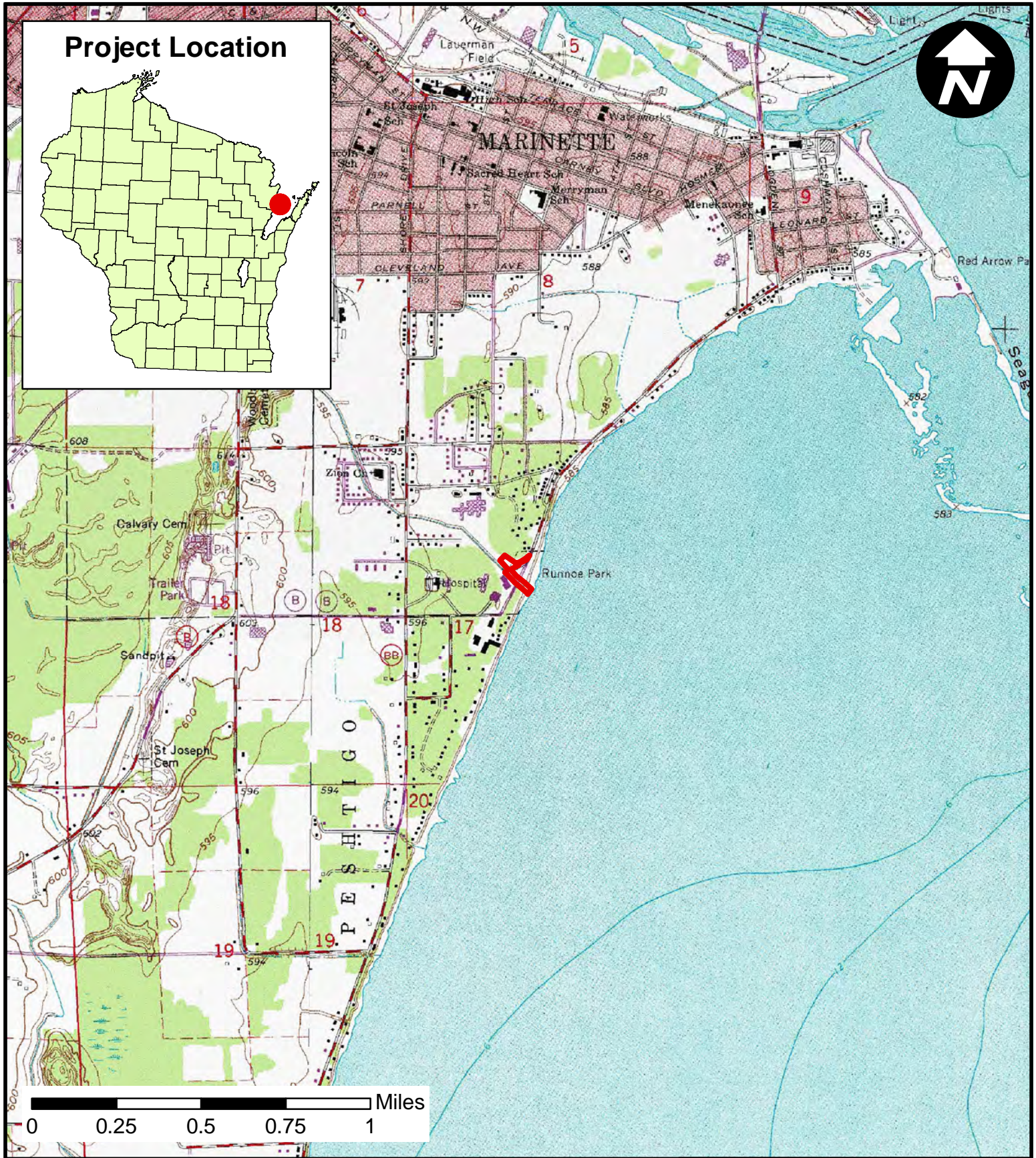
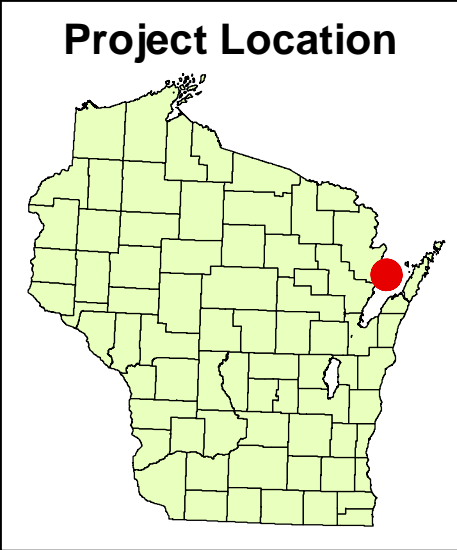
Legend

 Environmental Survey Area


TYCO FIRE PRODUCTS, L.P.
DITCH INVESTIGATION

PROJECT LOCATION - SITE A
MARINETTE COUNTY, WISCONSIN

 **ARCADIS** **FIGURE 1A**



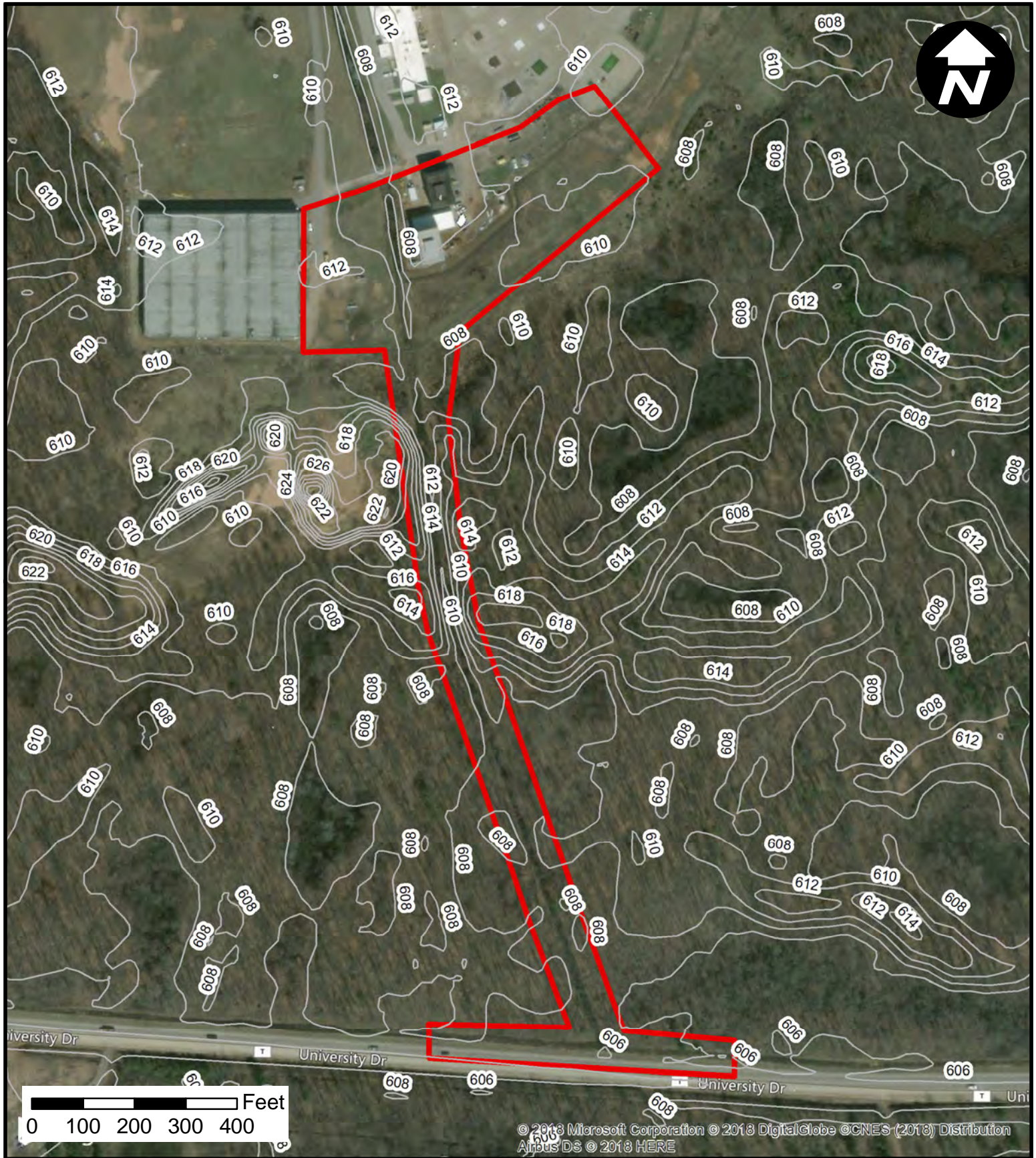
Legend

 Environmental Survey Area

TYCO FIRE PRODUCTS, L.P.
DITCH INVESTIGATION

PROJECT LOCATION - SITE B
MARINETTE COUNTY, WISCONSIN

 **ARCADIS** **FIGURE 1B**



Legend

- 2' Contours
- Environmental Survey Area

TYCO FIRE PRODUCTS, L.P.
DITCH INVESTIGATION

CONTOUR MAP - SITE A
MARINETTE COUNTY, WISCONSIN

 **ARCADIS**

FIGURE
2A



Legend

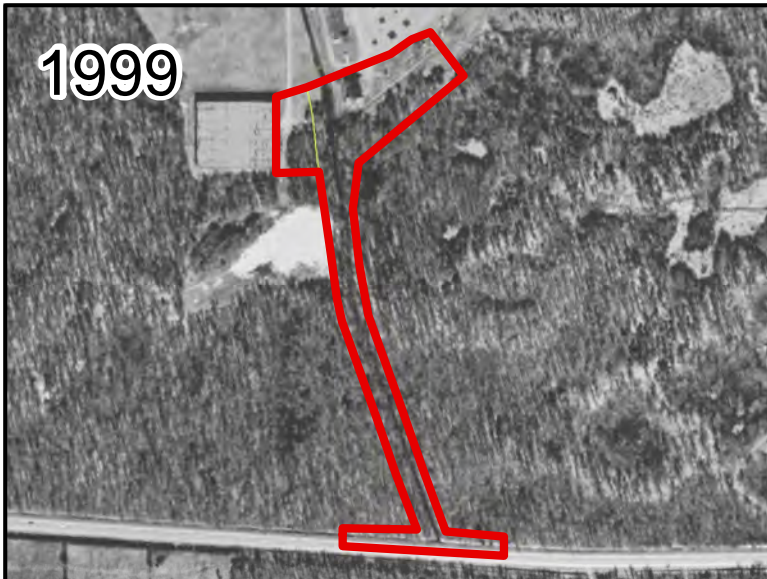
- 2' Contours
- Environmental Survey Area

TYCO FIRE PRODUCTS, L.P.
DITCH INVESTIGATION

CONTOUR MAP - SITE B
MARINETTE COUNTY, WISCONSIN

 **ARCADIS**

FIGURE
2B



Legend

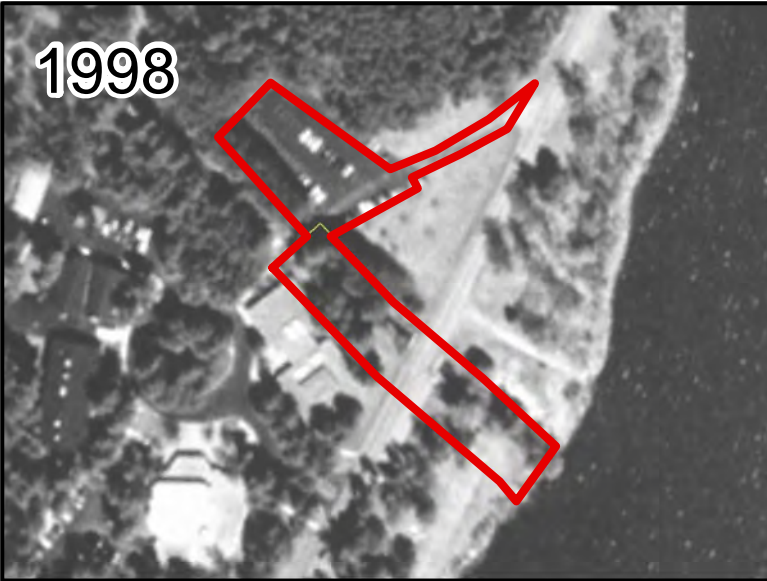
 Environmental Survey Area

TYCO FIRE PRODUCTS, L.P.
DITCH INVESTIGATION

HISTORIC AERIAL IMAGERY - SITE A
MARINETTE COUNTY, WISCONSIN



FIGURE
3A



Legend

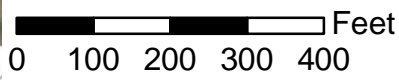
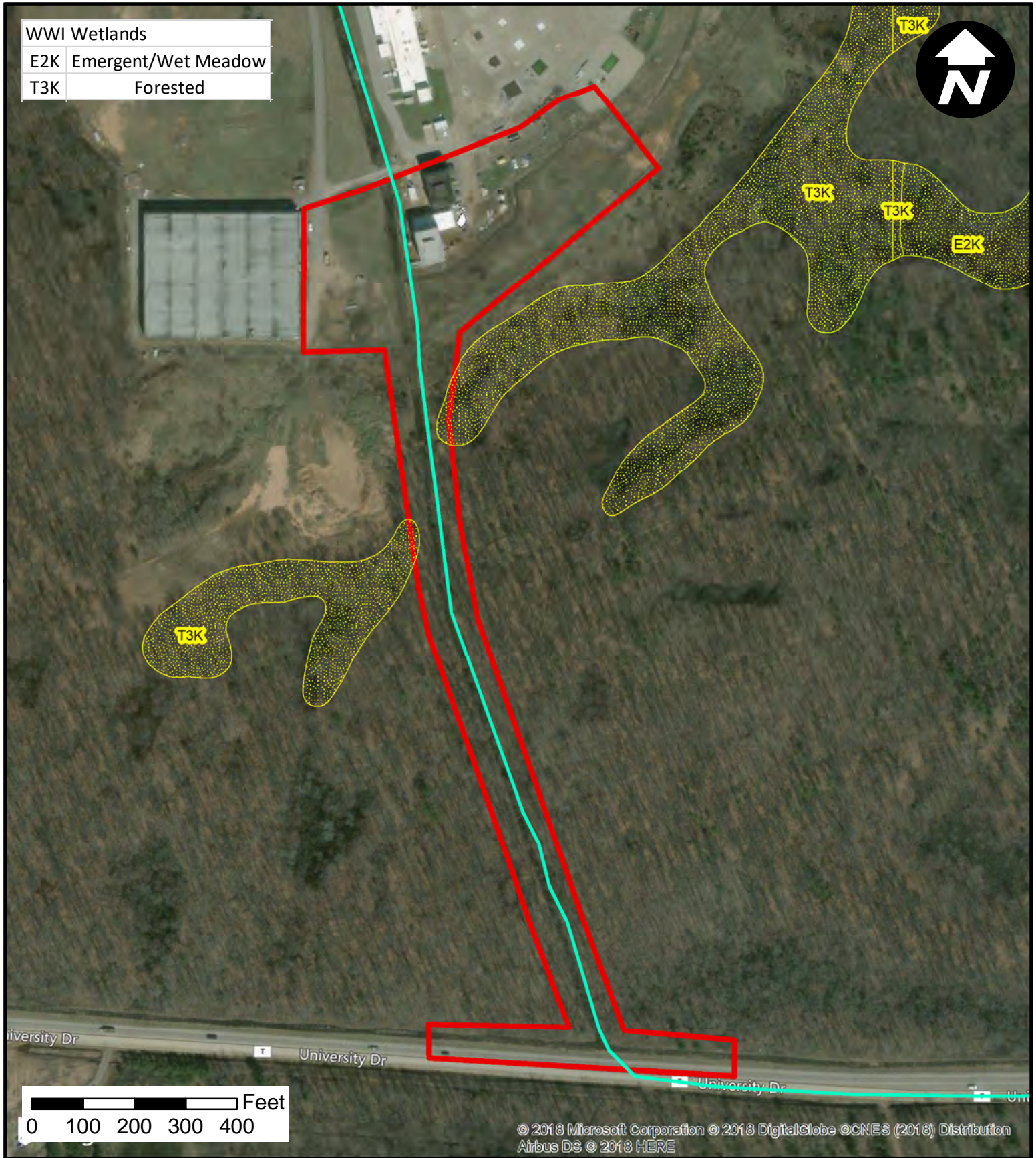
 Environmental Survey Area

