

January 10, 2020

**Re: Lordstown Battery Cell Plant
Permit - Intermediate
Application and Support
401 Wetlands
Trumbull County
DSW401206639**



Application for Section 401 Water Quality Certification

Division of Surface Water 401 Water Quality Certification and Isolated Wetland Permitting Unit

PERSON ID:
PLACE ID:
DOCUMENT ID: 24408
ORGANIZATION ID: 20158008
REVENUE ID: 1339988
check: 817808

Section 1: Applicant and Agent Information		
	Applicant:	Agent:
Company/ Agency Name:	General Motors LLC on behalf of GigaPower LLC	Arcadis
Name of Contact:	James F. Hartnett	Vinnie Tremante
Title:	Remediation Team Manager	Senior Ecologist
Technical Point of Contact:	Click here to enter text.	Click here to enter text.
Address:	300 Renaissance Center	100 E. Campus View Blvd., Suite 230
City, State, Zip:	Detroit, MI, 48265-3000	Columbus, Ohio 43235
Phone Number(s):	315-856-2011	614-985-9186
Email Address:	Jim.f.hartnett@gm.com	vinnie.tremante@arcadis.com

Section 2: Project Information		
A. Project Name: Lordstown Battery Cell Plant Project		
B Has Pre-App. Coordination occurred? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Indicate the 401 reviewer: Boyles DATE: 11/25/2019		
C. Brief Project Description/Purpose: Construct a mass-production battery cell manufacturing facility for future electric vehicles		
D. Construction Timeframe (Provide ~start and end dates): April 2020 January 2022		
E. Is any portion of the activity complete now? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Is this an "After-The-Fact" permit application? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If YES to either, describe the extent of completed portion of the activity below and the unauthorized impacts on waters of the state: Click here to enter text.		
F. Coordinates (degree, minutes, seconds): 41°09' 09.83" N - 80° 51' 46.85" W		
G. Project Address: Street: Tod Avenue SW		City or Town: Lordstown
Zip Code: 44481	Township: Lordstown	County: Trumbull
H. 12 Digit HUC No.: 050301030602	I. Watershed Name: Mud Creek	J. Corps District: Pittsburgh
K. Proposed impacts to "waters of the state":		L. Other water related permits issued or required include:
<input type="checkbox"/> Beach Nourish <input type="checkbox"/> Levees/Berms <input type="checkbox"/> Blasting <input type="checkbox"/> Mine Through <input type="checkbox"/> Breakwater <input type="checkbox"/> Revetment <input type="checkbox"/> Bulkhead <input type="checkbox"/> Bank Stabilization <input type="checkbox"/> Bridge/Culvert <input type="checkbox"/> Stream Channeliz. <input type="checkbox"/> Dam <input type="checkbox"/> Stream Relocation <input type="checkbox"/> Dredge <input type="checkbox"/> Water Body Cross <input checked="" type="checkbox"/> Fill <input type="checkbox"/> Weirs <input type="checkbox"/> Groin/Jetty <input type="checkbox"/> Other		<input checked="" type="checkbox"/> Individual 404 Permit – Public Notice # Click here to enter text. <input type="checkbox"/> Nationwide Permit # Choose an item. Choose an item. Click here to enter a date. <input type="checkbox"/> Section 10 Permit - Choose an item. Click here to enter a date. <input type="checkbox"/> Section 9 Permit - Click here to enter text. <input type="checkbox"/> Iso. Wetland Permit Choose an item. Click here to enter a date. Choose an item. <input checked="" type="checkbox"/> NPDES Permit – General Will be Submitted Click here to enter a date. <input type="checkbox"/> Oil & Gas Storm Water General Permit – Choose an item. Click here to enter a date. <input checked="" type="checkbox"/> Permit to Install – Will be Submitted : Click here to enter a date. <input type="checkbox"/> ODNR Choose an item. Permit - Choose an item. Click here to enter a date. <input type="checkbox"/> ODNR Coastal Permit - Choose an item. Click here to enter a date. <input type="checkbox"/> Regional Permit - Choose an item. Click here to enter a date.

PAID

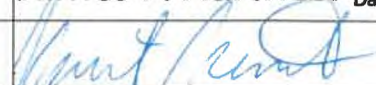
Amount: 12,600⁰⁰ Date: 1/9/2020
 Check #: 291069 Date: 1/10/2020

Application for Section 401 Water Quality Certification

Section 3: Fees				
Are you exempt from fees? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO (if YES, leave fee section blank)				
Application Fee =				\$ 200.00
Review Fee				
Wetland	Acres Impacted	65.99	x \$500 =	\$ 32,995.00
Ephemeral Stream	Linear Feet Impacted	81.00	x \$5.00 =	\$ 405.00 (\$200.00 minimum)
Intermittent Stream	Linear Feet Impacted		x \$10.00 =	\$ 0.00 (\$200.00 minimum)
Perennial Stream	Linear Feet Impacted		x \$15.00 =	\$ 0.00 (\$200.00 minimum)
Lake	Cubic Yards		x \$3.00 =	\$ 0.00
Total Review Fees =				\$ 33,400.00
Total Fees (\$200 Application Fee + Total Review Fees) =				\$ 33,600.00
Standard Applicant - Is the fee cap (\$25,000) exceeded? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				
If YES, \$12,600 is due with application and \$12,400 is due at time of 401 WQC issuance				
County, Township or Municipal Corp. - Is the fee cap (\$5,000) exceeded? <input type="checkbox"/> YES <input type="checkbox"/> NO				
If YES, \$2,600 is due with application and \$2,400 is due at time of 401 WQC issuance				
If fee cap is not exceeded:				
DUE AT TIME OF 401 WQC APP. SUBMITTAL - APPLICATION FEE AND ½ OF REVIEW FEE =				\$ 16,900.00
DUE AT TIME OF 401 WQC ISSUANCE - ½ OF REVIEW FEE (Invoice will be sent) =				\$ 16,700.00
PLEASE MAKE FEE CHECK PAYABLE TO: "TREASURER, STATE OF OHIO"				

Section 4: Submitted Documentation		
Check all documents/items that have been submitted which must be included for a complete application:		
<input checked="" type="checkbox"/> Investigation report of waters of the U.S.	<input checked="" type="checkbox"/> Site photographs	<input checked="" type="checkbox"/> 10 page ORAM forms - impacted wetlands
<input checked="" type="checkbox"/> Data supporting existing aquatic life use for each undesignated stream ¹	<input checked="" type="checkbox"/> U.S. ACOE JD letter	<input checked="" type="checkbox"/> US ACOE 404 Permit Public Notice or Provisional NWP
<input checked="" type="checkbox"/> USFWS & ODNR T&E coordination	<input checked="" type="checkbox"/> Antidegradation alternatives analysis ²	<input checked="" type="checkbox"/> A specific & detailed mitigation plan
<input checked="" type="checkbox"/> Applicable fees		

¹ See pages 6 and 10 in the instructions ² See page 12 in the instructions

Section 5: Applicant and Agent Signature			
<i>I hereby designate and authorize the agent/consultant identified in Section 1 to act on my behalf in the processing of this permit application, and to furnish, upon request, supplemental information in support of the application:</i>			
Applicant Name	James F. Hartnett	Applicant Signature	James F. Hartnett Digitally signed by James F. Hartnett Date: 2020.01.09 10:55:56 -05'00'
<i>Application is hereby made for a Section 401 Water Quality Certification. I certify that the information provided on this form and all attachments related to this project are true and accurate to the best of my knowledge:</i>			
Applicant Name	James F. Hartnett	Applicant Signature	James F. Hartnett Digitally signed by James F. Hartnett Date: 2020.01.09 10:56:16 -05'00'
Agent Name	Vinnie Tremante	Agent Signature	 01/09/2020

Please submit the completed application package and fees to:

Ohio EPA
 Division of Surface Water
 Attn: 401/IWP/Mitigation Section Manager
 P.O. Box 1049
 Columbus, OH 43216-1049

For Internal Ohio EPA Use	
Reviewer:	HARDESTY
Project ID #	206639
Date Received:	1/10/20
CR Due:	

