



Harbor Island

October 2024



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Executive Summary

On behalf of the City of Grand Haven, HDR Michigan, Inc. (HDR) has prepared this wetland delineation report for Harbor Island, located near North 3rd Street, Grand Haven, Ottawa County, Michigan (Site).

Prior to HDR's field delineation, a desktop review of publicly available data and historical information was performed to provide insight on the existing conditions and potential presence of aquatic features, including wetlands. Data reviewed consisted of, but was not limited to, U.S. Fish and Wildlife Service's National Wetland Inventory (NWI); Michigan Department of Environment, Great Lakes, and Energy (EGLE) Wetland Inventory; U.S. Geological Survey National Hydrography; U.S. Department of Agriculture Natural Resource Conservation Center Soil Survey; and current and historical aerial imagery datasets. The results of the desktop survey show mapped NWI wetlands, mapped wetlands on the EGLE wetland inventory maps due to the presence of mapped hydric soil, and mapped 100-year floodplain.

On April 25 and 26, 2024, HDR performed an on-site wetland field reconnaissance of the approximately 131-acre project area to delineate aquatic features. The Project area consisted of eight areas that met the criteria of wetlands in that they had a predominance of hydrophytic vegetation, showed signs of wetland hydrology, and wetland soil indicators were present. Additionally present on the Site are the shoreline of the North Channel, the inactive Unit 1/2 and former Unit 3A/B Impoundments, and the former Coal Pile that are associated with the Former J.B. Sims Generating Station, as shown in the Aerial Wetland Determination Exhibit.



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1.0 Introduction

HDR Engineering, Inc. (HDR) conducted a wetland delineation of the former J.B. Sims Generation Station property, located at 1231 North 3rd Street, Grand Haven, Ottawa County, Michigan (Site), and surrounding areas within Harbor Island (together, the "Project Area"), to identify the boundaries existing wetland for consideration as part of the implementation of remediation alternatives and future uses of the Site.

The delineation was conducted to locate the extent of: 1) waters of the U.S. (WOTUS), which includes wetlands and other water resources typically under the jurisdiction of the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA); and 2) water resources under the jurisdiction of Michigan Department of Environment, Great Lakes, and Energy (EGLE) Water Resources Division under Parts 301 (inland lakes and streams) and 303 (wetlands) of the Michigan Natural Resources and Environmental Protection Act (NREPA). In 1984, Michigan received authorization from the federal government to administer Section 404 of the CWA for inland waters. In accordance with Section 404(g) of the CWA, , the USACE retains federal jurisdiction over traditionally navigable waters, including the Great Lakes, connecting channels, other waters connected to the Great Lakes where navigational conditions are maintained, and wetlands directly adjacent to these waters.

Pursuant to the 1986 USACE regulations (33 CFR Part 323), which provides that the USACE generally does not consider artificial lakes, ponds, or drainages created by excavating dry land to collect and retain water for settling basins to be jurisdictional WOTUS, the locations of constructed stormwater features were identified within the Project area and are included in this report. Additionally, wetland areas that are not contiguous to the Great Lakes, an inland lake or pond, or a river or stream; and are 5 acres or less in size are not regulated by Michigan EGLE under Part 303. Part 303 unregulated wetland areas were delineated and are identified in this report as they may be regulated under the CWA.

HDR scientists Andrea Cline, a Professional Wetland Scientist (PWS), and Andrew Byks conducted a field survey of the Project Area on April 25 and 26, 2024, following procedures detailed in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)* to evaluate and delineate potentially jurisdictional wetlands or WOTUS features (USACE 2010). The purpose of this report is to identify and describe the wetlands and/or WOTUS within the Project Area. The results of the delineation are summarized in Section 5.0.

This delineation report will be submitted to EGLE, to determine the extent of regulated water resources. EGLE will determine which features will be regulated under Part 303 of NREPA.

1.1 Aquatic Resource Delineation Project Area

The approximately 82-acre targeted area at Harbor Island, is located near North 3rd Street, Grand Haven, Ottawa County, Michigan. This area is generally bounded to the north, south, and west by the Grand River and to the east by N 3rd Street. The surrounding areas also included in this delineation are approximately 49-acres in size, for a total Project Area of approximately 131 acres. Appendix A provides a location map that shows the boundary of the Project Area.



As defined by the Public Land Survey System, the Project Area is located in Township 8 North, Range 16 West, Section 20, west of the Michigan Principal Meridian. Minor portions of the North Channel shoreline are also present along the boundaries of Township 8 North, Range 16 West, Sections 17 and 21. Elevations are mapped at approximately 580-590 feet above mean sea level.

1.2 Contact Information

1.2.1 Project Applicant

The applicant for the Project is:

City of Grand Haven

1120 Jackson Street

Grand Haven, Michigan 49417

Attention: Derek Gajdos, Public Works Director

1.2.2 Land Ownership

Land in the Project Area is owned by City of Grand Haven.

1.2.3 Contact Information for the Delineation Consultant

HDR Michigan, Inc.

1000 Oakbrook Drive, Suite 200

Ann Arbor, Michigan 48104

Andrea Cline, PWS (773) 380-7937 Andrea.Cline@hdrinc.com

2.0 Regulatory Framework

As described in Part 328 of Title 33 in the Code of Federal Regulations (CFR), the objective of the CWA is to maintain and restore the chemical, physical, and biological integrity of the waters of the United States (33 CFR Section 328.4). Any person, firm, or agency planning to alter or work in any WOTUS, including the discharge of dredged or fill material, must first obtain authorization from the USACE under CWA Section 404 and, if applicable, Section 10 of the Rivers and Harbors Act of 1899 (Title 33 United States Code Section 403) for work within navigable WOTUS.

This section discusses the regulatory framework that might apply to areas within the Project Area that are potentially subject to federal and state jurisdiction.



2.1 Section 404 of the Clean Water Act

Waters of the United States is the encompassing term for areas that qualify for federal regulation under Section 404 of the CWA. Section 404 of the CWA gives the U.S. Environmental Protection Agency (USEPA) and USACE regulatory and permitting authority regarding discharge of dredged or fill material into "navigable waters of the United States." Section 502(7) of the CWA defines *navigable waters* as "waters of the United States, including territorial seas."

The U.S. Supreme Court's majority opinion issued on May 25, 2023, in *Sackett v. Environmental Protection Agency (USEPA)*, 598 U.S. 651 (2023) effectively nullifies the use of the *Rapanos* significant nexus evaluation in future jurisdictional determinations (JDs). To summarize the *Sackett* ruling, WOTUS include navigable waters, impoundments of navigable waters, relatively permanent tributaries of navigable waters, and contiguous or adjoining wetlands. Ephemeral tributaries and excavated ditches above the ordinary high-water mark (OHWM) of relatively permanent waters (RPWs) / outside adjoining wetlands, and wetlands or aquatic habitats separated from RPWs by natural or authorized berms or levees, or sufficient distance of uplands to be "distinguished" from WOTUS (i.e., isolated wetlands) are not anticipated to be WOTUS.

In response to the *Sackett* decision, on August 29, 2023, the USEPA and USACE issued a final rule which became effective September 8, 2023 to amend a prior January 2023 rule. According to a September 27, 2023 memo between USEPA and USACE, "to be consistent with the Sackett ruling, the agencies will not assert jurisdiction based on the significant nexus standard, will not assert jurisdiction over interstate wetlands solely because they are interstate, will interpret "adjacent" to mean "having a continuous surface connection," and will limit the scope of the (a)(3) provision to only relatively permanent lakes and ponds that do not meet one of the other jurisdictional categories."

Waters of the U.S. is defined in the regulations as follows: All waters currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce; All interstate waters that are relatively permanent; and Wetlands adjacent to waters.

An approved jurisdictional determination is within the regulatory authority of the USACE and USEPA and would be subject to the rules in effect at the time of review by the agencies.

2.1.1 Michigan EGLE Regulations under NREPA

In Michigan, water resources are regulated as follows: 1) waters of the U.S., which includes wetlands and other water resources typically under the jurisdiction of the U.S. Army Corps of Engineers (USACE) are regulated under Section 404 of the Clean Water Act (CWA); and 2) water resources are under the jurisdiction of Michigan EGLE Water Resources Division under Parts 301 (inland lakes and streams) and 303 (wetlands) and are regulated under the Michigan Natural Resources and Environmental Protection Act (NREPA). In 1984, Michigan received authorization from the federal government to administer Section 404 of the CWA for inland waters. In accordance with the CWA, Section 404(g), the USACE retains federal jurisdiction over traditionally navigable waters, including the Great Lakes, connecting channels, other waters connected to the Great Lakes where navigational conditions are maintained, and wetlands directly adjacent to these waters. Wetland areas that are not contiguous to the Great



Lakes, an inland lake or pond, or a river or stream; and are five acres or less in size are not regulated by Michigan EGLE under Part 303. Wetlands that are located within 500 feet of an inland lake, pond, river or stream are regulated under Part 303. Wetlands greater than five acres in size require a permit from EGLE Water Resources Division. In general, to obtain a permit, applicants must show avoidance of wetland resources to the greatest extent possible and minimization of unavoidable wetland impacts.

2.2 Section 401 of the Clean Water Act

Section 401 of the CWA requires state water quality certification for any permit or license issued by a federal agency for an activity that could discharge fill into WOTUS. This requirement allows each state to have input into federally approved projects that could affect its waters (rivers, streams, lakes, and wetlands) and to ensure that projects will comply with state water quality standards and any other water quality requirements of state law. Each Section 401 water quality certification for projects administered by EGLE ensures that the project will comply with applicable state water quality standards. The State of Michigan has conditionally certified several permits, so individual certification is typically not required for authorizations granted under general permits.

3.0 Delineation Methodology

The wetland delineation was conducted in accordance with the "Routine Determination" procedures outlined in the USACE Wetlands Delineation Manual (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region – Version 2.0 (USACE 2012). These manuals are the technical standard for wetland delineation required by both the USACE and EGLE. The wetland delineation approach for the USACE and EGLE is based on the presence of three parameters (i.e., hydrophytic vegetation, hydric soils, and wetland hydrology). The USACE and EGLE technical guidelines for wetlands require that a positive wetland indicator be present for each of the three parameters, except in specialized cases identified in the regional supplement.

3.1 Preliminary Data Gathering

Before conducting delineation fieldwork, HDR reviewed information from several sources, including the following:

- USACE delineation manuals and delineation reference guides (described in Section 3.3);
- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps in geographic information systems (GIS) format;
- EGLE Wetland Inventory mapping in GIS format;
- Topography and surface water maps from the U.S. Geological Survey;
- U.S. Department of Agriculture, Natural Resources Conservation Service's (USDA NRCS)
 Web Soil Survey (USDA NRCS 2021b); and
- Aerial images of the Project Area.



3.2 Delineation Survey Area Boundaries

The targeted Project Area is identified as the western arm of Harbor Island and is generally bounded to the north, south, and west by the Grand River and to the east by N 3rd Street. Areas within the Project Area were included in the delineation.

3.3 Delineation Procedures

HDR conducted fieldwork for the delineation on April 25 and 26, 2024. The delineation was performed in accordance with the following delineation manuals and delineation reference guides:

- Corps of Engineers Wetlands Delineation Manual (USACE 1987);
- Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0) (Mid-West Regional Supplement; USACE 2012); and
- USACE regulatory guidance letters and joint agency (USACE and USEPA) regulations, policies, references, and guidance including determinations of wetlands on agricultural lands.

HDR assessed the entire Project Area to determine the presence or absence of aquatic features. Based on field observations, a sample point was taken within each area exhibiting wetland signatures. A "Wetland Determination Data Form – Northcentral and Northeast Region" was completed for each sample point. These forms are presented in Appendix I. The 2020 National Wetland Plant List Northcentral Great Lakes Region (Lichvar et al., 2020) was used to determine wetland indicator status of vegetation noted in the Wetland Determination Data Forms. Sample points and wetland boundaries were mapped in the field using global positioning system (GPS) technology and were classified according to Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al., December 1979). Photographic documentation of observed wetlands and water resources is included as Appendix H.

3.3.1 Wetlands

The occurrence of wetlands is determined based on the presence or absence of hydrophytic (wetland) vegetation, hydric (wetland) soils, and wetland hydrology (USACE 1987). The presence of all three of these criteria is necessary for an area to be designated as a wetland unless problematic conditions or significant disturbance are identified and evaluated in accordance with delineation procedures. Wetland boundaries are considered to be a line across which the

What are wetland delineation parameters?

There are three wetland delineation parameters: vegetation, soils, and hydrology (USACE 1987).

vegetation, soils, and hydrologic characteristics begin or cease to meet the wetland criteria.

Vegetation

Hydrophytic vegetation consists mainly of plants that are adapted to grow in water, or in a substrate that is at least periodically deficient in oxygen as a result of excessive water contact. Hydrophytic vegetation indicators include the dominance test, prevalence index, and



morphological adaptations. **Error! Reference source not found.** lists the current indicator s tatuses assigned to plant species for the purpose of delineating wetlands (USACE 2018).

Table 1. Wetland Indicator Status System

Indicator Status Indicator D Symbol		Definition
Obligate wetland	OBL	Plants that almost always occur in wetlands.
Facultative wetland	FACW	Plants that usually occur in wetlands but could occur in non-wetlands.
Facultative FAC Plants that occur in wetlands a		Plants that occur in wetlands and non-wetlands.
Facultative upland	FACU	Plants that usually occur in non-wetlands but could occur in wetlands.
Upland plants UPL Plants that almost never occur in wetlands.		Plants that almost never occur in wetlands.
		Plants that are not listed on the National Wetland Plant List (NWPL) and therefore are assumed to be upland.

What are the dominance test and prevalence index?

Dominance test and prevalence index are indicators of hydrophytic vegetation. The dominance test is satisfied when over 50% of the dominant species in a sample plot have an indicator status of FAC, FACW, or OBL. The prevalence index considers the percent cover and indicator status of all species in a sample plot. An index value of less than 3.0 indicates hydrophytic vegetation.

HDR documented vegetation within a sample plot surrounding each sampling point location. Each sample plot was visually inspected to identify plant species and estimate the percent cover of each species.

Vegetation was considered hydrophytic when over 50% of the dominant species had an indicator status of facultative (FAC), facultative wetland (FACW), or obligate (OBL) (the dominance test). In cases where the dominance was less than or equal to 50%, vegetation was considered hydrophytic when the prevalence index was less than 3.0.

To identify the appropriate indicator status of each plant species recorded, HDR referenced the most current version (2020) of the National Wetland Plant List (NWPL) that was available for delineation fieldwork and analysis (USACE 2020).

Soils

Hydric soils are soils that are saturated, flooded, or ponded for long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile. Anaerobic conditions favor the growth and regeneration of hydrophytic vegetation. Hydric soil indicators can include organic soils (histosols); mineral soils saturated and rich in organics (histic epipedons); sulfidic odor; low dissolved oxygen concentration (aquic moisture regime) and reducing conditions; gleyed and/or low-chroma soils; soils listed on national, state, or local hydric soils lists; and iron and manganese concentrations close to the soil surface. HDR used a standard Munsell soil color chart to determine the soil matrix and mottle colors (Munsell Color 2009). In accordance with USACE methodology, soil profiles were investigated at sampling points in the Survey Area and were examined for indicators of hydric conditions.



Hydrology

The term *wetland hydrology* encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season. Areas with evident characteristics of wetland hydrology are those where the presence of water has an overriding influence on the characteristics of vegetation and soils due to anaerobic and reducing conditions, respectively. Wetland hydrology indicators include obvious characteristics such as surface water, soil saturation, and shallow water table depth. Other indicators include soil cracking, a salt crust, drainage patterns, water-stained leaves, and the presence of oxidized rhizospheres. HDR evaluated the hydrology at each sampling point.

3.3.2 Other Aquatic Resources (Other Waters)

This delineation also evaluated the presence of aquatic resources other than wetlands potentially subject to USACE's jurisdiction. In non-tidal areas, USACE maintains jurisdiction over areas below the ordinary high-water mark (OHWM) in water features such as navigable streams, rivers, and lakes; interstate waters; and tributaries to navigable waters.

HDR delineated non-wetland aquatic features based on the presence of an OHWM (USACE 2005). Potentially jurisdictional non-wetland features are delineated along the OHWM. If a feature did not exhibit an OHWM and did not show distinct vegetation changes, it was not further evaluated as a potential aquatic resource or considered to be a potentially jurisdictional water.

3.3.3 Jurisdictional Status of Aquatic Resources

In Michigan, the Federal government has transferred the jurisdiction of inland waters (and wetlands) to the State of Michigan (EGLE). If the identified areas are located within 500 feet of an inland lake, pond, river or stream regulated under Part 303, they may be regulated by EGLE as well. Additionally, impacts to identified wetlands that have an area of greater than five acres require a permit from EGLE. In general, an applicant must show avoidance of wetland resources to the greatest extent possible and minimization of unavoidable wetland impacts.

4.0 Environmental Setting

Preliminary data gathering was conducted prior to the on-site field delineation. A summary of HDR's desktop findings using publicly available information is provided below.

4.1 Existing Field Conditions

The Project Area is within the beach and dunes physiographic region of Michigan and consists of disturbed areas and railroad tracks.

Weather data for the general Project Area was obtained from historical records collected in Grand Haven, Michigan (U.S. Climate Data 2024). The daily average for the average high and low temperatures for April are 55 and 36-degrees Fahrenheit, respectively, and the average rainfall for April is 0.08 inches. The average annual precipitation in Grand Haven is 32.68 inches.

Topography on Site is relatively flat, as the area was previously occupied by the former J.B. Sims Generating Station. Onsite runoff flows naturally to the adjacent Grand River north and



south channels, or the internal surface water impoundments and/or wetlands. The Project Area is located in the Grand River Watershed, hydrologic unit code 040500060712 (EGLE 2024).

4.1.1 National Wetlands Inventory

NWI maps provide data regarding wetlands and deep-water habitats such as lakes and streams, as categorized in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin Classification System; Cowardin et al. 1979). NWI data are based primarily on the interpretation of high-altitude images and do not represent regulatory boundaries.

Appendix B, National Wetlands Inventory Exhibit, displays NWI data in the Project area. These NWI wetlands are documented below:

NWI Abbreviation	Wetland Classification	
PABG	Palustrine, Aquatic Bed, Intermittently Exposed	
PEM1C	Palustrine, Emergent, Persistent, Seasonally Flooded	
PUBGx	Palustrine, Unconsolidated Bottom, Intermittently Exposed, Excavated	
L2UBGx	Lacustrine, Littoral, Unconsolidated Bottom, Intermittently Exposed, Excavated	
R2UBH	Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded	

4.1.2 EGLE Wetland Inventory

The EGLE Wetland inventory was produced by overlaying data from the following sources:

- The National Wetland Inventory (NWI), conducted by the USFWS through interpretation of topographic data and aerial photographs.
- Land Cover, as mapped by the Michigan Department of Natural Resources' Michigan Resource Inventory System (MIRIS), through interpretation of aerial photographs.
- Soils, as mapped by the U.S. Department of Agriculture, Natural Resource Conservation Service.

The inventory represents existing information that suggests the probability that a wetland may or may not exist in a given area. Areas shown as wetlands, wetland soils, or open water on the map are potential wetlands, and deserve further investigation to verify if wetlands are actually present. The maps may not identify all potential wetlands in a county. It may show wetlands that are not actually present, and it may not show wetlands which are actually present.

Appendix C, EGLE Wetland Inventory Exhibit, provides a map that displays NWI data in the Project boundary. The EGLE Wetland data include five wetlands within the Project area totaling approximately 18 acres. The EGLE identified wetlands were derived from hydric soils, NWI, and the DNR.

4.1.3 General Soil Conditions

Soil types occurring within the Project area are listed in Table 2:

Table 2. Soil Types within Project Area



Map Unit Symbol	Map Unit Name	Farmland Classification	Hydric Soil Y or N	Acres in Project Area	Percent of Project Area
HgtafA	Houghton-Adrian mucks, lake moderated, 0 to 1 percent slopes	Farmland of local importance	Υ	23.3	17.8%
Ма	Made land	Not prime farmland	N/A	34.9	26.7%
W	Water	N/A	N/A	72.5	55.5%
	Total for Project Area				100.0

Source: USDA NRCS (2024a)

Soil map unit boundaries for the Project Area are provided in Appendix D, Soil Survey Exhibit and USDA NRCS Custom Soil Resource Report (USDA NRCS 2024).

4.1.4 General Hydrology

The Grand River and its associated water features, as well as three surface water impoundments, are mapped as surface water in the vicinity of the Project Area, as shown on the USGS Topographic Survey exhibit in Appendix E. There are mapped wetlands shown through part of the Project Area.

4.1.5 Flood Insurance Rate Map

The Flood Insurance Rate Map shows that major portions of the Project Area lie within the 100-Year Floodplain. The map is located in Appendix F.

4.1.6 General Plant Community Types

Portions of the Project Area previously were occupied by the former J.B. Sims Generating Station that officially was decommissioned and demolished in July 2020. Dominate upland vegetation includes wild carrot (*Daucus carota*), Kentucky bluegrass (*Poa pratensis*), garlic mustard (*Alliaria petiolata*), eastern cottonwood (*Populus deltoides*), and other weedy species common in disturbed areas. Dominant wetland vegetation includes reed canary grass (*Phalaris arundinacea*), giant reed (*Phragmites australis*), and wide-leaved cattail (*Typha latifolia*), as well as other species.

5.0 Results

Eight areas met the criteria for delineated wetlands and are described further below. Details of the areas delineated are presented in this section and Table 3. Results are further detailed in Appendix G, Aerial Wetland Delineation, Appendix H Representative Site Photographs, and Appendix I Wetland Determination Data Forms. A summary of the results is as follows:

Table 3. Delineated Wetlands

Wetland	Sample ID	Photo No.	Wetland Classification* (Cowardin)
Wetland 1	1A	1	PUB3x
Wetland 2	2A	3	PUB3x
Wetland 3	3A	5	PUB3x
Wetland 4	4A, 5A	7, 9	PUBGx/PEM1C
Wetland 5	6A	11	R2EM
Wetland 6	7A	13	PFO1C
Wetland 7	8A	15	PFO1C



Wetland 8 N/A 18 PEM1C

Wetland 1 is mapped on the NWI as a PEM1C wetland located within the footprint of the former J.B. Sims Generating Station Units 1/2 Impoundment. The wetland is represented at data point 1A. Vegetation is dominated by giant reed (*Phragmites australis*) and reed canary grass (*Phalaris arundinacea*). Soils within this area are disturbed, however they are assumed to be hydric due to nearby landscape settings including a concave surface and positioned at the ridge of another wetland or water body. Hydrology indicators are visible saturation on aerial imagery and during field efforts, geomorphic position, since the location is within a concave area, and the data point passed the FAC-Neutral Test.

Wetland 2 is not mapped on the NWI and is represented at data point 2A. Vegetation is dominated by giant reed (*Phragmites australis*) and soft-stem bulrush (*Schoenoplectus tabernaemontani*). Soils within this area are disturbed, however they are assumed to be hydric due to nearby landscape settings including a concave surface and positioned at the ridge of another wetland or water body. Hydrology indicators are high water table, inundation visible on aerial imagery, geomorphic position, located within a concave area, and the data point passed the FAC-Neutral Test.

Wetland 3 is mapped on the NWI as PEM1C and similar to Wetland 1 is located within the footprint of the former J.B. Sims Generating Station Units 1/2 Impoundment. The wetland is represented at data point 3A. Vegetation is dominated by reed canary grass (*Phalaris arundinacea*), giant reed (*Phragmites australis*), and needle spikerush (*Eleocharis acicularis*). Soils within this area are disturbed, however they are assumed to be hydric due to nearby landscape settings including a concave surface and positioned at the ridge of another wetland or water body. Hydrology indicators are high water table, geomorphic position, since the location is within a concave area, and the data point passed the FAC-Neutral Test.