TYCO FIRE PRODUCTS, L.P.
DITCH INVESTIGATION

HISTORIC AERIAL IMAGERY - SITE B
MARINETTE COUNTY, WISCONSIN





 **ARCADIS** **FIGURE 3B**

WWI Wetlands	
E2K	Emergent/Wet Meadow
T3K	Forested



© 2018 Microsoft Corporation © 2018 DigitalGlobe © CNES (2018) Distribution Airbus DS © 2018 HERE

Legend

-  NHD
-  FEMA Floodplain (Digitized)
-  WWI
-  Environmental Survey Area

TYCO FIRE PRODUCTS, L.P.
DITCH INVESTIGATION

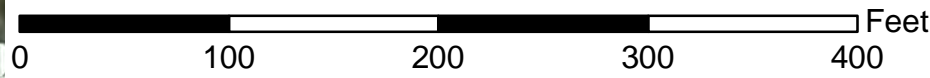
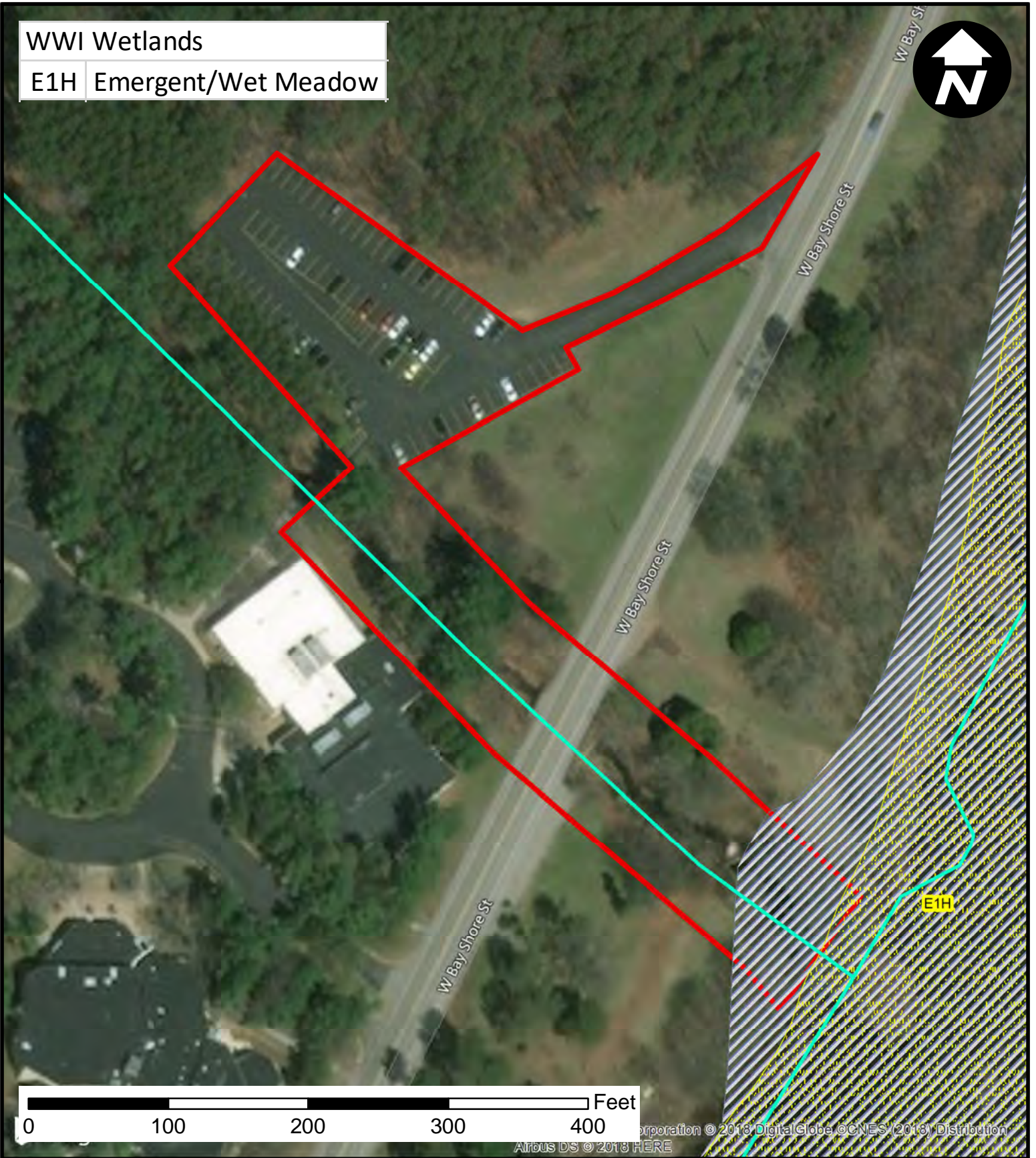
DESKTOP REVIEW - SITE A
MARINETTE COUNTY, WISCONSIN



FIGURE
4A

WWI Wetlands

E1H Emergent/Wet Meadow



© 2018 DigitalGlobe © CNES (2018) Distribution Airbus DS © 2018 HERE

Legend

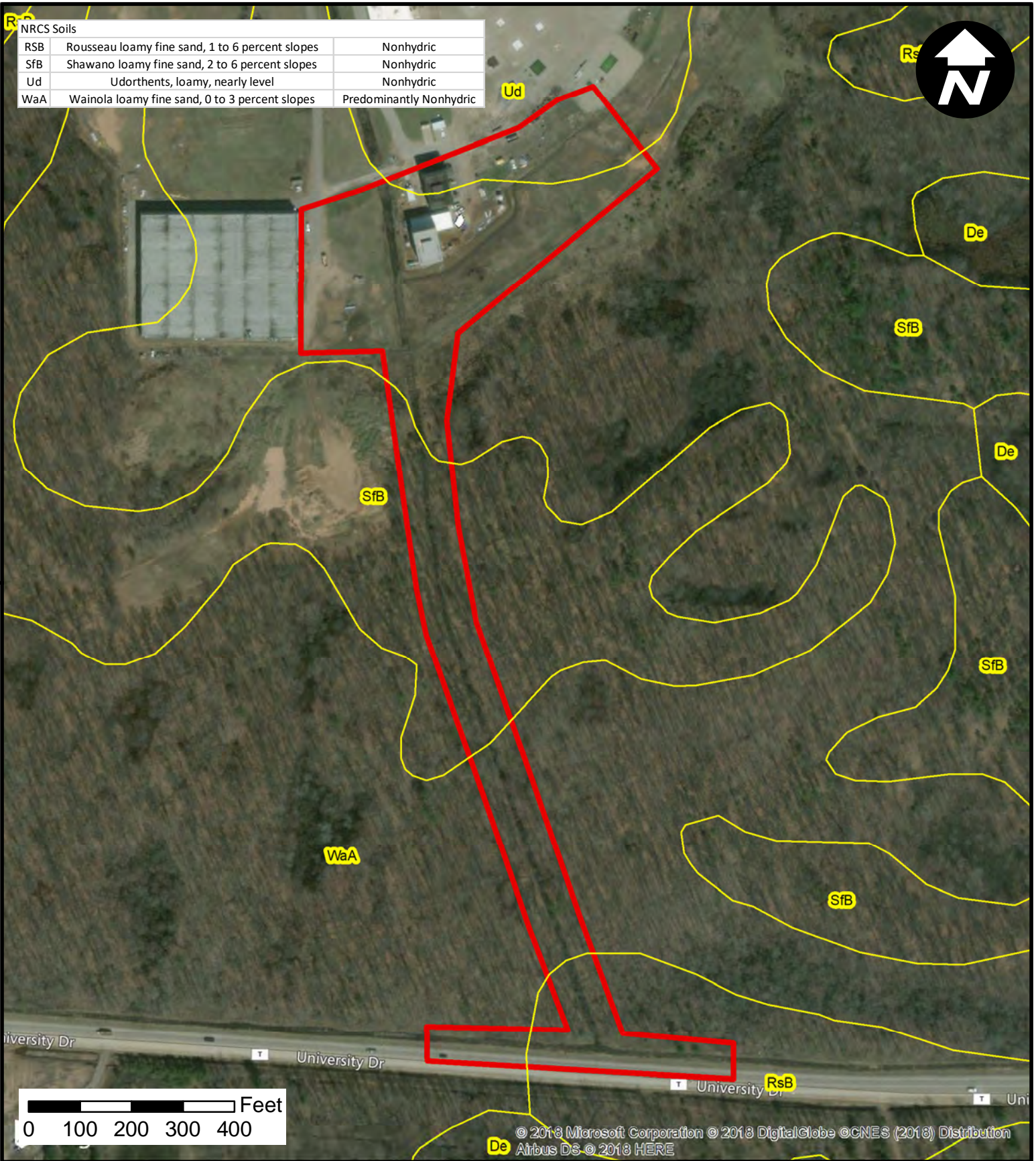
- NHD
- FEMA Floodplain (Digitized)
- WWI
- Environmental Survey Area

TYCO FIRE PRODUCTS, L.P.
DITCH INVESTIGATION

DESKTOP REVIEW - SITE B
MARINETTE COUNTY, WISCONSIN

ARCADIS **FIGURE 4B**

NRCS Soils		
RSB	Rousseau loamy fine sand, 1 to 6 percent slopes	Nonhydic
SfB	Shawano loamy fine sand, 2 to 6 percent slopes	Nonhydic
Ud	Udorthents, loamy, nearly level	Nonhydic
WaA	Wainola loamy fine sand, 0 to 3 percent slopes	Predominantly Nonhydic



© 2018 Microsoft Corporation © 2018 DigitalGlobe © CNES (2018) Distribution Airbus DS © 2018 HERE

Legend

- NRCS Soils
- Environmental Survey Area

TYCO FIRE PRODUCTS, L.P.
DITCH INVESTIGATION

NRCS SOILS - SITE A
MARINETTE COUNTY, WISCONSIN



FIGURE
5A

NRCS Soils		
SfB	Shawano loamy fine sand, 2 to 6 percent slopes	Nonhydic
WaA	Wainola loamy fine sand, 0 to 3 percent slopes	Predominantly Nonhydic



© 2018 DigitalGlobe © CNES (2018) Distribution
 Airbus DS © 2018 HERE

Legend

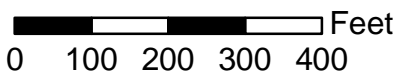
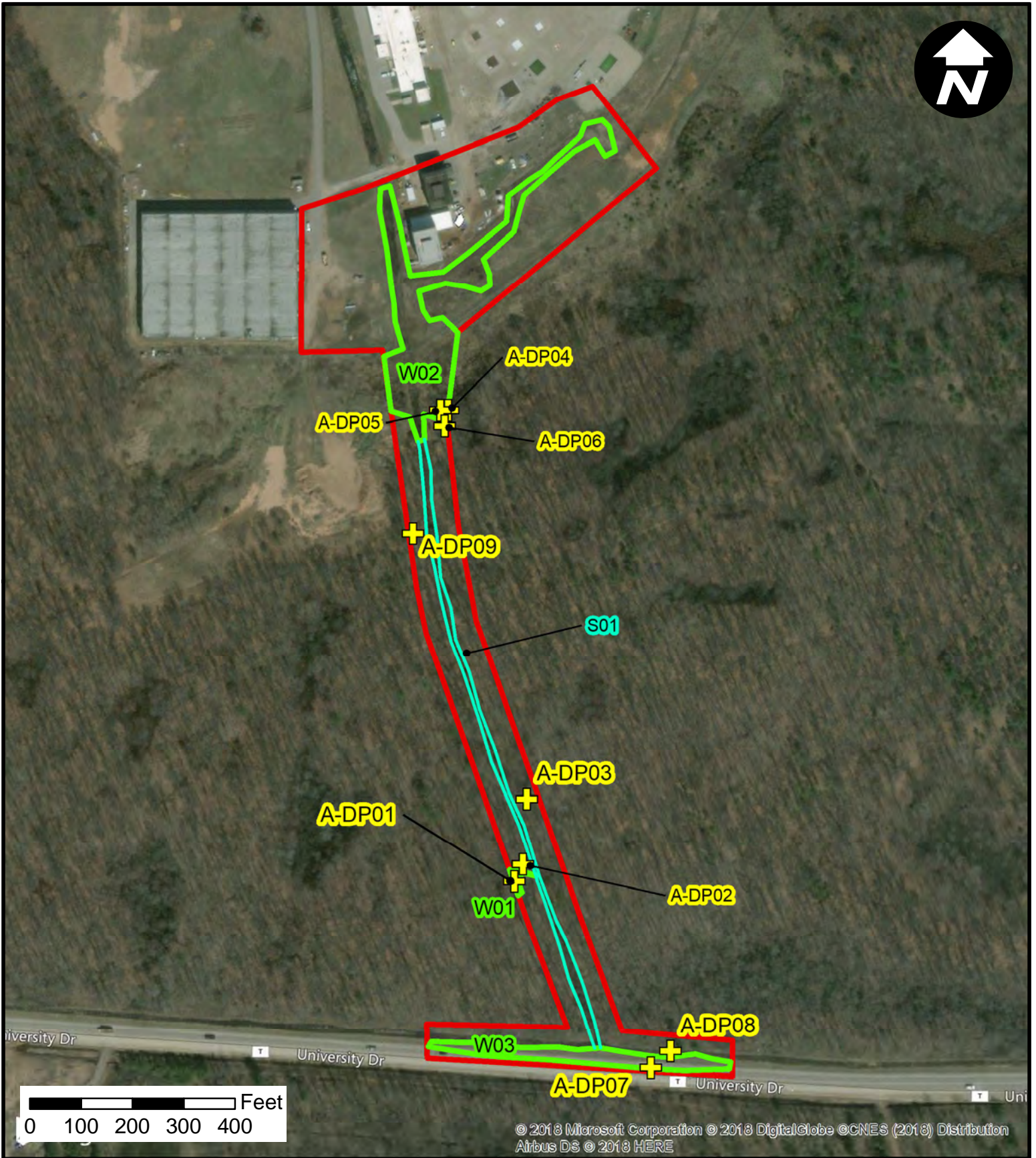
- NRCS Soils
- Environmental Survey Area