GENERAL MOTORS LLC

**OHIO ENVIRONMENTAL
PROTECTION AGENCY**

Individual Section 401 Water Quality Certification
Application

Lordstown Battery Cell Plant Project

Trumbull County, Ohio

January 2020

**OHIO ENVIRONMENTAL
PROTECTION AGENCY**

Individual Section 401 Water Quality
Certification Application

Lordstown Battery Cell Plant Project

Trumbull County, Ohio



Vinnie Tremante, PWS
Senior Ecologist

Prepared for:

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Prepared by:

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Tel 614 985 9100

Our Ref.:

30039056

Date:

January 2020



Bret Graves
Project Ecologist

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INTRODUCTION

General Motors LLC (GM or Applicant), on behalf of a recently announced joint venture, currently named GigaPower LLC, (the JV) between General Motors Holdings LLC and LG Chem Michigan Inc. (LG), proposes to construct a large manufacturing facility in Trumbull County, Ohio to mass-produce automotive battery cells for future battery-electric vehicles (the Project). The JV will invest up to a total of \$2.3 billion to establish a battery cell assembly plant that is expected to create more than 1,100 new jobs. The JV plans to build a state-of-the-art plant to use the most advanced manufacturing processes to produce battery cells efficiently, with little waste.

The Project is located in the Village of Lordstown, Trumbull County, Ohio northeast of I-80, west of state route 45 Tod Ave SW, and east of the Lordstown Motors Corporation manufacturing facility and is more specifically located at coordinates 41.152727, -80.863155 (the Site). The Site is bounded to the north by an existing railroad switching yard, to the east by Tod Avenue SW, to the south by a new development by Old Dominion Freight Line Inc. and by the Lordstown Motors Corporation plant and to the west by the Lordstown Motors Corporation plant (Figures 1.1.1, 1.1.2 and 1.2).

The proposed Project area includes one parcel owned by NP Lordstown 173, LLC (Parcel ID 45-904682) totaling approximately 158 acres. Vicinity aerial map, vicinity land use map, and a flood hazard zone map for the Site are included in Figures 1.3.1, 1.3.2 and 1.4, respectively.

On behalf of the Applicant, Arcadis has prepared both a Clean Water Act (CWA) Section 404 individual permit application with the United States Army Corps of Engineers (USACE) and a CWA Section 401 individual Water Quality Certification (WQC) application with the Ohio Environmental Protection Agency (Ohio EPA) for proposed impacts to Waters of the United States (WOTUS) in association with the proposed Project. The Applicant is seeking authorization for the proposed impacts from the USACE and the Ohio EPA.

The sequence of this permit application follows the format of the Ohio EPA Section 401 Water Quality Certification Application Completion and Submittal Instructions (rev. 1/2019). Included in this document is the completed Application for 401 WQC.

1 401 WATER QUALITY CERTIFICATION APPLICATION

The completed Certification for 401 Water Quality Certification is included in Appendix A.

2 SUMMARY OF IMPACTS

The Project area contains a total of 65.99 acres of jurisdictional wetlands. Additionally, there are two stream features within the Project area (Figure 2).

2.1 Proposed Wetland Impacts

The proposed wetland impacts include:

- 19.91 acres of Category 1 jurisdictional non-forested wetlands,

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- 0.30 acre of Category 1 jurisdictional forested wetlands,
- 29.30 acres of Category 2 jurisdictional non-forested wetlands,
- 16.48 acres of Category 2 jurisdictional forested wetlands.

There are no Category 3 wetlands on the Site.

These impacts are summarized on the Ohio EPA Proposed Wetland Impacts and Mitigation table included in Appendix A.

2.2 Proposed Stream Impacts

The Site contains two ephemeral streams of 81 and 50 linear feet. The proposed stream impacts include:

- 81 linear feet to Stream 1
- 0 linear feet to Stream 2 (avoided)

These impacts are summarized on the Ohio EPA Proposed Stream Impacts and Mitigation table included in Appendix A.

3 SURFACE WATER DELINEATION

Wetlands on the Site were originally delineated on September 30, 2014 and October 1, 2014 by Terra Technologies, a consulting firm based in Leawood, Kansas. Investigators from Terra Technologies observed ten (10) wetlands on the site totaling 8.81 acres and three (3) stream segment totaling 2,597 linear feet on-site. The delineation was submitted to the USACE in October 2014. On May 22, 2017 through May 24, 2017, EMH&T conducted a delineation of the Site. All wetland boundaries were flagged and surveyed using a handheld GPS unit. Delineation datasheets were completed for all delineated wetlands. EMH&T identified 24.56 acres of wetlands on-site, and 0.21 acre of wetland in the right-of-way of Tod Ave SW, and three (3) stream segments totaling 3,040 linear feet on-site. The USACE issued a preliminary jurisdictional determination (LRP 2014-1077) on December 20, 2017 based on EHM&T's 2017 wetland delineation (See Figure 3).

Field visits and investigations of the Site were conducted by GHD from September through December 2019 to determine the location and extent of potential WOTUS, including streams and wetlands. A site visit was conducted on December 13, 2019 with the USACE, the U.S. Environmental Protection Agency, and the Ohio EPA to verify the resource boundaries and to validate the Ohio Rapid Assessment Method (ORAM) scoring. A total of 65.99 wetlands were delineated consisting of 19.91 acres of Category 1 non-forested wetlands, 0.30 acre of Category 1 forested wetlands, 16.48 acres of Category 2 forested and 29.30 acres of Category 2 non-forested wetlands. The surface water delineation report is attached to this permit application as Appendix B.

4 AGENCY CORRESPONDENCE

Prior to review of the Section 401 application, initiation of coordination with the following agencies is required for a complete application: USACE, United States Fish and Wildlife Service (USFWS), Ohio Department of Natural Resources (ODNR), and the State Historic Preservation Office (SHPO). These

agencies were contacted about information pertaining to the Project. The information received from these agencies is summarized below.

4.1 USACE Jurisdictional Determination

Ohio Revised Code (ORC) 6111.30(A)(1) requires that a 401 WQC application include a copy of the Preliminary Jurisdictional Determination (PJD) letter from the USACE documenting its jurisdiction over the wetlands, streams or other WOTUS that are the subject of the 401 WQC application. A site visit with the USACE was completed on December 13, 2019. From that meeting the USACE suggested that all site resources may be considered jurisdictional. The PJD is included in Appendix C.

4.2 USACE Public Notice

ORC 6111.30(A)(10) requires that a 401 WQC application include a copy of the USACE Public Notice regarding the Section 404 permit application concerning the proposed Project. The public notice for the proposed Project is included as Appendix C.

4.3 State-Listed Endangered or Threatened Species

ORC 6111.30(A)(7) requires that a 401 WQC application include “adequate documentation confirming that the Applicant has requested comments from the Department of Natural Resources... regarding threatened and endangered species, including the presence or absence of critical habitat.”

The ODNR was contacted for available information concerning the presence of state listed endangered, threatened, and proposed species or their habitat for the Project area. A formal Environmental Review was requested through the Office of Real Estate and Land Management on October 15, 2019. The ODNR response letter was received on November 27, 2019 (Appendix D). The ODNR Natural Heritage Database search indicated it has one record of a great blue heron rookery located within 1 mile of the Project area. The ODNR Division of Wildlife indicated that the Project area is located within the range of nine (9) state-listed species listed below and provided certain recommendations which are also discussed below for each species:

- Indiana bat (*Myotis sodalis*; state endangered; federally endangered): if suitable habitat, conserve trees, only cut October 1 – March 31 or do mist net study. A presence/probable absence survey was conducted by Copperhead Environmental Consulting in 2018 and during that study no Indiana bats were observed using the Site, therefore the project is not likely to affect this species (Appendix E).
- Clubshell (*Pleurobema clava*; state endangered; federally endangered): no in-water work is proposed in a perennial stream therefore the project is not likely to impact this species.
- Black sandshell (*Ligumia recta*; state threatened): no in- water work is proposed in a perennial stream therefore the project is not likely to impact this species.
- Northern brook lamprey (*Ichthyomyzon fossor*; state endangered): no in- water work is proposed in a perennial stream therefore the project is not or is not likely to impact this species.
- Mountain brook lamprey (*Ichthyomyzon greeleyi*; state endangered): no in- water work is proposed in a perennial stream therefore the project is not likely to impact this species.