Wetland 4 is partially mapped on the NWI as PUBGx and is partially located within the footprint of the former J.B. Sims Generating Station Units 1/2 Impoundment. This wetland, represented at data points 4A and 5A is dominated by reed canary grass (*Phalaris arundinacea*), giant reed (*Phragmites australis*), and narrowleaf cattail (*Typha angustifolia*). Soils within this area are disturbed, however they are assumed to be hydric due to nearby landscape settings including a concave surface and positioned at the rridge of another wetland or water body. Hydrology indicators are the presence of a high water table, inundation visible on aerial imagery, geomorphic position, located within a concave area, and the data point passed the FAC-Neutral Test.

Wetland 5, represented at data point 6A, is not mapped on the NWI, but is immediately adjacent to the mapped R2UBH area. The wetland is a small depressional area between the constructed containment berm surrounding the former J.B. Sims Generating Station Units 3A/B impoundment and the Grand River. Dominant vegetation includes reed canary grass (*Phalaris arundinacea*), yellow iris (*Iris pseudacorus*), and common bulrush (*Scirpus atrovirens*). Soils within this area are disturbed, however they are assumed to be hydric due to nearby landscape settings including a concave surface and positioned at the rridge of another wetland or water



body. Hydrology is indicated by stunted or stressed plants and geomorphic position, located within a concave area.

Wetland 6 and Wetland 7, located along the constructed recreational paths adjacent to N 3rd Street and Power Plant Road are represented by data points 7A and 8A, respectively. These wetlands are not mapped on the NWI. Dominant vegetation includes narrowleaf cattail (*Typha angustifolia*), reed canary grass (*Phalaris arundinacea*), and silver maple (*Acer saccharinum*). Hydric soils are present in the form of hydric soil indicator F3 – Depleted Matrix. Hydrology is indicated by inundation visible on aerial imagery, geomorphic position, located in concave areas, and both data points passed the FAC-Neutral Test.

Wetland 8 is located east of N 3rd Street and includes areas within the ditch present along N 3rd Street and Coho Drive, as well as areas along the Grand River South Channel. As this area is not included within the formal study area as described in Section 1.1, a formal wetland data point was not collected, however dominant hydrophytic vegetation, hydrology, and hydric soil indicators present within the other onsite delineated wetlands within the targeted project area were observed.

6.0 Delineation Summary and Jurisdictional Evaluation

Based on the information available to HDR at the time of the delineation, the area inside the Project Area was assessed to determine the presence or absence of wetlands and other waters in accordance with the procedures and guidelines established by USACE. Although the jurisdictional status of aquatic resources is formally determined by EGLE, the results of this delineation indicate the Project Area potentially may contain regulated aquatic resources.

7.0 References

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe

1979 Classification of Wetlands and Deepwater Habitats of the United States. Office of Biological Services, U.S. Department of the Interior, FWS/OBS-79/31.

[EPA] Environmental Protection Agency

2024 How's My Waterway? Available online at https://mywaterway.epa.gov/community/1231%20N%203rd%20St,%20Grand%20Haven, %20MI,%2049417,%20USA/overview. Accessed July 1, 2024.

[FEMA] Federal Emergency Management Agency

FEMA Flood Map Service Center. Available online at <u>FEMA Flood Map Service Center</u> Search By Address. Accessed July 1, 2024.

Munsell Color

2009 Munsell Soil-Color Charts. Grand Rapids, Michigan.

U.S. Climate Data

2024 Climate Data for Grand, Michigan. Available online at https://www.usclimatedata.com/climate/grand-haven/michigan/united-states/usmi0340. Accessed December 20, 2022.



[USFWS] U.S. Fish and Wildlife Service

Wetland Classification Codes. Available online at https://www.fws.gov/wetlands/data/wetland-codes.html. Accessed July 1, 2024.

[USACE] U.S. Army Corps of Engineers

- 1987 Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U.S. Vicksburg, Mississippi: Army Engineer Waterways Experiment Station.
- 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual:
 Northcentral and Northeast Region (Version 2.0), ed. J.S. Wakeley, R.W. Lichvar, and
 C.V. Noble. ERDC/EL TR-10-16. Vicksburg, Mississippi: U.S. Army Engineer Research
 and Development Center.
- National Wetland Plant List, Northcentral Great Lakes Subregion dated 2020. Available online at http://wetland-plants.usace.army.mil/. Accessed April 25 and 26, 2024.

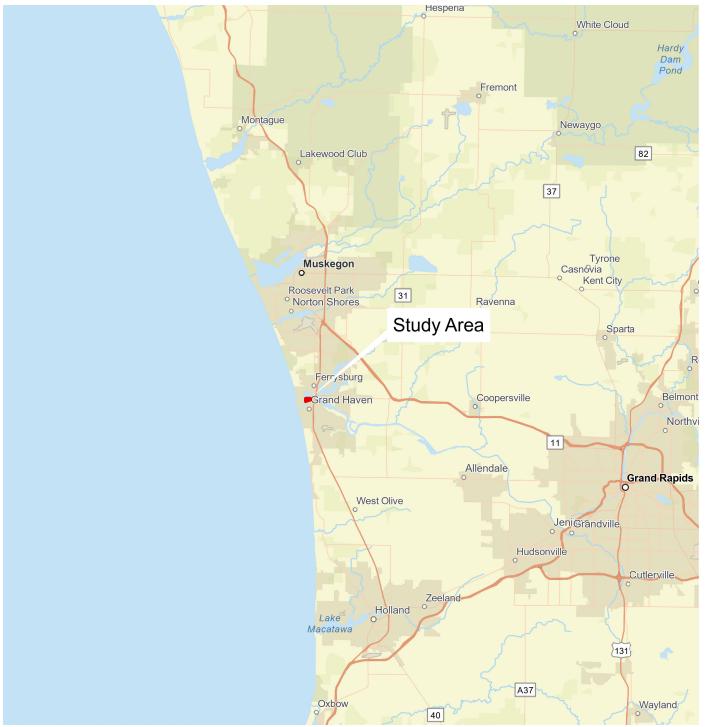
[USDA NRCS] U.S. Department of Agriculture, Natural Resources Conservation Service

2024a Web Soil Survey. Soil Survey Staff, USDA NRCS. Available online at http://websoilsurvey.nrcs.usda.gov. Accessed April 22, 2024.



A

Appendix A – Project Location Exhibit



Project Location Map Grand Haven Harbor Island

Study Area





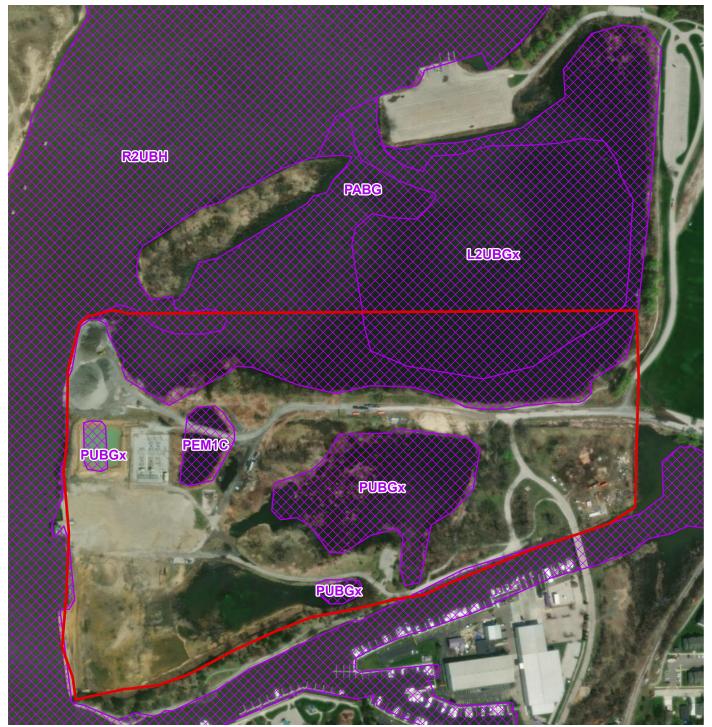






В

Appendix B – National Wetlands Inventory Exhibit



National Wetlands Inventory Map Grand Haven Harbor Island

Study Area

NWI Wetlands













C

Appendix C – Michigan EGLE Wetland Inventory Exhibit



EGLE and NWI Wetlands Inventory Map Grand Haven Harbor Island

Study Area NWI Wetlands EGLE Wetlands Wetlands on NWI and MIRIS maps Soil areas which include wetland soils Wetlands on NWI and MIRIS maps and wetland soils











Appendix D – Soil Survey Exhibit and USDA NRCS Custom Soil Resource Report



Soils Map Grand Haven Harbor Island

Study Area

Soils

Hydric Nonhydric













Natural Resources Conservation

Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Ottawa County, Michigan



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2 053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Ma—Made land	
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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

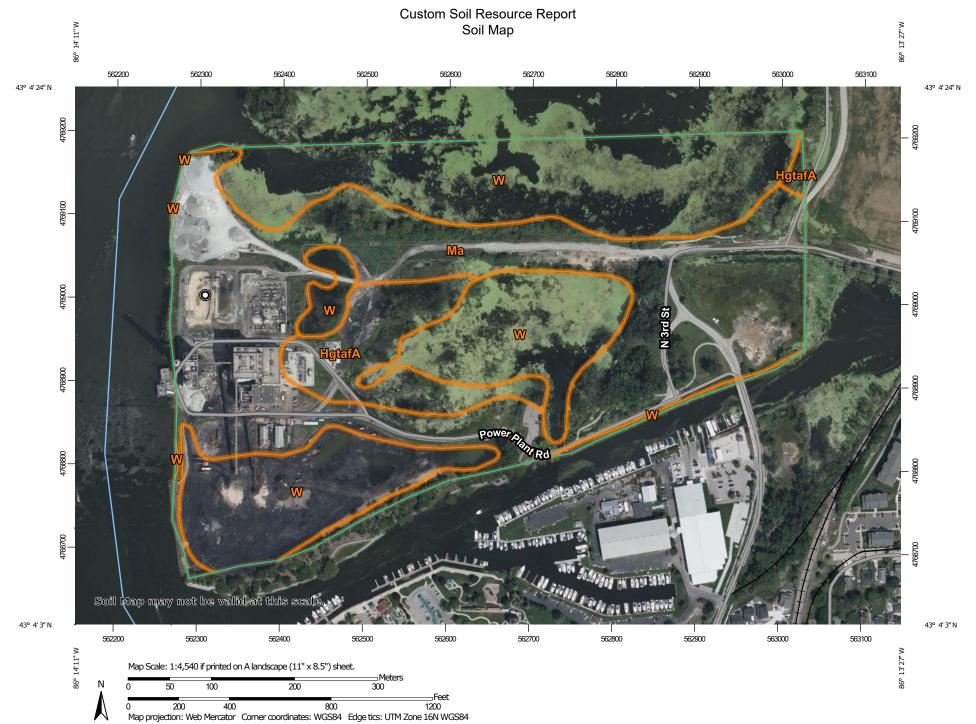
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

-

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

(0)

Blowout

 \boxtimes

Borrow Pit

Ж

Clay Spot

 \Diamond

Closed Depression

Š

Gravel Pit

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Gravelly Spot

0

Landfill Lava Flow

٨.

Marsh or swamp

尕

Mine or Quarry

9

Miscellaneous Water
Perennial Water

0

Rock Outcrop

+

Saline Spot

0.0

Sandy Spot

-

Severely Eroded Spot

Sinkhole

6

Slide or Slip

Ø

Sodic Spot

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Spoil Area Stony Spot



Very Stony Spot



Wet Spot Other



Special Line Features

Water Features

_

Streams and Canals

Transportation

ransp

Rails

~

Interstate Highways

US Routes

 \sim

Major Roads

~

Local Roads

Background

10

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15.800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Ottawa County, Michigan Survey Area Data: Version 18, Aug 25, 2023

Soil map units are labeled (as space allows) for map scales 1:50.000 or larger.

Date(s) aerial images were photographed: Aug 11, 2020—Aug 21, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI	
HgtafA	Houghton-Adrian mucks, lake moderated, 0 to 1 percent slopes	6.3	8.3%	
Ма	Made land	35.4	46.9%	
W	Water	33.8	44.8%	
Totals for Area of Interest		75.4	100.0%	

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The

Custom Soil Resource Report

delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An association is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Ottawa County, Michigan

HgtafA—Houghton-Adrian mucks, lake moderated, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2zdky

Elevation: 580 to 680 feet

Mean annual precipitation: 34 to 41 inches Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 135 to 175 days

Farmland classification: Farmland of local importance

Map Unit Composition

Houghton and similar soils: 55 percent Adrian and similar soils: 35 percent Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houghton

Setting

Landform: Ground moraines, outwash plains, depressions on lake plains

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Base slope

Down-slope shape: Concave Across-slope shape: Linear

Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 12 inches: muck Oa2 - 12 to 35 inches: muck Oa3 - 35 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high

(0.14 to 14.17 in/hr)

Depth to water table: About 0 inches

Frequency of flooding: None Frequency of ponding: Frequent

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Sodium adsorption ratio, maximum: 0.6

Available water supply, 0 to 60 inches: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: A/D

Ecological site: R097XA024MI - Great Lakes Marsh

Hydric soil rating: Yes

Description of Adrian

Setting

Landform: Depressions on lake plains, outwash plains, ground moraines

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Base slope

Down-slope shape: Concave Across-slope shape: Linear

Parent material: Herbaceous organic material over sandy glaciofluvial deposits

Typical profile

Oa1 - 0 to 12 inches: muck Oa2 - 12 to 34 inches: muck Cg - 34 to 80 inches: sand

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high

(0.14 to 14.17 in/hr)

Depth to water table: About 0 inches

Frequency of flooding: None Frequency of ponding: Frequent

Calcium carbonate, maximum content: 15 percent Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Sodium adsorption ratio, maximum: 0.4

Available water supply, 0 to 60 inches: Very high (about 15.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: A/D

Ecological site: R097XA024MI - Great Lakes Marsh

Hydric soil rating: Yes

Minor Components

Dair

Percent of map unit: 10 percent

Landform: Ground moraines, outwash plains, depressions on lake plains

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Base slope

Down-slope shape: Concave, linear

Across-slope shape: Linear

Ecological site: F097XA008MI - Wet Sandy Flatwoods

Hydric soil rating: Yes

Ma—Made land

Map Unit Setting

National map unit symbol: 6ghm

Mean annual precipitation: 30 to 36 inches Mean annual air temperature: 45 to 48 degrees F

Frost-free period: 140 to 150 days

Farmland classification: Not prime farmland

Map Unit Composition

Made land: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

W-Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2 053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2 053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2 053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf



Appendix E – USGS Topographic Exhibit

Ferrysburg The, Sag Ferry Seb Lights Lighthouse GRAND JAVEN GRAND HAVEN

Topographic Map Grand Haven Harbor Island

Study Area













Appendix F – Flood Insurance Rate Map Exhibit



Flood Insurance Rate Map Grand Haven Harbor Island















G

Appendix G – Aerial Wetland Determination Exhibit

Wetland 4

Aerial Wetland Determination Grand Haven Harbor Island

Study Area

Data Point

Delineated Wetlands

North Channel Shoreline

Former Coal Pile

Impoundment













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Appendix H – On-Site Representative Photographs

Photo #1. Point 1A. Photo taken by Andrew Byks on April 25th, 2024.



Photo #2. Point 1B. Photo taken by Andrew Byks on April 25th, 2024.



Photo #3. Point 2A. Photo taken by Andrew Byks on April 25th, 2024.



Photo #4. Point 2B. Photo taken by Andrew Byks on April 25th, 2024.



Photo #5. Point 3A. Photo taken by Andrew Byks on April 25th, 2024.



Photo #6. Point 3B. Photo taken by Andrew Byks on April 25th, 2024.



Photo #7. Point 4A. Photo taken by Andrew Byks on April 25th, 2024.



Photo #8. Point 4B. Photo taken by Andrew Byks on April 25th, 2024.



Photo #9. Point 5A. Photo taken by Andrew Byks on April 25th, 2024.



Photo #10. Point 5B. Photo taken by Andrew Byks on April 25th, 2024.



Photo #11. Point 6A. Photo taken by Andrew Byks on April 26th, 2024.



Photo #12. Point 6B. Photo taken by Andrew Byks on April 26th, 2024.



Photo #13. Point 7A. Photo taken by Andrew Byks on April 26th, 2024.



Photo #14. Point 7B. Photo taken by Andrew Byks on April 26th, 2024.



Photo #15. Point 8A. Photo taken by Andrew Byks on April 26th, 2024.



Photo #16. Point 8B. Photo taken by Andrew Byks on April 26th, 2024.



Photo #17. Point 9B. Photo taken by Andrew Byks on April 26th, 2024.



Photo #18. Shoreline facing south. Photo taken by Andrew Byks on April 26th, 2024.



Photo #19. Impoundment, facing north. Photo taken by Andrew Byks on April 26th, 2024.



Photo #20. Previous coal pile, inundated. Photo taken by Andrew Byks on April 26th, 2024.





Appendix I –Wetland Determination Data Forms

Controlled Unclass Hi&d Ariffor GARRACH ECOIMPERS WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region

See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)

Project/Site: Harbor Island	City/County: Grand Haven city/ Ottawa County Sampling Date: 2024-04-25					
Applicant/Owner: City of Grand Haven	State: MI Sampling Point: 1A					
Investigator(s): Andrea Cline, Andrew Byks	Section, Township, Range: 20, 008N, 016W					
	relief (concave, convex, none): Concave Slope %: 1					
Subregion (LRR or MLRA): LRR L, MLRA 97 43 43.071357	Long: -86.23340025 Datum: WGS 1984					
Soil Map Unit Name: Made land	NWI classification: N/A					
·						
Are climatic / hydrologic conditions on the site typical for this time of year?	Yes X No (If no, explain in Remarks.)					
Are Vegetation X, Soil X, or Hydrology significantly distur						
Are Vegetation, Soil, or Hydrologynaturally problems	atic? (If needed, explain any answers in Remarks.)					
SUMMARY OF FINDINGS – Attach site map showing same	ipling point locations, transects, important features, etc.					
Lludranhutia Vanatatian Dagasat2	In the Committed Asso					
Hydrophytic Vegetation Present? Yes X No Hydric Soil Present? Yes X No	Is the Sampled Area within a Wetland? Yes X No					
Wetland Hydrology Present? Yes X No	If yes, optional Wetland Site ID:					
Remarks: (Explain alternative procedures here or in a separate report.)	in you, optional violatio cito is:					
Remarks. (Explain alternative procedures here of in a separate report.)						
HYDROLOGY						
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)					
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)					
Surface Water (A1)Water-Stained Leaves (B9) Drainage Patterns (B10)					
X High Water Table (A2) Aquatic Fauna (B13)	Moss Trim Lines (B16)					
Saturation (A3)Marl Deposits (B15)	Dry-Season Water Table (C2)					
Water Marks (B1) Hydrogen Sulfide Odor						
Sediment Deposits (B2) Oxidized Rhizospheres						
Drift Deposits (B3) Presence of Reduced In						
Algal Mat or Crust (B4) Recent Iron Reduction in This Music Surface (C7)						
Iron Deposits (B5) X Inundation Visible on Aerial Imagery (B7) Thin Muck Surface (C7) Other (Explain in Remark)						
Sparsely Vegetated Concave Surface (B8)	X FAC-Neutral Test (D5)					
Field Observations:	<u> </u>					
Surface Water Present? Yes No X Depth (inches):						
Water Table Present? Yes X No Depth (inches):						
Saturation Present? Yes X No Depth (inches):						
(includes capillary fringe)						
Describe Recorded Data (stream gauge, monitoring well, aerial photos, pre	evious inspections), if available:					
Remarks:						
ENG FORM 6116-8, JUL 2018						

<u>Tree Stratum</u> (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. Populus deltoides	5	Yes	FAC	Number of Dominant Species
2.	-			That Are OBL, FACW, or FAC:3(A)
3. 4.				Total Number of Dominant Species Across All Strata: 3 (B)
5.6.				Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)
7				Prevalence Index worksheet:
	5	=Total Cover		Total % Cover of: Multiply by:
Sapling/Shrub Stratum (Plot size: 15 ft)			OBL species 2 x 1 = 2
1.				FACW species 80 x 2 = 160
2.				FAC species 5 x 3 = 15
3				FACU species 5 x 4 = 20
4.				UPL species 0 x 5 = 0
5.				Column Totals: 92 (A) 197 (B)
6.				Prevalence Index = B/A = 2.14
7.				Hydrophytic Vegetation Indicators:
		=Total Cover		1 - Rapid Test for Hydrophytic Vegetation
Herb Stratum (Plot size: 5 ft)				X 2 - Dominance Test is >50%
Phragmites australis	50	Yes	FACW	X 3 - Prevalence Index is ≤3.0 ¹
2. Typha latifolia	2	No	OBL	4 - Morphological Adaptations ¹ (Provide supporting
3. Cirsium arvense	5	No	FACU	data in Remarks or on a separate sheet)
4. Phalaris arundinacea	25	Yes	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)
5. Verbena hastata6.	5	No	_FACW_	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7.				Definitions of Vegetation Strata:
8. 9.				Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
10.				Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
12.		=Total Cover		Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody Vine Stratum (Plot size: 30 ft 1.)			Woody vines – All woody vines greater than 3.28 ft in height.
2				Hydrophytic Vegetation
4				Present? Yes X No No
Pamarka: (Include photo numbers here or on a co		=Total Cover		

Remarks: (Include photo numbers here or on a separate sheet.)

Som trolled Unclassified I	nformation ((CUI)
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Sampling Point:

1A Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Redox Features Loc² (inches) Color (moist) Color (moist) Texture Remarks Type¹ 10YR 2/1 0-18 100 Loamy/Clayey 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: Histosol (A1) Dark Surface (S7) 2 cm Muck (A10) (LRR K, L, MLRA 149B) Histic Epipedon (A2) Polyvalue Below Surface (S8) (LRR R, 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) Polyvalue Below Surface (S8) (LRR K, L) Black Histic (A3) MLRA 149B) Hydrogen Sulfide (A4) Thin Dark Surface (S9) (LRR R, MLRA 149B) Thin Dark Surface (S9) (LRR K, L) Stratified Layers (A5) High Chroma Sands (S11) (LRR K, L) Iron-Manganese Masses (F12) (LRR K, L, R) Depleted Below Dark Surface (A11) Loamy Mucky Mineral (F1) (LRR K, L) Piedmont Floodplain Soils (F19) (MLRA 149B) Thick Dark Surface (A12) Loamy Gleyed Matrix (F2) Red Parent Material (F21) (outside MLRA 145) Very Shallow Dark Surface (F22) Mesic Spodic (A17) Depleted Matrix (F3) (MLRA 144A, 145, 149B) Redox Dark Surface (F6) Other (Explain in Remarks) Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) Sandy Gleyed Matrix (S4) Redox Depressions (F8) Sandy Redox (S5) Marl (F10) (LRR K, L) ³Indicators of hydrophytic vegetation and Stripped Matrix (S6) Red Parent Material (F21) (MLRA 145) wetland hydrology must be present, unless disturbed or problematic. Restrictive Layer (if observed): Type: **Hydric Soil Present?** Depth (inches): Yes Remarks: Soil is disturbed.