TYCO FIRE PRODUCTS, L.P.
 DITCH INVESTIGATION

NRCS SOILS - SITE B
 MARINETTE COUNTY, WISCONSIN

ARCADIS

FIGURE
5B



© 2018 Microsoft Corporation © 2018 DigitalGlobe © CNES (2018) Distribution Airbus DS © 2018 HERE

Legend

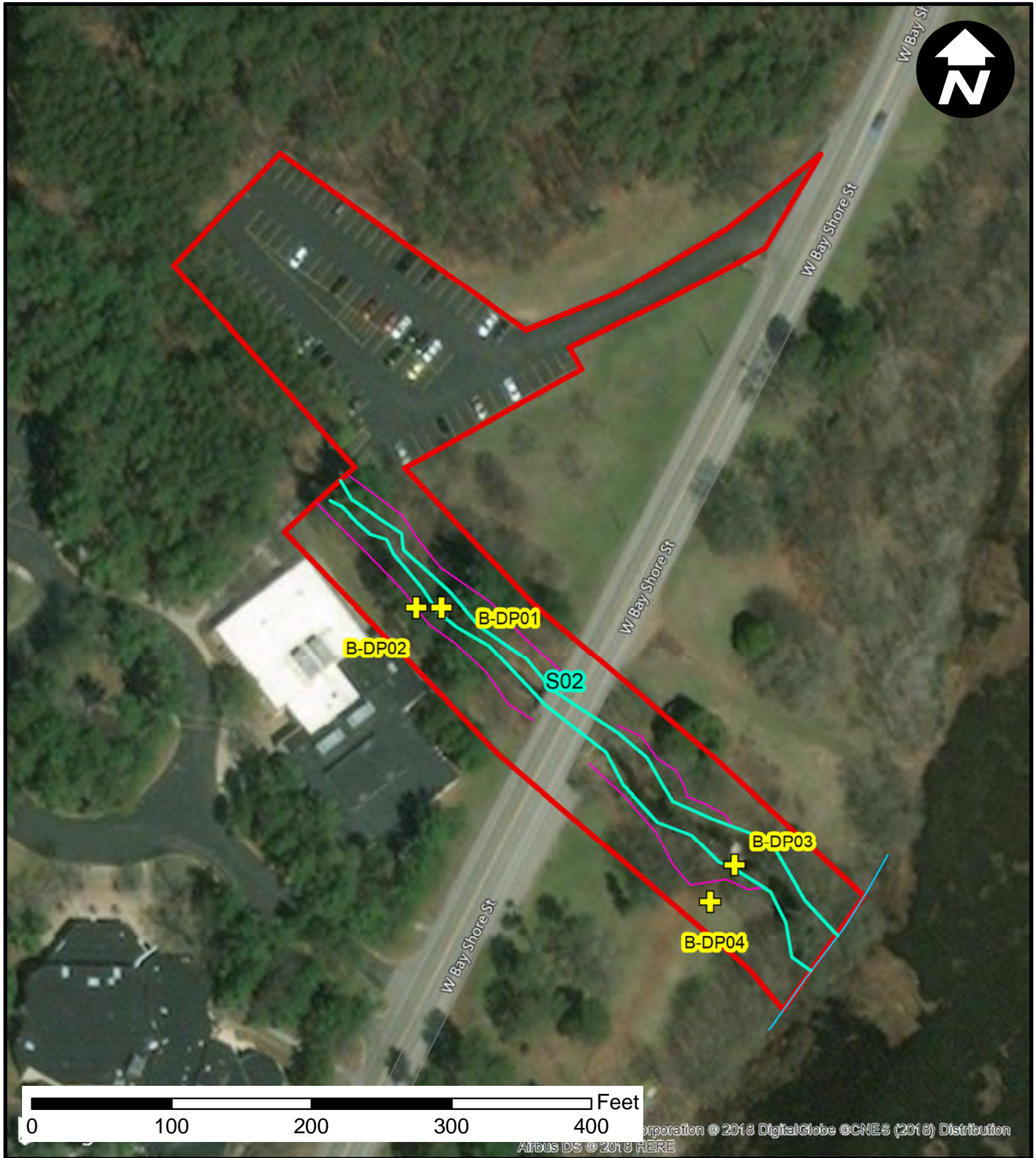
- Data Points
- Delineated Wetlands
- Delineated OHWM
- Environmental Survey Area

TYCO FIRE PRODUCTS, L.P.
DITCH INVESTIGATION

DELINEATED WETLANDS AND WATERBODIES - SITE A
MARINETTE COUNTY, WISCONSIN

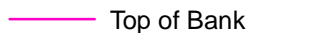

ARCADIS

FIGURE 6A



© 2018 DigitalGlobe © CNES (2018) Distribution
Airsbus DS © 2018 HERE

Legend

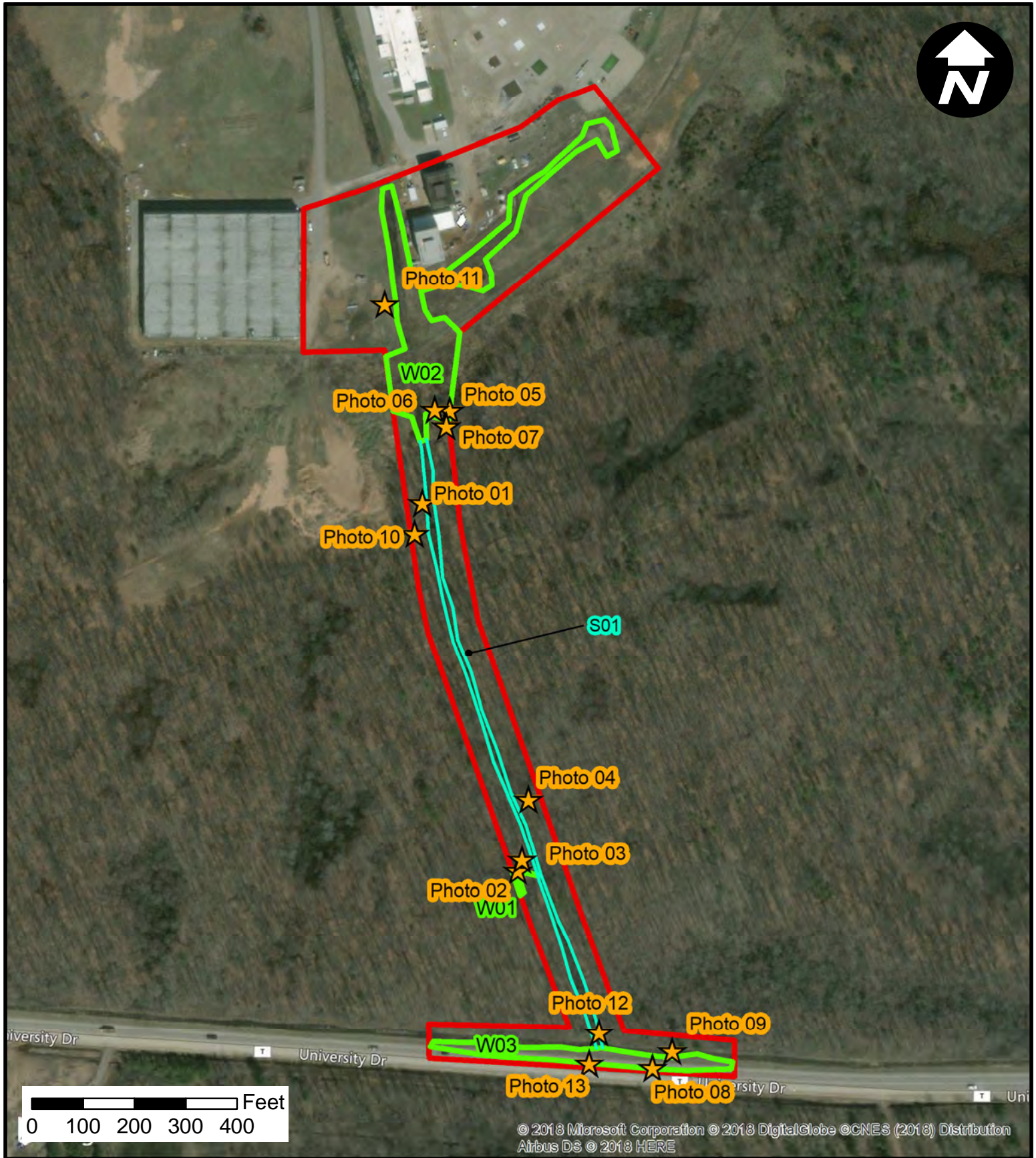
-  Data Points
-  Delineated OHWM
-  Top of Bank
-  Lake Michigan Water Level (7/23/2018)
-  Delineated Wetlands
-  Environmental Survey Area

TYCO FIRE PRODUCTS, L.P.
DITCH INVESTIGATION

DELINEATED WETLANDS AND WATERBODIES - SITE B
MARINETTE COUNTY, WISCONSIN

 **ARCADIS**

FIGURE 6B



Legend

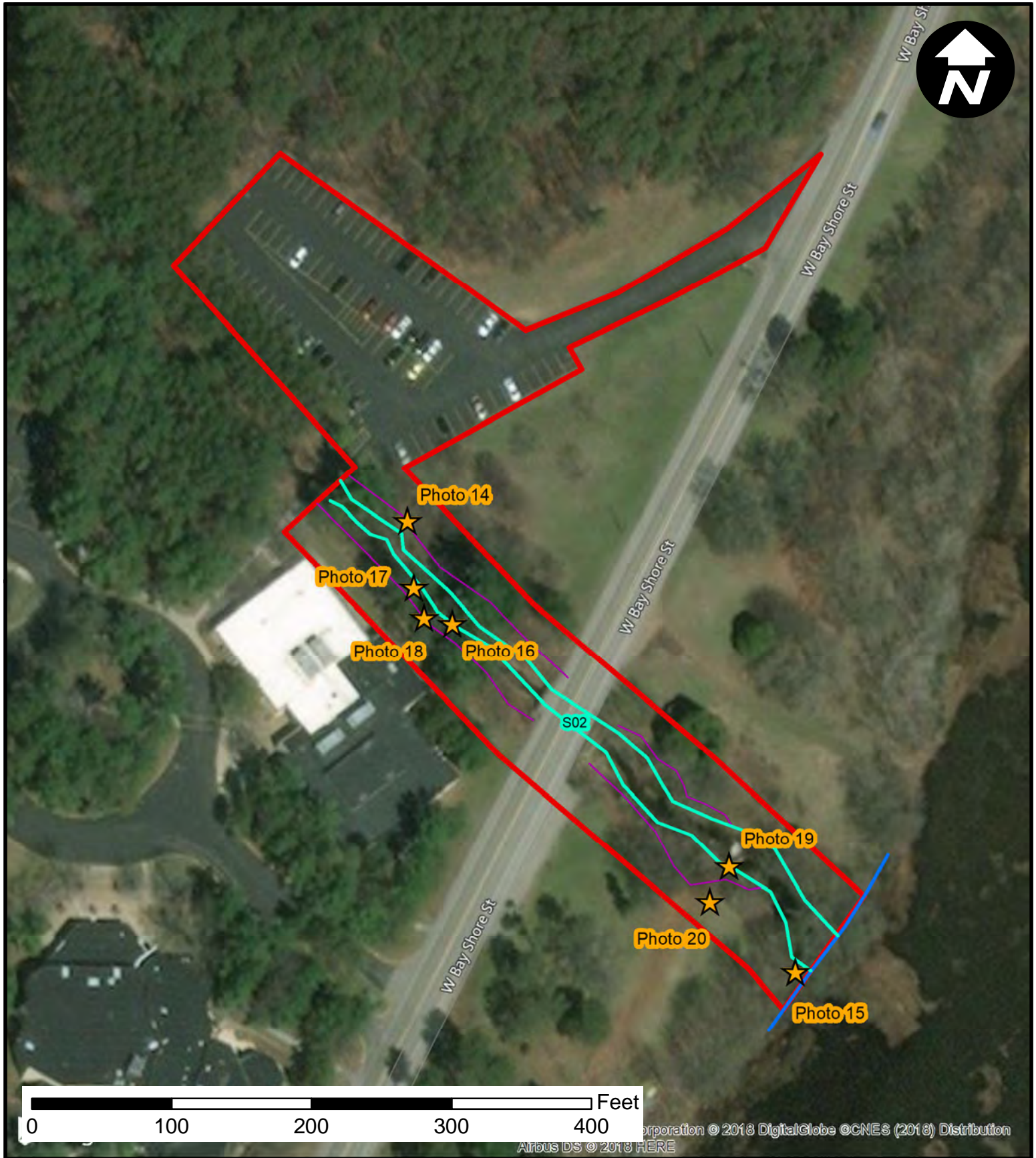
- ★ Photo Locations
- Delineated Wetlands
- Delineated OHWM
- Environmental Survey Area

TYCO FIRE PRODUCTS, L.P.
DITCH INVESTIGATION

PHOTO LOCATIONS - SITE A
MARINETTE COUNTY, WISCONSIN

 **ARCADIS**

FIGURE 7A



© 2018 DigitalGlobe © CNES (2018) Distribution
ArcGIS Desktop © 2018 HERE

Legend

- Photo Locations
- Delineated OHWM
- Top of Bank
- Lake Michigan Water Level (7/23/2018)
- Delineated Wetlands
- Environmental Survey Area

TYCO FIRE PRODUCTS, L.P.
DITCH INVESTIGATION

PHOTO LOCATIONS - SITE B
MARINETTE COUNTY, WISCONSIN

ARCADIS **FIGURE 7B**

APPENDIX A

Antecedent Precipitation Tables



Table 4
Antecedent Precipitation Data

May 1, 2018 - July 30, 2018					
MARINETTE (WI) USC00475091					
3rd Month Prior		2nd Month Prior		1st Month Prior	
Date	PPT	Date	PPT	Date	PPT
5/1/2018	0	6/1/2018	0.03	7/1/2018	0
5/2/2018	0.31	6/2/2018	0	7/2/2018	0.85
5/3/2018	0	6/3/2018	0.63	7/3/2018	0
5/4/2018	1.1	6/4/2018	0.02	7/4/2018	0
5/5/2018	0	6/5/2018	0.05	7/5/2018	1.02
5/6/2018	0	6/6/2018	0	7/6/2018	0
5/7/2018	0	6/7/2018	0	7/7/2018	0
5/8/2018	0	6/8/2018	0	7/8/2018	0
5/9/2018	0	6/9/2018	0	7/9/2018	0
5/10/2018	0.37	6/10/2018	0	7/10/2018	0
5/11/2018	0	6/11/2018	0	7/11/2018	0
5/12/2018	0	6/12/2018	0	7/12/2018	0
5/13/2018	0	6/13/2018	0.01	7/13/2018	0.27
5/14/2018	0	6/14/2018	0	7/14/2018	0
5/15/2018	0.1	6/15/2018	0	7/15/2018	0
5/16/2018	0	6/16/2018	0.74	7/16/2018	0
5/17/2018	0	6/17/2018	1.08	7/17/2018	0
5/18/2018	0	6/18/2018	1.25	7/18/2018	0
5/19/2018	0.05	6/19/2018	0.07	7/19/2018	0
5/20/2018	T	6/20/2018	0	7/20/2018	0.27
5/21/2018	0	6/21/2018	0	7/21/2018	0.17
5/22/2018	0.04	6/22/2018	0	7/22/2018	0.14
5/23/2018	0	6/23/2018	0	7/23/2018	0
5/24/2018	0	6/24/2018	0	7/24/2018	0
5/25/2018	0	6/25/2018	0	7/25/2018	0.33
5/26/2018	0.25	6/26/2018	0	7/26/2018	0.46
5/27/2018	0.09	6/27/2018	0.44	7/27/2018	0.08
5/28/2018	0.06	6/28/2018	0	7/28/2018	0.02
5/29/2018	0	6/29/2018	0	7/29/2018	0
5/30/2018	0	6/30/2018	0	7/30/2018	0
5/31/2018	0.06				
Total =	2.43	Total =	4.32	Total =	3.61

Notes:

M = Missing

PPT = Precipitation in inches

T = Trace

Table 5
WETS Analysis

Project Site: Tyco Fire Products, L.P.: Ditch Investigation
 Period of interest: March 1, 2018 to May 31, 2018
 County: Marinette

Long-term rainfall records (from WETS table)

	Month	3 years in 10 less than	Normal	3 years in 10 greater than
1st month prior:	July	2.38	3.47	4.13
2nd month prior:	June	2.11	3.54	4.30
3rd month prior:	May	2.14	3.11	3.71
		Sum =	10.12	

Site determination

Site Rainfall (in)	Condition Dry/Normal*/Wet	Condition** Value	Month Weight	Product
3.61	Normal	2	3	6
4.32	Wet	3	2	6
2.43	Normal	2	1	2
Sum =		10.36	Sum*** =	14

*Normal precipitation with 30% to 70% probability of occurrence

**Condition value:

Dry = 1
 Normal = 2
 Wet = 3

***If sum is:

6 to 9 then period has been drier than normal
 10 to 14 then period has been normal
 15 to 18 then period has been wetter than normal

Determination:

Wet
 Dry
 X **Normal**

Precipitation data source: MARINETTE (WI) USC00475091

WETS Station: MARINETTE (WI) USC00475091

Reference: Donald E. Woodward, ed. 1997. *Hydrology Tools for Wetland Determination*, Chapter 19. Engineering Field Handbook. U.S. Department of Agriculture, Natural Resources Conservation Service, Fort Worth, TX.