- Eastern hellbender (*Cryptobranchus alleganiensis alleganiensis*; state endangered; federal species of concern): no in- water work is proposed in a perennial stream therefore the project is not likely to impact this species.
- Eastern massasauga (*Sistrurus catenatus*; state endangered; federally threatened): the project is not likely to impact this species due to the location and the lack of suitable habitat, such as wet prairies and fens, within the project site and the vicinity of the project.
- Spotted turtle (*Clemmys guttata*; state threatened): the project is not likely to impact this species due to the location and the lack of suitable habitat, such as fens, bogs and marshes, within the project site and the vicinity of the project area.
- Northern harrier (*Circus cyaneus*; state endangered): avoid nesting habitat if present during nesting May 15 – August 1. This species is not likely to be impacted due to the lack of suitable breeding habitat, such as large intact grasslands, within the project site.
- Upland sandpiper (*Bartramia longicauda*; state endangered): avoid nesting habitat if present during nesting April 15 - July 31. This species is not likely to be impacted due to the lack of suitable habitat, such as large intact grasslands, ungrazed pastures, and hayfields, within the project site.
- Least bittern (*Ixobrychus exilis*; state threatened): avoid nesting habitat if present during nesting May 31 – July 31. This species is not likely to be impacted due to the lack of suitable habitat, such as thick stands of cattails, sedges, sawgrass or other semiaquatic vegetation interspersed with woody vegetation and open water, within the project site.

4.4 Federally Listed Endangered or Threatened Species

ORC 6111.30(A)(7) requires that a 401 WQC application include “adequate documentation confirming that the Applicant has requested comments from the...United States Fish and Wildlife Service regarding threatened and endangered species, including the presence or absence of critical habitat.”

The USFWS published list of endangered and threatened species in Ohio (October 2019) was reviewed. According to the list, there are four (4) listed species found distributed within Trumbull County, Ohio, which include:

- Indiana bat – Endangered
- Northern long-eared bat (*Myotis septentrionalis*) – Threatened
- Eastern massasauga – Threatened
- Clubshell – Endangered

Informal coordination with the USFWS was initiated by GHD through the USFWS’ Information for Planning and Consultation (IPaC) online system. On September 25, 2019 a reply was received from the USFWS IPaC system confirming the four (4) listed species identified above. In addition, the letter indicated there were no critical habitats located within the Project area (Appendix E).

Copperhead Environmental Consulting conducted a bat presence/probable absence survey within the Site from June 5 to 7, 2018. During this survey, no federally listed bat species were captured (Appendix E). Upon review of this report, the USFWS provided a subsequent letter concurring with these findings and confirmed that tree clearing at any time of the year before March 31, 2024 would unlikely result in adverse impacts to Indiana bats. During a pre-application meeting on December 6, 2019, the USACE asked the

USFWS if they would be opposed to the USACE making a “no effects” determination for the Indiana bat. At that meeting, Jeromy Applegate with the USFWS stated that they would not be opposed to a “no effects” determination for the Indiana bat.

With no records of known hibernacula or maternity roosts for northern long-eared bat in the vicinity of the Project, the USFWS indicated the Endangered Species Act Section 4(d) rule could be applied.

Additionally, GHD sent a request letter to the USFWS on January 2, 2020 (Appendix E) regarding confirmation of previous evaluations by the USFWS in regard to the Project. In an email dated January 3, 2020 to GHD, the USFWS indicated tree clearing on the Site could occur at any time of the year, until March 31, 2024 and that it did not anticipate impacts to any other federally listed species (Appendix E).

4.5 Archaeological and Historical Information

On October 14, 2019 GHD sent correspondence to the State Historic Preservation Office (SHPO) to determine if the Project might affect historic properties. On October 28, 2019, GHD received a response letter from SHPO recommending an archaeological survey, as well as a history/architecture survey for the entire Area of Potential Effects (Appendix F).

On December 3, 2019, Weller & Associates, Inc. (Weller) conducted a Cultural Resource Management Preliminary review (Phase 1a) for the Project area and a study area of 1-mile surrounding the Project. Weller reported that the Project area has not been the subject of any previous investigations and there are no sites (archaeological or architectural) recorded within it. There are no recorded National Register or significant cultural resources located within or near the Project area. The Project area remains undeveloped with open previously farmed areas and patches of woods and scrub or rangeland. Based on Weller’s experience in this region and in the immediate vicinity, Weller indicated it is unlikely that any significant cultural resources would be present within the area. A copy of Weller’s Cultural Resource Management Preliminary Review is contained in Appendix F.

Weller conducted a Phase 1b cultural resource investigation at the Site from December 3 to 5, 2019. The field investigations by Weller involved subsurface methods of sampling and visual inspection. The field reconnaissance did not result in the identification of any archaeological deposits. Much of the Site was found to be severely disturbed from previous activities or contained in designated wetlands. There were no archaeological sites identified during this survey. Weller considers a finding of no historic properties affected (36 CFR 800.5) appropriate and no further archaeological work is considered to be necessary for this Undertaking. A copy of the Phase I Archaeological Investigations report is contained in Appendix F.

In December of 2019, Weller also conducted history/architecture investigations for the Site. The literature review and field investigations identified two individual resources (TRU0104022 and TRU0104122) 50 years of age or older within the Area of Potential Effects. Both resources were found to be ineligible for inclusion in the NRHP under Criteria A, B, or C due to a lack of associative significance, a loss of integrity, and an absence of character defining features. Weller recommends a finding of ‘no historic properties affected’ for this Site. A copy of the History/Architecture Investigations report is contained in Appendix F.

5 ANTIDegradation ANALYSIS

An antidegradation analysis is required to be performed as part of a 401 Water Quality Certification application pursuant to ORC 6111.30 and Ohio Administrative Code (OAC) 3745-32-03, 3745-1-05 and 3745-1-54. This analysis shall be prepared in accordance with 40 CFR Part 230 and OAC 3745-32-03, 3745-1-05 and 3745-1-54.

The sequence of the antidegradation analysis discussion follows the format of the Ohio EPA Section 401 Water Quality Certification Application Completion and Submittal Instructions (rev. 1/2019).

5.1 Project Purpose and Description

The purpose of the proposed Project is to develop a minimum of 150 acres of land in the Mahoning Valley region of Ohio to construct a mass-production battery cell manufacturing plant near rail and highway access to supply GM's next generation of battery-electric vehicles. State, regional and local governments and other community stakeholders have all expressed a desire to have the Mahoning Valley region become a hub for electric vehicle and electric vehicle component development and manufacturing and their support makes the Mahoning Valley a preferred location for the Project. This new facility is expected to create more than 1,100 new jobs. Construction is anticipated to begin in April 2020 and be completed in January of 2022.

5.2 Practicable Alternatives and Demonstration of Avoidance, Minimization and Mitigation

This analysis of practicable alternatives was prepared to present the Project alternatives that were evaluated during the environmental planning process for the Project. This analysis is provided to demonstrate compliance with the federal Clean Water Act Section 404(b)(1) guidelines (40 CFR 230) and Ohio Section 401 Water Quality Certification guidelines, which require that non-water dependent projects avoid or minimize impacts to aquatic resources to the greatest extent practicable (i.e., considering cost, existing technology, and logistics in light of overall Project purposes) and demonstrate that any proposed aquatic impacts are necessary to achieve the basic Project purpose.

5.2.1 Define Project Purpose

The purpose of the Project is to construct a battery cell manufacturing plant with access to rail, highway, and high voltage power to meet demand for electric vehicles and to bring jobs and economic growth back to the Mahoning Valley area with construction starting in April 2020 and completing in January 2022.

5.2.2 Water Dependency Determination

The Project does not require access to, proximity to, or siting within a special aquatic site to fulfil its basic purpose. Therefore, the Project is not a water dependent project.

5.2.3 Identify Project Alternatives

Alternative sites were evaluated to determine if they would meet the overall Project purpose. A description of the off-site and on-site alternatives analysis is provided below.