Controlled Unclass Hi&d Ariffor GARRACH ECOIMPERS WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region

See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)

Project/Site: Harbor Island	City/County: Grand Haven city/ Ottawa County					
Applicant/Owner: City of Grand Haven	State: MI Sampling Point: 1B					
Investigator(s): Andrea Cline, Andrew Byks	Section, Township, Range: 20, 008N, 016W					
·	Il relief (concave, convex, none): None Slope %: 0					
Subregion (LRR or MLRA): LRR L, MLRA 97 43 43.071327	Long: -86.2334502 Datum: WGS 1984					
Soil Map Unit Name: Made land	NWI classification: N/A					
·						
Are climatic / hydrologic conditions on the site typical for this time of year?						
Are Vegetation X, Soil X, or Hydrology significantly distu						
Are Vegetation X, Soil X, or Hydrology naturally problem	natic? (If needed, explain any answers in Remarks.)					
SUMMARY OF FINDINGS – Attach site map showing sar	mpling point locations, transects, important features, etc.					
Hudrophytia Vagatation Brogant?	In the Sampled Area					
Hydrophytic Vegetation Present? Hydric Soil Present? Yes No X Yes No X	Is the Sampled Area within a Wetland? Yes No _X					
Wetland Hydrology Present? Yes No X	If yes, optional Wetland Site ID:					
Remarks: (Explain alternative procedures here or in a separate report.)	,,,,					
Tremaine. (Explain alientative procedures field of in a separate reports)						
HYDROLOGY						
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)					
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)					
Surface Water (A1) Water-Stained Leaves						
High Water Table (A2) Aquatic Fauna (B13)	Moss Trim Lines (B16)					
Saturation (A3)Marl Deposits (B15)	Dry-Season Water Table (C2)					
Water Marks (B1) Hydrogen Sulfide Odor						
	s on Living Roots (C3) Saturation Visible on Aerial Imagery (C9)					
Drift Deposits (B3) Presence of Reduced I Algal Mat or Crust (B4) Recent Iron Reduction						
Iron Deposits (B5) Thin Muck Surface (C7						
Inundation Visible on Aerial Imagery (B7) Other (Explain in Rema						
Sparsely Vegetated Concave Surface (B8)	FAC-Neutral Test (D5)					
Field Observations:						
Surface Water Present? Yes No X Depth (inches):					
Water Table Present? Yes No X Depth (inches						
Saturation Present? Yes No X Depth (inches): Wetland Hydrology Present? Yes No X					
(includes capillary fringe)						
Describe Recorded Data (stream gauge, monitoring well, aerial photos, p	revious inspections), if available:					
Demodra						
Remarks:						
ENG FORM 6116-8, JUL 2018						

Absolute	Dominant	Indicator			-	1B	
% Cover	Species?	Status	Dominance Test	worksheet	:		
						1	(A)
_						3	_(B)
				•		33.3%	_(A/B
			Prevalence Inde	x workshee	t:		
	=Total Cover		Total % Cov	ver of:	Mu	Itiply by:	
_)			OBL species	0	x 1 =	0	
<u> </u>			FACW species	30	x 2 =	60	
<u> </u>			FAC species	0	x 3 =	0	
	<u> </u>		FACU species	50	x 4 =	200	
			_		_	125	_
			_		_		<u> </u> (В
			_		` ′ -		—`
	=Total Cover					netation	
						jotation	
30	Yes	FACW					
						ovide sur	oportir
				-			
40			Problematic	Hvdrophytic	Vegetatio	on¹ (Expla	ain)
	No	FACU			_		
							must
			Definitions of Ve	egetation St	rata:		
	<u> </u>		Troe Moody pla	anto 2 in 7	C am) ar	mara in	
							neight
			Sanling/shrub	Woody plan	ate loce th	on 3 in [חשר
							ווטכ
			Harb All barbas	nagua (nan u	ام (بدمون	anta ras	ardlaa
105	=Total Cover			,			ardies
)	-		NA do - do	· · ·		41 0	00 # :
— ′			-	ali woody vin	ies greate	er than 3.	28 π ΙΙ
			•				
			Hydrophytic				
			Vegetation Present?	Yes	No	X	
	30 25 5 40 5	=Total Cover =Total Cover =Total Cover =Total Cover 30	=Total Cover =Total Cover =Total Cover =Total Cover 30	Number of Domir That Are OBL, F/ Total Number of Species Across A Percent of Domir That Are OBL, F/ Prevalence Inde Total % Cor OBL species FACW species FACU species FACU species UPL species Column Totals: Prevalence Hydrophytic Veg 1 - Rapid Teg 2 - Dominanc 30 Yes FACW 25 Yes UPL 5 No FACU 5 No FACU 7 Indicators of hyd be present, unles Definitions of Veg diameter at breast Sapling/shrub— and greater than Herb—All herbac of size, and wood Woody vines—A height. Hydrophytic Woody vines—A height.	Number of Dominant Species That Are OBL, FACW, or FACE Total Number of Dominant Species Across All Strata: Percent of Dominant Species That Are OBL, FACW, or FACE That Are OBL, FACW That Are OBL, FACW Species That Are OBL, F	Number of Dominant Species That Are OBL, FACW, or FAC: Total Number of Dominant Species Across All Strata: Percent of Dominant Species That Are OBL, FACW, or FAC: Total Species Across All Strata: Percent of Dominant Species That Are OBL, FACW, or FAC: Species That Are OBL, FACW, or FAC: Total % Cover of: Mu OBL species 0 x1 = FACW species 30 x2 = FACW species 50 x4 = UPL species 50 x4 = UPL species 25 x5 = Column Totals: 105 (A) Prevalence Index = B/A = Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Veg 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0¹ 4 - Morphological Adaptations¹ (Predata in Remarks or on a separa Problematic Hydrophytic Vegetation Total % Uples of the problematic Hydrophytic Vegetation Definitions of Vegetation Strata: Tree - Woody plants 3 in. (7.6 cm) or diameter at breast height (DBH), regare Sapling/shrub - Woody plants less than 3.2 Woody vines - All woody vines greate height. Hydrophytic Hydrophytic	Number of Dominant Species That Are OBL, FACW, or FAC: 1 Total Number of Dominant Species Across All Strata: 3 Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3% Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0 x1 = 0 FACW species 30 x2 = 60 FAC species 0 x3 = 0 FACU species 50 x4 = 200 UPL species 50 x4 = 200 UPL species 25 x5 = 125 Column Totals: 105 (A) 385 Prevalence Index = B/A = 3.67 Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 30 Yes FACW 10 - FACU 11 - FACU 11 - FACU 12 - Dominance Test is >50% 13 - Prevalence Index is ≤3.0¹ 1 - Rapid Test for Hydrophytic Vegetation of the second

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Sampling Point 1B Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Remarks

(inches)	Color (moist)	%	Color (moist)		Loc ²	Texture	Remarks	
0-12	10YR 2/1	100				Loamy/Clayey		
0 12	10111 2/1	100				Loamyrolaycy		
			_			_		
		—			—			
						_		
¹Type: C=Co	ncentration, D=Deple	etion RM	-Reduced Matrix N	AS-Masked Sand	d Grains	² Location: P	L=Pore Lining, M=Matrix.	
Hydric Soil In		Juon, raivi	-reduced Matrix, is	NO-Masked Cark	J Oranis.		or Problematic Hydric Soils ³ :	
Histosol (Dark Surface ((S7)			ick (A10) (LRR K, L, MLRA 149B)	
	pedon (A2)	•		ow Surface (S8) (LRR R,		icky Peat or Peat (S3) (LRR K, L,	
Black His		•	MLRA 149B		,		e Below Surface (S8) (LRR K, L)	,
	Sulfide (A4)		Thin Dark Surf	ace (S9) (LRR R	, MLRA 1		k Surface (S9) (LRR K, L)	
Stratified	Layers (A5)	•	High Chroma S	Sands (S11) (LRI	R K, L)	Iron-Mar	nganese Masses (F12) (LRR K, L,	R)
Depleted	Below Dark Surface	(A11)	Loamy Mucky	Mineral (F1) (LR	R K, L)	Piedmor	nt Floodplain Soils (F19) (MLRA 1 4	19B)
Thick Dar	k Surface (A12)	•	Loamy Gleyed	Matrix (F2)		Red Par	ent Material (F21) (outside MLRA	145)
Mesic Sp	odic (A17)		Depleted Matri	ix (F3)		Very Sh	allow Dark Surface (F22)	
(MLRA	A 144A, 145, 149B)		Redox Dark Su	urface (F6)		Other (E	xplain in Remarks)	
	ucky Mineral (S1)		Depleted Dark	Surface (F7)				
	eyed Matrix (S4)		Redox Depres			0		
Sandy Re			Marl (F10) (LR				ors of hydrophytic vegetation and	
Stripped I	Matrix (S6)	•	Red Parent Ma	aterial (F21) (MLF	RA 145)		and hydrology must be present,	
Description I	('f -					unless	s disturbed or problematic.	
	ayer (if observed):							
Type:								
Depth (in	ches):					Hydric Soil Prese	nt? Yes No X	_
Remarks:								
Soil is disturb	ed.							
ENG EOPM 61	16_0_ _2019							

Redox Features

Controlled Unclass Hi&d Ariffor GARRACH ECOIMPERS WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region

See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)

Project/Site: Harbor Island	City/County: Grand Haven city/ Ottawa County Sampling Date: 2024-04-25				
Applicant/Owner: City of Grand Haven	State: MI Sampling Point: 2A				
Investigator(s): Andrea Cline, Andrew Byks	Section, Township, Range: 20, 008N, 016W				
Landform (hillside, terrace, etc.): Flat Local	Il relief (concave, convex, none): Concave Slope %: 1				
Subregion (LRR or MLRA): LRR L, MLRA 97 43 43.071499					
Soil Map Unit Name: Made land	NWI classification: N/A				
Are climatic / hydrologic conditions on the site typical for this time of year?					
Are Vegetation X , Soil X , or Hydrology significantly distu					
Are Vegetation, Soil, or Hydrologynaturally problem					
SUMMARY OF FINDINGS – Attach site map showing sar	mpling point locations, transects, important features, etc.				
Hydrophytic Vegetation Present? Yes X No	Is the Sampled Area				
Hydric Soil Present? Yes X No	within a Wetland? Yes X No				
Wetland Hydrology Present? Yes X No	If yes, optional Wetland Site ID:				
Remarks: (Explain alternative procedures here or in a separate report.)					
HYDROLOGY					
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)				
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)				
Surface Water (A1)Water-Stained Leaves	(B9) Drainage Patterns (B10)				
X High Water Table (A2) Aquatic Fauna (B13)	Moss Trim Lines (B16)				
Saturation (A3) — Marl Deposits (B15)	Dry-Season Water Table (C2)				
Water Marks (B1)Hydrogen Sulfide Odor					
Sediment Deposits (B2) Oxidized Rhizospheres Define the control of the control					
Drift Deposits (B3) Presence of Reduced I					
Algal Mat or Crust (B4) Iron Deposits (B5) Recent Iron Reduction Thin Muck Surface (C7	· · · · · · · · · · · · · · · · · · ·				
X Inundation Visible on Aerial Imagery (B7) Other (Explain in Rema					
Sparsely Vegetated Concave Surface (B8)	X FAC-Neutral Test (D5)				
Field Observations:					
Surface Water Present? Yes No X Depth (inches)):				
Water Table Present? Yes X No Depth (inches)					
Saturation Present? Yes X No Depth (inches)					
(includes capillary fringe)					
Describe Recorded Data (stream gauge, monitoring well, aerial photos, p	revious inspections), if available:				
Remarks:					
Remarks.					
ENG FORM 6116-8, JUL 2018					

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
		Species:	Status	
·				Number of Dominant Species That Are OBL, FACW, or FAC: (A)
3. i.				Total Number of Dominant Species Across All Strata: 1 (B)
i.				Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)
·				Prevalence Index worksheet:
		=Total Cover		Total % Cover of: Multiply by:
capling/Shrub Stratum (Plot size: 15 ft)			OBL species 5 x 1 = 5
	- ′			FACW species 70 x 2 = 140
				FAC species 0 x 3 = 0
-				FACU species 0 x 4 = 0
				UPL species 0 x 5 = 0
				Column Totals: 75 (A) 145 (B)
				Prevalence Index = $B/A = 1.93$
				Hydrophytic Vegetation Indicators:
		=Total Cover		1 - Rapid Test for Hydrophytic Vegetation
Herb Stratum (Plot size: 5 ft)		-10tal 0010l		X 2 - Dominance Test is >50%
. Phragmites australis	70	Yes	FACW	\times 3 - Prevalence Index is $\le 3.0^1$
Schoenoplectus tabernaemontani	5		OBL	4 - Morphological Adaptations ¹ (Provide supportin
			ODL	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:
3)				Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
0 1	_			Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
2.		=Total Cover		Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Noody Vine Stratum (Plot size: 30 ft		-10tal 00vol		Woody vines – All woody vines greater than 3.28 ft in
l	- - ———			height.
2				Hydrophytic
				Vegetation
i				Present? Yes X No No
		=Total Cover		

Som trolled Unclassified	Information	(CUI)
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Sampling Point: 2A

Depth	ription: (Describe t Matrix	J ale ue	-	dox Featur			J absence	or maioators	···,	
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture		Remarks	
0-18	10YR 2/1	100					Mucky Loam/Clay			
								•		
								-		
								-		
			-							
								-		
								-		
	_									
			-				-	-		
Type: C=Co	oncentration, D=Depl	etion. RM	/=Reduced Matrix.	MS=Mas	ked San	d Grains.	² Location:	PL=Pore Lini	ng. M=Matrix.	
Hydric Soil I		,	,						atic Hydric So	ils³:
Histosol	(A1)		Dark Surface	e (S7)			2 cm l	Muck (A10) (L	RR K, L, MLRA	A 149B)
Histic Ep	pipedon (A2)		Polyvalue Be	low Surfa	ce (S8)	LRR R,	5 cm l	Mucky Peat or	Peat (S3) (LRI	R K, L, R)
Black His	stic (A3)		MLRA 149	B)			Polyva	alue Below Su	rface (S8) (LRF	R K, L)
Hydroge	n Sulfide (A4)		Thin Dark Su				149B) Thin E	ark Surface (S9) (LRR K, L)	
	Layers (A5)		High Chroma			-		_	sses (F12) (LR	
	I Below Dark Surface	(A11)	X Loamy Muck			R K, L)			n Soils (F19) (M	
	rk Surface (A12)		Loamy Gleye		(F2)		Red Parent Material (F21) (outside MLRA 14			
	oodic (A17)		Depleted Ma		-0)			Shallow Dark S		
	A 144A, 145, 149B)		Redox Dark				Other	(Explain in Re	emarks)	
	lucky Mineral (S1) leyed Matrix (S4)		Depleted Dar							
	edox (S5)		Marl (F10) (L		0)		³ Indic:	ators of hydron	hytic vegetatio	n and
	Matrix (S6)		Red Parent M		21) (M L	RA 145)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present,			
	matrix (CO)			viatoriai (i	, (_				or problematic.	,
Restrictive L	_ayer (if observed):									
Type:										
Depth (ir	nches):						Hydric Soil Pres	ent?	Yes X N	lo
Remarks:										
Soil is disturb	ped.									
NC FORM 6	146 0 1111 2040									

See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)

Project/Site: Harbor Island	City/County: Grand Haven city/ Ottawa County Sampling Date: 2024-04-25					
Applicant/Owner: City of Grand Haven	State: MI Sampling Point: 2B					
Investigator(s): Andrea Cline, Andrew Byks	Section, Township, Range: 20, 008N, 016W					
-	relief (concave, convex, none): None Slope %: 0					
Subregion (LRR or MLRA): LRR L, MLRA 97 43 43.071441	Long: -86.23363034 Datum: WGS 1984					
Soil Map Unit Name: Made land	NWI classification: N/A					
· · · · · · · · · · · · · · · · · · ·						
Are climatic / hydrologic conditions on the site typical for this time of year?	Yes X No (If no, explain in Remarks.)					
Are Vegetation X, Soil X, or Hydrology significantly distu						
Are Vegetation X, Soil X, or Hydrology naturally problem	atic? (If needed, explain any answers in Remarks.)					
SUMMARY OF FINDINGS – Attach site map showing san	npling point locations, transects, important features, etc.					
Lhudranhutia Varatetian Present?	In the Complet Area					
Hydrophytic Vegetation Present? Yes X No Yes No X	Is the Sampled Area within a Wetland? Yes No _X_					
Wetland Hydrology Present? Yes No X	If yes, optional Wetland Site ID:					
Remarks: (Explain alternative procedures here or in a separate report.)	ii yoo, opaonai voitana eito ib.					
Remarks. (Explain alternative procedures here of in a separate report.)						
HYDROLOGY						
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)					
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)					
Surface Water (A1)Water-Stained Leaves	B9) Drainage Patterns (B10)					
High Water Table (A2) Aquatic Fauna (B13)	Moss Trim Lines (B16)					
Saturation (A3) Marl Deposits (B15)	Dry-Season Water Table (C2)					
Water Marks (B1) Hydrogen Sulfide Odor						
Sediment Deposits (B2) Oxidized Rhizospheres						
Drift Deposits (B3) Presence of Reduced II						
Algal Mat or Crust (B4) Recent Iron Reduction						
Iron Deposits (B5) Thin Muck Surface (C7) Other (Figure in Power)	· · · · · · · · · · · · · · · · · · ·					
Inundation Visible on Aerial Imagery (B7) Other (Explain in Rema						
Sparsely Vegetated Concave Surface (B8)	FAC-Neutral Test (D5)					
Field Observations: Surface Water Present? Yes No X Depth (inches)						
Surface Water Present? Yes No X Depth (inches) Water Table Present? Yes No X Depth (inches)						
Saturation Present? Yes No X Depth (inches)						
(includes capillary fringe)						
Describe Recorded Data (stream gauge, monitoring well, aerial photos, pr	revious inspections), if available:					
	, ,					
Remarks:						
ENG FORM 6116-8, JUL 2018						

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test	Samplin	<u> </u>		_
. (Flot Size)	% Cover	Species?	Status	Dominance rest	WOIKSHEE	ι.		
·				Number of Domin That Are OBL, FA			2	_(A)
·				Total Number of I Species Across A			3	(B)
				Percent of Domin That Are OBL, FA			66.7%	_(A/B
				Prevalence Inde	x workshe	et:		
		=Total Cover		Total % Cover of: Multiply by:				
apling/Shrub Stratum (Plot size: 15 ft)			OBL species	0	x 1 =	0	
				FACW species	30	x 2 =	60	
				FAC species	25	x 3 =	75	
				FACU species		-	40	
				UPL species		x 5 =	200	_
				Column Totals:		(A)		— (В
				_	e Index = E	· ` ´ -		
				Hydrophytic Veg			0.07	
-		=Total Cover					rotation	
orb Ctratum (Diet einer Eft)		= Total Cover		1 - Rapid Tes			getation	
erb Stratum (Plot size: 5 ft)	00	V	E40)4/	X 2 - Dominano				
Phragmites australis	30	Yes	FACW	3 - Prevalenc				
Panicum virgatum Daucus carota	25	Yes	FAC	4 - Morpholog	gicai Adapta marks or or			
Daucus carota	40	Yes	<u>UPL</u>					
Lotus corniculatus	10	No	FACU	Problematic I	Hydrophytic	: Vegetatio	on' (Expla	ain)
				¹ Indicators of hyd be present, unles				must
				Definitions of Ve		-		
·				Tree – Woody pla	ents 3 in <i>(</i> 7	6 cm) or	more in	
	<u> </u>			diameter at breas				neight
0				Sapling/shrub –				ЭВН
1				and greater than	or equal to	3.28 ft (1 i	m) tall.	
2				Herb – All herbad				ardles
	105	=Total Cover		of size, and wood	y plants les	ss than 3.2	28 ft tall.	
/oody Vine Stratum (Plot size: 30 ft)			Woody vines – A	All woody vi	nes greate	er than 3.2	28 ft ir
				height.				
·				Hydrophytic				
				Vegetation				
·				Present?	Yes X	No_		
		=Total Cover						

Som trolled Unclassified Information (CUI'
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%

100

Color (moist)

10YR 2/1

Depth

(inches)

0-12

Sampling Point 2B Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Remarks

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) Mesic Spodic (A17) (MLRA 144A, 145, 149B) Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Sandy Redox (S5)	Dark Surface (S7) Polyvalue Below Surface (S8) (LRR R, MLRA 149B) Thin Dark Surface (S9) (LRR R, MLRA 14 High Chroma Sands (S11) (LRR K, L) 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) Marl (F10) (LRR K, L)	Indicators for Problematic Hydric Soils ³ : 2 cm Muck (A10) (LRR K, L, MLRA 149B) 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) 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) Red Parent Material (F21) (outside MLRA 145) Very Shallow Dark Surface (F22) Other (Explain in Remarks)			
Stripped Matrix (S6)	Red Parent Material (F21) (MLRA 145)	wetland hydrology must be present, unless disturbed or problematic.			
Restrictive Layer (if observed): Type: Depth (inches): Remarks: Soil is disturbed.		Hydric Soil Present? Yes No _X_			

Redox Features

Color (moist)

Type¹ Loc²

Texture

Loamy/Clayey

Controlled Unclass Hied Ariffy (中四季の利用では) Pers WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region

See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

Project/Site: Harbor Island	City/Co	ounty: Grand Haven city/ Ottawa County	Sampling Date: 2024-04-25
Applicant/Owner: City of Grand Haven		State: MI	Sampling Point: 3A
Investigator(s): Andrea Cline, Andrew Byks		Section, Township, Range: 20, 008	N, 016W
Landform (hillside, terrace, etc.): Flat	Local relief (co	oncave, convex, none): None	Slope %:0
Subregion (LRR or MLRA): LRR L, MLRA 9	7 43 43.071557	Long: -86.23319543	Datum: WGS 1984
Soil Map Unit Name: Water		NWI classification	PEM1C
Are climatic / hydrologic conditions on the site	typical for this time of year?	Yes X No (If no	, explain in Remarks.)
Are Vegetation X , Soil X , or Hydro	•	Are "Normal Circumstances" pres	•
Are Vegetation X , Soil X , or Hydro		(If needed, explain any answers in	
SUMMARY OF FINDINGS – Attach			
Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?	Yes X No within	e Sampled Area in a Wetland? S, optional Wetland Site ID:	No
Remarks: (Explain alternative procedures he		s, optional Wetland Site ID:	
HYDROLOGY			
Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is requir		Surface Soil Crack	` '
Surface Water (A1)	Water-Stained Leaves (B9)	Drainage Patterns	
X High Water Table (A2) Saturation (A3)	Aquatic Fauna (B13) Marl Deposits (B15)	Moss Trim Lines (Dry-Season Water	
Water Marks (B1)	Hydrogen Sulfide Odor (C1)	Crayfish Burrows (
Sediment Deposits (B2)	Oxidized Rhizospheres on Living	 ·	on Aerial Imagery (C9)
Drift Deposits (B3)	Presence of Reduced Iron (C4)	Stunted or Stresse	= : : :
Algal Mat or Crust (B4)	Recent Iron Reduction in Tilled S	Soils (C6) X Geomorphic Positi	ion (D2)
Iron Deposits (B5)	Thin Muck Surface (C7)	Shallow Aquitard (D3)
Inundation Visible on Aerial Imagery (B7	· · · · · · · · · · · · · · · · · · ·		
Sparsely Vegetated Concave Surface (E	38)	X FAC-Neutral Test	(D5)
Field Observations:	No. V. Donath (in all pa)		
Surface Water Present? Yes Water Table Present? Yes X	No X Depth (inches): 4	-	
Saturation Present? Yes X	No Depth (inches): 4 No Depth (inches): 4	Wetland Hydrology Present?	Yes X No
(includes capillary fringe)		_	
Describe Recorded Data (stream gauge, mo	nitoring well, aerial photos, previous in	spections), if available:	
Remarks:			
ENG FORM 6116-8. JUL 2018			

esetalton undersidiant Inderso	Absolute	Dominant	Indicator					
<u>Free Stratum</u> (Plot size:30 ft)	% Cover	Species?	Status	Dominance Test v	vorksheet:			
2.				Number of Domina That Are OBL, FAC	•	1		(A)
				Total Number of Do Species Across All		1		(B)
		-		Percent of Dominal		100.0)%	(A/B
:				Prevalence Index	worksheet:	•		
		=Total Cover		Total % Cove	r of:	Multiply	y by:	
apling/Shrub Stratum (Plot size: 15 ft)			OBL species	12 x	1 =	12	
				FACW species	92 x	2 =	184	
				FAC species	0 x	3 =	0	
				FACU species	2 x	4 =	8	
				UPL species		5 =	0	_
				Column Totals:	106 (/	A)	204	<u> </u> (В
				Prevalence	Index = B/A =	= 1	.92	_ `
				Hydrophytic Vege	tation Indica	tors:		
	_	=Total Cover		1 - Rapid Test			tion	
erb Stratum (Plot size: 5 ft)		-		X 2 - Dominance		_		
. Phalaris arundinacea	20	No	FACW	X 3 - Prevalence				
. Phragmites australis	70	Yes	FACW	4 - Morphologic			le sup	portir
Eleocharis acicularis	10	No	OBL		arks or on a s			•
Lysimachia nummularia		No	FACW	 Problematic Hydrophytic Vegetation¹ (Expl. 				in)
. Ruppia maritima	2		OBL					
. Cirsium arvense	2	No	FACU	 Indicators of hydric soil and wetland hydrology be present, unless disturbed or problematic. 				nust
	_			Definitions of Veg	etation Strat	a:		
·				Tree – Woody plan	nts 3 in 7 6 c	m) or mor	e in	
	_			diameter at breast				eight
0	_	_		Sapling/shrub – W	Voody plants I	ess than :	3 in. D	вн
1				and greater than or				
2	_			Herb – All herbaceous (non-woody) pl			. rega	rdles
	106	=Total Cover		of size, and woody				
Voody Vine Stratum (Plot size: 30 ft	_)			Woody vines – All height.	woody vines	greater th	an 3.2	28 ft i
	_			- U				
				Hydrophytic				
				Vegetation Present? Y	es X	No		
		=Total Cover					_	
		_ = 10tai 00vci						