APPENDIX B

Photographic Log



PHOTOGRAPHIC LOG

Photo No. 01	Date: 7/23/2018	
Direction Photo Taken: East		
Description: S01 located at Site A.		


Photo No. 02	Date: 7/23/2018	
Direction Photo Taken: South		
Description: Wetland data point A-DP01 located in W01 at Site A.		

Photo No. 03	Date: 7/23/2018
Direction Photo Taken: North	
Description: Upland data point A-DP02 at Site A.	



Photo No. 04	Date: 7/23/2018
Direction Photo Taken: North	
Description: Upland data point A-DP03 at Site A.	




Photo No. 05	Date: 7/23/2018	
Direction Photo Taken:		
North		
Description:		
<p>Wetland data point A-DP04 (PEM) located within W02 at Site A.</p>		


Photo No. 06	Date: 7/23/2018	
Direction Photo Taken:		
West		
Description:		
<p>Wetland data point A-DP05 located within W02 at Site A. The subject data point is located along a tree line within wetland W02, however, dominant plant community within W02 consisted of PEM.</p>		

Photo No. 07	Date: 7/23/2018
Direction Photo Taken: West	
Description: Upland data point A-DP06 at Site A.	



Photo No. 08	Date: 7/23/2018
Direction Photo Taken: East	
Description: Wetland data point A-DP07 located within W03 at Site A.	




Photo No. 09	Date: 7/23/2018	
Direction Photo Taken: West		
Description: Upland data point A-DP08 at Site A.		

Photo No. 10	Date: 7/23/2018	
Direction Photo Taken: West		
Description: Upland data point A-DP09 within mapped WWI wetland area at Site A.		

Photo No. 11	Date: 7/23/2018
Direction Photo Taken: South	
Description: Overview of proposed project location and wetland at Site A.	




Photo No. 12	Date: 7/23/2018
Direction Photo Taken: North	
Description: View of location of proposed treatment system installation in S01 at Site A.	




Photo No. 13	Date: 7/23/2018	
Direction Photo Taken: West		
Description: View of proposed access to treatment system from University Drive at Site A.		

Photo No. 14	Date: 7/23/2018	
Direction Photo Taken: West		
Description: Overview of proposed project location at Site B.		

PHOTOGRAPHIC LOG

Photo No. 15	Date: 7/23/2018
Direction Photo Taken: East	
Description: Lake Michigan at Site B.	




Photo No. 16	Date: 7/23/2018
Direction Photo Taken: Southeast	
Description: S02 looking downstream and wetland data point B-DP01 within the wetland fringe of S02 at Site B.	



Photo No. 17	Date: 7/23/2018	
Direction Photo Taken: Northwest		
Description: S02 looking upstream and wetland data point B-DP01 within the wetland fringe of S02 at Site B.		

Photo No. 18	Date: 7/23/2018	
Direction Photo Taken: Northwest		
Description: Upland data point B-DP02 at Site B.		



Photo No. 19	Date: 7/23/2018	
Direction Photo Taken: East		
Description: Wetland data point B-DP03 within the wetland fringe of S02 at Site B.		

Photo No. 20	Date: 7/23/2018	
Direction Photo Taken: East		
Description: Upland data point B-DP04 at Site B.		

APPENDIX C

Wetland Determination Data Forms



WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ditch Investigation City/County: Marinette, Marinette County Sampling Date: 2018-July-23

Applicant/Owner: Tyco Fire Products L.P. State: Wisconsin Sampling Point: A-DP01

Investigator(s): Stephen Chu Section, Township, Range: S21 T1N R20E

Landform (hillslope, terrace, etc.): Summit slope Local relief (concave, convex, none): Convex Slope (%): 0-1

Subregion (LRR or MLRA): LRR K Lat: 45.0717670492 Long: -87.6426728815 Datum: WGS84

Soil Map Unit Name: Wainola loamy fine sand, 0-3% slope (WaA) NWI classification:

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, optional Wetland Site ID:	W01
Remarks: (Explain alternative procedures here or in a separate report)			
Based on the presence of all three parameters, this area is a wetland. Representative photograph: Photo #2 of Appendix B			

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input checked="" type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (includes capillary fringe)	Depth (inches): _____	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Topo maps, soils map, WWI map, and aerial imagery		
Remarks:		
The criterion for wetland hydrology is met. Based on WETS analysis, antecedent hydrologic conditions are within a normal range.		

VEGETATION -- Use scientific names of plants.

Sampling Point: A-DP01

	Absolute % Cover	Dominant Species?	Indicator Status																									
Tree Stratum (Plot size: 30' r)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80</u> (A/B) Prevalence Index worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;"><u>Total % Cover of:</u></th> <th style="width: 25%; text-align: center;"><u>Multiply By:</u></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 1 = <u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;"><u>20</u></td> <td style="text-align: center;">x 2 = <u>40</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;"><u>120</u></td> <td style="text-align: center;">x 3 = <u>360</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;"><u>10</u></td> <td style="text-align: center;">x 4 = <u>40</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals</td> <td style="text-align: center;"><u>150</u></td> <td style="text-align: center;">(A) <u>440</u> (B)</td> </tr> <tr> <td colspan="3" style="text-align: right;">Prevalence Index = B/A = <u>2.9</u></td> </tr> </tbody> </table>		<u>Total % Cover of:</u>	<u>Multiply By:</u>	OBL species	<u>0</u>	x 1 = <u>0</u>	FACW species	<u>20</u>	x 2 = <u>40</u>	FAC species	<u>120</u>	x 3 = <u>360</u>	FACU species	<u>10</u>	x 4 = <u>40</u>	UPL species	<u>0</u>	x 5 = <u>0</u>	Column Totals	<u>150</u>	(A) <u>440</u> (B)	Prevalence Index = B/A = <u>2.9</u>		
	<u>Total % Cover of:</u>	<u>Multiply By:</u>																										
OBL species	<u>0</u>	x 1 = <u>0</u>																										
FACW species	<u>20</u>	x 2 = <u>40</u>																										
FAC species	<u>120</u>	x 3 = <u>360</u>																										
FACU species	<u>10</u>	x 4 = <u>40</u>																										
UPL species	<u>0</u>	x 5 = <u>0</u>																										
Column Totals	<u>150</u>	(A) <u>440</u> (B)																										
Prevalence Index = B/A = <u>2.9</u>																												
1. <i>Acer rubrum</i>	80	Yes	FAC																									
2. <i>Fraxinus pennsylvanica</i>	10	No	FACW																									
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
<u>90</u> = Total Cover																												
Sapling/Shrub Stratum (Plot size: 15' r)																												
1. <i>Frangula alnus</i>	30	Yes	FAC																									
2. _____																												
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
<u>30</u> = Total Cover																												
Herb Stratum (Plot size: 5' r)																												
1. <i>Pteridium aquilinum</i>	10	Yes	FACU																									
2. <i>Huperzia lucidula</i>	10	Yes	FAC																									
3. <i>Phalaris arundinacea</i>	10	Yes	FACW																									
4. _____																												
5. _____																												
6. _____																												
7. _____																												
8. _____																												
9. _____																												
10. _____																												
11. _____																												
12. _____																												
<u>30</u> = Total Cover																												
Woody Vine Stratum (Plot size: 30' r)																												
1. _____																												
2. _____																												
3. _____																												
4. _____																												
<u>0</u> = Total Cover																												
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1- Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic																												
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																												
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																												
Remarks: (Include photo numbers here or on a separate sheet.) The criterion for hydrophytic vegetation is met. Floodplain Forest plant community.																												

SOIL

Sampling Point: A-DP01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 3/4	100					Silt Loam	
2 - 12	10YR 2/1	95	10YR 4/6	5	C	M	Sandy Loam	
12 - 20	10YR 4/6	100					Sandy Loam	

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. ²Location: PL = Pore Lining, M = Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):		Hydric Soil Present?	
Type:	None	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Depth (inches):			

Remarks:

The criterion for hydric soil is met.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ditch Investigation City/County: Marinette, Marinette County Sampling Date: 2018-July-23

Applicant/Owner: Tyco Fire Products L.P. State: Wisconsin Sampling Point: A-DP02

Investigator(s): Stephen Chu Section, Township, Range: S21 T1N R20E

Landform (hillslope, terrace, etc.): Summit slope Local relief (concave, convex, none): Convex Slope (%): 0-1

Subregion (LRR or MLRA): LRR K Lat: 45.0719290057 Long: -87.6427181438 Datum: WGS84

Soil Map Unit Name: Wainola loamy fine sand, 0-3% slope (WaA) NWI classification: _____

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Hydric Soil Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, optional Wetland Site ID:	
Remarks: (Explain alternative procedures here or in a separate report)			
Based on the absence of all three parameters, this area is an upland. Representative photograph: Photo #3 of Appendix B			

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (includes capillary fringe)	Depth (inches): _____	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Topo maps, soils map, WWI map, and aerial imagery		
Remarks:		
The criterion for wetland hydrology is not met. Based on WETS analysis, antecedent hydrologic conditions are within a normal range.		

VEGETATION -- Use scientific names of plants.

Sampling Point: A-DP02

	Absolute % Cover	Dominant Species?	Indicator Status																									
Tree Stratum (Plot size: 30' r)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>40</u> (A/B) Prevalence Index worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;"><u>Total % Cover of:</u></th> <th style="width: 25%; text-align: center;"><u>Multiply By:</u></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 1 = <u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 2 = <u>0</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;"><u>85</u></td> <td style="text-align: center;">x 3 = <u>255</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;"><u>50</u></td> <td style="text-align: center;">x 4 = <u>200</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals</td> <td style="text-align: center;"><u>135</u></td> <td style="text-align: center;">(A) <u>455</u> (B)</td> </tr> <tr> <td colspan="3" style="text-align: right;">Prevalence Index = B/A = <u>3.4</u></td> </tr> </tbody> </table>		<u>Total % Cover of:</u>	<u>Multiply By:</u>	OBL species	<u>0</u>	x 1 = <u>0</u>	FACW species	<u>0</u>	x 2 = <u>0</u>	FAC species	<u>85</u>	x 3 = <u>255</u>	FACU species	<u>50</u>	x 4 = <u>200</u>	UPL species	<u>0</u>	x 5 = <u>0</u>	Column Totals	<u>135</u>	(A) <u>455</u> (B)	Prevalence Index = B/A = <u>3.4</u>		
	<u>Total % Cover of:</u>	<u>Multiply By:</u>																										
OBL species	<u>0</u>	x 1 = <u>0</u>																										
FACW species	<u>0</u>	x 2 = <u>0</u>																										
FAC species	<u>85</u>	x 3 = <u>255</u>																										
FACU species	<u>50</u>	x 4 = <u>200</u>																										
UPL species	<u>0</u>	x 5 = <u>0</u>																										
Column Totals	<u>135</u>	(A) <u>455</u> (B)																										
Prevalence Index = B/A = <u>3.4</u>																												
1. <i>Acer rubrum</i>	75	Yes	FAC																									
2. <i>Populus tremuloides</i>	20	Yes	FACU																									
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
<u>95</u> = Total Cover																												
Sapling/Shrub Stratum (Plot size: 15' r)																												
1. <i>Frangula alnus</i>	10	Yes	FAC																									
2. _____																												
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
<u>10</u> = Total Cover																												
Herb Stratum (Plot size: 5' r)																												
1. <i>Schedonorus arundinaceus</i>	20	Yes	FACU																									
2. <i>Pteridium aquilinum</i>	10	Yes	FACU																									
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
8. _____																												
9. _____																												
10. _____																												
11. _____																												
12. _____																												
<u>30</u> = Total Cover																												
Woody Vine Stratum (Plot size: 30' r)																												
1. _____																												
2. _____																												
3. _____																												
4. _____																												
<u>0</u> = Total Cover																												
Hydrophytic Vegetation Indicators: ___ 1- Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is > 50% ___ 3 - Prevalence Index is ≤ 3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic																												
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																												
Hydrophytic Vegetation Present? Yes ___ No <input checked="" type="checkbox"/>																												
Remarks: (Include photo numbers here or on a separate sheet.) The criterion for hydrophytic vegetation is not met. Upland woodland.																												

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ditch Investigation City/County: Marinette, Marinette County Sampling Date: 2018-July-23
 Applicant/Owner: Tyco Fire Products L.P. State: Wisconsin Sampling Point: A-DP03
 Investigator(s): Stephen Chu Section, Township, Range: S21 T1N R20E
 Landform (hillslope, terrace, etc.): Summit slope Local relief (concave, convex, none): Convex Slope (%): 0-1
 Subregion (LRR or MLRA): LRR K Lat: 45.0723855123 Long: -87.6426712051 Datum: WGS84
 Soil Map Unit Name: Wainola loamy fine sand, 0-3% slope (WaA) NWI classification: _____

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Hydric Soil Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, optional Wetland Site ID:	
Remarks:(Explain alternative procedures here or in a separate report)			
Based on the absence of all three parameters, this area is an upland. Representative photograph: Photo #4 of Appendix B			

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____
(includes capillary fringe)	
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Topo maps, soils map, WWI map, and aerial imagery	
Remarks:	
The criterion for wetland hydrology is not met. Based on WETS analysis, antecedent hydrologic conditions are within a normal range.	