5.2.3.1 Off-Site Alternatives Analysis

In the search for a suitable site location that could meet the overall Project purpose, the Applicant utilized a realty firm to research potential parcels within the region. Desired parcels were required to be on the market, zoned industrial, no less than 150-acres with a preference for additional acreage for potential expansion in the future. Additionally, sites were preferred to be within the Mahoning Valley area due to an existing experienced labor force, the region's positioning as a technology hub, and its proximity to supply chains, infrastructure, and markets. Bringing new jobs in the area and establishing battery cell manufacturing expertise were driving factors behind the selection of the location. The realty firm utilized their own database and received information from the regional chamber of commerce to amass an initial list of over 100 potential parcels. The list was narrowed down, using the criteria above, to seven large sites and six small sites for the Applicant to evaluate further. The six smaller sites were all considerably less than 150-acres and not evaluated further. One of the larger sites was a brownfield site. The phase II environmental and clean up was not complete and there was no confidence on exactly when it could be completed. Underground basement area foundations were left in place that could pose unforeseen conditions for our new Project foundations. Warning signs of deep silt layer and adjacency to a river posed more risk that we were prepared to address. For these reasons, the site was not evaluated further. The six remaining large sites were considered for further evaluation.

5.2.3.2 Practicable Alternative Analysis

Site visits by the Applicant's development and construction staff were completed for the remaining six large sites. These sites were evaluated for proximity to an interstate highway system (less than 5-miles), preferred nearby available rail with rail access at the site, and adjacency to high-voltage power lines to meet required power demands. Appendix G contains the property overview, zoning, transportation, property condition, available documents, incentives, and utilities information for these six sites, which are described in more detail below. The terms poor, moderate and good are used in this section to describe relative access to utilities/features. Poor access indicates that access to a utility/feature is beyond project needs-criteria, or access issues to utility/feature appear significant and/or unable to be overcome. Moderate access indicates that access to a utility/feature is not ideal, but a workable solution seems possible. Good access indicates that no significant issues to accessing the utility/feature are apparent.

Site 1 is a 158-acre parcel owned by NorthPoint Development and is located just east of the Lordstown Motors Corporation complex. This site contains sufficient acreage for the Project, although 158 acres is on the lower end of the sizing criterion. The listed cost per acre of the site is \$35,000. The potential for future expansion, whether it be on-site or adjacent, remains undetermined. Site 1 is zoned for industrial use, which is favorable for development at this location. Electric, gas, sanitary sewer, and communication utilities are available nearby and on-site storm water management will be required. Site 1 is less than one mile to the nearest interstate for employee commuter access and trucking distribution with no disruption to neighborhood or downtown areas and it has adjacent rail potential. A previous wetland determination/delineation indicates there were only approximately 8.8 acres back in 2014. A majority of

the site was cleared of trees in 2015. A second delineation was completed in 2017, after tree clearing on the site had been completed, that indicated 24.5 acres of wetlands had been developed. There are no NWI-mapped wetlands on the Site. The Site is within the FEMA-mapped flood zone X (area of minimal flood hazard). Moderate flexibility of building arrangement and only moderate clearing issues makes site conditions appear feasible for construction. For these reasons and despite the newly formed wetland area on Site 1, this site was retained for a more detailed evaluation.

Site 2 is a linear 250-acre brownfield site owned by BDM Warren Steel Holdings and is located just south of Warren, OH on Pine Avenue. This site has a sufficient parcel size for project needs and is zoned for industrial use. The listed cost per acre is \$50,000. Electric, storm sewer and sanitary sewer infrastructure and communication utilities are located nearby, and gas service is available to the site. Transportation accessibility for Site 2 is poor, requiring vehicular and truck traffic to travel through local neighborhoods and downtown corridors in Warren and Niles to and from the nearest interstate expressway. While it has good rail potential, it is 5-10 miles from the nearest expressway making this site not reasonably accessible for both transportation methods. Since the site is large, it offers flexibility for adjusting building arrangements and there are no site clearing issues since the site is not forested. There are approximately 5 acres of NWI mapped resources on this site. Unavoidable impacts to these resources would require permitting. In addition, approximately one third of the site is within the FEMA-mapped flood hazard zones A and AE (1% annual chance flooding) of the Mahoning River; development in the floodplain for battery cell manufacturing is not prudent since flooding could result in unsafe or hazardous conditions at the facility. A major concern with Site 2 is that environmental remediation work at the site is not complete. There are significant environmental and geotechnical concerns regarding former structures, foundations, and underground utilities that were previously on the site. The investigations and closure of these subsurface issues would require extensive evaluations and costs and cannot be resolved in a time frame meeting the Project schedule. To summarize, distance to the nearest expressway, poor site transportation, and unacceptability of site development in a floodplain are the reasons Site 2 was not selected for further evaluation.

Site 3 is another linear 267-acre brownfield site owned by BDM Warren Steel Holdings and is located just south of Warren, OH on Pine Avenue. This site has a sufficient parcel size and is zoned for industrial use. The cost per acre is listed as \$30,000. Gas utilities are available on-site and electric, sanitary sewer infrastructure, and communication utilities are located nearby. Storm water retention availability is not yet determined. Similar to nearby Site 2, transportation accessibility to Site 3 is poor requiring vehicular and truck traffic to travel through local neighborhoods and downtown corridors in Warren and Niles. It is also 5-10 miles from the nearest expressway. There is one NWI-mapped shrub-scrub wetland approximately 1.5 acres in size and two NWI mapped riverine features on the site. The site is also within the FEMA-mapped flood zone X (area of minimal flood hazard). Flexibility of building arrangement is good, but site-clearing issues present moderate problems as a significant portion of the site is wooded. Soil reports for the site identify a significant amount of the wooded area as having hydric soils, an indicator of likely forested wetlands on the site. The poor site transportation, distance from the nearest expressway and potential for significant forested wetlands are the reasons Site 3 was not selected for further evaluation.

Site 4 is a multi-parcel site with the largest parcel owned by Norfolk Southern and six smaller parcels owned by various entities including Arnil Inc. The site is located on Ellsworth-Bailey Road just west of the Lordstown Motors Corporation facility and is bisected by Industrial Trace road. The Norfolk Southern parcel is located south of Industrial Trace and the six other parcels are north of Industrial Trace. This

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combined site has a sufficient parcel size of 304 acres and is zoned for industrial use. The evaluated site south of Industrial Trace is approximately 161 acres. The listed cost per acre is \$37,000-\$50,000. Sanitary sewer, and communication utilities are located nearby. Gas is available at the site and required electric power is not adjacent but is moderately available. Accessibility to Site 4 has good expressway is less than one mile. Ease of rail access is moderate with the ability to extend an existing rail line across Ellsworth-Bailey Rd onto the site. Flexibility of building arrangement was good but heavy lumber/hardwood clearing would be required to make the site conditions feasible for construction. There is one NWI mapped wetland approximately 2 acres in size and one NWI-mapped riverine feature on the site that would be impacted and require permitting. The site is within the FEMA-mapped flood zone X (area of minimal flood hazard). This site was retained for a more detailed evaluation.

Site 5 is owned by Leonard Enterprises, Ltd. and is in North Jackson, OH on Leonard Parkway. This site has a sufficient parcel size of 152 acres which is on the low end of acreage needed. The cost per acre is \$35,000. This site is not zoned for industrial use and would require 3 City Council votes and a referendum to change zoning. Electric, gas, sanitary sewer, and communication utilities are all located nearby. Accessibility to Site 5 is good. Site transportation to and from the site is less than one mile to the nearest expressway. The site has poor access to rail. The flexibility of building arrangement is poor due to the overall parcel shape and a large gas main traversing the center of the site minimizing site layout options. [Subsequent to the initial screening process to further evaluate practicability, the cost to move the gas line was estimated to be approximately \$100 per foot at a significant total cost of \$350,000.] Site clearing issues were moderate as a portion of the site is wooded. There are no NWI-mapped resources on the site, and it is within the FEMA-mapped flood zone X (area of minimal flood hazard). The lack of appropriate existing zoning, poor rail potential, poor flexibility of building arrangement, and impacts to an unknown quantity/quality of off-site wetland sources from rail siding installation are the reasons Site 5 was not selected for further evaluation.