Som trolled Unclassified	Information	(CUI)
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Sampling Point: 3

ЗА	

Profile Desc Depth	ription: (Describe to th Matrix	e depth need		ument th x Featur		ator or c	onfirm the absence	of indicators.)
(inches)		6 Color	r (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-18	10YR 2/1 2	0					Mucky Loam/Clay	
0-10	10111 2/1 2	.0					Wideky Loam/Clay	
			_					
			_					
¹ Type: C=Co	oncentration, D=Depletion	n, RM=Reduc	ed Matrix, N	/IS=Masl	ked Sand	d Grains.	² Location:	PL=Pore Lining, M=Matrix.
Hydric Soil I	ndicators:						Indicators	for Problematic Hydric Soils ³ :
Histosol			k Surface (2 cm M	luck (A10) (LRR K, L, MLRA 149B)
	ipedon (A2)		yvalue Belo		ce (S8) (LRR R,		lucky Peat or Peat (S3) (LRR K, L, R)
Black His			ILRA 149B	,				ue Below Surface (S8) (LRR K, L)
	n Sulfide (A4)		n Dark Surf				· —	ark Surface (S9) (LRR K, L)
	Layers (A5)		h Chroma S			-		anganese Masses (F12) (LRR K, L, R)
	Below Dark Surface (A1		my Mucky			R K, L)		ont Floodplain Soils (F19) (MLRA 149B)
	rk Surface (A12)		amy Gleyed		F2)			arent Material (F21) (outside MLRA 145)
	oodic (A17)		oleted Matri		·c)			hallow Dark Surface (F22)
-	A 144A, 145, 149B) lucky Mineral (S1)		dox Dark Su oleted Dark				Other (Explain in Remarks)
	leyed Matrix (S4)		dox Depres					
	edox (S5)		rl (F10) (LR		3)		³ Indicat	tors of hydrophytic vegetation and
	Matrix (S6)		d Parent Ma		21) (MLF	RA 145)		and hydrology must be present,
					, (.	,		ss disturbed or problematic.
Restrictive L	ayer (if observed):							, , , , , , , , , , , , , , , , , , , ,
Type:	,							
Depth (ir	nches):		_				Hydric Soil Prese	ent? Yes X No
							<u> </u>	
Remarks: Soil is disturb	ned							
Oon is distuit	oca.							
NC FORM 64	146_9 2049							<u> </u>

See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

Project/Site: Harbor Island	City/County: Grand Haven city/ Ottawa County
Applicant/Owner: City of Grand Haven	State: MI Sampling Point: 3B
Investigator(s): Andrea Cline, Andrew Byks	Section, Township, Range: 20, 008N, 016W
·	I relief (concave, convex, none): None Slope %: 0
Subregion (LRR or MLRA): LRR L, MLRA 97 43 43.071543	Long: -86.23321858 Datum: WGS 1984
Soil Map Unit Name: Made land	NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year?	
Are Vegetation X, Soil X, or Hydrology significantly distu	
Are Vegetation X, Soil X, or Hydrology naturally problem	
SUMMARY OF FINDINGS – Attach site map showing sar	mpling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No X	Is the Sampled Area
Hydric Soil Present? Yes No X	within a Wetland? Yes No _X
Wetland Hydrology Present? Yes No X	If yes, optional Wetland Site ID:
Remarks: (Explain alternative procedures here or in a separate report.)	
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
Surface Water (A1) Water-Stained Leaves	
High Water Table (A2) Aquatic Fauna (B13)	Moss Trim Lines (B16)
Saturation (A3) Marl Deposits (B15)	Dry-Season Water Table (C2)
Water Marks (B1) Hydrogen Sulfide Odor	Crayfish Burrows (C8)
Sediment Deposits (B2) Oxidized Rhizospheres	
Drift Deposits (B3) Presence of Reduced I	
Algal Mat or Crust (B4) Recent Iron Reduction	
Iron Deposits (B5) Thin Muck Surface (C7) Other (Explain in Page	
Inundation Visible on Aerial Imagery (B7) Other (Explain in Rema Sparsely Vegetated Concave Surface (B8)	FAC-Neutral Test (D5)
Field Observations:	I AO-Neutiai Test (D3)
Surface Water Present? Yes No X Depth (inches)):
Water Table Present? Yes No X Depth (inches)	
Saturation Present? Yes No X Depth (inches)	
(includes capillary fringe)	<u> </u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, p	revious inspections), if available:
Remarks:	
ENG FORM 6116-8, JUL 2018	

Free Stratum (Plot size:30 ft)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test workshee	t:		
1. 2.				Number of Dominant Specie That Are OBL, FACW, or FA		1	(A)
3. i.				Total Number of Dominant Species Across All Strata:		2	(B)
5. 5.		- ——		Percent of Dominant Specie That Are OBL, FACW, or FA		50.0%	(A/B)
7.				Prevalence Index workshe	et:		
		=Total Cover		Total % Cover of:	Mu	ultiply by:	
Sapling/Shrub Stratum (Plot size:15 ft)				OBL species 0	x 1 =	0	
				FACW species 40	x 2 =	80	
				FAC species 0	x 3 =	0	
				FACU species 10	x 4 =	40	
				UPL species 45	x 5 =	225	
. [Column Totals: 95	(A)	345	(B)
i				Prevalence Index = E	3/A =	3.63	
·				Hydrophytic Vegetation Inc	dicators:		
		=Total Cover		1 - Rapid Test for Hydro	phytic Ve	getation	
lerb Stratum (Plot size:5 ft)				2 - Dominance Test is >	50%		
Phragmites australis	40	Yes	FACW	3 - Prevalence Index is	≤3.0 ¹		
2. Linaria dalmatica	15	No	UPL	4 - Morphological Adapta			
B. Daucus carota	20	Yes	UPL	data in Remarks or on a separate sheet			
. Cirsium arvense	10	No	FACU	Problematic Hydrophytic	: Vegetati	on¹ (Expl	ain)
Asclepias syriaca	10	No	UPL	 Indicators of hydric soil and wetland hydrology be present, unless disturbed or problematic. 			
:				Definitions of Vegetation S	-		
3.							
				Tree – Woody plants 3 in. (7 diameter at breast height (Di			height.
0 1				Sapling/shrub – Woody pla and greater than or equal to			DBH
12.				Herb – All herbaceous (non-	woody) n	lante roa	ardlacc
	95	=Total Cover		of size, and woody plants les	• , .	-	aruics
Noody Vine Stratum (Plot size: 30 ft)		-		Woody vines – All woody vi	nes great	er than 3.	.28 ft ir
				· · · · · · · · · · · · · · · · · · ·			
3.				Hydrophytic			
l.				Vegetation Present? Yes	No	Х	
		=Total Cover					
		TOTAL OUVEL					

Som trolled Unclassified	Information	(CUI)
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Sampling Point

3B

Profile Desc Depth	ription: (Describe to Matrix	the de		ument tl x Featur		ator or co	onfirm the absence	of indicator	rs.)		
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture		Rem	arks	
	40VD 0/4						L a a many/Clayers				
0-6	10YR 2/1	100					Loamy/Clayey	,			
	-										
								•		-	
								•			
¹ Type: C=Co	ncentration, D=Deple	tion, RM	l=Reduced Matrix, N	MS=Mas	ked Sand	d Grains.	² Location: 1	PL=Pore Lir	ning, M=M	fatrix.	
Hydric Soil I			•				Indicators		_		3.
Histosol	(A1)		Dark Surface (S7)			2 cm M	luck (A10) (I	LRR K, L	, MLRA 1	49B)
Histic Ep	ipedon (A2)		Polyvalue Beld	w Surfa	ce (S8) (LRR R,	5 cm M	lucky Peat o	or Peat (S	3) (LRR I	K, L, R)
Black His	stic (A3)		MLRA 149B)			Polyval	ue Below S	urface (St	3) (LRR K	(, L)
Hydrogei	n Sulfide (A4)		Thin Dark Surf	ace (S9)	(LRR R	, MLRA 1	Thin Da	ark Surface	(S9) (LRF	₹ K, L)	
Stratified	Layers (A5)		High Chroma S	Sands (S	311) (LR I	R K, L)	Iron-Ma	anganese M	asses (F1	2) (LRR	K, L, R)
Depleted	Below Dark Surface	(A11)	Loamy Mucky	Mineral	(F1) (LR	R K, L)	Piedmo	nt Floodpla	in Soils (F	-19) (MLF	RA 149B)
Thick Da	rk Surface (A12)		Loamy Gleyed	Matrix (F2)		Red Pa	rent Materia	al (F21) (c	outside N	ILRA 145)
Mesic Sp	odic (A17)		Depleted Matri	x (F3)			Very Sh	nallow Dark	Surface (F22)	
(MLR	A 144A, 145, 149B)		Redox Dark Su	ırface (F	6)		Other (Explain in R	temarks)		
Sandy M	ucky Mineral (S1)		Depleted Dark	Surface	(F7)						
Sandy G	eyed Matrix (S4)		Redox Depress	sions (F	8)		_				
	edox (S5)		Marl (F10) (LR	R K, L)			³ Indicat	ors of hydro	ophytic ve	getation a	and
Stripped	Matrix (S6)		Red Parent Ma	terial (F	21) (ML F	RA 145)					,
							unles	s disturbed	or proble	matic.	
	.ayer (if observed): Grave	.I									
Type:							Ukuduia Cail Duasa	40	V	N.	V
Depth (in	cnes):	6					Hydric Soil Prese	ent?	Yes		<u>X</u>
Remarks:	- 4										
Soil is disturb	eu.										
NG FORM 64	46-9 IIII 2019										

See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

Project/Site: Harbor Island	City/County: Grand Haven city/ Ottawa County Sampling Date: 2024-04-25
Applicant/Owner: City of Grand Haven	State: MI Sampling Point: 4A
Investigator(s): Andrea Cline, Andrew Byks	Section, Township, Range: 20, 008N, 016W
	relief (concave, convex, none): Concave Slope %: 1
Subregion (LRR or MLRA): LRR L, MLRA 97 43 43.070204	Long: -86.23244494 Datum: WGS 1984
Soil Map Unit Name: Houghton-Adrian mucks, lake moderated, 0 to 1 perc	
Are climatic / hydrologic conditions on the site typical for this time of year?	Yes X No (If no, explain in Remarks.)
Are Vegetation, SoilX_, or Hydrologysignificantly disturb	
Are Vegetation, Soil, or Hydrologynaturally problema	atic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing sam	pling point locations, transects, important features, etc.
Hadronket's Vandation Broads (2000)	In the Committed Asset
Hydrophytic Vegetation Present? Yes X No Hydric Soil Present? Yes X No	Is the Sampled Area within a Wetland? Yes X No
Hydric Soil Present? Wetland Hydrology Present? Yes X No Yes X No	within a Wetland? Yes X No If yes, optional Wetland Site ID:
	ii yes, optional wetiand one ib.
Remarks: (Explain alternative procedures here or in a separate report.)	
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
Surface Water (A1)Water-Stained Leaves (B	B9) Drainage Patterns (B10)
X High Water Table (A2) Aquatic Fauna (B13)	Moss Trim Lines (B16)
Saturation (A3) Marl Deposits (B15)	Dry-Season Water Table (C2)
Water Marks (B1) Hydrogen Sulfide Odor (
Sediment Deposits (B2) Oxidized Rhizospheres of	
Drift Deposits (B3) Presence of Reduced Iro	
Algal Mat or Crust (B4) Recent Iron Reduction in This Much Carfora (O7)	
Iron Deposits (B5) Thin Muck Surface (C7) Valuate to a Visible on Aerial Imagen (P7) Other (Explain in Remote	Shallow Aquitard (D3)
X Inundation Visible on Aerial Imagery (B7) Other (Explain in Remar Sparsely Vegetated Concave Surface (B8)	X FAC-Neutral Test (D5)
	A FAC-Neutral Test (D3)
Field Observations: Surface Water Present? Yes No X Depth (inches):	
Surface Water Present? Yes No X Depth (inches): Water Table Present? Yes X No Depth (inches):	12
Saturation Present? Yes X No Depth (inches):	
(includes capillary fringe)	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, pre	evious inspections), if available:
Remarks:	
ENG FORM 6116-8, JUL 2018	

1	2 2	=Total Cover No	Status	Hydrophytic Vege 1 - Rapid Test X 2 - Dominance	ant Species CW, or FAC: cominant I Strata: ant Species CW, or FAC: ant Species	Mult x 1 = x 2 = x 3 = x 4 = x 5 = (A) = ators:	130 0 16 0 181 1.74	— — —
2	2 2	=Total Cover	FACU	That Are OBL, FAC Total Number of Do Species Across All Percent of Domina That Are OBL, FAC Prevalence Index Total % Cove OBL species FACW species FACU species UPL species UPL species Column Totals: Prevalence Hydrophytic Vege 1 - Rapid Test X 2 - Dominance	CW, or FAC: cominant I Strata: ant Species CW, or FAC: worksheet: are of: 35 0 4 0 104 (Index = B/A: artation Indicat for Hydrophyte are Test is >50%	Mult x 1 = x 2 = x 3 = x 4 = x 5 = (A) = ators:	2 0.0% iply by: 35 130 0 16 0 181 1.74	(B) (A/B)
3.	2 2	=Total Cover	FACU	Total Number of Do Species Across All Percent of Domina That Are OBL, FAC Prevalence Index Total % Cove OBL species FACW species FACU species FACU species UPL species Column Totals: Prevalence Hydrophytic Vege 1 - Rapid Test X 2 - Dominance	lominant I Strata: ant Species CW, or FAC: aworksheet: ar of: 35 0 4 0 104 (Index = B/A: attation Indicat for Hydrophyte a Test is >50%	Mult x 1 = x 2 = x 3 = x 4 = x 5 = (A) = ators:	2 0.0% iply by: 35 130 0 16 0 181 1.74	(B) (A/B)
4	2 2	=Total Cover	FACU	Species Across All Percent of Domina That Are OBL, FAC Prevalence Index Total % Cove OBL species FACW species FAC species FACU species UPL species Column Totals: Prevalence Hydrophytic Vege 1 - Rapid Test X 2 - Dominance	I Strata: ant Species CW, or FAC: worksheet: er of: 35 65 0 4 0 104 (Index = B/A: ertation Indicates for Hydrophytes Test is >50%	Mult x 1 = x 2 = x 3 = x 4 = x 5 = (A) = ators:	0.0% siply by: 35 130 0 16 0 181 1.74	(A/B)
6.	2 2	=Total Cover	FACU	That Are OBL, FAC Prevalence Index Total % Cove OBL species FACW species FAC species UPL species Column Totals: Prevalence Hydrophytic Vege 1 - Rapid Test X 2 - Dominance	CW, or FAC: worksheet: er of: 35 65 0 4 0 104 Index = B/A: etation Indicates of Hydrophytics Test is >50%	Mult x 1 = x 2 = x 3 = x 4 = x 5 = (A) = ators:	35 130 0 16 0 181	— — — —
7	2 2	=Total Cover	FACU	Total % Cove OBL species FACW species FAC species FACU species UPL species Column Totals: Prevalence Hydrophytic Vege 1 - Rapid Test X 2 - Dominance	9 Test is >50%	x 1 = _ x 2 = _ x 3 = _ x 4 = _ x 5 = _ (A) _ = _ ators:	35 130 0 16 0 181 1.74	(B)
1	2 2	=Total Cover	FACU	OBL species FACW species FAC species FACU species UPL species Column Totals: Prevalence Hydrophytic Vege 1 - Rapid Test X 2 - Dominance	35	x 1 = _ x 2 = _ x 3 = _ x 4 = _ x 5 = _ (A) _ = _ ators:	35 130 0 16 0 181 1.74	(B)
1	2	No	FACU	FACW species FAC species FACU species UPL species Column Totals: Prevalence Hydrophytic Vege 1 - Rapid Test X 2 - Dominance	65 x 0 x 4 x 0 x 104 (Index = B/A : etation Indica for Hydrophyte Test is >50%	x 2 = x 3 = x 4 = x 5 = (A) = ators:	130 0 16 0 181 1.74	(B)
2.	2	No	FACU	FAC species FACU species UPL species Column Totals: Prevalence Hydrophytic Vege 1 - Rapid Test X 2 - Dominance	0 x 0 x 104 (Index = B/A setation Indicate of Hydrophysical Test is >50%	x 3 = x 4 = x 5 = (A) = ators:	0 16 0 181 1.74	(B)
3.	2	No	FACU	FACU species UPL species Column Totals: Prevalence Hydrophytic Vege 1 - Rapid Test X 2 - Dominance	4 x 0 x 104 (Index = B/A : etation Indica for Hydrophyte e Test is >50%	x 4 = x 5 = (A) = ators:	16 0 181 1.74	(B)
4.	2	No	FACU	UPL species Column Totals: Prevalence Hydrophytic Vege 1 - Rapid Test X 2 - Dominance	0 x 104 (Index = B/A : etation Indica for Hydrophyte Test is >50%	x 5 = (A) = ators:	0 181 1.74	(B)
5	2	No	FACU	Column Totals: Prevalence Hydrophytic Vege 1 - Rapid Test X 2 - Dominance	104 (Index = B/A : etation Indica : for Hydrophy: e Test is >50%	(A) eators:	181 1.74	(B)
6. Herb Stratum (Plot size: 5 ft) 1. Cirsium arvense 2 2. Cirsium vulgare 2 3. Typha angustifolia 2	2	No	FACU	Prevalence Hydrophytic Vege 1 - Rapid Test X 2 - Dominance	Index = B/A : etation Indica for Hydrophy e Test is >50%	ators:	1.74	(B)
7. Herb Stratum (Plot size: 5 ft) 1. Cirsium arvense 2 2. Cirsium vulgare 2 3. Typha angustifolia 2	2	No	FACU	Hydrophytic Vege 1 - Rapid Test X 2 - Dominance	etation Indica for Hydrophy e Test is >50%	ators:		_
Herb Stratum (Plot size: 5 ft) 1. Cirsium arvense 2 2. Cirsium vulgare 2 3. Typha angustifolia 2	2	No	FACU	1 - Rapid Test X 2 - Dominance	for Hydrophy Test is >50%	rtic Veg	etation	
1. Cirsium arvense 2 2. Cirsium vulgare 2 3. Typha angustifolia 2	2	No	FACU	X 2 - Dominance	e Test is >50%	6	etation	
1. Cirsium arvense 2 2. Cirsium vulgare 2 3. Typha angustifolia 2	2		FACU					
 Cirsium vulgare Typha angustifolia 2 	2		FACU	X 3 - Prevalence	e Index is ≤3.0) ¹		
3. Typha angustifolia 2		No		X 3 - Prevalence Index is ≤3.0¹				
) E	No	FACU	4 - Morphologi				portino
4. Phalaris arundinacea 5	25	Yes	OBL	data in Rem	narks or on a s	separat	e sheet)	
· · · · · · · · · · · · · · · · · · ·	50	Yes	FACW	Problematic H	lydrophytic Ve	getatio	n¹ (Expla	in)
5. Eleocharis acicularis 1	10	No	OBL	 Indicators of hydric soil and wetland hydrology 				must
6. Phragmites australis 1	15	No	FACW					
7				Definitions of Veg	getation Strat	ta:		
8				Tree – Woody plar	nts 3 in. (7.6 c	cm) or n	nore in	
9				diameter at breast				eight.
10				Sapling/shrub – V	Noody plants	less tha	an 3 in. E	ВН
11				and greater than or				
12				Herb – All herbace	eous (non-woo	ody) pla	nts, rega	ırdless
10	04	=Total Cover		of size, and woody	,			
Woody Vine Stratum (Plot size: 30 ft) 1.				Woody vines – All height.	Il woody vines	greate	r than 3.2	28 ft in
				noight.				
2				Hydrophytic				
4.				Vegetation Present?	Yes X	No		
		=Total Cover		i resent:	163 <u>/</u>	NO_		
Remarks: (Include photo numbers here or on a separate sh		- i Ulai CUVEI						

Som trolled Unclassified Information (CUI)
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Sampling Point: 4A

Depth	ription: (Describe t Matrix	o the de		u ment th x Featur		ator or co	onfirm the a	bsence of inc	dicators.)	
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Textu	re	Remarks	
0-14	10YR 2/1	100					Loamy/C			
		_								
				_	_					
¹Type: C=Co		 etion, RM	 I=Reduced Matrix, N	 //S=Masl	 ked Sand	Grains.	2Lc		Pore Lining, M=Matrix	
Black His Hydroger Stratified Depleted Thick Dat Mesic Sp (MLRA Sandy Me Sandy Gl Sandy Re Stripped Restrictive L Type:	A1) ipedon (A2) itic (A3) i Sulfide (A4) Layers (A5) Below Dark Surface rk Surface (A12) odic (A17) A 144A, 145, 149B) ucky Mineral (S1) eyed Matrix (S4)		Dark Surface (Polyvalue Belo MLRA 149B Thin Dark Surf High Chroma S Loamy Mucky Loamy Gleyed Depleted Matri Redox Dark Su Depleted Dark Redox Depress Marl (F10) (LR Red Parent Ma	ow Surface Sands (S9) Sands (S Mineral (Matrix (I x (F3) urface (F Surface sions (F8 R K, L)	(LRR R 611) (LRI (F1) (LRI F2) 66) (F7)	, MLRA 1 R K, L) R K, L)	49B)	dicators for P 2 cm Muck (5 cm Mucky Polyvalue Bo Thin Dark So Iron-Mangar Piedmont Flo Red Parent I Very Shallov Other (Explain	Problematic Hydric (A10) (LRR K, L, ML Peat or Peat (S3) (Lelow Surface (S8) (Lurface (S9) (LRR K, nese Masses (F12) (oodplain Soils (F19) Material (F21) (outs w Dark Surface (F22 ain in Remarks) of hydrophytic vegeta ydrology must be presturbed or problematic	Soils ³ : .RA 149B) .RR K, L, R) .RR K, L) L) LRR K, L, R) (MLRA 149B) ide MLRA 145))
Remarks: Soil is disturb	ed.									
ENG FORM OF	16 8, JUL 2018									