VEGETATION -- Use scientific names of plants.

Sampling Point: A-DP03

	Absolute % Cover	Dominant Species?	Indicator Status																									
Tree Stratum (Plot size: 30' r)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B) Prevalence Index worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;"><u>Total % Cover of:</u></th> <th style="width: 25%; text-align: center;"><u>Multiply By:</u></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 1 = <u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 2 = <u>0</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;"><u>85</u></td> <td style="text-align: center;">x 3 = <u>255</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;"><u>80</u></td> <td style="text-align: center;">x 4 = <u>320</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals</td> <td style="text-align: center;"><u>165</u></td> <td style="text-align: center;">(A) <u>575</u> (B)</td> </tr> <tr> <td colspan="3" style="text-align: center;">Prevalence Index = B/A = <u>3.5</u></td> </tr> </tbody> </table>		<u>Total % Cover of:</u>	<u>Multiply By:</u>	OBL species	<u>0</u>	x 1 = <u>0</u>	FACW species	<u>0</u>	x 2 = <u>0</u>	FAC species	<u>85</u>	x 3 = <u>255</u>	FACU species	<u>80</u>	x 4 = <u>320</u>	UPL species	<u>0</u>	x 5 = <u>0</u>	Column Totals	<u>165</u>	(A) <u>575</u> (B)	Prevalence Index = B/A = <u>3.5</u>		
	<u>Total % Cover of:</u>	<u>Multiply By:</u>																										
OBL species	<u>0</u>	x 1 = <u>0</u>																										
FACW species	<u>0</u>	x 2 = <u>0</u>																										
FAC species	<u>85</u>	x 3 = <u>255</u>																										
FACU species	<u>80</u>	x 4 = <u>320</u>																										
UPL species	<u>0</u>	x 5 = <u>0</u>																										
Column Totals	<u>165</u>	(A) <u>575</u> (B)																										
Prevalence Index = B/A = <u>3.5</u>																												
1. <i>Acer rubrum</i>	60	Yes	FAC																									
2. <i>Populus tremuloides</i>	40	Yes	FACU																									
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
<u>100</u> = Total Cover																												
Sapling/Shrub Stratum (Plot size: 15' r)																												
1. <i>Frangula alnus</i>	25	Yes	FAC																									
2. _____																												
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
<u>25</u> = Total Cover																												
Herb Stratum (Plot size: 5' r)																												
1. <i>Pteridium aquilinum</i>	40	Yes	FACU																									
2. _____																												
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
8. _____																												
9. _____																												
10. _____																												
11. _____																												
12. _____																												
<u>40</u> = Total Cover																												
Woody Vine Stratum (Plot size: 30' r)																												
1. _____																												
2. _____																												
3. _____																												
4. _____																												
<u>0</u> = Total Cover																												
Remarks: (Include photo numbers here or on a separate sheet.) The criterion for hydrophytic vegetation is met.																												

SOIL

Sampling Point: A-DP03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 3	10YR 2/1	100					Silt Loam	
3 - 9	10YR 2/2	100					Sandy Loam	
9 - 20	10YR 4/6	100					Sandy Loam	

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. ²Location: PL = Pore Lining, M = Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

The criterion for hydric soil is not met.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ditch Investigation City/County: Marinette, Marinette County Sampling Date: 2018-July-23
 Applicant/Owner: Tyco Fire Products L.P. State: Wisconsin Sampling Point: A-DP04
 Investigator(s): Stephen Chu Section, Township, Range: S21 T1N R20E
 Landform (hillslope, terrace, etc.): Toe slope Local relief (concave, convex, none): Concave Slope (%): 0-1
 Subregion (LRR or MLRA): LRR K Lat: 45.0744021006 Long: -87.6431047171 Datum: WGS84
 Soil Map Unit Name: Wainola loamy fine sand, 0-3% slope (WaA) NWI classification: PFO
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, optional Wetland Site ID: <u>W02</u>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Remarks: (Explain alternative procedures here or in a separate report)	
Based on the presence of all three parameters, this area is a wetland. Representative photograph: Photo #5 of Appendix B			

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>11</u>	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>9</u>	
(includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
<u>Topo maps, soils map, WWI map, and aerial imagery</u>		
Remarks:		
<u>The criterion for wetland hydrology is met. Based on WETS analysis, antecedent hydrologic conditions are within a normal range.</u>		

VEGETATION -- Use scientific names of plants.

Sampling Point: A-DP04

	Absolute % Cover	Dominant Species?	Indicator Status																									
Tree Stratum (Plot size: 30' r)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) Prevalence Index worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;"><u>Total % Cover of:</u></th> <th style="width: 25%; text-align: center;"><u>Multiply By:</u></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td style="text-align: center;"><u>93</u></td> <td style="text-align: center;">x 1 = <u>93</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;"><u>35</u></td> <td style="text-align: center;">x 2 = <u>70</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;"><u>10</u></td> <td style="text-align: center;">x 3 = <u>30</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;"><u>5</u></td> <td style="text-align: center;">x 4 = <u>20</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals</td> <td style="text-align: center;"><u>143</u></td> <td style="text-align: center;">(A) <u>213</u> (B)</td> </tr> <tr> <td colspan="3" style="text-align: center;">Prevalence Index = B/A = <u>1.5</u></td> </tr> </tbody> </table>		<u>Total % Cover of:</u>	<u>Multiply By:</u>	OBL species	<u>93</u>	x 1 = <u>93</u>	FACW species	<u>35</u>	x 2 = <u>70</u>	FAC species	<u>10</u>	x 3 = <u>30</u>	FACU species	<u>5</u>	x 4 = <u>20</u>	UPL species	<u>0</u>	x 5 = <u>0</u>	Column Totals	<u>143</u>	(A) <u>213</u> (B)	Prevalence Index = B/A = <u>1.5</u>		
	<u>Total % Cover of:</u>	<u>Multiply By:</u>																										
OBL species	<u>93</u>	x 1 = <u>93</u>																										
FACW species	<u>35</u>	x 2 = <u>70</u>																										
FAC species	<u>10</u>	x 3 = <u>30</u>																										
FACU species	<u>5</u>	x 4 = <u>20</u>																										
UPL species	<u>0</u>	x 5 = <u>0</u>																										
Column Totals	<u>143</u>	(A) <u>213</u> (B)																										
Prevalence Index = B/A = <u>1.5</u>																												
1. <i>Quercus palustris</i>	25	Yes	FACW																									
2. <i>Populus tremuloides</i>	5	No	FACU																									
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
<u>30</u> = Total Cover																												
Sapling/Shrub Stratum (Plot size: 15' r)																												
1. <i>Frangula alnus</i>	10	Yes	FAC																									
2. _____																												
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
<u>10</u> = Total Cover																												
Herb Stratum (Plot size: 5' r)																												
1. <i>Scirpus cyperinus</i>	90	Yes	OBL																									
2. <i>Phalaris arundinacea</i>	10	No	FACW																									
3. <i>Lythrum salicaria</i>	3	No	OBL																									
4. _____																												
5. _____																												
6. _____																												
7. _____																												
8. _____																												
9. _____																												
10. _____																												
11. _____																												
12. _____																												
<u>103</u> = Total Cover																												
Woody Vine Stratum (Plot size: 30' r)																												
1. _____																												
2. _____																												
3. _____																												
4. _____																												
<u>0</u> = Total Cover																												
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1- Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic																												
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																												
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																												
Remarks: (Include photo numbers here or on a separate sheet.) The criterion for hydrophytic vegetation is met.																												

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ditch Investigation City/County: Marinette, Marinette County Sampling Date: 2018-July-23
 Applicant/Owner: Tyco Fire Products L.P. State: Wisconsin Sampling Point: A-DP05
 Investigator(s): Stephen Chu Section, Township, Range: S21 T1N R20E
 Landform (hillslope, terrace, etc.): Toe slope Local relief (concave, convex, none): Concave Slope (%): 0-1
 Subregion (LRR or MLRA): LRR K Lat: 45.0743379365 Long: -87.6432606205 Datum: WGS84
 Soil Map Unit Name: Wainola loamy fine sand, 0-3% slope (WaA) NWI classification: PFO

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, optional Wetland Site ID:	W02
Remarks: (Explain alternative procedures here or in a separate report)			
Based on the presence of all three parameters, this area is a wetland. Representative photograph: Photo #6 of Appendix B Data point is located along a tree line, however, the dominant plant community consist of Palustrine Emergent plant community.			

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:		
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>11</u>
Saturation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>9</u>
(includes capillary fringe)		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Topo maps, soils map, WWI map, and aerial imagery		
Remarks:		
The criterion for wetland hydrology is met. Based on WETS analysis, antecedent hydrologic conditions are within a normal range.		

VEGETATION -- Use scientific names of plants.

Sampling Point: A-DP05

	Absolute % Cover	Dominant Species?	Indicator Status																									
Tree Stratum (Plot size: 30' r)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) Prevalence Index worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;"><u>Total % Cover of:</u></th> <th style="width: 25%; text-align: center;"><u>Multiply By:</u></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 1 = <u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;"><u>115</u></td> <td style="text-align: center;">x 2 = <u>230</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;"><u>60</u></td> <td style="text-align: center;">x 3 = <u>180</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;"><u>5</u></td> <td style="text-align: center;">x 4 = <u>20</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals</td> <td style="text-align: center;"><u>180</u></td> <td style="text-align: center;">(A) <u>430</u> (B)</td> </tr> <tr> <td colspan="3" style="text-align: center;">Prevalence Index = B/A = <u>2.4</u></td> </tr> </tbody> </table>		<u>Total % Cover of:</u>	<u>Multiply By:</u>	OBL species	<u>0</u>	x 1 = <u>0</u>	FACW species	<u>115</u>	x 2 = <u>230</u>	FAC species	<u>60</u>	x 3 = <u>180</u>	FACU species	<u>5</u>	x 4 = <u>20</u>	UPL species	<u>0</u>	x 5 = <u>0</u>	Column Totals	<u>180</u>	(A) <u>430</u> (B)	Prevalence Index = B/A = <u>2.4</u>		
	<u>Total % Cover of:</u>	<u>Multiply By:</u>																										
OBL species	<u>0</u>	x 1 = <u>0</u>																										
FACW species	<u>115</u>	x 2 = <u>230</u>																										
FAC species	<u>60</u>	x 3 = <u>180</u>																										
FACU species	<u>5</u>	x 4 = <u>20</u>																										
UPL species	<u>0</u>	x 5 = <u>0</u>																										
Column Totals	<u>180</u>	(A) <u>430</u> (B)																										
Prevalence Index = B/A = <u>2.4</u>																												
1. <i>Quercus palustris</i>	75	Yes	FACW																									
2. <i>Populus tremuloides</i>	5	No	FACU																									
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
	<u>80</u>	= Total Cover																										
Sapling/Shrub Stratum (Plot size: 15' r)																												
1. <i>Frangula alnus</i>	40	Yes	FAC																									
2. _____																												
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
	<u>40</u>	= Total Cover																										
Herb Stratum (Plot size: 5' r)																												
1. <i>Phalaris arundinacea</i>	40	Yes	FACW																									
2. <i>Frangula alnus</i>	20	Yes	FAC																									
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
8. _____																												
9. _____																												
10. _____																												
11. _____																												
12. _____																												
	<u>60</u>	= Total Cover																										
Woody Vine Stratum (Plot size: 30' r)																												
1. _____																												
2. _____																												
3. _____																												
4. _____																												
	<u>0</u>	= Total Cover																										
Remarks: (Include photo numbers here or on a separate sheet.) The criterion for hydrophytic vegetation is met.																												

SOIL

Sampling Point: A-DP05

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 2/1	100					Silt Loam	
2 - 20	10YR 3/2	95	10YR 4/6	5	C	M	Sandy Loam	

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. ²Location: PL = Pore Lining, M = Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B)	<input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Dark Surface (S7) (LRR K, L)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		<input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)	
<input checked="" type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> Red Parent Material (F21)	
<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B)		<input type="checkbox"/> Other (Explain in Remarks)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):		Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type:	None		
Depth (inches):			

Remarks:
 The criterion for hydric soil is met.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ditch Investigation City/County: Marinette, Marinette County Sampling Date: 2018-July-23
 Applicant/Owner: Tyco Fire Products L.P. State: Wisconsin Sampling Point: A-DP06
 Investigator(s): Stephen Chu Section, Township, Range: S21 T1N R20E
 Landform (hillslope, terrace, etc.): Summit slope Local relief (concave, convex, none): Convex Slope (%): 0-1
 Subregion (LRR or MLRA): LRR K Lat: 45.0740512094 Long: -87.6431486383 Datum: WGS84
 Soil Map Unit Name: Wainola loamy fine sand, 0-3% slope (WaA) NWI classification: PFO

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report) Based on the absence of all three parameters, this area is an upland. Representative photograph: Photo #7 of Appendix B		

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u>			<u>Secondary Indicators (minimum of two required)</u>		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)			
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)			
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)			
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)			
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)			
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)			
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)			
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)			
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)			
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)			
		<input type="checkbox"/> FAC-Neutral Test (D5)			
Field Observations:			Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____			
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____			
Saturation Present? (includes capillary fringe)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Topo maps, soils map, WWI map, and aerial imagery					
Remarks: The criterion for wetland hydrology is not met. Based on WETS analysis, antecedent hydrologic conditions are within a normal range.					

VEGETATION -- Use scientific names of plants.

Sampling Point: A-DP06

	Absolute % Cover	Dominant Species?	Indicator Status																	
Tree Stratum (Plot size: 30' r)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B) Prevalence Index worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">Total % Cover of:</th> <th style="width: 50%; text-align: center;">Multiply By:</th> </tr> </thead> <tbody> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>80</u></td> <td>x 3 = <u>240</u></td> </tr> <tr> <td>FACU species <u>100</u></td> <td>x 4 = <u>400</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals <u>180</u></td> <td>(A) <u>640</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>3.6</u></td> </tr> </tbody> </table>	Total % Cover of:	Multiply By:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>80</u>	x 3 = <u>240</u>	FACU species <u>100</u>	x 4 = <u>400</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals <u>180</u>	(A) <u>640</u> (B)	Prevalence Index = B/A = <u>3.6</u>	
Total % Cover of:	Multiply By:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>0</u>	x 2 = <u>0</u>																			
FAC species <u>80</u>	x 3 = <u>240</u>																			
FACU species <u>100</u>	x 4 = <u>400</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals <u>180</u>	(A) <u>640</u> (B)																			
Prevalence Index = B/A = <u>3.6</u>																				
1. <i>Acer rubrum</i>	70	Yes	FAC																	
2. <i>Populus tremuloides</i>	20	Yes	FACU																	
3. _____																				
4. _____																				
5. _____																				
6. _____																				
7. _____																				
<u>90</u> = Total Cover																				
Sapling/Shrub Stratum (Plot size: 15' r)																				
1. <i>Frangula alnus</i>	10	Yes	FAC																	
2. _____																				
3. _____																				
4. _____																				
5. _____																				
6. _____																				
7. _____																				
<u>10</u> = Total Cover																				
Herb Stratum (Plot size: 5' r)																				
1. <i>Pteridium aquilinum</i>	80	Yes	FACU																	
2. _____																				
3. _____																				
4. _____																				
5. _____																				
6. _____																				
7. _____																				
8. _____																				
9. _____																				
10. _____																				
11. _____																				
12. _____																				
<u>80</u> = Total Cover																				
Woody Vine Stratum (Plot size: 30' r)																				
1. _____																				
2. _____																				
3. _____																				
4. _____																				
<u>0</u> = Total Cover																				
Remarks: (Include photo numbers here or on a separate sheet.) The criterion for hydrophytic vegetation is not met. Upland woodland.																				