Site 6 is a 138-acre site owned by BHGH Properties LLC and is located on Tod Ave and is part of the Lordstown Commerce Park West. This site has a parcel size of 138 acres, which is below the project needs, and is \$7,150 per acre. This site is currently zoned for agricultural use and would require re-zoning. There are three NWI-mapped wetlands totalling approximately 4 acres in size and one NWI-mapped riverine feature on the site that would be impacted and require permitting. The availability of utilities is not yet determined. Site 6 has poor rail potential and is located 10-15 miles from the nearest expressway. The flexibility of building arrangement was restricted due to the small site size and is almost entirely wooded. The small site size, lack of appropriate existing zoning, poor utility availability, poor rail potential, and need for significant tree clearing are the reasons Site 6 was not selected for further evaluation.

From preliminary screening and inspections of the six large sites, all but two – Sites 1 and 4 – were eliminated for further evaluation due to significant site constraints making those four sites unsuitable for this project. Appendix H provides a table summary of the six sites assessed and the criteria that were used to screen down to the final two sites. Sites 1 and 4 are evaluated further for the least environmentally damaging alternative.

5.2.3.3 Least Environmentally Damaging Practicable Alternative

Site 4 met many of the Project site needs from a development perspective. However, similar to Site 1, Site 4 has a significant quantity of wetlands that would be impacted by the Project. Initial conceptual layouts on Site 4 indicated impacts of 40 acres to Category 2 forested wetlands. However, as a preliminary conceptual layout, this only included the primary building and the outbuildings; there was no accounting for utilities, rail sidings or loading areas, stormwater management, trucking roads or parking. Additionally, the Project building in the initial concept plans is anticipated to increase in size by 15 percent. Updated preliminary project layouts incorporating this building size increase indicate that impacts to approximately 68 acres of wetlands including approximately 65 acres of potentially Category 2 wetlands and 600 linear feet of intermittent stream would be necessary on Site 4 (Figure 4).

The wetlands at Site 1 are 75% verified Category 1 and Category 2 non-forested wetlands while the wetlands on Site 4 are 96% Category 2 (viewed by Ohio EPA but unverified) forested wetlands. Given that the quantity of impacts at the two sites are similar, impacts to the mostly non-forested wetlands on Site 1 would be less environmentally damaging than impacting approximately 68 acres of forested and non-forested wetlands on Site 4. In addition, approximately 600 linear feet of intermittent stream would be impacted on Site 4.

Site 4 is over 90% forested and at least 100-acres of trees will need to be cleared. Tree removal poses an issue due to the potential for impacts to protected bat species. Presence/absence of protected bat species has not been established for Site 4, while the Site 1 has a completed and approved bat survey with USFWS concurrence that Site 1 is not being used by protected bat species. Comparing forest and bat issues for the two sites, Site 1 has less environmental impacts as it has been documented that bats do not use the Site.

Investigations into the electrical infrastructure in the area by GM experts reveal not enough power for the new facilities on Site 1. A new regional substation would have to be constructed to feed the plant. However, land area on-site could be allocated to accommodate this installation and to speed development. On Site 4, the electrical feed from Ohio Edison would pose a very difficult challenge as this site is fed from a separate grid and requires significant design. Additional property and easement acquisition would be required for this site to be feasible.

Lastly, the acquisition process for Site 4 has been problematic. Verbal negotiations with the parcel owner began well; however, marked up purchase documents were sent to the owner for review and no response has been received. With the site needing to be acquired in early 2020, this has become an obstacle for potential development of Site 4. On the other hand, the Applicant has completed negotiating and has entered into a contract to buy Site 1 as of October of 2019.

The Applicant also prefers Site 1 over Site 4 for other development related reasons: (1) GM is already familiar with Site 1 and capabilities of its surrounding infrastructure because Site 1 was originally part of the Lordstown Assembly Plant complex; (2) Site 1, unlike Site 4, already has rail service immediately adjacent to the boundary of Site 1 whereas Site 4 would require an extension of rail across Ellsworth-Bailey Rd.; (3) the seller of Site 1 and GM have already completed significant due diligence (e.g., geotechnical samples) for Site 1 demonstrating that site construction is feasible and allowing timely project design for Site 1 – an important factor given the Project's timeline.

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To arrive at the Least Environmentally Damaging Practicable Alternative (LEDPA), a comparison was made between Site 1 and Site 4 for the following factors: wetland impacts, stream impacts, quantity of forest clearing, cultural resource impacts, and potential to impact protected bat species. In reviewing the two alternatives, Site 1 has fewer higher quality wetland impacts, less forest clearing, no impacts to cultural resources, and confirmation that protected bat species do not use the Site (Table 1). For these reasons Site 1 is the LEDPA. Figure 6 contains the limits of disturbance for the preferred alternative design drawings. Figure 7 depicts the preferred alternative with the delineated wetlands and streams. Figure 8 contains cross sectional views of the Project.

Table 1 – Least Environmentally Damaging Practicable Alternatives Comparison Matrix

ENVIRONMENTAL FACTOR		SITE 1 – NorthPoint	SITE 4 – Norfolk Southern ^a	
Wetland Impacts (Acres)	Non-Forested	Category 1	19.91	1.58
		Category 2	29.30	1.13
	Forested	Category 1	0.30	0.07
		Category 2	16.48	65.57
	Total Wetland Impacts		65.99	68.35
Stream Impacts (Linear Feet)		81	600	
Forest Clearing (Acres)		+/- 50	100+	
USFWS Approved Bat Study with “Unlikely to Affect” Determination		Yes	No	
Cultural Resources	Phase 1a Preliminary Review Completed	Yes No Adverse Effects Anticipated	Yes No Adverse Effects Anticipated	
	Phase 1b Archaeological Investigation Completed	Yes No Effect on any Significant Resources	No No Feld Investigations Conducted	
	History of Architecture Investigation Completed	Yes No Historic Properties Affected	No No Evaluation of Historic Properties	
Least Environmentally Damaging Practicable Alternative		Yes	No	

^a ORAM scores at the Norfolk Southern site have not been verified the Ohio EPA

5.2.4 On-Site Alternatives Analysis

In accordance with 40 CFR Part 230 and OAC 3745-1-05, the Applicant completed an analysis of on-site alternatives to determine if there is an on-site alternative that would result in less water quality impacts. This analysis included an evaluation of on-site avoidance of existing waters to determine if the site could be re-designed without impacting some amount of wetland area or streams.

An initial configuration was developed that incorporated the three large process operations buildings into one single structure. The building is required to be linear in nature to accommodate the equipment and modules for the cell manufacturing processes. This option was considered due to its smaller overall footprint. Despite this reduction, the size of the building was still large enough that no other alignment other than north-south was practicable. As this design was further evaluated, it was discovered that fire codes required the operations buildings be separated by a minimum of 60-feet. The single-building approach was abandoned for the three-building configuration.

Due to the limited size and configuration of Site 1, the size of the proposed facility, building layout and associated features necessary, and the spatial distribution of wetlands on-site, avoidance of impacting wetland areas is not a practical option. Stream 2 will be completely avoided. The railroad spur along the north end of the Site has been shortened sufficiently to avoid all impacts to Stream 2. Stream 1 cannot be avoided due to the amount of grading required along that edge of the Site (Figure 5).

5.2.5 Avoidance

Avoidance considerations were factored into the alternatives analysis which included implementing the Project without affecting water resources, re-designing the Project and/or making the Project footprint smaller in order to fit the site without affecting water resources, identification of logistical issues (highway access to the site, rail and high voltage power), and consideration of alternative sites.