See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

Project/Site: Harbor Island	City/County: Grand Haven city/ Ottawa County Sampling Date: 2024-04-25					
Applicant/Owner: City of Grand Haven	State: MI Sampling Point: 4B					
Investigator(s): Andrea Cline, Andrew Byks	Section, Township, Range: 20, 008N, 016W					
	ocal relief (concave, convex, none): None Slope %: 1					
Subregion (LRR or MLRA): LRR L, MLRA 97 43	Long: -86.23249024 Datum: WGS 1984					
Soil Map Unit Name: Houghton-Adrian mucks, lake moderated, 0 to 1						
Are climatic / hydrologic conditions on the site typical for this time of year						
Are Vegetation, SoilX _, or Hydrology significantly di						
Are Vegetation, Soil, or Hydrologynaturally prob						
SUMMARY OF FINDINGS – Attach site map showing s	sampling point locations, transects, important features, etc.					
Hydrophytic Vegetation Present? Yes No X	Is the Sampled Area					
Hydric Soil Present? Yes No X	within a Wetland? Yes No _X					
Wetland Hydrology Present? Yes No X	If yes, optional Wetland Site ID:					
Remarks: (Explain alternative procedures here or in a separate report.	.)					
HADBOLOGA						
HYDROLOGY	On an administration (as in income and the arrange of the arrange					
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)					
Primary Indicators (minimum of one is required; check all that apply) Surface Water (A1) Water-Stained Leav	Surface Soil Cracks (B6) ves (B9) Drainage Patterns (B10)					
High Water Table (A2) High Water Table (A2) Aquatic Fauna (B13)						
Saturation (A3) Marl Deposits (B15)	·					
Water Marks (B1) Hydrogen Sulfide O						
1 — · · · · · · · · · · · · · · · · · ·	res on Living Roots (C3) Saturation Visible on Aerial Imagery (C9)					
Drift Deposits (B3) Presence of Reduce	ced Iron (C4) Stunted or Stressed Plants (D1)					
Algal Mat or Crust (B4) Recent Iron Reducti	n in Tilled Soils (C6) Geomorphic Position (D2)					
Iron Deposits (B5) Thin Muck Surface ((C7) Shallow Aquitard (D3)					
Inundation Visible on Aerial Imagery (B7)Other (Explain in Re	emarks)					
Sparsely Vegetated Concave Surface (B8)	FAC-Neutral Test (D5)					
Field Observations:						
Surface Water Present? Yes No X Depth (inch						
Water Table Present? Yes No X Depth (inch						
Saturation Present? Yes No X Depth (inch	nes): Wetland Hydrology Present? Yes No _X					
(includes capillary fringe)						
Describe Recorded Data (stream gauge, monitoring well, aerial photos	s, previous inspections), if available:					
Remarks:						
-NO FORM 0440 0 HILL 0040						
ENG FORM 6116-8, JUL 2018						

PEGETATION UNGESSIFIARE INTRESPAT	Absolute	Dominant	Indicator		_			
Tree Stratum (Plot size: 30 ft)	% Cover	Species?	Status	Dominance Test	worksheet:			
2.				Number of Domina That Are OBL, FA			0	_(A)
3				Total Number of D Species Across A			1	_(B)
5. 6.				Percent of Domina That Are OBL, FA	•		0.0%	(A/B
7.				Prevalence Index	worksheet:	•		_
		=Total Cover		Total % Cov	er of:	Mυ	ultiply by:	
Sapling/Shrub Stratum (Plot size: 15 ft)			OBL species	0	x 1 =	0	
1. <u> </u>				FACW species	0	x 2 =	0	
2.				FAC species	0	x 3 =	0	
s				FACU species	96	x 4 =	384	
i				UPL species	0	x 5 =	0	<u></u>
i				Column Totals:	96	(A)	384	— (B)
S		<u> </u>		Prevalence	Index = B/A	. =	4.00	
7.				Hydrophytic Veg	etation Indic	ators:		
		=Total Cover		1 - Rapid Tes	t for Hydrophy	ytic Ve	getation	
Herb Stratum (Plot size: 5 ft)		•		2 - Dominance				
1. Poa pratensis	80	Yes	FACU	3 - Prevalence	e Index is ≤3.	0 ¹		
2. Digitaria sanguinalis	10	No	FACU	4 - Morpholog	ical Adaptatio	ons¹ (Pi	rovide su	pportin
3. Cirsium vulgare	2	No	FACU	data in Remarks or on a separate sh				
1. Elaeagnus angustifolia	2	No	FACU	Problematic H	Hvdrophytic V	egetati	on¹ (Expl	ain)
5. Solidago canadensis	2	No	FACU	¹ Indicators of hydr be present, unless	ric soil and we	etland h	nydrology	
7	_			Definitions of Ve			mano.	
3.					_			
).				Tree – Woody pla diameter at breast				height.
10 11				Sapling/shrub – and greater than o				DBH
12	_			Herb – All herbac			_	ardles
Woody Vine Stratum (Plot size: 30 ft	96	_=Total Cover		of size, and woody				
<u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> 1.)			Woody vines – A height.	II woody vine:	s great	er than 3	.28 ft ir
2.	_							
3.				Hydrophytic Vegetation	V	NI.	V	
4		Tatal Cause		Present?	Yes	NO.	<u> </u>	
		_=Total Cover						

Som trolled Unclassified	Information	(CUI)
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Sampling Point: 4B

Profile Description Depth	Matrix	- ine ac			x Featur			J alc ab3c1	.co or man			
	olor (moist)	%	Color	(moist)	%	Type ¹	Loc ²	Texture		Rem	arks	
0-18	10YR 2/1	100						Loamy/Clayey	,			
1Tyrac C. Canaant	ration D Dank	otion DA	A Doduce	d Matrix N		Lod Con	d Crains	21 apptis		alinina M N	Actrix	
¹ Type: C=Concent Hydric Soil Indica		ellon, Kr	vi=Reduce	u iviatrix, iv	/IS=IVIASI	keu San	d Grains.			e Lining, M=N		
Histosol (A1)	.015.		Dark	Surface (S 7)					_	., MLRA 149E	3/
Histic Epipedor	n (A2)					ce (S8) (IRRR				33) (LRR K, L	
Black Histic (A:				yvalue Below Surface (S8) (LRR R, ILRA 149B)					-		8) (LRR K, L)	
Hydrogen Sulfi				n Dark Surface (S9) (LRR R, MLRA 1					-	face (S9) (LR		,
Stratified Layer				h Chroma Sands (S11) (LRR K, L)							12) (LRR K, L	_, R)
Depleted Below		(A11)		amy Mucky Mineral (F1) (LRR K, L) Piedmont Floodplain Soils (F1								
Thick Dark Sur		` ,		ny Gleyed			, ,				outside MLR	
Mesic Spodic (A17)			leted Matri		,				Dark Surface		,
(MLRA 144)	A, 145, 149B)		Red	ox Dark Sι	urface (F	6)		Oth	er (Explain	in Remarks)		
Sandy Mucky N	/lineral (S1)		Dep	leted Dark	Surface	(F7)						
Sandy Gleyed	Matrix (S4)		Red	ox Depres	sions (F	3)						
Sandy Redox (S5)		Marl	(F10) (LR	R K, L)			³ Inc	dicators of h	nydrophytic ve	egetation and	
Stripped Matrix	(S6)		Red	Parent Ma	aterial (F	21) (ML l	RA 145)	V	vetland hyd	rology must b	e present,	
								u	ınless distu	rbed or proble	ematic.	
Restrictive Layer (-											
Type:	Grav	el										
Depth (inches):		18						Hydric Soil P	resent?	Yes	No _>	(
Remarks:												
Soil is disturbed.												

See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

Project/Site: Harbor Island	City/County: Grand Haven city/ Ottawa County						
Applicant/Owner: City of Grand Haven	State: MI Sampling Point: 5A						
Investigator(s): Andrea Cline, Andrew Byks	Section, Township, Range: 20, 008N, 016W						
	Il relief (concave, convex, none): None Slope %: 2						
Subregion (LRR or MLRA): LRR L, MLRA 97 43 43.071391	Long: -86.23169554 Datum: WGS 1984						
Soil Map Unit Name: Made land	NWI classification:						
·							
Are climatic / hydrologic conditions on the site typical for this time of year?							
Are Vegetation, SoilX_, or Hydrologysignificantly distu							
Are Vegetation, Soil, or Hydrologynaturally problem	natic? (If needed, explain any answers in Remarks.)						
SUMMARY OF FINDINGS – Attach site map showing sar	mpling point locations, transects, important features, etc.						
Hydrophytic Vegetation Present? Yes X No Hydric Soil Present? Yes X No Wetland Hydrology Present? Yes X No	Is the Sampled Area within a Wetland? Yes X No If yes, optional Wetland Site ID:						
Remarks: (Explain alternative procedures here or in a separate report.)							
HYDROLOGY							
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)						
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)						
Surface Water (A1)Water-Stained Leaves	(B9) Drainage Patterns (B10)						
High Water Table (A2) Aquatic Fauna (B13)	Moss Trim Lines (B16)						
Saturation (A3)Marl Deposits (B15)	Dry-Season Water Table (C2)						
Water Marks (B1) Hydrogen Sulfide Odor							
	es on Living Roots (C3) Saturation Visible on Aerial Imagery (C9)						
Drift Deposits (B3) Presence of Reduced I	· · · · · · · · · · · · · · · · · · ·						
Algal Mat or Crust (B4) Recent Iron Reduction This Music Surface (C7)							
Iron Deposits (B5) Thin Muck Surface (C7 Inundation Visible on Aerial Imagery (B7) Other (Explain in Rema							
Inundation Visible on Aerial Imagery (B7) Other (Explain in Rema Sparsely Vegetated Concave Surface (B8)	X FAC-Neutral Test (D5)						
Field Observations:	A TAO Noutial Test (Bo)						
Surface Water Present? Yes No X Depth (inches)).						
Water Table Present? Yes No X Depth (inches)							
Saturation Present? Yes No X Depth (inches)							
(includes capillary fringe)							
Describe Recorded Data (stream gauge, monitoring well, aerial photos, p	revious inspections), if available:						
Remarks:							
ENG FORM 6116-8, JUL 2018							

Tree Stratum (Plot size:30 ft) 1 2.	% Cover	Species?	Status	
_			Otatao	Dominance Test worksheet:
2	_			Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
3				Total Number of Dominant Species Across All Strata: 2 (B)
5	_	·		Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)
7				Prevalence Index worksheet:
<i>.</i>	_	=Total Cover		Total % Cover of: Multiply by:
Sapling/Shrub Stratum (Plot size: 15 ft		- Total Gover		OBL species 0 x 1 = 0
1.	_'			FACW species 50 x 2 = 100
•				FAC species 50 x 3 = 150
				FACU species 5 x 4 = 20
4				
4				UPL species 0 x 5 = 0
5.	_			Column Totals: 105 (A) 270 (B
6.				Prevalence Index = B/A = 2.57
7				Hydrophytic Vegetation Indicators:
		=Total Cover		1 - Rapid Test for Hydrophytic Vegetation
Herb Stratum (Plot size: 5 ft)				X 2 - Dominance Test is >50%
Phalaris arundinacea	50	Yes	FACW	X 3 - Prevalence Index is ≤3.0 ¹
2. Panicum virgatum	50	Yes	FAC	4 - Morphological Adaptations (Provide supporting
3. Cirsium arvense	5	No	FACU	data in Remarks or on a separate sheet)
4	_			Problematic Hydrophytic Vegetation ¹ (Explain)
5.				¹ Indicators of hydric soil and wetland hydrology must
6				be present, unless disturbed or problematic. Definitions of Vegetation Strata:
8.				
9.				Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
10 11.				Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
12.				Herb – All herbaceous (non-woody) plants, regardless
	105	=Total Cover		of size, and woody plants less than 3.28 ft tall.
Woody Vine Stratum (Plot size: 30 ft 1.	_)			Woody vines – All woody vines greater than 3.28 ft in height.
2.	_			<u> </u>
3.	_			Hydrophytic
4.				Vegetation Present? Yes X No
T	_	=Total Cover		100 <u>X</u> 100
		- 10tal 00VEI		

trolled Unclassified Information (CUI)
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Sampling	Point:	5A
Jannymig		٥, ١

Profile Descriptio	n: (Describe to	the dep	oth needed to docu	ment th	ne indica	ator or co	onfirm the absence of indicators.)				
Depth	Matrix		Redox	c Featur	es						
(inches) C	olor (moist)	<u>%</u>	Color (moist)	%	Type ¹	Loc ²	Texture Remarks				
0-4	10YR 2/1	100					Loamy/Clayey				
4-12	10YR 2/1	60	10YR 5/6	40	RM	М	Loamy/Clayey				
			·								
		—					·	—			
	_							—			
		—						—			
¹ Type: C=Concent	tration D=Deple	tion RM	=Reduced Matrix, M	 IS=Masi	ked Sand	d Grains	² Location: PL=Pore Lining, M=Matrix.	_			
Hydric Soil Indica		don, raw	-readood Matrix, iv	- Mao	nou can	2 01411101	Indicators for Problematic Hydric Soils ³ :				
Histosol (A1)			Dark Surface (S7)			2 cm Muck (A10) (LRR K, L, MLRA 149B)				
Histic Epipedo	n (A2)		Polyvalue Belo	w Surfa	ce (S8) (LRR R,	5 cm Mucky Peat or Peat (S3) (LRR K, L, R	()			
Black Histic (A	.3)	•	MLRA 149B))			Polyvalue Below Surface (S8) (LRR K, L)				
Hydrogen Sulfi	ide (A4)	·	Thin Dark Surfa				149B) Thin Dark Surface (S9) (LRR K, L)				
X Stratified Laye		,	High Chroma S			-	Iron-Manganese Masses (F12) (LRR K, L, F				
	w Dark Surface	(A11)	Loamy Mucky I			R K, L)	Piedmont Floodplain Soils (F19) (MLRA 149				
Thick Dark Sur		•	Loamy Gleyed		F2)		Red Parent Material (F21) (outside MLRA 145				
Mesic Spodic (A 17) A, 145, 149B)		Depleted Matrix Redox Dark Su		·6)		Very Shallow Dark Surface (F22) Other (Explain in Remarks)				
Sandy Mucky I	•		Depleted Dark				Outer (Explain in Remarks)				
Sandy Gleyed			Redox Depress								
Sandy Redox (` '	•	 Marl (F10) (LR l		,		³ Indicators of hydrophytic vegetation and				
Stripped Matrix	k (S6)	,	Red Parent Ma	terial (F	21) (MLF	RA 145)	wetland hydrology must be present,				
							unless disturbed or problematic.				
Restrictive Layer	(if observed):										
Type:											
Depth (inches)	:						Hydric Soil Present? Yes X No	-			
Remarks:							-				
							soil is hydric based on the hydric soil definition: "a soil that				
Soil is disturbed.	illions of salural	1011, 11000	ing or ponding long	enougn	during ti	ne growin	ng season to develop anaerobic conditions in the upper pa	л.			

See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

Project/Site: Harbor Island	City/County: Grand Haven city/ Ottawa County					
Applicant/Owner: City of Grand Haven	State: MI Sampling Point: 5B					
Investigator(s): Andrea Cline, Andrew Byks	Section, Township, Range: 20, 008N, 016W					
-	I relief (concave, convex, none): None Slope %: 0					
Subregion (LRR or MLRA): LRR L, MLRA 97 43 43.071187	Long: -86.23199734 Datum: WGS 1984					
Soil Map Unit Name: Houghton-Adrian mucks, lake moderated, 0 to 1 per						
Are climatic / hydrologic conditions on the site typical for this time of year?						
	· · · · · · · · · · · · · · · · ·					
Are Vegetation, SoilX , or Hydrology significantly disturbed.						
Are Vegetation, Soil, or Hydrologynaturally problem						
SUMMARY OF FINDINGS – Attach site map showing sar	mpling point locations, transects, important features, etc.					
Hydrophytic Vegetation Present? Yes No X	Is the Sampled Area					
Hydric Soil Present? Yes X No	within a Wetland? Yes No _X					
Wetland Hydrology Present? Yes No X	If yes, optional Wetland Site ID:					
Remarks: (Explain alternative procedures here or in a separate report.)						
HYDROLOGY						
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)					
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)					
Surface Water (A1) Water-Stained Leaves						
High Water Table (A2) Aquatic Fauna (B13)	Moss Trim Lines (B16)					
Saturation (A3) Marl Deposits (B15)	Dry-Season Water Table (C2)					
Water Marks (B1) Hydrogen Sulfide Odor	(C1) Crayfish Burrows (C8)					
Sediment Deposits (B2) Oxidized Rhizospheres						
Drift Deposits (B3) Presence of Reduced I						
Algal Mat or Crust (B4) Recent Iron Reduction						
Iron Deposits (B5) Thin Muck Surface (C7						
Inundation Visible on Aerial Imagery (B7) Other (Explain in Rema						
Sparsely Vegetated Concave Surface (B8)	FAC-Neutral Test (D5)					
Field Observations: Surface Water Present? Yes No X Depth (inches)	1.					
Surface Water Present? Yes No X Depth (inches) Water Table Present? Yes No X Depth (inches)						
Saturation Present? Yes No X Depth (inches)						
(includes capillary fringe)	Total Indiana Hydrology Freschi:					
Describe Recorded Data (stream gauge, monitoring well, aerial photos, pl	revious inspections), if available:					
Remarks:						
ENG FORM 6116-8, JUL 2018						

AEGETAHONUNGASSIGIAAH NAFAEGAA	Absolute	Dominant	Indicator		Sampling Poir				
<u>Tree Stratum</u> (Plot size:30 ft)	% Cover	Species?	Status	Dominance Test	worksheet:				
1				Number of Domina	•				
2	·			That Are OBL, FA	CW, or FAC:	0	_(A)		
3 4	-			Total Number of D Species Across A		1	_(B)		
5.6.				Percent of Domina		0.0%	(A/B)		
7.				Prevalence Index	worksheet:				
		=Total Cover		Total % Cov	er of:	Multiply by:			
Sapling/Shrub Stratum (Plot size: 15 ft)			OBL species	0 x 1	= 0			
1.				FACW species	5 x 2	= 10			
2				FAC species	15 x 3	= 45			
3.				FACU species	97 x 4	= 388			
4.				UPL species	5 x 5	= 25			
5				Column Totals:	122 (A)	468	(B)		
6.				Prevalence	Index = B/A =	3.84			
7.				Hydrophytic Veg	etation Indicato	rs:	<u> </u>		
		=Total Cover		1 - Rapid Tes	t for Hydrophytic	Vegetation			
Herb Stratum (Plot size: 5 ft)				2 - Dominance	e Test is >50%				
1. Phalaris arundinacea	5	No	FACW	3 - Prevalence	e Index is ≤3.0 ¹				
2. Panicum virgatum	15	No	FAC	4 - Morpholog	ical Adaptations	¹ (Provide su	pporting		
3. Poa pratensis	95	Yes	FACU	data in Remarks or on a separate sheet)					
4. Daucus carota	5	No	UPL	Problematic H	lydrophytic Vege	tation ¹ (Expl	lain)		
5. Cirsium arvense6.	2	<u>No</u>	FACU	¹ Indicators of hydr be present, unless			must		
7				Definitions of Ve	•				
8.									
9.				Tree – Woody pla diameter at breast			height.		
10 11				Sapling/shrub – v			DBH		
12.									
	122	=Total Cover		Herb – All herbace of size, and woody	` .	,	jardless		
Woody Vine Stratum (Plot size: 30 ft)	•		Woody vines – A	•		.28 ft in		
1.				height.					
2.				Hydrophytic					
3.				Vegetation					
4				Present?	Yes	No <u>X</u>			
		=Total Cover							

Som trolled Unclassified	Information	(CUI)
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	ription: (Describe	to the dep	th needed to doc	ument tl	he indica	ator or co	onfirm th	ne absence of indi	icators.)	
Depth	Matrix			x Featur		. 3				
inches)	Color (moist)	<u>%</u>	Color (moist)	%	Type ¹	Loc ²	Te	exture	Remarks	
0-2	10YR 2/2	100					Loam	y/Clayey		
2-16	10YR 2/1	100					Loam	y/Clayey		
						_				
		·								
Type: C=Co	ncentration, D=Dep	letion, RM	Reduced Matrix, N	MS=Mas	ked Sand	d Grains.		² Location: PL=Po	ore Lining, M=Matri	X.
ydric Soil II		·	·						oblematic Hydric	
Histosol ((A1)	_	Dark Surface ((S7)				2 cm Muck (A	(10) (LRR K, L, M L	RA 149B)
Histic Epi	pedon (A2)		Polyvalue Belo	w Surfa	ce (S8) (LRR R,		5 cm Mucky F	Peat or Peat (S3) (I	LRR K, L, R)
Black His	tic (A3)		MLRA 149B	3)				Polyvalue Bel	ow Surface (S8) (L	.RR K, L)
Hydroger	Sulfide (A4)	_	Thin Dark Surf	ace (S9)	(LRR R	, MLRA 1	49B)	Thin Dark Su	rface (S9) (LRR K,	L)
Stratified	Layers (A5)		High Chroma	Sands (S	311) (LR I	R K, L)		Iron-Mangane	ese Masses (F12) (LRR K, L, R)
Depleted	Below Dark Surface	e (A11)	Loamy Mucky	Mineral	(F1) (LR	R K, L)		Piedmont Flo	odplain Soils (F19)	(MLRA 149B)
Thick Da	rk Surface (A12)	•	Loamy Gleyed	Matrix (F2)			Red Parent M	laterial (F21) (outs	ide MLRA 145
Mesic Sp	odic (A17)	•	Depleted Matri	ix (F3)				Very Shallow	Dark Surface (F22)
(MLRA	A 144A, 145, 149B)	•	Redox Dark Si	urface (F	⁻ 6)			Other (Explain	n in Remarks)	
Sandy M	ucky Mineral (S1)	-	Depleted Dark	Surface	(F7)					
Sandy GI	eyed Matrix (S4)	-	Redox Depres							
Sandy Re		•	 Marl (F10) (LR		,			³ Indicators of	hydrophytic vegeta	ation and
	Matrix (S6)	-	Red Parent Ma	aterial (F	21) (ML F	RA 145)		-	drology must be pre urbed or problemat	
estrictive L	ayer (if observed):									
	ches):						Hydri	c Soil Present?	Yes X	No
Depth (in										