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ditch Investigation City/County: Marinette, Marinette County Sampling Date: 2018-July-23

Applicant/Owner: Tyco Fire Products L.P. State: Wisconsin Sampling Point: A-DP07

Investigator(s): Stephen Chu Section, Township, Range: S21 T1N R20E

Landform (hillslope, terrace, etc.): Toe slope Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR K Lat: 45.0707567048 Long: -87.6417763531 Datum: WGS84

Soil Map Unit Name: Rousseau loamy fine sand, 1-6% (RsB) NWI classification: _____

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No _____		
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/> No _____
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No _____	If yes, optional Wetland Site ID:	W03
Remarks: (Explain alternative procedures here or in a separate report)			
Based on the presence of all three parameters, this area is a wetland. Representative photograph: Photo #8 of Appendix B			

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:		
Surface Water Present? Yes _____ No _____	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Water Table Present? Yes _____ No _____	Depth (inches): _____	
Saturation Present? Yes _____ No _____	Depth (inches): _____	
<i>(includes capillary fringe)</i>		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Topo maps, soils map, WWI map, and aerial imagery		
Remarks:		

VEGETATION -- Use scientific names of plants.

Sampling Point: A-DP07

	Absolute % Cover	Dominant Species?	Indicator Status																									
Tree Stratum (Plot size: 30' r)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) Prevalence Index worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;"><u>Total % Cover of:</u></th> <th style="width: 25%; text-align: center;"><u>Multiply By:</u></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td style="text-align: center;"><u>60</u></td> <td>x 1 = <u>60</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;"><u>50</u></td> <td>x 2 = <u>100</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;"><u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;"><u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;"><u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals</td> <td style="text-align: center;"><u>110</u></td> <td>(A) <u>160</u> (B)</td> </tr> <tr> <td colspan="3" style="text-align: center;">Prevalence Index = B/A = <u>1.5</u></td> </tr> </tbody> </table>		<u>Total % Cover of:</u>	<u>Multiply By:</u>	OBL species	<u>60</u>	x 1 = <u>60</u>	FACW species	<u>50</u>	x 2 = <u>100</u>	FAC species	<u>0</u>	x 3 = <u>0</u>	FACU species	<u>0</u>	x 4 = <u>0</u>	UPL species	<u>0</u>	x 5 = <u>0</u>	Column Totals	<u>110</u>	(A) <u>160</u> (B)	Prevalence Index = B/A = <u>1.5</u>		
	<u>Total % Cover of:</u>	<u>Multiply By:</u>																										
OBL species	<u>60</u>	x 1 = <u>60</u>																										
FACW species	<u>50</u>	x 2 = <u>100</u>																										
FAC species	<u>0</u>	x 3 = <u>0</u>																										
FACU species	<u>0</u>	x 4 = <u>0</u>																										
UPL species	<u>0</u>	x 5 = <u>0</u>																										
Column Totals	<u>110</u>	(A) <u>160</u> (B)																										
Prevalence Index = B/A = <u>1.5</u>																												
1. _____	_____	_____	_____																									
2. _____	_____	_____	_____																									
3. _____	_____	_____	_____																									
4. _____	_____	_____	_____																									
5. _____	_____	_____	_____																									
6. _____	_____	_____	_____																									
7. _____	_____	_____	_____																									
	<u>0</u>	= Total Cover																										
Sapling/Shrub Stratum (Plot size: 15' r)																												
1. _____	_____	_____	_____																									
2. _____	_____	_____	_____																									
3. _____	_____	_____	_____																									
4. _____	_____	_____	_____																									
5. _____	_____	_____	_____																									
6. _____	_____	_____	_____																									
7. _____	_____	_____	_____																									
	<u>0</u>	= Total Cover																										
Herb Stratum (Plot size: 5' r)																												
1. <i>Typha latifolia</i>	60	Yes	OBL																									
2. <i>Phalaris arundinacea</i>	40	Yes	FACW																									
3. <i>Onoclea sensibilis</i>	10	No	FACW																									
4. _____	_____	_____	_____																									
5. _____	_____	_____	_____																									
6. _____	_____	_____	_____																									
7. _____	_____	_____	_____																									
8. _____	_____	_____	_____																									
9. _____	_____	_____	_____																									
10. _____	_____	_____	_____																									
11. _____	_____	_____	_____																									
12. _____	_____	_____	_____																									
	<u>110</u>	= Total Cover																										
Woody Vine Stratum (Plot size: 30' r)																												
1. _____	_____	_____	_____																									
2. _____	_____	_____	_____																									
3. _____	_____	_____	_____																									
4. _____	_____	_____	_____																									
	<u>0</u>	= Total Cover																										

Hydrophytic Vegetation Indicators:
 1- Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is >50%
 3 - Prevalence Index is ≤ 3.0¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:
Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)
 The criterion for hydrophytic vegetation is met. Fresh "wet" Meadow plant community.

SOIL

Sampling Point: A-DP07

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 2/1	100					Silt Loam	
2 - 14	10YR 2/1	97	10YR 4/6	3	C	M	Silt Loam	
14 - 20	10YR 6/2	100					Sandy Loam	

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. ²Location: PL = Pore Lining, M = Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

The criterion for hydric soil is met.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ditch Investigation City/County: Marinette, Marinette County Sampling Date: 2018-July-23

Applicant/Owner: Tyco Fire Products L.P. State: Wisconsin Sampling Point: A-DP08

Investigator(s): Stephen Chu Section, Township, Range: S21 T1N R20E

Landform (hillslope, terrace, etc.): Summit slope Local relief (concave, convex, none): Convex Slope (%): 0-1

Subregion (LRR or MLRA): LRR K Lat: 45.0708296339 Long: -87.6415530592 Datum: WGS84

Soil Map Unit Name: Rousseau loamy fine sand, 1-6% (RsB) NWI classification: _____

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)

Are Vegetation Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No

Are Vegetation Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report) Based on the absence of all three parameters, this area is an upland. Representative photograph: Photo #9 of Appendix B		

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (includes capillary fringe)	Depth (inches): _____	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Topo maps, soils map, WWI map, and aerial imagery		
Remarks: The criterion for wetland hydrology is not met.		

VEGETATION -- Use scientific names of plants.

Sampling Point: A-DP08

	Absolute % Cover	Dominant Species?	Indicator Status																									
Tree Stratum (Plot size: 30' r)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33.3</u> (A/B) Prevalence Index worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;"><u>Total % Cover of:</u></th> <th style="width: 25%; text-align: center;"><u>Multiply By:</u></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td style="text-align: center;"><u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;"><u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;"><u>70</u></td> <td>x 3 = <u>210</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;"><u>90</u></td> <td>x 4 = <u>360</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;"><u>5</u></td> <td>x 5 = <u>25</u></td> </tr> <tr> <td>Column Totals</td> <td style="text-align: center;"><u>165</u></td> <td>(A) <u>595</u> (B)</td> </tr> <tr> <td colspan="3" style="text-align: right;">Prevalence Index = B/A = <u>3.6</u></td> </tr> </tbody> </table>		<u>Total % Cover of:</u>	<u>Multiply By:</u>	OBL species	<u>0</u>	x 1 = <u>0</u>	FACW species	<u>0</u>	x 2 = <u>0</u>	FAC species	<u>70</u>	x 3 = <u>210</u>	FACU species	<u>90</u>	x 4 = <u>360</u>	UPL species	<u>5</u>	x 5 = <u>25</u>	Column Totals	<u>165</u>	(A) <u>595</u> (B)	Prevalence Index = B/A = <u>3.6</u>		
	<u>Total % Cover of:</u>	<u>Multiply By:</u>																										
OBL species	<u>0</u>	x 1 = <u>0</u>																										
FACW species	<u>0</u>	x 2 = <u>0</u>																										
FAC species	<u>70</u>	x 3 = <u>210</u>																										
FACU species	<u>90</u>	x 4 = <u>360</u>																										
UPL species	<u>5</u>	x 5 = <u>25</u>																										
Column Totals	<u>165</u>	(A) <u>595</u> (B)																										
Prevalence Index = B/A = <u>3.6</u>																												
1. <i>Acer rubrum</i>	60	Yes	FAC																									
2. <i>Populus tremuloides</i>	20	Yes	FACU																									
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
80 = Total Cover																												
Sapling/Shrub Stratum (Plot size: 15' r)																												
1. _____																												
2. _____																												
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
0 = Total Cover																												
Herb Stratum (Plot size: 5' r)																												
1. <i>Pteridium aquilinum</i>	70	Yes	FACU																									
2. <i>Echinochloa crus-galli</i>	10	No	FAC																									
3. <i>Daucus carota</i>	5	No	UPL																									
4. _____																												
5. _____																												
6. _____																												
7. _____																												
8. _____																												
9. _____																												
10. _____																												
11. _____																												
12. _____																												
85 = Total Cover																												
Woody Vine Stratum (Plot size: 30' r)																												
1. _____																												
2. _____																												
3. _____																												
4. _____																												
0 = Total Cover																												

Hydrophytic Vegetation Indicators:
 ___ 1- Rapid Test for Hydrophytic Vegetation
 ___ 2 - Dominance Test is > 50%
 ___ 3 - Prevalence Index is ≤ 3.0¹
 ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 ___ Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:
Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No

Remarks: (Include photo numbers here or on a separate sheet.)
 The criterion for hydrophytic vegetation is not met. Upland woodland.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ditch Investigation City/County: Marinette, Marinette County Sampling Date: 2018-July-23

Applicant/Owner: Tyco Fire Products L.P. State: Wisconsin Sampling Point: A-DP09

Investigator(s): Stephen Chu Section, Township, Range: S21 T1N R20E

Landform (hillslope, terrace, etc.): Summit slope Local relief (concave, convex, none): Convex Slope (%): 0-1

Subregion (LRR or MLRA): LRR K Lat: 45.0733051441 Long: -87.643459104 Datum: WGS84

Soil Map Unit Name: Shawano loamy fine sand, 2-6% slope (SfB) NWI classification: PFO

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)

Are Vegetation Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No

Are Vegetation Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Hydric Soil Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, optional Wetland Site ID:
Remarks: (Explain alternative procedures here or in a separate report)		
Based on the absence of all three parameters, this area is an upland. Representative photograph: Photo #10 of Appendix B		

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
(includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Topo maps, soils map, WWI map, and aerial imagery		
Remarks:		
The criterion for wetland hydrology is not met. Based on WETS analysis, antecedent hydrologic conditions are within a normal range.		

VEGETATION -- Use scientific names of plants.

Sampling Point: A-DP09

	Absolute % Cover	Dominant Species?	Indicator Status																									
Tree Stratum (Plot size: 30' r)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33.3</u> (A/B) Prevalence Index worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;"><u>Total % Cover of:</u></th> <th style="width: 25%; text-align: center;"><u>Multiply By:</u></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 1 = <u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 2 = <u>0</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;"><u>70</u></td> <td style="text-align: center;">x 3 = <u>210</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;"><u>50</u></td> <td style="text-align: center;">x 4 = <u>200</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals</td> <td style="text-align: center;"><u>120</u></td> <td style="text-align: center;">(A) <u>410</u> (B)</td> </tr> <tr> <td colspan="3" style="text-align: right;">Prevalence Index = B/A = <u>3.4</u></td> </tr> </tbody> </table>		<u>Total % Cover of:</u>	<u>Multiply By:</u>	OBL species	<u>0</u>	x 1 = <u>0</u>	FACW species	<u>0</u>	x 2 = <u>0</u>	FAC species	<u>70</u>	x 3 = <u>210</u>	FACU species	<u>50</u>	x 4 = <u>200</u>	UPL species	<u>0</u>	x 5 = <u>0</u>	Column Totals	<u>120</u>	(A) <u>410</u> (B)	Prevalence Index = B/A = <u>3.4</u>		
	<u>Total % Cover of:</u>	<u>Multiply By:</u>																										
OBL species	<u>0</u>	x 1 = <u>0</u>																										
FACW species	<u>0</u>	x 2 = <u>0</u>																										
FAC species	<u>70</u>	x 3 = <u>210</u>																										
FACU species	<u>50</u>	x 4 = <u>200</u>																										
UPL species	<u>0</u>	x 5 = <u>0</u>																										
Column Totals	<u>120</u>	(A) <u>410</u> (B)																										
Prevalence Index = B/A = <u>3.4</u>																												
1. <i>Acer rubrum</i>	70	Yes	FAC																									
2. _____	_____	_____	_____																									
3. _____	_____	_____	_____																									
4. _____	_____	_____	_____																									
5. _____	_____	_____	_____																									
6. _____	_____	_____	_____																									
7. _____	_____	_____	_____																									
<u>70</u> = Total Cover																												
Sapling/Shrub Stratum (Plot size: 15' r)																												
1. _____	_____	_____	_____																									
2. _____	_____	_____	_____																									
3. _____	_____	_____	_____																									
4. _____	_____	_____	_____																									
5. _____	_____	_____	_____																									
6. _____	_____	_____	_____																									
7. _____	_____	_____	_____																									
<u>0</u> = Total Cover																												
Herb Stratum (Plot size: 5' r)																												
1. <i>Pteridium aquilinum</i>	40	Yes	FACU																									
2. <i>Ageratina altissima</i>	10	Yes	FACU																									
3. _____	_____	_____	_____																									
4. _____	_____	_____	_____																									
5. _____	_____	_____	_____																									
6. _____	_____	_____	_____																									
7. _____	_____	_____	_____																									
8. _____	_____	_____	_____																									
9. _____	_____	_____	_____																									
10. _____	_____	_____	_____																									
11. _____	_____	_____	_____																									
12. _____	_____	_____	_____																									
<u>50</u> = Total Cover																												
Woody Vine Stratum (Plot size: 30' r)																												
1. _____	_____	_____	_____																									
2. _____	_____	_____	_____																									
3. _____	_____	_____	_____																									
4. _____	_____	_____	_____																									
<u>0</u> = Total Cover																												
Hydrophytic Vegetation Indicators: ___ 1- Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is > 50% ___ 3 - Prevalence Index is ≤ 3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic																												
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																												
Hydrophytic Vegetation Present? Yes ___ No <input checked="" type="checkbox"/>																												
Remarks: (Include photo numbers here or on a separate sheet.) The criterion for hydrophytic vegetation is not met. Upland woodland.																												

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ditch Investigation City/County: Marinette, Marinette County Sampling Date: 2018-July-23
 Applicant/Owner: Tyco Fire Products L.P. State: Wisconsin Sampling Point: B-DP01
 Investigator(s): Stephen Chu Section, Township, Range: S21 T1N R20E
 Landform (hillslope, terrace, etc.): Foot slope Local relief (concave, convex, none): Convex Slope (%): 1-10
 Subregion (LRR or MLRA): LRR K Lat: 45.0725652252 Long: -87.6130814105 Datum: WGS84
 Soil Map Unit Name: Wainola loamy fine sand, 0-3% slope (WaA) NWI classification:
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, optional Wetland Site ID: Wetland fringe of waterway S02.	
Remarks:(Explain alternative procedures here or in a separate report)			
Based on the presence of all three parameters, this area is a wetland. Data point located along wetland fringe of waterway S02, within the OHWM. Representative photograph: Photo #16 and #17 of Appendix B.			