Of the six large sites in the Mahoning Valley that were initially evaluated for development, five sites (Sites 1, 2, 3, 4, and 6) contained wetlands and/or streams. Those five sites would require a permit to impact regulated wetland or stream resources to complete the proposed Project's purpose and need. The remaining site, Site 5 does not have any mapped NWI wetlands or stream. Development of this site was rejected as not practicable or feasible for several reasons. The site is not zoned industrial and required the lengthy and uncertain approval process. The zoning approval would represent nearly a year's delay in the Project due to the need to pass referendum. A referendum would have to wait for the November 2020 ballot due to timing for multiple city council hearings and required timeframes to put an initiative on the ballot. That significant a delay in the Project would result in lost markets due to failure to deliver a timely product and costing in the range of \$300 million in lost employee wages (Assuming 1,100 jobs at an average salary of \$25,000). Site 5 is nearly a mile away (straight line) from the nearest rail line. Assuming that a safe alignment was possible, a rail spur to the site may require up to a mile and a half of new line at a significant cost of \$6.2 million. Furthermore, the most direct and feasible alignment for this rail spur would have to cross multiple properties with mapped NWI wetlands which would require a clean water act permit to impact. Obtaining right of way across multiple properties would be unlikely. Lastly, Site 5 is traversed by a high pressure 6-inch natural gas line. This line runs approximately 2,300 linear feet across the site. The line would have to be relocated which would extend its length to approximately 3,500 linear feet at a significant cost of \$350,000. Site 5 would require significant additional cost in time and money to develop and would still require a clean water act permit to make the site

practicable. None of the sites that were potentially feasible can be developed without some degree of impact to WOTUS and requiring a Clean Water Act permit.

The preferred Site 1 is approximately 158-acres which is at the lower range of the Project's site need for acreage. The Site is slightly irregular in shape which limits alignment options for a project with a large building footprint. The site is also elevated in the center which will require significant grading to accommodate the proposed several large buildings. The building is required to be linear in nature to accommodate the equipment and modules for the battery cell manufacturing processes. These factors contribute to the entire Site area needing to be utilized to fit all the required Project components. There is no alignment or configuration of the required components that could be arranged that would allow the Project to proceed without impacting resources and requiring a permit from the USACE. The Project is also sized to meet an initial demand. Modifying or reducing the Project's scale such that there would be no resource impacts would make the Project infeasible and unable to meet production needs.

5.2.6 Minimization

The proposed Project requires approximately 1.6 million square feet of operational manufacturing space. Additional space is required for attendant structures and features to provide various support functions such as parking for employees, railroad sidings and loading areas, utility and access roads for trucks, stormwater management facilities, a substation, an administration building, a guard house, hazardous material storage, recycling, and a boiler. The Site is approximately 158-acres which is at the lower range of the Project's site need for acreage. The Site is also slightly irregular in shape which limits alignment options for a project with such a large building footprint. The site is elevated in the center which will require significant grading to accommodate the proposed several large buildings. With the large buildings in the center, site grading and attendant structures must be placed around the perimeter. These factors will contribute to nearly the entire Site area needing to be utilized to fit all the required Project components. The Project is also sized to meet an initial demand. Modifying the Project's scale would make the Project infeasible and unable to meet production needs.

5.2.7 Mitigation

As described in the previous sections detailing the alternatives analysis, avoidance and minimization, it is not practicable to implement the proposed Project without impacting water resources. Mitigation will be necessary to offset losses from unavoidable impacts. The proposed mitigation is described in more detail in Section 7 below.

For the proposed Project, the Applicant has evaluated multiple site within the Mahoning watershed for mitigation potential with the goal of providing as many of the required credits at one location as possible. The preferred mitigation site is an approximately 180-acre parcel of land located near Mosquito Creek Lake. The current land use at the site is active agriculture. All wetland mitigation credits are anticipated to be accommodated at this site. The land is publicly owned and will be protected in perpetuity with an environmental covenant.

Availability of Mitigation Bank or In-Lieu Fee Programs

There are no wetland banks that currently have mitigation credits available for the Mahoning River watershed. The Applicant has reserved 13.9 in-lieu fee (ILF) wetland credits from the Nature Conservancy. There are 10 ILF credits available with Stream + Wetland Foundation. As neither of these programs can provide the needed amount of mitigation, the Application is identifying PRM with the intent of providing all credits in one location.

The Stream +Wetland Foundation has 13,120 linear feet of ILF stream credits. ILF stream credits will be purchased for mitigation of stream impacts.

5.3 Magnitude of the Proposed Lowering of Water Quality

The proposed Project will permanently impact a total of approximately 65.99 acres of jurisdictional wetlands. A summary of wetland impacts is provided in Appendix A and a summary of stream impacts is provided in Appendix B. These resources would be filled to accommodate the proposed manufacturing facility and associated features. The potential impacts to habitat, biota, human health and welfare, recreation, and aesthetics associated with these proposed fills are detailed below.

5.3.1 Stream Impacts:

Approximately 131 linear feet of unmapped ephemeral headwater streams are contained within the Project area. The Site contains two streams; Stream 1 (81 linear feet) and Stream 2 (50 linear feet). A total of 81 linear feet of Stream 1 will be permanently impacted by the Project. Stream 2 will not be impacted by the Project. Stream 1 would be filled to accommodate the proposed development. Stream characteristics are described in more detailed below, and stream impacts are provided in Appendix B.

5.3.1.1 Stream 1

Stream 1 is an ephemeral stream that originates in the northern end of Wetland Z with the source of hydrology being surface water run-off from within Wetland Z. The stream channel was dry in September of 2019 and had about an inch of water in the channel in December of 2019. The channel is headcutting and incised. The drainage area to the channel is approximately 61 acres. The dominant substrate types are gravel and clay/hardpan. No aquatic macroinvertebrates or fish were observed during the December site visit. The on-site channel drains to a railroad side ditch that drains southeast then north to Mud Creek north of the Site. Stream 1 is of low value due to the ephemeral nature of its channel and the lack of significant groundwater inputs. Stream 1 received a HHEI score of 30, which is consistent with an Ohio EPA Class II Modified PWH stream classification.

The flow path from Stream 1 to Mud Creek to the confluence with the Mahoning River, as measured on Google Earth using the USEPA's Watershed Assessment, Tracking and Environmental Results System (WATERS) kmz stream layer, is approximately 6.60 miles or 34,859 linear feet. The loss of 81 linear feet of Stream 1 represents 0.2 percent of this flow path. This minimal loss within the Mud Creek and Mahoning watershed will not significantly impact aquatic biota and will be replaced by on-site stormwater management systems.

5.3.1.2 Stream 2

Stream 2 is an ephemeral stream that originates in the extreme northwestern portion of the Site and will not be impacted due to avoidance measures. It is a small channel, dominated by gravel and clay/hardpan and fed by a man-made upland ditch. Stream 2 exits the Site through a culvert under railroad tracks to the northwest of the Site and continues to the north where it drains into an unnamed tributary to Mud Creek. The riparian corridor of Stream 2 is very narrow containing mostly young red maple (*Acer rubrum*), silky dogwood (*Cornus amomum*), and glossy buckthorn (*Frangula alnus*) shrubs with an understory of multiflora rose (*Rosa multiflora*). The ordinary high-water mark (OHWM) is less than 1 meter wide and the stream was flowing during the December 2019 site visit, which was in response to recent rain events. No aquatic life was observed within Stream 2 during the site visit in December of 2019. Stream 2 received a HHEI score of 25 which is consistent with an Ohio EPA Class I Modified PHWH stream classification.

The flow path from Stream 2 to the confluence with the Mahoning River via a small reach of Mud Creek, as measured on Google Earth using the USEPA's WATERS kmz stream layer, is approximately 5.64 miles or 29,776 linear feet. There will be no impacts to Stream 2.

5.3.2 Wetland Impacts

Approximately 65.99 acres of wetland are within the Project area (Figure 2). This includes 20.21 acres of Category 1 jurisdictional wetlands and 45.78 acres of Category 2 jurisdictional wetlands. The total wetland area to be permanently impacted on the Site is approximately 65.99 acres. These resources would be filled to accommodate the proposed development. Wetland impacts are provided in Appendix A.