ENG FORM 6116-8, JUL 2018 **Controlled Unclassified Information (CUI)**

See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

Project/Site: Harbor Island	City/County: Grand Haven city/ Ottawa County Sampling Date: 2024-04-25					
Applicant/Owner: City of Grand Haven	State: MI Sampling Point: 6A					
Investigator(s): Andrea Cline, Andrew Byks	Section, Township, Range: 20, 008N, 016W					
	relief (concave, convex, none): Concave Slope %: 2					
Subregion (LRR or MLRA): LRR L, MLRA 97 43 43.071493	Long: -86.23517233 Datum: WGS 1984					
Soil Map Unit Name: Made land	NWI classification: R2UBH					
Are climatic / hydrologic conditions on the site typical for this time of year?						
Are Vegetation, SoilX, or Hydrology significantly disturb						
Are Vegetation, Soil, or Hydrologynaturally problema						
SUMMARY OF FINDINGS – Attach site map showing sam	pling point locations, transects, important features, etc.					
Hydrophytic Vegetation Present? Yes X No	Is the Sampled Area					
Hydric Soil Present? Yes X No	within a Wetland? Yes X No					
Wetland Hydrology Present? Yes X No	If yes, optional Wetland Site ID:					
Remarks: (Explain alternative procedures here or in a separate report.)						
HYDROLOGY						
	Considerate legislature (estimate un efficient de la considerate)					
Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6)					
Surface Water (A1) Water-Stained Leaves (E						
High Water Table (A2) Aquatic Fauna (B13)	Moss Trim Lines (B16)					
Saturation (A3) Marl Deposits (B15)	Dry-Season Water Table (C2)					
Water Marks (B1) Hydrogen Sulfide Odor (
Sediment Deposits (B2) Oxidized Rhizospheres of						
Drift Deposits (B3) Presence of Reduced Iro	——————————————————————————————————————					
Algal Mat or Crust (B4) Recent Iron Reduction in	n Tilled Soils (C6) X Geomorphic Position (D2)					
Iron Deposits (B5) Thin Muck Surface (C7)	Shallow Aquitard (D3)					
Inundation Visible on Aerial Imagery (B7)Other (Explain in Remark	· · · · · · · · · · · · · · · · · · ·					
Sparsely Vegetated Concave Surface (B8)	FAC-Neutral Test (D5)					
Field Observations:						
Surface Water Present? Yes No X Depth (inches):						
Water Table Present? Yes No X Depth (inches):						
Saturation Present? Yes X No Depth (inches): (includes capillary fringe)	12 Wetland Hydrology Present? Yes X No					
Describe Recorded Data (stream gauge, monitoring well, aerial photos, pre	avious inspections) if available:					
Describe Necorded Data (stream gauge, monitoring well, aerial priotos, pre	svious irrspections), ir available.					
Remarks:						
ENG FORM 6116-8, JUL 2018						

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test	worksheet:			
1. Populus deltoides 2.	5	Yes	FAC	Number of Domin That Are OBL, FA			2	(A)
3. 4.				Total Number of D	Dominant		3	_(B)
5				Percent of Domina That Are OBL, FA		: 6	66.7%	(A/B)
7.				Prevalence Index	worksheet			
	<u> </u>	=Total Cover		Total % Cov	er of:	Mu	Itiply by:	
Sapling/Shrub Stratum (Plot size: 15 ft)			OBL species	10		10	
1.	-			FACW species	30	x 2 =	60	
2.				FAC species		x 3 =	15	
3.				FACU species		x 4 =	80	
4.				UPL species	0	x 5 =	0	
5.				Column Totals:	65	(A)	165	— (B)
6.				_	Index = B/A	` ′ -		` ` ′
7.				Hydrophytic Veg	etation Indic	ators:		
		=Total Cover		1 - Rapid Tes			etation	
Herb Stratum (Plot size: 5 ft)				X 2 - Dominanc		-	,	
Dipsacus laciniatus	5	No	FACU	X 3 - Prevalence				
Iris pseudacorus		No	OBL	4 - Morpholog			ovide su	pporting
Cirsium arvense		No	FACU		narks or on a			
Galium aparine	10	Yes	FACU	Problematic H	lvdrophytic V	egetation	on¹ (Expla	ain)
5. Phalaris arundinacea	30	Yes	FACW	I		_		
6. Scirpus atrovirens	5	No	OBL	¹ Indicators of hydronic be present, unless				must
7.				Definitions of Ve				
8.	_			Tree – Woody pla	nts 3 in. (7.6	cm) or	more in	
9				diameter at breas	t height (DBH	l), regar	dless of	height.
10 11				Sapling/shrub – and greater than of				DBH
12.		Tatal Cause		Herb – All herbac				ardless
Woody Vino Stratum (Plataire) 20 ft	60	=Total Cover		of size, and wood	y piants iess	tnan 3.2	28 IT TAII.	
Woody Vine Stratum (Plot size:30 ft1.	_' 			Woody vines – A height.	ll woody vine	s greate	er than 3.	.28 ft in
2	_							
3.				Hydrophytic Vegetation				
4				_	Yes X	No_		
		=Total Cover						

Som trolled Unclassified	Information	(CUI)
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Sampling Point 6A

	-	to the de	-			ator or co	onfirm the absence o	f indicators.)
Depth (inches)	Matrix	0/		x Featur		Loc ²	Touturo	Domorko
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc	Texture	Remarks
0-12	10R 4/3	100					Sandy	
12-18	10YR 2/1	75	10YR 3/6	25	RM	M	Sandy	
¹ Type: C=Co	ncentration, D=Dep	letion, RI	M=Reduced Matrix, N	MS=Mas	ked Sand	d Grains.	² Location: F	PL=Pore Lining, M=Matrix.
Hydric Soil I		·	·					or Problematic Hydric Soils ³ :
Histosol ((A1)		Dark Surface (uck (A10) (LRR K, L, MLRA 149B)
I —	ipedon (A2)		Polyvalue Beld		ce (S8) (LRR R,		ucky Peat or Peat (S3) (LRR K, L, R)
Black His			MLRA 149B	•	. /			ue Below Surface (S8) (LRR K, L)
I —	Sulfide (A4)		Thin Dark Surf					rk Surface (S9) (LRR K, L)
l —	Layers (A5) Below Dark Surface	a (Δ11)	High Chroma S Loamy Mucky			-		nganese Masses (F12) (LRR K, L, R) nt Floodplain Soils (F19) (MLRA 149B)
I —	rk Surface (A12)	- (A11)	Loamy Gleyed			ι κ ικ, ∟)		rent Material (F21) (outside MLRA 145)
	odic (A17)		Depleted Matr		,			allow Dark Surface (F22)
	A 144A, 145, 149B)		Redox Dark S		6)			Explain in Remarks)
Sandy M	ucky Mineral (S1)		Depleted Dark	Surface	(F7)			
	leyed Matrix (S4)		Redox Depres		8)		2	
	edox (S5)		Marl (F10) (LR					ors of hydrophytic vegetation and
Stripped	Matrix (S6)		Red Parent Ma	aterial (F	21) (ML F	RA 145)		nd hydrology must be present, s disturbed or problematic.
Restrictive L	ayer (if observed):						unless	s disturbed of problematic.
Type:	, (
Depth (in	ches):						Hydric Soil Prese	nt? Yes X No
Remarks:	· · · · · · · · · · · · · · · · · · ·		<u> </u>				I .	
Soil is disturb	ed.							
ENG FORM OF	46.0 1111 0040							
ENG FORM 61	16-8. JUL 2018							

See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

Project/Site: Harbor Island	City/County: Grand Haven city/ Ottawa County Sampling Date: 2024-04-25
Applicant/Owner: City of Grand Haven	State: MI Sampling Point: 6B
Investigator(s): Andrea Cline, Andrew Byks	Section, Township, Range: 20, 008N, 016W
	cal relief (concave, convex, none): Convex Slope %: 5
Subregion (LRR or MLRA): LRR L, MLRA 97 43 43.071532	2 Long: -86.2350677 Datum: WGS 1984
Soil Map Unit Name: Made land	NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year	r? Yes X No (If no, explain in Remarks.)
Are Vegetation, Soil _ X _, or Hydrology significantly dist	
Are Vegetation , Soil , or Hydrology naturally proble	<u> </u>
<u> </u>	ampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No X	Is the Sampled Area
Hydric Soil Present? Westland Hydrology Present? Yes No X	within a Wetland? Yes No X
Wetland Hydrology Present? Yes No X	If yes, optional Wetland Site ID:
Remarks: (Explain alternative procedures here or in a separate report.)	'
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
Surface Water (A1)Water-Stained Leaves	ps (B9) Drainage Patterns (B10)
High Water Table (A2) Aquatic Fauna (B13)	
Saturation (A3) Marl Deposits (B15)	Dry-Season Water Table (C2)
Water Marks (B1) Hydrogen Sulfide Odd	
	es on Living Roots (C3) Saturation Visible on Aerial Imagery (C9)
Drift Deposits (B3) Presence of Reduced	
Algal Mat or Crust (B4)Recent Iron Reduction	
Iron Deposits (B5) Thin Muck Surface (C	
Inundation Visible on Aerial Imagery (B7) Other (Explain in Rem	
Sparsely Vegetated Concave Surface (B8)	FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No X Depth (inches	
Water Table Present? Yes No X Depth (inchest Saturation Present? Yes No X Depth (inchest Saturation Present)	
Saturation Present? Yes No _X Depth (inchest includes capillary fringe)	es): Wetland Hydrology Present? Yes No _X
Describe Recorded Data (stream gauge, monitoring well, aerial photos,	nrevious inspections) if available:
Describe Necorded Data (Stream gauge, memoring wen, denat proces,	previous inspections, in available.
Remarks:	
ENG FORM 6116-8, JUL 2018	

<u>Tree Stratum</u> (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:		
1 2				Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
3. 4.				Total Number of Dominant Species Across All Strata:	1	(B)
5				Percent of Dominant Species That Are OBL, FACW, or FAC:	0.0%	(A/B)
7.				Prevalence Index worksheet:		<u> </u>
		=Total Cover		Total % Cover of:	Multiply by:	
Sapling/Shrub Stratum (Plot size: 15 ft)	•		OBL species 0 x 1	1 = 0	
1.	•′				2 = 0	
2.				FAC species 0 x 3		
3.				FACU species 115 x 4		
4.				-	5 = 85	
5.		· <u></u>		Column Totals: 132 (A)) 545	— (B)
6.				Prevalence Index = B/A =		
7.				Hydrophytic Vegetation Indicate	ors:	
		=Total Cover		1 - Rapid Test for Hydrophytic	C Vegetation	
Herb Stratum (Plot size: 5 ft)		•		2 - Dominance Test is >50%		
1. Daucus carota	10	No	UPL	3 - Prevalence Index is ≤3.0 ¹		
2. Alliaria petiolata	5	No	FACU	4 - Morphological Adaptations	s ¹ (Provide sup	porting
3. Verbascum thapsus	2	No	UPL	data in Remarks or on a se	eparate sheet)	
4. Poa pratensis	90	Yes	FACU	Problematic Hydrophytic Vege	etation ¹ (Expla	ain)
5. Digitaria sanguinalis	10	No	FACU	¹ Indicators of hydric soil and wetla	and budgeless.	must
6. Dipsacus laciniatus	10	No	FACU	be present, unless disturbed or pre-		must
7. Hypericum perforatum	5	No	UPL	Definitions of Vegetation Strata	:	
8	_			Tree – Woody plants 3 in. (7.6 cm diameter at breast height (DBH), r		heiaht
10.				Sapling/shrub – Woody plants le		
11	_			and greater than or equal to 3.28 to		5511
12	132	=Total Cover		Herb – All herbaceous (non-wood of size, and woody plants less tha		ardless
Woody Vine Stratum (Plot size: 30 ft)	, – rotal Gover		Woody vines – All woody vines g		28 ft in
1.				height.	reater triair 5.	20 11 111
2.						
3.				Hydrophytic Vegetation		
4.				_	No X	
		=Total Cover				

≲o ntroll	led Unclassifie	ed Info	rmation (CL	JI) <u>.</u>				Sampling Po	int: 6B	1
	scription: (Describe	to the de	-		icator or c	onfirm th	ne absence of indi	cators.)		
Depth (inches)	Matrix Color (moist)	%	Color (moist)	ox Features % Type	Loc ²	Te	exture	Rem	arks	
•										
0-18	10YR 2/1	100		· — —		S	andy			
	-			· — —		•				
	-	·		·						
	_					-				
	_									
	-									
	_			· — —		•				
¹ Type: C=C	Concentration, D=Depl	letion, RM	1=Reduced Matrix, I	MS=Masked Sa	ınd Grains.		² Location: PL=Pc	re Lining, M=N	latrix.	
Hydric Soil	Indicators:						Indicators for Pr	oblematic Hyd	ric Soils³:	
Histoso			Dark Surface					10) (LRR K, L		
	Epipedon (A2)			ow Surface (S8) (LRR R,			Peat or Peat (S		
	listic (A3)		MLRA 149E	•	D MI DA	140B)		ow Surface (S8		-)
	en Sulfide (A4) ed Layers (A5)			face (S9) (LRR Sands (S11) (L		149B)		face (S9) (LRF se Masses (F1		I D)
	ed Below Dark Surface	(A11)		Mineral (F1) (L	-			odplain Soils (F		
	Oark Surface (A12)	, (, (, , ,	Loamy Gleyed		,			aterial (F21) (c		
	Spodic (A17)		Depleted Matr					Dark Surface (
(MLI	RA 144A, 145, 149B)		Redox Dark S	urface (F6)			Other (Explain	n in Remarks)		
Sandy l	Mucky Mineral (S1)		Depleted Dark	Surface (F7)						
	Gleyed Matrix (S4)		Redox Depres	, ,			2			
	Redox (S5)		Marl (F10) (LF					hydrophytic ve		l
Strippe	d Matrix (S6)		Red Parent M	aterial (F21) (M	LRA 145)			drology must be urbed or proble		
Restrictive	Layer (if observed):					1	uniess disti	inbed of proble	mauc.	
Type:	Luyer (ii observeu).									
	(inches):					Hydri	c Soil Present?	Yes	No:	X
						yu				<u> </u>
Remarks: Soil is distu	rhed									
Soil is distu	rbed.									

See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

Project/Site: Harbor Island	City/County: Grand Haven city/ Ottawa County Sampling Date: 2024-04-26						
Applicant/Owner: City of Grand Haven	State: MI Sampling Point: 7A						
Investigator(s): Andrea Cline, Andrew Byks	Section, Township, Range: 20, 008N, 016W						
Landform (hillside, terrace, etc.): Flat Local r	relief (concave, convex, none): Concave Slope %: 1						
Subregion (LRR or MLRA): LRR L, MLRA 97 43 43.070022	Long: -86.22826417 Datum: WGS 1984						
Soil Map Unit Name: Made land	NWI classification: N/A						
Are climatic / hydrologic conditions on the site typical for this time of year?	Yes X No (If no, explain in Remarks.)						
Are Vegetation, Soil, or Hydrologysignificantly disturb							
Are Vegetation, Soil, or Hydrologynaturally problema							
SUMMARY OF FINDINGS – Attach site map showing sam	ipling point locations, transects, important features, etc.						
Hydrophytic Vegetation Present? Yes X No	Is the Sampled Area						
Hydric Soil Present? Yes X No	within a Wetland? Yes X No						
Wetland Hydrology Present? Yes X No	If yes, optional Wetland Site ID:						
Remarks: (Explain alternative procedures here or in a separate report.)							
L HYDROLOGY							
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)						
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)						
Surface Water (A1) Water-Stained Leaves (E							
High Water Table (A2) Aquatic Fauna (B13)	Moss Trim Lines (B16)						
Saturation (A3) Marl Deposits (B15)	Dry-Season Water Table (C2)						
Water Marks (B1) Hydrogen Sulfide Odor (
Sediment Deposits (B2) Oxidized Rhizospheres of	on Living Roots (C3) Saturation Visible on Aerial Imagery (C9)						
Drift Deposits (B3) Presence of Reduced Iro	d Iron (C4) Stunted or Stressed Plants (D1)						
Algal Mat or Crust (B4)Recent Iron Reduction in	n Tilled Soils (C6) X Geomorphic Position (D2)						
Iron Deposits (B5) Thin Muck Surface (C7)	Shallow Aquitard (D3)						
X Inundation Visible on Aerial Imagery (B7) Other (Explain in Remark	· · · · · · · · · · · · · · · · · · ·						
Sparsely Vegetated Concave Surface (B8)	X FAC-Neutral Test (D5)						
Field Observations:							
Surface Water Present? Yes No X Depth (inches):							
Water Table Present? Yes No X Depth (inches):							
Saturation Present? Yes X No Depth (inches):	12 Wetland Hydrology Present? Yes X No						
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, pre	avious inspections) if available:						
Describe Recorded Bata (Stream gauge, monitoring well, acrial photos, pre	vious inspections), ii available.						
Remarks:							

VEGETAHONUNGA SSIFIAA INFAKSA FIANS (CUI)	
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ÆGETATION UNGE SSIEINATIC INJIAESOF DI	ants(COI)	•		Sampling Point:	7A		
Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:			
1. Acer saccharinum	5	Yes	FACW	Number of Dominant Species			
2. Acer negundo	10	Yes	FAC	That Are OBL, FACW, or FAC:	6 (A)		
3. Populus deltoides	5	Yes	FAC	Total Number of Dominant	_		
4.				Species Across All Strata:	7 (B)		
5.		·		Percent of Dominant Species			
6.		,		•	85.7% (A/B)		
7.				Prevalence Index worksheet:			
	20	=Total Cover		Total % Cover of: Mu	ultiply by:		
Sapling/Shrub Stratum (Plot size: 15 ft)	-	•		OBL species 70 x 1 =	70		
1. Lonicera morrowii	5	Yes	FACU	FACW species 32 x 2 =	64		
Cornus sericea	2	Yes	FACW	FAC species 15 x 3 =	45		
3.				FACU species 15 x 4 =	60		
4.		-		UPL species 0 x 5 =	0		
5.		-		Column Totals: 132 (A)	239 (B)		
6.				Prevalence Index = B/A =	1.81		
7.							
·	7	Total Cover		Hydrophytic Vegetation Indicators:			
Hards Officer (Dietaine) Eff	7	_=Total Cover		1 - Rapid Test for Hydrophytic Ve	getation		
Herb Stratum (Plot size: 5 ft)	70		001	X 2 - Dominance Test is >50%			
1. Typha angustifolia	70	Yes	OBL	X 3 - Prevalence Index is ≤3.0 ¹			
2. Phalaris arundinacea	25	Yes	FACW	4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)			
3. Nepeta cataria	5	<u>No</u>	FACU	·	,		
4. Arctium minus	5	No	FACU	Problematic Hydrophytic Vegetati	on ¹ (Explain)		
5 6.				¹ Indicators of hydric soil and wetland be present, unless disturbed or proble			
7.	-			Definitions of Vegetation Strata:			
8.							
9.				Tree – Woody plants 3 in. (7.6 cm) or diameter at breast height (DBH), rega			
10.					-		
				Sapling/shrub – Woody plants less to and greater than or equal to 3.28 ft (1			
42		• ——					
12.	105	Total Cover		Herb – All herbaceous (non-woody) p	-		
Manada Mina Chrotism (Diot cizo: 30 ft)	105	_=Total Cover		of size, and woody plants less than 3.			
Woody Vine Stratum (Plot size: 30 ft) 1.				Woody vines – All woody vines great height.	er than 3.28 ft in		
2.	· <u> </u>						
3.				Hydrophytic			
4.				Vegetation Present? Yes X No			
···	1	=Total Cover					
		- 10161 00101					

Som trolled Unclassified	Information	(CUI)
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Sampling Point: 7A

Depth	Matrix		-	dox Featu	res		onfirm the absence o	· · · · · · · · · · · · · · · · · · ·
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-4	10YR 2/2	100		_			Loamy/Clayey	
4-8	10YR 2/1	70	10YR 3/6	30	D	M	Loamy/Clayey	
8-18	10R 4/1	70	10YR 3/6	30	D	М	Sandy	
							,	
				_				
					. —			
¹Type: C=Co	oncentration, D=Depl	etion, R	M=Reduced Matrix	k, MS=Mas	sked San	d Grains.	² Location: F	PL=Pore Lining, M=Matrix.
Hydric Soil I	ndicators:						Indicators f	or Problematic Hydric Soils ³ :
Histosol			Dark Surfac					uck (A10) (LRR K, L, MLRA 149B)
	pipedon (A2)		Polyvalue B		ace (S8)	(LRR R,		ucky Peat or Peat (S3) (LRR K, L, R)
Black His			MLRA 14	,	\\	MIDA		ie Below Surface (S8) (LRR K, L)
	n Sulfide (A4) I Layers (A5)		Thin Dark S High Chrom					rk Surface (S9) (LRR K, L) nganese Masses (F12) (LRR K, L, R)
	l Below Dark Surface	(Δ11) د	Loamy Muc			-		nt Floodplain Soils (F19) (MLRA 149B)
	rk Surface (A12)	, (, (, 1, 1,	Loamy Gley	-		I., <i>L</i>)		rent Material (F21) (outside MLRA 145)
	oodic (A17)		X Depleted Ma		(-)			allow Dark Surface (F22)
	A 144A, 145, 149B)		Redox Dark		F6)			Explain in Remarks)
Sandy M	lucky Mineral (S1)		Depleted Da	ark Surface	e (F7)			
Sandy G	leyed Matrix (S4)		Redox Depr	essions (F	8)			
Sandy R	edox (S5)		Marl (F10) (LRR K, L)			³ Indicato	ors of hydrophytic vegetation and
Stripped	Matrix (S6)		Red Parent	Material (F	=21) (ML	.RA 145)		nd hydrology must be present,
Doctrictive I	aver (if absenced).						unless	s disturbed or problematic.
Type:	_ayer (if observed):							
Depth (ir	oches):						Hydric Soil Prese	nt? Yes X No
							Tryunc con riese	103 <u>X</u> 100
Remarks:								
NO FORM O	146 0 1111 2040							

See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

Project/Site: Harbor Island	City/County: Grand Haven city/ Ottawa County Sampling Date: 2024-04-26
Applicant/Owner: City of Grand Haven	State: MI Sampling Point: 7B
Investigator(s): Andrea Cline, Andrew Byks	Section, Township, Range: 20, 008N, 016W
Landform (hillside, terrace, etc.): Flat	Local relief (concave, convex, none): None Slope %: 0
Subregion (LRR or MLRA): LRR L, MLRA 97 43 43.07	· · · · · · · · · · · · · · · · · · ·
Soil Map Unit Name: Made land	NWI classification: N/A
·	
Are climatic / hydrologic conditions on the site typical for this time of	
Are Vegetation, Soil, or Hydrologysignificantly	
Are Vegetation, Soil, or Hydrologynaturally pr	oblematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing	g sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No X	Is the Sampled Area
Hydric Soil Present? Yes No X	within a Wetland? Yes No _X_
Wetland Hydrology Present? Yes No X	If yes, optional Wetland Site ID:
Remarks: (Explain alternative procedures here or in a separate rep	
L HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply	
Surface Water (A1) Water-Stained Le	
High Water Table (A2) Aquatic Fauna (B	Moss Trim Lines (B16)
Saturation (A3) Marl Deposits (B	Dry-Season Water Table (C2)
Water Marks (B1) Hydrogen Sulfide	Odor (C1) Crayfish Burrows (C8)
	heres on Living Roots (C3) Saturation Visible on Aerial Imagery (C9)
Drift Deposits (B3) Presence of Redu	
	uction in Tilled Soils (C6) Geomorphic Position (D2)
Iron Deposits (B5) Thin Muck Surface Other (Fynicin in	
Inundation Visible on Aerial Imagery (B7) Other (Explain in Sparsely Vegetated Concave Surface (B8)	FAC-Neutral Test (D5)
Field Observations:	(D3)
	nches):
Water Table Present? Yes No X Depth (in	nches):
Water Table Present? Yes No X Depth (ir Saturation Present? Yes No X Depth (ir	
(includes capillary fringe)	
Describe Recorded Data (stream gauge, monitoring well, aerial pho	tos, previous inspections), if available:
Remarks:	
ENG FORM 6116-8, JUL 2018	

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:		
Robinia pseudoacacia	5	Yes	FACU			
Acer negundo	_ <u> </u>	Yes	FAC	Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
3.		100	17.0	_		_(',')
4.				Total Number of Dominant Species Across All Strata:	5	(B)
5.				<u> </u>		_ (-/
6.				Percent of Dominant Species That Are OBL, FACW, or FAC:	40.0%	(A/B)
7.				Prevalence Index worksheet:		_ (' ' /
	10	=Total Cover		Total % Cover of: N	fultiply by:	
Sapling/Shrub Stratum (Plot size: 15 ft)	•		OBL species 0 x 1 =		
Lonicera morrowii	-^ 10	Yes	FACU	FACW species 50 x 2 =	100	
2.				FAC species 15 x 3 =	45	
3.				FACU species 60 x 4 =	240	
4.				UPL species 0 x 5 =	0	
5.				Column Totals: 125 (A)	385	(B)
6.				Prevalence Index = B/A =	3.08	
7.				Hydrophytic Vegetation Indicators	:	
	10	=Total Cover		1 - Rapid Test for Hydrophytic V	egetation	
Herb Stratum (Plot size: 5 ft)				2 - Dominance Test is >50%		
1. Phalaris arundinacea	50	Yes	FACW	3 - Prevalence Index is ≤3.0 ¹		
2. Prunella vulgaris	10	No	FAC	4 - Morphological Adaptations ¹ (I		
3. Poa pratensis	25	Yes	FACU	data in Remarks or on a sepa	rate sheet)	
4. Digitaria sanguinalis	10	No	FACU	Problematic Hydrophytic Vegeta	tion ¹ (Expla	ain)
5. Nepeta cataria	5	No	FACU	¹ Indicators of hydric soil and wetland	hydrology	must
6. Alliaria petiolata	5	No	FACU	be present, unless disturbed or probl		
7				Definitions of Vegetation Strata:		
8.	_			Tree – Woody plants 3 in. (7.6 cm) o	or more in	
9				diameter at breast height (DBH), reg	ardless of h	neight.
10				Sapling/shrub – Woody plants less and greater than or equal to 3.28 ft (OBH
12.				Herb – All herbaceous (non-woody)	nlants rega	ardless
		=Total Cover		of size, and woody plants less than 3		ai dicoo
Woody Vine Stratum (Plot size:30 ft1.	_)			Woody vines – All woody vines greatheight.	ater than 3.2	28 ft in
2.						
3.				Hydrophytic Vegetation Present? Yes No	x	
4.				Present? Yes No		

Remarks: (Include photo numbers here or on a separate sheet.)