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
(includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Topo maps, soils map, WWI map, and aerial imagery		
Remarks:		
The criterion for wetland hydrology is met. Based on WETS analysis, antecedent hydrologic conditions are within a normal range.		

VEGETATION -- Use scientific names of plants.

Sampling Point: B-DP01

	Absolute % Cover	Dominant Species?	Indicator Status																									
Tree Stratum (Plot size: 30' r)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80</u> (A/B) Prevalence Index worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;"><u>Total % Cover of:</u></th> <th style="width: 25%; text-align: center;"><u>Multiply By:</u></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 1 = <u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;"><u>25</u></td> <td style="text-align: center;">x 2 = <u>50</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;"><u>65</u></td> <td style="text-align: center;">x 3 = <u>195</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;"><u>10</u></td> <td style="text-align: center;">x 4 = <u>40</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals</td> <td style="text-align: center;"><u>100</u></td> <td style="text-align: center;">(A) <u>285</u> (B)</td> </tr> <tr> <td colspan="3" style="text-align: right;">Prevalence Index = B/A = <u>2.9</u></td> </tr> </tbody> </table>		<u>Total % Cover of:</u>	<u>Multiply By:</u>	OBL species	<u>0</u>	x 1 = <u>0</u>	FACW species	<u>25</u>	x 2 = <u>50</u>	FAC species	<u>65</u>	x 3 = <u>195</u>	FACU species	<u>10</u>	x 4 = <u>40</u>	UPL species	<u>0</u>	x 5 = <u>0</u>	Column Totals	<u>100</u>	(A) <u>285</u> (B)	Prevalence Index = B/A = <u>2.9</u>		
	<u>Total % Cover of:</u>	<u>Multiply By:</u>																										
OBL species	<u>0</u>	x 1 = <u>0</u>																										
FACW species	<u>25</u>	x 2 = <u>50</u>																										
FAC species	<u>65</u>	x 3 = <u>195</u>																										
FACU species	<u>10</u>	x 4 = <u>40</u>																										
UPL species	<u>0</u>	x 5 = <u>0</u>																										
Column Totals	<u>100</u>	(A) <u>285</u> (B)																										
Prevalence Index = B/A = <u>2.9</u>																												
1. <i>Acer negundo</i>	10	Yes	FAC																									
2. <i>Pinus strobus</i>	10	Yes	FACU																									
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
	<u>20</u>	= Total Cover																										
Sapling/Shrub Stratum (Plot size: 15' r)																												
1. <i>Rhamnus cathartica</i>	5	Yes	FAC																									
2. _____																												
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
	<u>5</u>	= Total Cover																										
Herb Stratum (Plot size: 5' r)																												
1. <i>Equisetum arvense</i>	50	Yes	FAC																									
2. <i>Phalaris arundinacea</i>	25	Yes	FACW																									
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
8. _____																												
9. _____																												
10. _____																												
11. _____																												
12. _____																												
	<u>75</u>	= Total Cover																										
Woody Vine Stratum (Plot size: 30' r)																												
1. _____																												
2. _____																												
3. _____																												
4. _____																												
	<u>0</u>	= Total Cover																										
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1- Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic																												
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																												
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																												
Remarks: (Include photo numbers here or on a separate sheet.) The criterion for hydrophytic vegetation is met.																												

SOIL

Sampling Point: B-DP01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 3	10YR 2/1	100					Silt Loam	
3 - 6	10YR 3/2	100					Silt Loam	
6 - 12	10YR 6/2	95	10YR 4/6	5	C	M	Sandy Loam	
12 - 18	10YR 3/2	100					Sandy Loam	

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. ²Location: PL = Pore Lining, M = Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):		Hydric Soil Present?	
Type:	None	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Depth (inches):			

Remarks:

The criterion for hydric soil is met.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ditch Investigation City/County: Marinette, Marinette County Sampling Date: 2018-July-23
 Applicant/Owner: Tyco Fire Products L.P. State: Wisconsin Sampling Point: B-DP02
 Investigator(s): Stephen Chu Section, Township, Range: S21 T1N R20E
 Landform (hillslope, terrace, etc.): Summit slope Local relief (concave, convex, none): Convex Slope (%): 0-1
 Subregion (LRR or MLRA): LRR K Lat: 45.0730394848 Long: -87.6141318306 Datum: WGS84
 Soil Map Unit Name: Wainola loamy fine sand, 0-3% slope (WaA) NWI classification:

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Hydric Soil Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, optional Wetland Site ID:	
Remarks:(Explain alternative procedures here or in a separate report)			
Based on the absence of all three parameters, this area is an upland. Representative photograph: Photo #18 of Appendix B.			

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____
(includes capillary fringe)	
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Topo maps, soils map, WWI map, and aerial imagery	
Remarks:	
The criterion for wetland hydrology is not met. Based on WETS analysis, antecedent hydrologic conditions are wetter than normal.	

VEGETATION -- Use scientific names of plants.

Sampling Point: B-DP02

	Absolute % Cover	Dominant Species?	Indicator Status																									
Tree Stratum (Plot size: 30' r)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>20</u> (A/B) Prevalence Index worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;"><u>Total % Cover of:</u></th> <th style="width: 25%; text-align: center;"><u>Multiply By:</u></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 1 = <u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 2 = <u>0</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;"><u>20</u></td> <td style="text-align: center;">x 3 = <u>60</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;"><u>150</u></td> <td style="text-align: center;">x 4 = <u>600</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals</td> <td style="text-align: center;"><u>170</u></td> <td style="text-align: center;">(A) <u>660</u> (B)</td> </tr> <tr> <td colspan="3" style="text-align: center;">Prevalence Index = B/A = <u>3.9</u></td> </tr> </tbody> </table>		<u>Total % Cover of:</u>	<u>Multiply By:</u>	OBL species	<u>0</u>	x 1 = <u>0</u>	FACW species	<u>0</u>	x 2 = <u>0</u>	FAC species	<u>20</u>	x 3 = <u>60</u>	FACU species	<u>150</u>	x 4 = <u>600</u>	UPL species	<u>0</u>	x 5 = <u>0</u>	Column Totals	<u>170</u>	(A) <u>660</u> (B)	Prevalence Index = B/A = <u>3.9</u>		
	<u>Total % Cover of:</u>	<u>Multiply By:</u>																										
OBL species	<u>0</u>	x 1 = <u>0</u>																										
FACW species	<u>0</u>	x 2 = <u>0</u>																										
FAC species	<u>20</u>	x 3 = <u>60</u>																										
FACU species	<u>150</u>	x 4 = <u>600</u>																										
UPL species	<u>0</u>	x 5 = <u>0</u>																										
Column Totals	<u>170</u>	(A) <u>660</u> (B)																										
Prevalence Index = B/A = <u>3.9</u>																												
1. <i>Pinus strobus</i>	40	Yes	FACU																									
2. <i>Pinus resinosa</i>	40	Yes	FACU																									
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
80 = Total Cover																												
Sapling/Shrub Stratum (Plot size: 15' r)																												
1. <i>Frangula alnus</i>	10	Yes	FAC																									
2. _____																												
3. _____																												
4. _____																												
5. _____																												
6. _____																												
7. _____																												
10 = Total Cover																												
Herb Stratum (Plot size: 5' r)																												
1. <i>Poa annua</i>	50	Yes	FACU																									
2. <i>Schedonorus arundinaceus</i>	20	Yes	FACU																									
3. <i>Equisetum hyemale</i>	10	No	FAC																									
4. _____																												
5. _____																												
6. _____																												
7. _____																												
8. _____																												
9. _____																												
10. _____																												
11. _____																												
12. _____																												
80 = Total Cover																												
Woody Vine Stratum (Plot size: 30' r)																												
1. _____																												
2. _____																												
3. _____																												
4. _____																												
0 = Total Cover																												
Hydrophytic Vegetation Indicators: ___ 1- Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is > 50% ___ 3 - Prevalence Index is ≤ 3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic																												
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																												
Hydrophytic Vegetation Present? Yes ___ No <input checked="" type="checkbox"/>																												
Remarks: (Include photo numbers here or on a separate sheet.) The criterion for hydrophytic vegetation is not met. Upland woodland.																												

SOIL

Sampling Point: B-DP02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 2/1	100					Sandy Loam	
2 - 10	10YR 3/1	100					Sandy Loam	
10 - 20	10YR 6/4	100					Sandy Loam	

¹Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. ²Location: PL = Pore Lining, M = Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

The criterion for hydric soil is not met.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ditch Investigation City/County: Marinette, Marinette County Sampling Date: 2018-July-23
 Applicant/Owner: Tyco Fire Products L.P. State: Wisconsin Sampling Point: B-DP03
 Investigator(s): Stephen Chu Section, Township, Range: S21 T1N R20E
 Landform (hillslope, terrace, etc.): Toe slope Local relief (concave, convex, none): Concave Slope (%): 0-1
 Subregion (LRR or MLRA): LRR K Lat: 45.0720106942 Long: -87.6121325791 Datum: WGS84
 Soil Map Unit Name: Wainola loamy fine sand, 0-3% slope (WaA) NWI classification: _____

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No ____ (If no, explain in Remarks.)
 Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes No ____
 Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No ____	
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No ____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No ____
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No ____	If yes, optional Wetland Site ID: Wetland fringe of S02
Remarks:(Explain alternative procedures here or in a separate report)		
Based on the presence of all three parameters, this area is a wetland. Data point located with the wetland fringe of waterway S02, within the OHWM. Representative photograph: Photo #19 of Appendix B.		

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:		
Surface Water Present? Yes ____ No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No ____
Water Table Present? Yes <input checked="" type="checkbox"/> No ____	Depth (inches): <u>8</u>	
Saturation Present? Yes <input checked="" type="checkbox"/> No ____ (includes capillary fringe)	Depth (inches): <u>3</u>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Topo maps, soils map, WWI map, and aerial imagery		
Remarks:		
The criterion for wetland hydrology is met. Based on WETS analysis, antecedent hydrologic conditions are within a normal range.		

VEGETATION -- Use scientific names of plants.

Sampling Point: B-DP03

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: 30' r)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80</u> (A/B)
1. <i>Quercus palustris</i>	25	Yes	FACW	
2. <i>Salix nigra</i>	20	Yes	OBL	
3. <i>Acer negundo</i>	10	No	FAC	
4. <i>Acer saccharinum</i>	10	No	FACW	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
			65 = Total Cover	
Sapling/Shrub Stratum (Plot size: 15' r)				
1. <i>Frangula alnus</i>	25	Yes	FAC	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
			25 = Total Cover	
Herb Stratum (Plot size: 5' r)				
1. <i>Phalaris arundinacea</i>	70	Yes	FACW	
2. <i>Alliaria petiolata</i>	30	Yes	FACU	
3. <i>Urtica dioica</i>	3	No	FAC	
4. <i>Lythrum salicaria</i>	2	No	OBL	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
			105 = Total Cover	
Woody Vine Stratum (Plot size: 30' r)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
			0 = Total Cover	
Remarks: (Include photo numbers here or on a separate sheet.) The criterion for hydrophytic vegetation is met. Floodplain Forest plant community.				

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ditch Investigation City/County: Marinette, Marinette County Sampling Date: 2018-July-23
 Applicant/Owner: Tyco Fire Products L.P. State: Wisconsin Sampling Point: B-DP04
 Investigator(s): Stephen Chu Section, Township, Range: S21 T1N R20E
 Landform (hillslope, terrace, etc.): Shoulder slope Local relief (concave, convex, none): Convex Slope (%): 1-10
 Subregion (LRR or MLRA): LRR K Lat: 45.0719550513 Long: -87.6123907417 Datum: WGS84
 Soil Map Unit Name: Wainola loamy fine sand, 0-3% slope (WaA) NWI classification: _____

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Hydric Soil Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, optional Wetland Site ID:	
Remarks:(Explain alternative procedures here or in a separate report)			
Based on the absence of all three parameters, this area is an upland. Representative photograph: Photo #20 of Appendix B.			

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (includes capillary fringe)	Depth (inches): _____	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Topo maps, soils map, WWI map, and aerial imagery		
Remarks:		
The criterion for wetland hydrology is not met. Based on WETS analysis, antecedent hydrologic conditions are within a normal range.		

VEGETATION -- Use scientific names of plants.

Sampling Point: B-DP04

	Absolute % Cover	Dominant Species?	Indicator Status																									
Tree Stratum (Plot size: 30' r)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B) Prevalence Index worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;"><u>Total % Cover of:</u></th> <th style="width: 25%; text-align: center;"><u>Multiply By:</u></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 1 = <u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 2 = <u>0</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;"><u>10</u></td> <td style="text-align: center;">x 3 = <u>30</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;"><u>60</u></td> <td style="text-align: center;">x 4 = <u>240</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;">x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals</td> <td style="text-align: center;"><u>70</u></td> <td style="text-align: center;">(A) <u>270</u> (B)</td> </tr> <tr> <td colspan="3" style="text-align: center;">Prevalence Index = B/A = <u>3.9</u></td> </tr> </tbody> </table> Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1- Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is > 50% <input type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.		<u>Total % Cover of:</u>	<u>Multiply By:</u>	OBL species	<u>0</u>	x 1 = <u>0</u>	FACW species	<u>0</u>	x 2 = <u>0</u>	FAC species	<u>10</u>	x 3 = <u>30</u>	FACU species	<u>60</u>	x 4 = <u>240</u>	UPL species	<u>0</u>	x 5 = <u>0</u>	Column Totals	<u>70</u>	(A) <u>270</u> (B)	Prevalence Index = B/A = <u>3.9</u>		
	<u>Total % Cover of:</u>	<u>Multiply By:</u>																										
OBL species	<u>0</u>	x 1 = <u>0</u>																										
FACW species	<u>0</u>	x 2 = <u>0</u>																										
FAC species	<u>10</u>	x 3 = <u>30</u>																										
FACU species	<u>60</u>	x 4 = <u>240</u>																										
UPL species	<u>0</u>	x 5 = <u>0</u>																										
Column Totals	<u>70</u>	(A) <u>270</u> (B)																										
Prevalence Index = B/A = <u>3.9</u>																												
1. _____	_____	_____	_____																									
2. _____	_____	_____	_____																									
3. _____	_____	_____	_____																									
4. _____	_____	_____	_____																									
5. _____	_____	_____	_____																									
6. _____	_____	_____	_____																									
7. _____	_____	_____	_____																									
0 = Total Cover																												
Sapling/Shrub Stratum (Plot size: 15' r)																												
1. _____	_____	_____	_____																									
2. _____	_____	_____	_____																									
3. _____	_____	_____	_____																									
4. _____	_____	_____	_____																									
5. _____	_____	_____	_____																									
6. _____	_____	_____	_____																									
7. _____	_____	_____	_____																									
0 = Total Cover																												
Herb Stratum (Plot size: 5' r)																												
1. <i>Poa annua</i>	50	Yes	FACU																									
2. <i>Geum canadense</i>	10	No	FAC																									
3. <i>Achillea millefolium</i>	10	No	FACU																									
4. _____	_____	_____	_____																									
5. _____	_____	_____	_____																									
6. _____	_____	_____	_____																									
7. _____	_____	_____	_____																									
8. _____	_____	_____	_____																									
9. _____	_____	_____	_____																									
10. _____	_____	_____	_____																									
11. _____	_____	_____	_____																									
12. _____	_____	_____	_____																									
70 = Total Cover																												
Woody Vine Stratum (Plot size: 30' r)																												
1. _____	_____	_____	_____																									
2. _____	_____	_____	_____																									
3. _____	_____	_____	_____																									
4. _____	_____	_____	_____																									
0 = Total Cover																												
Remarks: (Include photo numbers here or on a separate sheet.) The criterion for hydrophytic vegetation is not met.																												