No biological assessment of the wetlands on this Site was completed. The wetlands to be impacted range from an ORAM score of 14 to 40.5. The Project's impacts on amphibians are expected to be minimal as the wetlands are disturbed or do not contain significant vernal pools. Most of the wetlands are heavily disturbed and many of these wetlands are recently formed as a result of disturbance from recent logging activities. The recovering conditions of these systems does not provide high quality habitat for amphibians or macroinvertebrates. The recent timeframe from disturbance and low quality would not lend to significant recruitment of species to these newly formed wetlands.

The site was historically agricultural. Farming ceased in the 1970's and 1980's. Wetlands on the NorthPoint site were delineated on September 30, 2014 and October 1, 2014 by Terra Technologies, a consulting firm based in Leawood, Kansas. Investigators from Terra Technologies observed ten (10) wetlands on the site totaling 8.81 acres and three (3) stream segment totaling 2,597 linear feet on-site. The delineation was submitted to the USACE in October 2014 (Figure 3).

In March 2015, a clearing company cut trees on much of the property. The tree stumps were not removed in either uplands or wetlands. The USACE conducted a site visit in June 2015 and requested additional information for the site. The USACE did not verify the results of the Terra Technologies delineation.

In April 2017, EMH&T and the USACE conducted a joint site visit to observe the current site conditions. During that site visit, it appeared that wetlands on the site either had expanded outside their original boundaries or were larger than originally delineated. Some other areas on the site appeared to be holding water in uplands due to severe rutting caused by equipment used during the 2015 clearing activity. According to the EMH&T 2017 report, it was agreed that these upland areas holding water would not be considered wetlands at the time of the Corps April 2017 site visit.

On May 22, 2017 through May 24, 2017, EMH&T conducted a delineation of the NorthPoint property. All wetland boundaries were flagged and surveyed using a handheld GPS unit. Delineation datasheets were completed for all delineated wetlands. EMH&T observed that the boundaries of most wetlands had expanded in size since the 2014 Terra Technologies delineation was completed and several additional wetlands were identified and delineated. EMH&T identified 24.56 acres of wetlands on-site, and 0.21 acre of wetland in the right-of-way of Tod Ave SW, and three (3) stream segments totaling 3,040 linear feet on-site. The Corps issued a preliminary jurisdictional determination (LRP 2014-1077) on December 20, 2017 based on EHM&T's 2017 wetland delineation (Figure 3).

On behalf of GM, GHD conducted a wetland delineation from October 15 to October 22, 2019 (Appendix B). GHD reviewed the Terra Technologies and EMH&T reports prior to conducting field investigations. GHD observed that most of the site had been recently logged and severely rutted by logging activities, as noted by EHM&T in 2017. In addition to the wetland areas identified during previous delineations, GHD observed that large parts of the site that were previously identified as uplands, and that were severely rutted in 2015, are now dominated by a hydrophytic plant species, exhibited indicators of wetland hydrology, and had soils with a depleted matrix and redox features in the upper 10 inches of the soil profile. Based on these observations, GHD delineated 25 wetland areas totaling 65.99 acres on-site. GHD also identified two ephemeral stream segments (Streams 1 and 2) totaling 131 linear feet on-site. Two ephemeral man-made ditches (Ditches 1 and 2) were identified on-site. Ditch 1 totals 307.5 linear feet on-site. Ditch 2 totals 2,965 linear feet on-site (Figure 3). The USACE and Ohio EPA inspected the site on December 13, 2019. The USACE requested several minor revisions to the delineated wetland boundaries which were made. Ohio EPA verified ORAM 5.0 scoring of the wetlands and verified the extent of streams onsite.

It is GHD's opinion that the additional wetlands identified in 2019 as compared to 2014 and 2017, are clearly the result of the 2015 logging activities. The logging activities resulted in the disruption of the normal plant communities, alteration of site drainage and evapotranspiration, and compaction and rutting of the soils. These site conditions, coinciding with successive years of significantly above normal precipitation, resulted in the expansion of the wetlands on the site and the formation of new wetland areas in former upland areas on the site.

These newly formed wetlands have not had time to develop into moderate or high-quality resources. Since they recently formed on uplands as a result of logging activities, they do not provide a significant benefit in the overall watershed health. The wetlands are neither unique or rare in the state or local region. Their loss will not adversely affect aquatic biota or the surrounding ecosystems.

5.3.3 Quality of Aquatic Community

The proposed wetland impacts are permanent and would result in the elimination of aquatic life from these wetland areas. However, due to the recent significant disturbance and development of these wetlands, loss of aquatic life will not be substantial. Impacts to aquatic life within the streams are expected to be minimal. Stream 1 and Stream 2 are classified as ephemeral and therefore would not support long-lived aquatic organisms. Due to the location, type of habitat present, and that there is no in-water work proposed in a perennial stream, no state or federally listed aquatic species are anticipated to be affected.

5.3.4 Impacts to Terrestrial Biota

Construction activities will impact the forest on both the northeast and southwest corners of the Project area. It is anticipated that approximately 40 acres of trees will be impacted out of the 47.17 acres of wooded areas on the Site. Few terrestrial biota, including birds, amphibians, reptiles and small mammals are expected to be disturbed or displaced during construction. These wildlife species could re-colonize to similar habitats located on adjacent parcels. No impacts are anticipated to occur to endangered, threatened or proposed listed terrestrial species, as suitable habitat does not exist on the Site to support listed species. See Sections 4.3 and 4.4 for more detailed descriptions of federal and state listed species.

5.3.5 Human Health and Welfare Impacts

The surface waters on the Site are not used for direct contact recreation or as a direct source of drinking water, therefore no impacts are expected to occur to human health.

5.3.5.1 Sanitary Sewer

The Project will not have any on-site sanitary wastewater treatment facilities. Sanitary waste from the Site will primarily be from restroom facilities and will be sent to the Warren Municipal Wastewater Treatment Plant. All process water for operations is recovered and reused and will not enter the sanitary sewer system.

5.3.5.2 Stormwater Quantity Control

The Project will provide on-site stormwater management facilities to control for both water quality and water quantity. The Project will conform with all aspects for stormwater management in the Ohio NPDES General Construction Permit (Ohio EPA Permit No. OHC000005) including preparation of a Stormwater Pollution Prevention Plan. Post-construction peak discharge rates will not exceed pre-construction peak discharge rates per the Trumbull County stormwater regulations. Downstream sites will not be at greater risk from flooding as a result of the Project.

5.3.5.3 Hazardous Materials

The safe production of lithium-ion batteries does not result in any hazardous materials that will exit the manufacturing plant and enter directly or indirectly into WOTUS either on-site or downstream off-site. Minimizing the negative impacts of the Project is mainly associated with limiting the spread of pollution. This will be achieved by conducting the process inside production halls, the use of atmosphere protection devices (dust collectors, etc.), tight floors that are adapted to the stored substances of storage tanks, designation of appropriate waste storage places, and compliance with the technological regime. The Project will not affect the quantitative and chemical status of the groundwater; therefore, no negative impacts are anticipated to WOTUS either on-site or downstream off-site.

Wastewater and waste management at the Site will be conducted in a manner that does not pose a threat to the water and soil environment. Given that the Site is located in the FEMA-mapped flood zone X, the risk of flood is low.

Safety Data Sheets (SDS's) for all chemicals will be followed and available on-site. Electrolyte storage tanks will be made of materials resistant to the substances stored in them and placed in a hardened area, which will protect the soil and water environment. Transfer of electrolytes will take place under nitrogen pressure eliminating the possibility of substance emission. Leakage sensors will also be located on the valves. The tank unloading stand will be surrounded by a trough, equipped with sumps, and the floor will be covered with chemical resistant resin. Used or expired mixtures of chemicals and laboratory reagents will be selectively stored in closed, labelled containers, resistant to substances contained in waste, in a separate location on the premises. The storage location will be protected against weather conditions and unauthorized access. The warehouses will be equipped with drip trays, sorbent materials, and fire-fighting equipment. The plant will be equipped with a fire sprinkler system and any transfer of materials will take place over hardened areas equipped with separators. The transport of waste generated by the plant is adapted to the type and amount of waste and is carried out through authorized qualified transport companies. Air purification systems will be installed in product mixing areas, which will filter dust from the air before it is directed into the atmosphere. Any required air permits will be obtained to ensure the safety of air purification systems.