Som trolled Unclassified	Information	(CUI)
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Sampling Point:

7B

	Depth Desc	Matrix		-	x Featur			onfirm the absence o		,		
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.	(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture		Rema	ırks	
16-18	0-8	10YR 2/2	50	10YR 3/3	50	D	M	Sandy				
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Hydric Soil Indicators: Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Hydrogen Sulfide (A4) Thin Dark Surface (S9) (LRR R, MLRA 149B) High Cepipedon (A5) Depleted Below Dark Surface (A11) Loamy Mucky Mineral (F1) (LRR K, L) Depleted Below Dark Surface (A12) Loamy Mucky Mineral (F1) (LRR K, L) High Chroma Sands (S11) (LRR K, L) Piedmont Floodplain Soils (F19) (MLRA 149B) High Chroma Sands (S11) (LRR K, L) Piedmont Floodplain Soils (F19) (MLRA 149B) High Chroma Sands (S11) (LRR K, L) Piedmont Floodplain Soils (F19) (MLRA 149B) High Chroma Sands (S11) (LRR K, L) Piedmont Floodplain Soils (F19) (MLRA 149B) Hedmont Floodplain Soils (F19) (MLRA 149B) Redox Dark Surface (F6) Sandy Mucky Mineral (S1) Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Red Ox Depressions (F8) Sandy Redox (S5) Marl (F10) (LRR K, L) Pindicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. Restrictive Layer (if observed): Type: Depth (inches): Hydric Soil Present? Yes No X	8-16	10YR 3/3	100					Sandy				
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Hydric Soil Indicators: Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Hydrogen Sulfide (A4) Thin Dark Surface (S9) (LRR R, MLRA 149B) High Cepipedon (A5) Depleted Below Dark Surface (A11) Loamy Mucky Mineral (F1) (LRR K, L) Depleted Below Dark Surface (A12) Loamy Mucky Mineral (F1) (LRR K, L) High Chroma Sands (S11) (LRR K, L) Piedmont Floodplain Soils (F19) (MLRA 149B) High Chroma Sands (S11) (LRR K, L) Piedmont Floodplain Soils (F19) (MLRA 149B) High Chroma Sands (S11) (LRR K, L) Piedmont Floodplain Soils (F19) (MLRA 149B) High Chroma Sands (S11) (LRR K, L) Piedmont Floodplain Soils (F19) (MLRA 149B) Hedmont Floodplain Soils (F19) (MLRA 149B) Redox Dark Surface (F6) Sandy Mucky Mineral (S1) Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Red Ox Depressions (F8) Sandy Redox (S5) Marl (F10) (LRR K, L) Pindicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. Restrictive Layer (if observed): Type: Depth (inches): Hydric Soil Present? Yes No X	16-18	10YR 6/4	50	10YR 3/3	50			Sandy				
Hydric Soil Indicators: Histosol (A1) Dark Surface (S7) Polyvalue Below Surface (S8) (LRR R, Black Histic (A3) MLRA 149B) Thin Dark Surface (S9) (LRR R, MLRA 149B) Polyvalue Below Surface (S8) (LRR R, Black Histic (A3) MLRA 149B) Thin Dark Surface (S9) (LRR R, MLRA 149B) Thin Dark Surface (S9) (LRR R, MLRA 149B) Thin Dark Surface (S9) (LRR K, L) Stratified Layers (A5) High Chroma Sands (S11) (LRR K, L) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Mesic Spodic (A17) (MLRA 144B, 145, 149B) Sandy Mucky Mineral (S1) Sandy Mucky Mineral (S1) Sandy Mucky Mineral (S1) Sandy Redox (S5) Marl (F10) (LRR K, L) Depleted Dark Surface (F6) Sandy Mucky Mineral (S1) Sandy Redox (S5) Marl (F10) (LRR K, L) Stripped Matrix (S4) Redox Depressions (F8) Stripped Matrix (S6) Red Parent Material (F21) (MLRA 145) Red Parent Material (F21) (MLRA 145) Wetland hydrology must be present, unless disturbed or problematic. Hydric Soil Present? Yes No X	10 10	10111 0/4		101100				Carray				
Hydric Soil Indicators: Histosol (A1) Dark Surface (S7) Polyvalue Below Surface (S8) (LRR R, Black Histic (A3) MLRA 149B) Thin Dark Surface (S9) (LRR R, MLRA 149B) Polyvalue Below Surface (S8) (LRR R, Black Histic (A3) MLRA 149B) Thin Dark Surface (S9) (LRR R, MLRA 149B) Thin Dark Surface (S9) (LRR R, MLRA 149B) Thin Dark Surface (S9) (LRR K, L) Stratified Layers (A5) High Chroma Sands (S11) (LRR K, L) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Mesic Spodic (A17) (MLRA 144B, 145, 149B) Sandy Mucky Mineral (S1) Sandy Mucky Mineral (S1) Sandy Mucky Mineral (S1) Sandy Redox (S5) Marl (F10) (LRR K, L) Depleted Dark Surface (F6) Sandy Mucky Mineral (S1) Sandy Redox (S5) Marl (F10) (LRR K, L) Stripped Matrix (S4) Redox Depressions (F8) Stripped Matrix (S6) Red Parent Material (F21) (MLRA 145) Red Parent Material (F21) (MLRA 145) Wetland hydrology must be present, unless disturbed or problematic. Hydric Soil Present? Yes No X												
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Hydric Soil Indicators: Histosol (A1) Dark Surface (S7) Polyvalue Below Surface (S8) (LRR R, Black Histic (A3) MLRA 149B) Thin Dark Surface (S9) (LRR R, MLRA 149B) Polyvalue Below Surface (S8) (LRR R, Black Histic (A3) MLRA 149B) Thin Dark Surface (S9) (LRR R, MLRA 149B) Thin Dark Surface (S9) (LRR R, MLRA 149B) Thin Dark Surface (S9) (LRR K, L) Stratified Layers (A5) High Chroma Sands (S11) (LRR K, L) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Mesic Spodic (A17) (MLRA 144B, 145, 149B) Sandy Mucky Mineral (S1) Sandy Mucky Mineral (S1) Sandy Mucky Mineral (S1) Sandy Redox (S5) Marl (F10) (LRR K, L) Depleted Dark Surface (F6) Sandy Mucky Mineral (S1) Sandy Redox (S5) Marl (F10) (LRR K, L) Stripped Matrix (S4) Redox Depressions (F8) Stripped Matrix (S6) Red Parent Material (F21) (MLRA 145) Red Parent Material (F21) (MLRA 145) Wetland hydrology must be present, unless disturbed or problematic. Hydric Soil Present? Yes No X												
Hydric Soil Indicators: Histosol (A1) Dark Surface (S7) Polyvalue Below Surface (S8) (LRR R, Black Histic (A3) MLRA 149B) Thin Dark Surface (S9) (LRR R, MLRA 149B) Polyvalue Below Surface (S8) (LRR R, Black Histic (A3) MLRA 149B) Thin Dark Surface (S9) (LRR R, MLRA 149B) Thin Dark Surface (S9) (LRR R, MLRA 149B) Thin Dark Surface (S9) (LRR K, L) Stratified Layers (A5) High Chroma Sands (S11) (LRR K, L) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Mesic Spodic (A17) (MLRA 144B, 145, 149B) Sandy Mucky Mineral (S1) Sandy Mucky Mineral (S1) Sandy Mucky Mineral (S1) Sandy Redox (S5) Marl (F10) (LRR K, L) Depleted Dark Surface (F6) Sandy Mucky Mineral (S1) Sandy Redox (S5) Marl (F10) (LRR K, L) Stripped Matrix (S4) Redox Depressions (F8) Stripped Matrix (S6) Red Parent Material (F21) (MLRA 145) Red Parent Material (F21) (MLRA 145) Wetland hydrology must be present, unless disturbed or problematic. Hydric Soil Present? Yes No X												
Hydric Soil Indicators: Histosol (A1) Dark Surface (S7) Polyvalue Below Surface (S8) (LRR R, Black Histic (A3) MLRA 149B) Thin Dark Surface (S9) (LRR R, MLRA 149B) Polyvalue Below Surface (S8) (LRR R, Black Histic (A3) MLRA 149B) Thin Dark Surface (S9) (LRR R, MLRA 149B) Thin Dark Surface (S9) (LRR R, MLRA 149B) Thin Dark Surface (S9) (LRR K, L) Stratified Layers (A5) High Chroma Sands (S11) (LRR K, L) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Mesic Spodic (A17) (MLRA 144B, 145, 149B) Sandy Mucky Mineral (S1) Sandy Mucky Mineral (S1) Sandy Mucky Mineral (S1) Sandy Redox (S5) Marl (F10) (LRR K, L) Depleted Dark Surface (F6) Sandy Mucky Mineral (S1) Sandy Redox (S5) Marl (F10) (LRR K, L) Stripped Matrix (S4) Redox Depressions (F8) Stripped Matrix (S6) Red Parent Material (F21) (MLRA 145) Red Parent Material (F21) (MLRA 145) Wetland hydrology must be present, unless disturbed or problematic. Hydric Soil Present? Yes No X												
Histosol (A1) Dark Surface (S7) Polyvalue Below Surface (S8) (LRR R, 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) Black Histic (A3) MLRA 149B) Polyvalue Below Surface (S9) (LRR R, Polyvalue Below Surface (S8) (LRR K, L) Hydrogen Sulfide (A4) Thin Dark Surface (S9) (LRR R, MLRA 149B) Thin Dark Surface (S9) (LRR K, L) Stratified Layers (A5) High Chroma Sands (S11) (LRR K, L) Depleted Below Dark Surface (A11) Loamy Mucky Mineral (F1) (LRR K, L) Piedmont Floodplain Soils (F19) (MLRA 149B) Thick Dark Surface (A12) Mesic Spodic (A17) (MLRA 144A, 145, 149B) Sandy Mucky Mineral (S1) Sandy Mucky Mineral (S1) Sandy Redox (S5) Marl (F10) (LRR K, L) Redox Depressions (F8) Stripped Matrix (S6) Red Parent Material (F21) (MLRA 145) Wetland hydrology must be present, unless disturbed or problematic. Restrictive Layer (if observed): Type: Depth (inches): Hydric Soil Present? Yes No X			etion, RN	1=Reduced Matrix, N	1S=Mas	ked San	d Grains.			_		
Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Mesic Spodic (A17) Sandy Mucky Mineral (S1) Sandy Mucky Mineral (S1) Sandy Redox (S5) Sandy Redox (S5) Sandy Redox (S5) Stripped Matrix (S6) Marl (F10) (LRR K, L) Restrictive Layer (if observed): Type: Depth (inches): Polyvalue Below Surface (S3) (LRR K, L, R) Polyvalue Below Surface (S9) (LRR K, L) Inin Dark Surface (S9) (LRR K, L) Piedmont Floodplain Soils (F19) (MLRA 149B) Red Parent Material (F21) (outside MLRA 149B) Very Shallow Dark Surface (F22) Other (Explain in Remarks) Sandy Mcuky Mineral (S1) Sandy Redox (S5) Marl (F10) (LRR K, L) Red Parent Material (F21) (MLRA 145) wetland hydrology must be present, unless disturbed or problematic.	-			Dark Surface (S7)					-		ar)
Black Histic (A3)		` '			,	ice (S8) (LRR R.					
Hydrogen Sulfide (A4) Thin Dark Surface (S9) (LRR R, MLRA 149B) Thin Dark Surface (S9) (LRR K, L) Stratified Layers (A5) High Chroma Sands (S11) (LRR K, L) Depleted Below Dark Surface (A11) Loamy Mucky Mineral (F1) (LRR K, L) Thick Dark Surface (A12) Mesic Spodic (A17) (MLRA 144A, 145, 149B) Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Sandy Redox (S5) Marl (F10) (LRR K, L) Mesic Spodic (A77) Sandy Redox (S5) Marl (F10) (LRR K, L) Thin Dark Surface (S9) (LRR K, L) Piedmont Floodplain Soils (F19) (MLRA 149B) Red Parent Material (F21) (outside MLRA 149B) Very Shallow Dark Surface (F22) Other (Explain in Remarks) Other (Explain in Remarks) Sandy Redox (S5) Marl (F10) (LRR K, L) Stripped Matrix (S6) Red Parent Material (F21) (MLRA 145) Wetland hydrology must be present, unless disturbed or problematic. Restrictive Layer (if observed): Type: Depth (inches): Hydric Soil Present? Yes No X						.00 (00)	(=,		-			
Stratified Layers (A5)		` '			,) (LRR F	R, MLRA 1					,
Thick Dark Surface (A12) Mesic Spodic (A17) (MLRA 144A, 145, 149B) Sandy Mucky Mineral (S1) Sandy Redox (S5) Sandy Redox (S5) Stripped Matrix (S6) Red Parent Material (F21) (outside MLRA 14 Very Shallow Dark Surface (F22) Other (Explain in Remarks) Depleted Dark Surface (F7) Redox Depressions (F8) Sandy Redox (S5) Marl (F10) (LRR K, L) Stripped Matrix (S6) Red Parent Material (F21) (MLRA 145) Wetland hydrology must be present, unless disturbed or problematic. Restrictive Layer (if observed): Type: Depth (inches): Hydric Soil Present? Yes No X												L, R)
Mesic Spodic (A17) (MLRA 144A, 145, 149B) Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Sandy Redox (S5) Stripped Matrix (S6) Red Parent Material (F21) (MLRA 145) Restrictive Layer (if observed): Type: Depth (inches): Depleted Matrix (F3) Redox Dark Surface (F6) Other (Explain in Remarks) Other (Explain in Remarks) All (F10) (LRR K, L) Bendox Depressions (F8) Marl (F10) (LRR K, L) Redox Depressions (F8) Marl (F10) (LRR K, L) Red Parent Material (F21) (MLRA 145) Wetland hydrology must be present, unless disturbed or problematic. Hydric Soil Present? Yes No X	Depleted	Below Dark Surface	(A11)	Loamy Mucky	Mineral	(F1) (LR	R K, L)	Piedmoi	nt Floodplair	n Soils (F	19) (MLRA	149B)
(MLRA 144A, 145, 149B) Redox Dark Surface (F6) Other (Explain in Remarks) Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) Sandy Gleyed Matrix (S4) Redox Depressions (F8) Sandy Redox (S5) Marl (F10) (LRR K, L) Stripped Matrix (S6) Red Parent Material (F21) (MLRA 145) Wetland hydrology must be present, unless disturbed or problematic. Restrictive Layer (if observed): Type: Hydric Soil Present? Yes No X	Thick Da	rk Surface (A12)		Loamy Gleyed	Matrix ((F2)		Red Parent Material (F21) (outside MLRA 14				RA 145)
Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Sandy Redox (S5) Marl (F10) (LRR K, L) Stripped Matrix (S6) Red Parent Material (F21) (MLRA 145) Restrictive Layer (if observed): Type: Depth (inches): Hydric Soil Present? Yes No X	Mesic Sp	oodic (A17)		Depleted Matri	x (F3)			Very Sh	allow Dark S	Surface (F	- 22)	
Sandy Gleyed Matrix (S4) Sandy Redox (S5) Marl (F10) (LRR K, L) Stripped Matrix (S6) Red Parent Material (F21) (MLRA 145) Restrictive Layer (if observed): Type: Depth (inches): Hydric Soil Present? Yes No X	(MLR	A 144A, 145, 149B)		Redox Dark Su	ırface (F	- 6)		Other (E	xplain in Re	:marks)		
Sandy Redox (S5) Stripped Matrix (S6) Red Parent Material (F21) (MLRA 145) Wetland hydrology must be present, unless disturbed or problematic. Restrictive Layer (if observed): Type: Depth (inches): Hydric Soil Present? Yes No _ X	Sandy M	ucky Mineral (S1)		Depleted Dark	Surface	e (F7)						
Stripped Matrix (S6) Red Parent Material (F21) (MLRA 145) Restrictive Layer (if observed): Type: Depth (inches): Red Parent Material (F21) (MLRA 145) Wetland hydrology must be present, unless disturbed or problematic. Hydric Soil Present? Yes No X	Sandy G	leyed Matrix (S4)		Redox Depress	sions (F	(8)		_				
Restrictive Layer (if observed): Type: Depth (inches): Hydric Soil Present? Yes No X		` '										d
Restrictive Layer (if observed): Type:	Stripped	Matrix (S6)		Red Parent Ma	aterial (F	-21) (ML	RA 145)					
Type:	Postrictive I	aver (if observed):						unless	s disturbed c	r problen	natic.	
Depth (inches): Hydric Soil Present? Yes No X		ayer (ii observed).										
	-	nches):						Hydric Soil Prese	nt?	Yes	No	Х
remains.								,				
	Remarks.											
	'NO FORM 61	146 0 1111 2040										

See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

Project/Site: Harbor Island	City/County: Grand Haven city/ Ottawa County						
Applicant/Owner: City of Grand Haven	State: MI Sampling Point: 8A						
Investigator(s): Andrea Cline, Andrew Byks	Section, Township, Range: 20, 008N, 016W						
	Il relief (concave, convex, none): Concave Slope %: 2						
Subregion (LRR or MLRA): LRR L, MLRA 97 43 43.070368	· · · · · · · · · · · · · · · · · · ·						
Soil Map Unit Name: Made land	NWI classification: N/A						
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)							
Are Vegetation, Soil, or Hydrology significantly distu							
Are Vegetation, Soil, or Hydrology naturally problem							
SUMMARY OF FINDINGS – Attach site map showing sar	mpling point locations, transects, important features, etc.						
Hydrophytic Vegetation Present? Yes X No	Is the Sampled Area						
Hydric Soil Present? Yes X No	within a Wetland? Yes X No						
Wetland Hydrology Present? Yes X No	If yes, optional Wetland Site ID:						
Remarks: (Explain alternative procedures here or in a separate report.)							
HYDROLOGY							
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)						
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)						
Surface Water (A1) Water-Stained Leaves							
High Water Table (A2) Aquatic Fauna (B13)	Moss Trim Lines (B16)						
Saturation (A3) Marl Deposits (B15)	Dry-Season Water Table (C2)						
Water Marks (B1) Hydrogen Sulfide Odor	r (C1) Crayfish Burrows (C8)						
Sediment Deposits (B2) Oxidized Rhizospheres							
Drift Deposits (B3) Presence of Reduced I							
Algal Mat or Crust (B4) Recent Iron Reduction							
Iron Deposits (B5)Thin Muck Surface (C7							
Inundation Visible on Aerial Imagery (B7) Other (Explain in Rema	·						
Sparsely Vegetated Concave Surface (B8)	X FAC-Neutral Test (D5)						
Field Observations:	λ.						
Surface Water Present? Yes No X Depth (inches) Water Table Present? Yes No X Depth (inches)							
Saturation Present? Yes X No Depth (inches)							
(includes capillary fringe)	/- 10 Noticinal Hydrology Frederic Fee X No						
Describe Recorded Data (stream gauge, monitoring well, aerial photos, p	revious inspections), if available:						
	, , , , , , , , , , , , , , , , , , ,						
Remarks:							
ENG FORM 6116-8, JUL 2018							

VEGETATION UNGO SSIFIAGE INFAESTO BIANS (CUI
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ÆGETATION UNGÐSSIÐINÐIÐ INÐAESDÐÞIS	ող _s (CUI)			Sampling Point: 8A
Tree Stratum (Plot size:30 ft)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. Acer negundo	20	Yes	FAC	Number of Dominant Species
2. Populus deltoides	30	Yes	FAC	That Are OBL, FACW, or FAC:5(A)
3. Acer saccharinum	20	Yes	FACW	Total Number of Dominant
4.				Species Across All Strata:5(B)
5.				Percent of Dominant Species
6.				That Are OBL, FACW, or FAC:100.0%(A/B)
7.				Prevalence Index worksheet:
	70	=Total Cover		Total % Cover of: Multiply by:
Sapling/Shrub Stratum (Plot size: 15 ft)		•		OBL species 0 x 1 = 0
1. Vitis riparia	20	Yes	FAC	FACW species 75 x 2 = 150
2.				FAC species 75 x 3 = 225
3.				FACU species 2 x 4 = 8
4.				UPL species 0 x 5 = 0
5.				Column Totals: 152 (A) 383 (B)
6.				Prevalence Index = B/A = 2.52
7.				Hydrophytic Vegetation Indicators:
	20	=Total Cover		1 - Rapid Test for Hydrophytic Vegetation
Herb Stratum (Plot size: 5 ft)		•		X 2 - Dominance Test is >50%
1. Equisetum hyemale	5	No	FAC	X 3 - Prevalence Index is ≤3.0 ¹
2. Phalaris arundinacea	50	Yes	FACW	4 - Morphological Adaptations ¹ (Provide supporting
3. Cerastium arvense	2	No	FACU	data in Remarks or on a separate sheet)
4. Solidago gigantea	5	No	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)
5.				Indicators of hydric soil and wetland hydrology must
6.				be present, unless disturbed or problematic.
7.				Definitions of Vegetation Strata:
8.				Tree – Woody plants 3 in. (7.6 cm) or more in
9.				diameter at breast height (DBH), regardless of height.
10.				Sapling/shrub – Woody plants less than 3 in. DBH
11.				and greater than or equal to 3.28 ft (1 m) tall.
12.				Herb – All herbaceous (non-woody) plants, regardless
	62	=Total Cover		of size, and woody plants less than 3.28 ft tall.
Woody Vine Stratum (Plot size: 30 ft)		•		Woody vines – All woody vines greater than 3.28 ft in
1.				height.
2.				
3.				Hydrophytic Vegetation
4.				Present? Yes X No No No
		=Total Cover		
Remarks: (Include photo numbers here or on a separ	ate sheet.)			•