Arcadis U.S., Inc.

126 North Jefferson Street

Suite 400

Milwaukee, WI 53202

Tel 414 276 7742

Fax 414 276 7603

www.arcadis.com

A decorative graphic consisting of three thin orange lines. One line is horizontal, extending across the bottom of the page. Two other lines are diagonal, starting from the bottom left and extending towards the top right, intersecting the horizontal line.

APPENDIX D

ERR Log #18-576



Endangered Resources Review for the Proposed Tyco Area A, Marinette County

(ER Log # 18-576)

Section A. Location and brief description of the proposed project

Based on information provided by the ER Certified Reviewer and attached materials, the proposed project consists of the following:

Location	Marinette County - T30N R23E S13
Project Description	The proposed project involves the installation of a combination active/passive water treatment system, which includes installation of a pump, associated water piping and conduit, treatment tanks, and a weir.
Project Timing	Fall 2018
Current Habitat	The proposed project is located within the existing previously disturbed footprint of the Tyco Fire Products, L.P. facility, within forested and herbaceous wetlands, and through forested uplands along an unnamed tributary to the Little River.
Impacts to Wetlands or Waterbodies	The proposed project will result in temporary impacts to herbaceous wetlands, forested wetlands, and the unnamed tributary to the Little River.
Property Type	Private
Federal Nexus	Yes

It is best to request ER Reviews early in the project planning process. However, some important project details may not be known at that time. Details related to project location, design, and timing of disturbance are important for determining both the endangered resources that may be impacted by the project and any necessary follow-up actions. Please contact the Certified Coordinators whenever project plans change or new details become available to confirm if results of this ER Review are still valid.

Section B. Endangered resources recorded from within the project area and surrounding area

	Group	State Status	Federal Status
Northern Dry Forest (<i>Northern dry forest</i>)	Community	NA	
Great Lakes Beach (<i>Great lakes beach</i>)	Community~	NA	
Lake Sturgeon (<i>Acipenser fulvescens</i>)	Fish~	SC/H	
Few-flowered Spike-rush (<i>Eleocharis quinqueflora</i>)	Plant~	SC	

For additional information on the rare species, high-quality natural communities, and other endangered resources listed above, please visit our Biodiversity (<http://dnr.wi.gov/topic/EndangeredResources/biodiversity.html>) page. For further definitions of state and federal statuses (END=Endangered, THR=Threatened, SC=Special Concern), please refer to the Natural Heritage Inventory (NHI) Working List (<http://dnr.wi.gov/topic/nhi/wlist.html>).

Section C. Follow-up actions

Actions that need to be taken to comply with state and/or federal endangered species laws: None

Actions recommended to help conserve Wisconsin's Endangered Resources:

- Northern Dry Forest - Community

State Status: NA

Impact Type	Impact possible
--------------------	-----------------

Recommended Measures	Other
Description of Recommended Measures	Northern dry forest may occur within the project site. Natural communities may contain rare or declining species and their protection should be incorporated into project design as much as possible. We recommend minimizing impacts to and/or incorporating buffers along the edges of northern dry forest.

Remember that although these actions are not required by state or federal endangered species laws, they may be required by other laws, permits, granting programs, or policies of this or another agency. Examples include the federal Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, State Natural Areas law, DNR Chapter 30 Wetland and Waterway permits, DNR Stormwater permits, and Forest Certification.

Additional Recommendations

The Wisconsin Natural Heritage Inventory (NHI Portal) database contains all current Northern Long-eared Bat roost sites and hibernacula in Wisconsin. The NHI Portal contains verified survey results from WI DNR, FWS, and private organizations. The NHI Portal was consulted for this project, and per U.S. Fish and Wildlife Service's 4(d) rule, it was determined that this project is more than 150 feet from a known maternity roost tree AND is more than 1/4 mile from a known hibernacula. In addition, this project is not located within a Rusty Patched Bumble Bee High Potential Zone. Therefore, this project can proceed without federal restrictions.

No actions are required or recommended for the following endangered resources:

• Great Lakes Beach - Community~

State Status: NA

Impact Type	No impact or no/low broad ITP/A
Reason	Lack of Suitable Habitat within Project Boundary
Justification	This natural community is present nearby the project area, however the habitat is not present on site. Therefore, no adverse impacts to Great Lakes beach are anticipated as a result of this project.

• Lake Sturgeon (*Acipenser fulvescens*) - Fish~

State Status: SC/H

Impact Type	No impact or no/low broad ITP/A
Reason	Lack of Suitable Habitat within Project Boundary
Justification	Lake sturgeon are known to occur in the Menominee River and shoal waters of Lake Michigan. The proposed project is not anticipated to result in impacts to the Menominee River or Lake Michigan and the unnamed tributary to the Little River does not provide suitable habitat due to insufficient depth and width. Therefore, no adverse impacts to lake sturgeon are anticipated as a result of this project.

• Few-flowered Spike-rush (*Eleocharis quinqueflora*) - Plant~

State Status: SC

Impact Type	No impact or no/low broad ITP/A
Reason	Lack of Suitable Habitat within Project Boundary
Justification	Few-flowered spike-rush are found on cold coniferous poor fen mats, but also in a variety of moist meadows in calcareous areas. The project site does not contain these habitat types. Therefore, no adverse impacts to few-flowered spike-rush are anticipated as a result of this project.

Section D. Next Steps

1. Evaluate whether the 'Location and brief description of the proposed project' is still accurate. All recommendations in this ER Review are based on

the information supplied in this ER Review letter and additional attachments. If the proposed project has changed, please contact the ER Review Program to determine if the information in this ER Review is still valid.

2. Determine whether the project can incorporate and implement the **'Follow-up actions'** identified above:
 - o 'Actions that need to be taken to comply with state and/or federal endangered species laws' represent the Department's best available guidance for complying with state and federal endangered species laws based on the project information that you provided and the endangered resources information and data available to us. If the proposed project has not changed from the description that you provided us and you are able to implement all of the 'Actions that need to be taken to comply with state and/or federal endangered species laws', your project should comply with state and federal endangered species laws. Please remember that if a violation occurs, the person responsible for the taking is the liable party. Generally this is the landowner or project proponent. For questions or concerns about individual responsibilities related to Wisconsin's Endangered Species Law, please contact the ER Review Program.
 - o If the project is unable to incorporate and implement one or more of the 'Actions that need to be taken to comply with state and/or federal endangered species laws' identified above, the project may potentially violate one or more of these laws. Please contact the ER Review Program immediately to assist in identifying potential options that may allow the project to proceed in compliance with state and federal endangered species laws.
 - o 'Actions recommended to help conserve Wisconsin's Endangered Resources' may be required by another law, a policy of this or another Department, agency or program; or as part of another permitting, approval or granting process. Please make sure to carefully read all permits and approvals for the project to determine whether these or other measures may be required. Even if these actions are not required by another program or entity for the proposed project to proceed, the Department strongly encourages the implementation of these conservation measures on a voluntary basis to help prevent future listings and protect Wisconsin's biodiversity for future generations.
3. No federally-protected species or habitats are involved.

Section E. Contact Information

The Proposed ER Review for this project was requested and conducted by the following:

Requester: Ryan Bombeck, 126 North Jefferson Street, Suite 400, Milwaukee, WI 53202

Invoice will be sent to: Ryan Bombeck

Proposed ER Review conducted by: Ryan Bombeck, ryan.bombeck@arcadis-us.com, Arcadis, 320-296-6546

The Proposed ER Review was subsequently reviewed, modified (if needed), and approved by Wisconsin Department of Natural Resources (DNR):

Proposed ER Review approved by: Angela White, angelal.white@wi.gov, ER Review Program, DNR, 101 S. Webster St., PO Box 7921, Madison, Wisconsin 53707

DNR Signature:

Angela White

08/01/18

Section F. Standard Information to help you better understand this ER Review

Endangered Resources (ER) Reviews are conducted according to the protocols in the guidance document *Conducting Proposed Endangered Resources Reviews: A Step-by-Step Guide for Certified ER Reviewers*. A copy of this document is available upon request by contacting the ER Certification Coordinator at 608-266-5241

How endangered resources searches are conducted for the proposed project area: An endangered resources search is performed as part of all ER Reviews. A search consists of querying the Wisconsin Natural Heritage Inventory (NHI) database for endangered resources records for the proposed project area. The project area evaluated consists of both the specific project site and a buffer area surrounding the site. A 1 mile buffer is considered for terrestrial and wetland species, and a 2 mile buffer for aquatic species. Endangered resources records from the buffer area are considered because most lands and waters in the state, especially private lands, have not been surveyed. Considering records from the entire project area (also sometimes referred to as the search area) provides the best picture of species and communities that may be present on your specific site if suitable habitat for those species or communities is present.

Categories of endangered resources considered in ER Reviews and protections for each: Endangered resources records from the NHI database fall into one of the following categories:

- Federally-protected species include those federally listed as Endangered or Threatened and Designated Critical Habitats. Federally-protected animals are protected on all lands; federally-protected plants are protected only on federal lands and in the course of projects that include federal funding (see Federal Endangered Species Act of 1973 as amended).
- Animals (vertebrate and invertebrate) listed as Endangered or Threatened in Wisconsin are protected by Wisconsin's Endangered Species Law on all lands and waters of the state (s. 29.604, Wis. Stats.).
- Plants listed as Endangered or Threatened in Wisconsin are protected by Wisconsin's Endangered Species Law on public lands and on land that the person does not own or lease, except in the course of forestry, agriculture, utility, or bulk sampling actions (s. 29.604, Wis. Stats.).
- Special Concern species, high-quality examples of natural communities (sometimes called High Conservation Value areas), and natural features (e.g., caves and animal aggregation sites) are also included in the NHI database. These endangered resources are not legally protected by state or federal endangered species laws. However, other laws, policies (e.g., related to Forest Certification), or granting/permitting processes may require or strongly encourage protection of these resources. The main purpose of the Special Concern classification is to focus attention on species about which some problem of abundance or distribution is suspected before they become endangered or threatened.
- State Natural Areas (SNAs) are also included in the NHI database. SNAs protect outstanding examples of Wisconsin's native landscape of natural communities, significant geological formations, and archeological sites. Endangered species are often found within SNAs. SNAs are protected by law from any use that is inconsistent with or injurious to their natural values (s. 23.28, Wis. Stats.).

Please remember the following:

1. This ER Review is provided as information to comply with state and federal endangered species laws. By following the protocols and methodologies described above, the best information currently available about endangered resources that may be present in the proposed project area has been provided. However, the NHI database is not all inclusive; systematic surveys of most public lands have not been conducted, and the majority of private lands have not been surveyed. As a result, NHI data for the project area may be incomplete. Occurrences of endangered resources are only in the NHI database if the site has been previously surveyed for that species or group during the appropriate season, and an observation was reported to and entered into the NHI database. As such, absence of a record in the NHI database for a specific area should not be used to infer that no endangered resources are present in that area. Similarly, the presence of one species does not imply that surveys have been conducted for other species. Evaluations of the possible presence of rare species on the project site should always be based on whether suitable habitat exists on site for that species.
2. This ER Review provides an assessment of endangered resources that may be impacted by the project and measures that can be taken to avoid negatively impacting those resources based on the information that has been provided to ER Review Program at this time. Incomplete information, changes in the project, or subsequent survey results may affect our assessment and indicate the need for additional or different measures to avoid impacts to endangered resources.
3. This ER Review does not exempt the project from actions that may be required by Department permits or approvals for the project. Information contained in this ER Review may be shared with individuals who need this information in order to carry out specific roles in the planning, permitting, and implementation of the proposed project.

APPENDIX E

USFWS Office Species List





United States Department of the Interior



FISH AND WILDLIFE SERVICE
Green Bay Ecological Services Field Office
2661 Scott Tower Drive
New Franken, WI 54229-9565
Phone: (920) 866-1717 Fax: (920) 866-1710

In Reply Refer To:
Consultation Code: 03E17000-2018-SLI-1331
Event Code: 03E17000-2018-E-03047
Project Name: Area A

August 01, 2018

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The attached species list identifies any federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat if present within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the Service if they determine their project “may affect” listed species or critical habitat.

Under 50 CFR 402.12(e) (the regulations that implement Section 7 of the Endangered Species Act) the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally. You may verify the list by visiting the ECOS-IPaC website <http://ecos.fws.gov/ipac/> at regular intervals during project planning and implementation and completing the same process you used to receive the attached list. As an alternative, you may contact this Ecological Services Field Office for updates.

Please use the species list provided and visit the U.S. Fish and Wildlife Service's Region 3 Section 7 Technical Assistance website at - <http://www.fws.gov/midwest/endangered/section7/s7process/index.html>. This website contains step-by-step instructions which will help you determine if your project will have an adverse effect on listed species and will help lead you through the Section 7 process.

For all **wind energy projects** and **projects that include installing towers that use guy wires or are over 200 feet in height (e.g., communication towers)**, please contact this field office directly for assistance, even if no federally listed plants, animals or critical habitat are present within your proposed project or may be affected by your proposed project.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

Although no longer protected under the Endangered Species Act, be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*) and Migratory Bird Treaty Act (16 U.S.C. 703 *et seq.*), as are golden eagles. Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near an eagle nest or winter roost area, see our Eagle Permits website at <http://www.fws.gov/midwest/midwestbird/EaglePermits/index.html> to help you determine if you can avoid impacting eagles or if a permit may be necessary.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Green Bay Ecological Services Field Office

2661 Scott Tower Drive

New Franken, WI 54229-9565

(920) 866-1717

Project Summary

Consultation Code: 03E17000-2018-SLI-1331

Event Code: 03E17000-2018-E-03047

Project Name: Area A

Project Type: ** OTHER **

Project Description: The proposed project involves installation of an interim measure water treatment system within the unnamed tributary to the Little River.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/45.07306974082264N87.64331009309548W>



Counties: Marinette, WI

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Canada Lynx <i>Lynx canadensis</i> Population: Wherever Found in Contiguous U.S. There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened
Gray Wolf <i>Canis lupus</i> Population: U.S.A.: All of AL, AR, CA, CO, CT, DE, FL, GA, IA, IN, IL, KS, KY, LA, MA, MD, ME, MI, MO, MS, NC, ND, NE, NH, NJ, NV, NY, OH, OK, PA, RI, SC, SD, TN, TX, VA, VT, WI, and WV; and portions of AZ, NM, OR, UT, and WA. Mexico. There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/4488	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Kirtland's Warbler <i>Setophaga kirtlandii</i> (= <i>Dendroica kirtlandii</i>) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8078	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Arcadis U.S., Inc.

126 North Jefferson Street

Suite 400

Milwaukee, Wisconsin 53202

Tel 414 276 7742

Fax 414 276 7603

www.arcadis.com

A decorative graphic consisting of three thin orange lines. One line is horizontal, extending across the bottom of the page. Two other lines are diagonal, starting from the bottom left and extending towards the top right, crossing the horizontal line.