Som trolled Unclassified	Information	(CUI)
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Sampling Point:

8A

Depth	Matrix	o the de	-	lox Featu		ator or c	onfirm the absence	of indicators.)
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-10	10YR 2/1	100					Loamy/Clayey	
10-18	10YR 2/2	50	10YR 3/6	50	D	М	Mucky Loam/Clay	
1							2	
	ncentration, D=Depl	etion, RN	l=Reduced Matrix,	MS=Mas	ked San	d Grains.		PL=Pore Lining, M=Matrix.
Hydric Soil II Histosol (Dark Surface	(97)				for Problematic Hydric Soils ³ : Muck (A10) (LRR K, L, MLRA 149B)
	ipedon (A2)		Polyvalue Be	` '	ice (S8) ((IRRR		Mucky Peat or Peat (S3) (LRR K, L, R)
Black His			MLRA 149		(00)	(=::::,		lue Below Surface (S8) (LRR K, L)
	n Sulfide (A4)		Thin Dark Su	,) (LRR F	R, MLRA		ark Surface (S9) (LRR K, L)
	Layers (A5)		High Chroma					anganese Masses (F12) (LRR K, L, R)
Depleted	Below Dark Surface	(A11)	Loamy Mucky	y Mineral	(F1) (LR	R K, L)	Piedmo	ont Floodplain Soils (F19) (MLRA 149B)
Thick Da	rk Surface (A12)		Loamy Gleye	d Matrix ((F2)		Red Pa	arent Material (F21) (outside MLRA 145)
Mesic Sp	odic (A17)		Depleted Mat	trix (F3)			Very S	hallow Dark Surface (F22)
-	A 144A, 145, 149B)		Redox Dark S				Other ((Explain in Remarks)
	ucky Mineral (S1)		Depleted Dar					
	leyed Matrix (S4)		Redox Depre		8)		31	tono of building built wo so to the con-
	edox (S5) Matrix (S6)		Marl (F10) (L Red Parent M		21) /M I	DA 145\		tors of hydrophytic vegetation and and hydrology must be present,
Stripped	Matrix (30)		Neu Falent N	nateriai (i	21) (IVIL	KA 143)		ss disturbed or problematic.
Restrictive L	ayer (if observed):						driick	so distance of problematic.
Type:	, (
Depth (in	ches):						Hydric Soil Pres	ent? Yes X No
Remarks:							,	<u> </u>
Soil is disturb	ed.							
Con to diotars								
NC FORM 64	46.0 1111 2040							

See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

Project/Site: Harbor Island	City/County: Grand Haven city/ Ottawa County Sampling Date: 2024-04-26				
Applicant/Owner: City of Grand Haven	State: MI Sampling Point: 8B				
Investigator(s): Andrea Cline, Andrew Byks	Section, Township, Range: 20, 008N, 016W				
Landform (hillside, terrace, etc.): Flat Loc	cal relief (concave, convex, none): None Slope %: 0				
Subregion (LRR or MLRA): LRR L, MLRA 97 43 43.070666	6 Long: -86.22757011 Datum: WGS 1984				
Soil Map Unit Name: Made land	NWI classification:				
Are climatic / hydrologic conditions on the site typical for this time of year	r? Yes X No (If no, explain in Remarks.)				
Are Vegetation, Soil _X, or Hydrology significantly dis					
Are Vegetation X , Soil , or Hydrology naturally proble					
SOMMART OF FINDINGS - Attach site map showing sa	ampling point locations, transects, important features, etc.				
Hydrophytic Vegetation Present? Yes No _X	Is the Sampled Area				
Hydric Soil Present? Yes No _X	within a Wetland? Yes No _X				
Wetland Hydrology Present? Yes No _X	If yes, optional Wetland Site ID:				
Remarks: (Explain alternative procedures here or in a separate report.)					
HYDROLOGY					
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)				
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)				
Surface Water (A1) Water-Stained Leave					
High Water Table (A2) Aquatic Fauna (B13) And Brancies (B45)	Moss Trim Lines (B16)				
Saturation (A3) Marl Deposits (B15) Mortor Marko (B1)	Dry-Season Water Table (C2)				
Water Marks (B1) Hydrogen Sulfide Odd Sediment Deposits (B2) Oxidized Rhizosphere	or (C1) Crayfish Burrows (C8) es on Living Roots (C3) Saturation Visible on Aerial Imagery (C9)				
Drift Deposits (B3) Presence of Reduced					
Algal Mat or Crust (B4) Recent Iron Reduction					
Iron Deposits (B5) Thin Muck Surface (C	· · · · · · · · · · · · · · · · · · ·				
Inundation Visible on Aerial Imagery (B7) Other (Explain in Ren					
Sparsely Vegetated Concave Surface (B8)	FAC-Neutral Test (D5)				
Field Observations:					
Surface Water Present? Yes No X Depth (inche					
Water Table Present? Yes No X Depth (inche					
	es): Wetland Hydrology Present? Yes No _X				
(includes capillary fringe)	and the state of t				
Describe Recorded Data (stream gauge, monitoring well, aerial photos,	previous inspections), if available:				
Remarks:					
ENG FORM 6116-8, JUL 2018					

ree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test w	orksheet:		
·				Number of Dominar	nt Species		
				That Are OBL, FAC		0	_ (A)
•				Total Number of Do Species Across All		1	_(B)
• ,				Percent of Dominan	•	0.0%	_(A/B
				Prevalence Index v	vorksheet:		
		=Total Cover		Total % Cover	of: M	ultiply by:	
apling/Shrub Stratum (Plot size: 15 ft)			OBL species	0 x 1 =	0	
				FACW species	0 x 2 =	0	
				FAC species	0 x 3 =	0	
				FACU species	85 x 4 =	340	
				UPL species		50	
		<u> </u>		Column Totals:	95 (A)	390	(E
				Prevalence I	ndex = B/A =	4.11	
		·		Hydrophytic Veget	ation Indicators:		
		=Total Cover		1 - Rapid Test f	or Hydrophytic Ve	egetation	
erb Stratum (Plot size: 5 ft)				2 - Dominance	Test is >50%		
Bromus inermis	10	No	UPL	3 - Prevalence I	ndex is ≤3.0 ¹		
Cirsium arvense	5	No	FACU	4 - Morphologic	al Adaptations ¹ (F	Provide su	pporti
Poa pratensis	80	Yes	FACU	data in Rema	arks or on a sepa	rate sheet))
				Problematic Hy	drophytic Vegetat	tion ¹ (Expla	ain)
				¹ Indicators of hydric be present, unless of			must
				Definitions of Vege	•		
				Troc Monday plant	- 2 in (7.0 nm) -	:	
				Tree – Woody plant diameter at breast h			height
0				Sapling/shrub – W	oody plants less	than 3 in. I	DBH
I				and greater than or			
2				Herb – All herbaced	ous (non-woody) r	olants. reg	ardles
	95	=Total Cover		of size, and woody			
/oody Vine Stratum (Plot size: 30 ft)			Woody vines – All height.	woody vines grea	ter than 3.	.28 ft i
				Hydrophytic			
				Vegetation Present? Yes	es No	X	
		=Total Cover					
temarks: (Include photo numbers here or on a sep							
and a sep	on out.)						

Som trolled Unclassified Information (CUI'
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Som trolle	ed Unclassifie	ed Info	rmation (CU	I).					Samplin	g Point:	8B
Profile Desc	ription: (Describe	to the de	pth needed to docu	ıment the	indica	tor or co	onfirm t	the absence of in	dicators.)		
Depth	Matrix		Redox	x Features							
(inches)	Color (moist)	%	Color (moist)	<u>%</u> 1	Гуре ¹	Loc ²	T	exture	ı	Remarks	
0-6	10YR 3/2	100						Sandy			
6-12	10YR 4/6	100						Sandy			
12-18	10YR 3/2	100						Sandy			
				— -		—					
		-									
¹Type: C=Co	ncentration D-Denl	etion RM	 1=Reduced Matrix, M		d Sand	Grains		² Location: PL=I	Pore Lining	M-Matrix	<u> </u>
Hydric Soil I		etion, Kiv	=Reduced Matrix, M	IS=IVIASKE	u Sanu	Giailis.		Indicators for F			
Histosol			Dark Surface (S	S7)					(A10) (LRR	-	
	ipedon (A2)		Polyvalue Belov	•	(S8) (L	.RR R,					RR K, L, R)
Black His			MLRA 149B)		()(,			elow Surfac		
	n Sulfide (A4)		Thin Dark Surfa		RR R,	MLRA 1	49B)		urface (S9)		
	Layers (A5)		High Chroma S				,				RR K, L, R)
	Below Dark Surface	(A11)	Loamy Mucky N			-					(MLRA 149B)
	rk Surface (A12)	, ,	Loamy Gleyed								de MLRA 145)
	oodic (A17)		Depleted Matrix		,				w Dark Surfa		-
	A 144A, 145, 149B)		Redox Dark Su						ain in Remai		
-	ucky Mineral (S1)		Depleted Dark		7)					,	
	leyed Matrix (S4)		Redox Depress								
	edox (S5)		Marl (F10) (LRI					³ Indicators	of hydrophyti	ic vegetat	ion and
Stripped	Matrix (S6)		Red Parent Ma) (ML R	A 145)		wetland h	ydrology mu	ust be pres	sent,
Restrictive L	.ayer (if observed):							unless dis	sturbed or pr	oblematio	<u>).</u>
Туре:											
Depth (in	iches):						Hyd	ric Soil Present?	Yes	·	No X
Remarks:											
Soil is disturb	oed.										

See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

Project/Site: Harbor Island	City/County: Grand Haven city/ Ottawa County Sampling Date: 2024-04-26						
Applicant/Owner: City of Grand Haven	State: MI Sampling Point: 9B						
Investigator(s): Andrea Cline, Andrew Byks	Section, Township, Range: 20, 008N, 016W						
	cal relief (concave, convex, none): Concave Slope %: 2						
Subregion (LRR or MLRA): LRR L, MLRA 97 43 43.07092							
Soil Map Unit Name: Made land	NWI classification: N/A						
Are climatic / hydrologic conditions on the site typical for this time of year							
Are Vegetation, Soil, or Hydrologysignificantly dis							
Are Vegetation, Soil, or Hydrologynaturally proble							
SUMMARY OF FINDINGS – Attach site map showing sa	ampling point locations, transects, important features, etc.						
Hydrophytic Vegetation Present? Yes X No	Is the Sampled Area						
Hydric Soil Present? Yes No X	within a Wetland? Yes No _X						
Wetland Hydrology Present? Yes No X	If yes, optional Wetland Site ID:						
Remarks: (Explain alternative procedures here or in a separate report.)							
HYDROLOGY							
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)						
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)						
Surface Water (A1) Water-Stained Leaves							
High Water Table (A2) Aquatic Fauna (B13)	Moss Trim Lines (B16)						
Saturation (A3) Marl Deposits (B15)	Dry-Season Water Table (C2)						
Water Marks (B1) Hydrogen Sulfide Odd							
Sediment Deposits (B2) Oxidized Rhizosphere	es on Living Roots (C3) Saturation Visible on Aerial Imagery (C9)						
Drift Deposits (B3)Presence of Reduced	d Iron (C4) Stunted or Stressed Plants (D1)						
Algal Mat or Crust (B4)Recent Iron Reduction	n in Tilled Soils (C6) Geomorphic Position (D2)						
Iron Deposits (B5) Thin Muck Surface (C	C7) Shallow Aquitard (D3)						
Inundation Visible on Aerial Imagery (B7)Other (Explain in Rem							
Sparsely Vegetated Concave Surface (B8)	FAC-Neutral Test (D5)						
Field Observations:							
Surface Water Present? Yes No X Depth (inche							
Water Table Present? Yes No X Depth (inche							
Saturation Present? Yes No X Depth (inche	es): Wetland Hydrology Present? Yes No _X						
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos,							
Describe Recorded Data (Stream gauge, monitoring well, aerial photos,	previous inspections), if available.						
Remarks:							
ENG FORM 6116-8, JUL 2018							
ENG I CINII CITO C, COL ZOTO							

VEGETATION UNGA SSIFIAAL INFAKAA FIAAS (CUI).

EGETATION LIVED SOIE HAIRE HAIRE SOFF	lants(CUI)			Sampling Point:	<u>9B</u>				
Free Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:					
. Populus deltoides	30	Yes	FAC	Number of Dominant Species					
. Acer negundo	30	Yes	FAC	That Are OBL, FACW, or FAC:	3 (A)				
3. Acer saccharinum	10	No	FACW	Total Number of Dominant					
i				Species Across All Strata:	4 (B)				
i.				Percent of Dominant Species					
i				That Are OBL, FACW, or FAC:	75.0% (A/B)				
·				Prevalence Index worksheet:					
	70	=Total Cover		Total % Cover of: N	lultiply by:				
Sapling/Shrub Stratum (Plot size: 15 ft))			OBL species 0 x 1 =	0				
				FACW species 35 x 2 =	70				
				FAC species 60 x 3 =	180				
				FACU species 55 x 4 =	220				
				UPL species 0 x 5 =	0				
				Column Totals: 150 (A)	470 (B				
·				Prevalence Index = B/A =	3.13				
				Hydrophytic Vegetation Indicators					
		=Total Cover		1 - Rapid Test for Hydrophytic V					
Herb Stratum (Plot size: 5 ft)		- rotal Cover		X 2 - Dominance Test is >50%	ogotation				
. Alliaria petiolata	50	Yes	FACU	3 - Prevalence Index is ≤3.0 ¹					
· · · · · · · · · · · · · · · · · · ·	5	No	FACU	4 - Morphological Adaptations ¹ (Provide supporti					
. Nepeta cataria . Phalaris arundinacea	25	Yes	FACW	data in Remarks or on a separate sheet)					
. Fridians arunumacea		res	FACV	Problematic Hydrophytic Vegeta	tion ¹ (Explain)				
				1 Indicators of budgio soil and wattened	hudralagu must				
				 Indicators of hydric soil and wetland hydrology mus be present, unless disturbed or problematic. 					
				Definitions of Vegetation Strata:					
•				Tree – Woody plants 3 in. (7.6 cm) o	r more in				
				diameter at breast height (DBH), reg					
0				Sapling/shrub – Woody plants less	than 3 in DBH				
1				and greater than or equal to 3.28 ft (
2.				Herb – All herbaceous (non-woody)	nlants regardles				
	80	=Total Cover		of size, and woody plants less than 3					
Voody Vine Stratum (Plot size: 30 ft	·			Mandy vines All woody vines gree	starthan 2 20 ft i				
				Woody vines – All woody vines greatheight.	ater than 3.28 it ii				
				Hydrophytic					
				Vegetation Present? Yes X No)				
		=Total Cover		100 <u>//</u>	·				
		- i otal Covel		Ī					

Som trolled Unclassified	Information	(CUI)
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Sampling Point

9B

Depth	Matrix	to the de	pth needed to docu Redox	r Featur		ator or ct	ommin the ab	serice or ii	idicators.)		
(inches)	Color (moist)	%	Color (moist)	_%	Type ¹	Loc ²	Texture		Re	emarks	
0-6	10YR 2/1	100					Sandy				
6-18	10YR 2/2	100					Sandy				
		<u> </u>									
1							2.				
'Type: C=Co		letion, RM	1=Reduced Matrix, M	IS=Mas	ked Sand	d Grains.			Pore Lining, M		
Histosol			Dark Surface (S7)						, L, MLRA 149B)	
	oipedon (A2)		Polyvalue Belo		ce (S8) (LRR R,			, , ,	(S3) (LRR K, L, R	2)
Black His			MLRA 149B		` , `	·			-	(S8) (LRR K, L)	,
Hydroge	n Sulfide (A4)		Thin Dark Surfa	ace (S9)	(LRR R	, MLRA 1	49B)	Thin Dark	Surface (S9) (L	.RR K, L)	
	Layers (A5)		High Chroma S			-		_		(F12) (LRR K, L, F	
	Below Dark Surface	e (A11)	Loamy Mucky			R K, L)				s (F19) (MLRA 14 9	
	ork Surface (A12) oodic (A17)		Loamy Gleyed Depleted Matrix		F2)				t Material (F21) ow Dark Surfac) (outside MLRA 1	145)
	A 144A, 145, 149B)		Redox Dark Su		(6)			-	lain in Remark		
-	lucky Mineral (S1)		Depleted Dark					` '		,	
Sandy G	leyed Matrix (S4)		Redox Depress	ions (F	3)						
	edox (S5)		Marl (F10) (LR				(vegetation and	
Stripped	Matrix (S6)		Red Parent Ma	terial (F	21) (ML I	RA 145)			hydrology must		
Postrictive I	_ayer (if observed):							unless d	isturbed or prol	olematic.	
Type:	Layer (II Observed).										
· · · -	nches):						Hydric Soi	I Present?	Yes_	No X	
Remarks:							,			<u> </u>	-
Remarks.											

See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

Project/Site: Harbor Island	City/County: Grand Haven city/ Ottawa County Sampling Date: 2024-04-26
Applicant/Owner: City of Grand Haven	State: MI Sampling Point: 10B
Investigator(s): Andrea Cline, Andrew Byks	Section, Township, Range: 20, 008N, 016W
Landform (hillside, terrace, etc.): Flat	Local relief (concave, convex, none): None Slope %: 0
Subregion (LRR or MLRA): LRR L, MLRA 97 43	43.070243 Long: -86.22824717 Datum: WGS 1984
Soil Map Unit Name: Made land	NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this ti	me of year? Yes X No (If no, explain in Remarks.)
Are Vegetation, SoilX_, or Hydrologysigni	
Are Vegetation, Soil, or Hydrologynatur	
	owing sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No	X Is the Sampled Area
	X within a Wetland? Yes No X
Wetland Hydrology Present? Yes No	X If yes, optional Wetland Site ID:
Remarks: (Explain alternative procedures here or in a separa	te report.)
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that	apply) Surface Soil Cracks (B6)
Surface Water (A1) Water-Stair	ned Leaves (B9) Drainage Patterns (B10)
High Water Table (A2) Aquatic Fa	
Saturation (A3)Marl Depos	
	Sulfide Odor (C1) Crayfish Burrows (C8)
	nizospheres on Living Roots (C3) Saturation Visible on Aerial Imagery (C9)
	f Reduced Iron (C4) Reduction in Tilled Soils (C6) Stunted or Stressed Plants (D1) Geomorphic Position (D2)
	Surface (C7) Shallow Aquitard (D3)
	ain in Remarks)
Sparsely Vegetated Concave Surface (B8)	FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No X De	pth (inches):
	pth (inches):
Saturation Present? Yes No X De	pth (inches): Wetland Hydrology Present? Yes No X
(includes capillary fringe)	
Describe Recorded Data (stream gauge, monitoring well, aeri	al photos, previous inspections), if available:
Remarks:	
Nemano.	
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	Absolute	Dominant	Indicator					<u> </u>
ree Stratum (Plot size: 30 ft)	% Cover	Species?	Status	Dominance Test	worksheet			
Acer negundo	40	Yes	FAC	Number of Domina That Are OBL, FA			1	_(A)
				Total Number of D Species Across Al			3	_(B)
		·		Percent of Domina That Are OBL, FA	•		33.3%	_(A/B
	_			Prevalence Index	workshee	t:		
	40	=Total Cover		Total % Cove	er of:	Mu	Itiply by:	
apling/Shrub Stratum (Plot size: 15 ft)			OBL species	0	x 1 = _	0	
	_			FACW species	0	x 2 = _	0	
	_			FAC species	40	x 3 =	120	
				FACU species	45	x 4 =	180	
				UPL species	0	x 5 =	0	
				Column Totals:	85	(A)	300	(E
				Prevalence	Index = B/	A =	3.53	
				Hydrophytic Vege	etation Indi	cators:		
		=Total Cover		1 - Rapid Test for Hydrophytic \				
erb Stratum (Plot size: 5 ft)				2 - Dominance Test is >50%				
Alliaria petiolata	35	Yes	FACU	3 - Prevalence	e Index is ≤	3.0 ¹		
Nepeta cataria	10	Yes	FACU	4 - Morphological Adaptations ¹ (Provide suppo data in Remarks or on a separate sheet)				
				Problematic H	lvdrophytic '	Vegetatio	on¹ (Expla	ain)
				¹ Indicators of hydr be present, unless	ic soil and v	vetland h	ydrology	
				Definitions of Ve		-		
				Tree – Woody pla	- nts 3 in. (7.6	6 cm) or		h a i a h t
	_			diameter at breast	Tielgrit (DB	i i), iegai	uless of i	rieigrii
				 Sapling/shrub – Woody plants less than 3 in. and greater than or equal to 3.28 ft (1 m) tall. 				DBH
2	45	=Total Cover		Herb – All herbace of size, and woody	•		-	ardles
oody Vine Stratum (Plot size: 30 ft)			Woody vines – A height.	ll woody vin	es greate	er than 3.	.28 ft i
				Hydrophytic				
				Vegetation Present? Yes			X	
	_	=Total Cover				-		
emarks: (Include photo numbers here or on a se		•						

Somtrolled Unclassified Information (CUI)

Sampling Point: 10B

Profile Desc Depth	ription: (Describe t Matrix	o the de		ument tl x Featur		ator or co	onfirm the absence o	f indicators.)
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-12	10YR 2/2	100	, ,				Sandy	
			10VD 2/2					Distinct raday concentrations
12-18	10YR 5/3		10YR 2/2	50		M	Sandy	Distinct redox concentrations
¹Type: C=Co	ncentration, D=Depl	etion, RM	=Reduced Matrix, N	//S=Mas	ked San	d Grains.	² Location: P	L=Pore Lining, M=Matrix.
Black His Hydroger Stratified Depleted Thick Da Mesic Sp (MLRA Sandy M Sandy G Stripped	(A1) ipedon (A2)	e (A11)	Dark Surface (Polyvalue Belo MLRA 149B Thin Dark Surf High Chroma S Loamy Mucky Loamy Gleyed Depleted Matri Redox Dark Si Depleted Dark Redox Depres Marl (F10) (LR Red Parent Ma	ow Surface (S9) Sands (S Mineral I Matrix (ix (F3) urface (F Surface sions (F8 R K, L)	(LRR R 611) (LR (F1) (LR F2) (6) (F7)	R, MLRA 1 R K, L) R K, L)	2 cm Mu 5 cm Mu Polyvalu 49B) Thin Da Iron-Mai Piedmoi Red Par Very Sh Other (E	or Problematic Hydric Soils ³ : ack (A10) (LRR K, L, MLRA 149B) acky Peat or Peat (S3) (LRR K, L, R) be Below Surface (S8) (LRR K, L) rk Surface (S9) (LRR K, L) anganese Masses (F12) (LRR K, L, R) ant Floodplain Soils (F19) (MLRA 149B) bent Material (F21) (outside MLRA 145 allow Dark Surface (F22) explain in Remarks) braces of hydrophytic vegetation and and hydrology must be present, as disturbed or problematic.
Type:							Hydric Soil Prese	nt? Yes No_X_
Remarks: Soil is disturb	ed.							