5.3.6 Recreational Impacts:

The size, type, and quality of the existing surface waters on the Site make recreational opportunities such as fishing and swimming impractical. The area could potentially support passive recreation; however, the Site is not currently used for any recreational activities.

5.3.7 Social, Economic and Aesthetic Impacts

No direct loss of jobs will occur due to the filling of the wetland areas located on Site, or due to the proposed mitigation options. The recently purchased Lordstown Motors Corporation plant was formerly a General Motors plant which ceased production in March 2019. With the transfer of employees to other GM locations or to other positions outside GM, more than 1,400 jobs were lost in the local area. The Project is expected to create more than 1,100 new jobs in the area and would positively impact the economy. Since manufacturing brings in capital from outside the area rather than just recirculating it, these new factory positions will increase the need for other support jobs in the region such as food service, healthcare, education and retail. No direct or indirect lowering of property values is anticipated due the construction of the proposed manufacturing facility. By returning jobs to the area, demand for housing will increase and would bolster rather than lower housing costs. The highway infrastructure was developed to accommodate the high volume of laborers at the automotive plant. With the Site being located next to the Lordstown Motors Corporation plant, traffic will not create a burden to the surrounding areas. The aesthetics of the local area will not be significantly impacted as there is already the Lordstown Motors Corporation plant to the west, an active rail switching yard to the north and a large plant to the east of the Project area.

5.4 Technical Feasibility and Cost Effectiveness

The JV will mass produce battery cells for future GM battery-electric vehicles. GM and LG will invest up to a total of \$2.3 billion to develop, build and tool a new battery cell manufacturing plant. This joint venture brings together two leaders in battery cell science to develop and produce advanced battery cell

technology. The JV will establish a battery cell assembly plant in the Mahoning Valley area and will create more than 1,100 new jobs.

The state-of-the-art plant will use the most advanced manufacturing processes to produce cells in the most efficient manner possible. The new plant will be extremely flexible and able to adapt to ongoing advances in technology and materials. This new facility positions the Mahoning Valley as a major hub for technology and electric vehicle manufacturing.

While this investment will have tremendously positive impact on the Lordstown area and the Mahoning Valley, GM and LG are still developing their needs on a variety of issues related to the ultimate operation of the new plant beyond the disclosed creation of more than 1,100 new jobs. Due to the fiercely competitive nature of the automotive industry, additional details are confidential at this time.

5.5 Social and Economic Considerations

Trumbull County had an unemployment rate of 5.8% as of October 2019, according to the Bureau of Labor Statistics, and a poverty rate of 17.2% according to the U.S. Census Bureau. The most common job groups in Lordstown, Ohio include production occupations, office and administrative support occupations, and management occupations. The GM plant ceased production in March of 2019, and approximately 1,400 people either relocated with GM or took on other employment. More than 1,400 local jobs were lost in the area. The new facility is expected to create over 1,100 permanent jobs in addition to many temporary construction positions. These positions would generate an increase in local and state tax revenues annually. This would decrease the current unemployment rate and increase the median household income. The median household income for Trumbull County in 2017 was \$45,380, compared to the \$57,652 average for the United States. Revenues from construction employment, as well as local expenditures by both the construction companies (materials) and non-local construction workings (for temporary housing, food, and entertainment) will benefit the local economy. Jobs created from the Project would have significant, positive social and economic impacts for the surrounding area.

5.6 Cumulative Impact

Years of agriculture and industrial/municipal sources of pollution dating back to the industrial revolution have degraded the water quality of the lower Mahoning River. Per *The Biological and Water Quality Study of the Lower Mahoning River Watershed 2011, 2013* (Ohio EPA, 2018), biological communities in the Mahoning River have experienced impressive reestablishment due to the elimination of pollution sources, removal or toxic discharges, improved chemical water quality, decreases in ammonia and phosphorous concentrations and improved wastewater treatment. Approximately half of the lower Mahoning River mainstem is developed in Ohio. Once it crosses into Pennsylvania, the Mahoning River maintains a riparian buffer.

Historically, the Site was used for agriculture but contained a few wooded areas up until the 1980's. The Site was then used for natural gas purposes in the 1990's when a natural gas well, gas collection lines, a gas meter and a small oil collection tank were installed. In 2015, about 75% of the Site was clear cut while the other 25% was selectively logged. These logging activities caused an increase in overall wetland area due to loss of evapotranspiration from the trees and newly created depressions and ruts caused by the logging equipment.

The recently purchased Lordstown Motors Corporation plant is located to the west and south of the Site, industrial and agricultural uses are located to the east, and rail lines are to the north. Dating back to the early 1990's, the majority of the Mud Creek subwatershed was agricultural. Adjacent to the Lordstown Motors Corporation plant, HomeGoods, Inc. is developing a 1.2 million square foot distribution center building, associated parking lots, storm water detention pond, and access driveways. This development is expected to be completed in 2020.

The Applicant is fully mitigating within the Mahoning River watershed all its impacts to aquatic resources to off-set potential cumulative impacts to the watershed. Any other impacts to regulated waters of the U.S. will have to go through the Section 404/401 permitting and mitigation process.

5.7 Indirect (Secondary) Impacts

The ecological and hydrological functions of the on-site wetlands would be reduced by the Project, as there will be impacts to 81 linear feet of ephemeral stream and 65.99 acres of jurisdictional wetlands. About 40 acres of these wetlands are newly formed wetlands that were caused by severe rutting and disturbances in former uplands in 2015. These newly formed wetlands have limited wetland functions and values due to their origin and age. These surface water resources would be impacted to allow for the development of the Project and the associated infrastructure. To offset permanent impacts to stream and wetland areas, the Applicant will be providing compensatory mitigation (See Section 7). The Project is at the top of the watershed, therefore there are no upstream indirect effects and no potential barriers to movement for aquatic species. Riparian buffers on-site were already impacted due to recent logging activities. The on-site stormwater management system will not increase discharge volumes or rates and will maintain stream flow regimes. The stormwater management system will be designed to be protective of downstream aquatic resources in accordance with local regulations.

The site is at the top of the watershed. The areas downstream of the Site has been previously impacted by rail and other industrial uses. Possible indirect impacts off-site due to development include variation of surface water temperatures in the streams and the potential for sediment to enter downstream surface waters. Best Management Practices (BMP's), including the use of erosion control barriers, will be utilized to prevent and mitigate potential thermal impacts and sediment pollution of downstream resources. There are no anticipated increases in stormwater discharge rates or volumes (See Section 5.8) and required water quality standards will be maintained.

5.8 Stormwater Management Plans

5.8.1 Construction Stormwater Management Plans

The Project will develop a construction stormwater management plan as part of its construction stormwater general permit. Site controls will be implemented during construction to control for discharges such as sediment, concrete truck washout, construction chemicals and debris. Sediment is the greatest pollutant of concern during construction activities. On-site sediment basins and sediment barriers will be implemented to control all sediment related discharges.

5.8.2 Post-Construction Stormwater Management Plans

The Project will provide on-site stormwater management facilities to control for both water quality and water quantity. The Project will conform with all aspects for stormwater management in the Ohio NPDES General Construction permit (Ohio EPA Permit No. OHC000005) including preparation of a Stormwater Pollution Prevention Plan (Figure 9). Post-construction peak discharge rates will not exceed pre-construction peak discharge rates per the Trumbull County stormwater regulations.

6 PROJECT MAPPING

6.1 Existing Conditions

Below is a list of existing conditions maps required for the Section 401 water quality certification application.

Topographic Map

A topographic map is provided as Figure 1.1.1 at a 1:24,000 scale and Figure 1.1.2 at a 1:9,600 scale.

Aerial Photography

Aerial photography is provided in Figure 1.2 at a 1:12,000 scale.

Vicinity Map

A vicinity aerial map is provided as Figure 1.3.1 at a 1:24,000 scale. A vicinity land use map is provided as Figure 1.3.2 at a 1:24,000 scale.

Floodplain/Flood Control Map

A FEMA flood hazard zone map is provided as Figure 1.4 at a 1:12,000 scale.

Other Maps

A wetland location map is provided as Figure 2 at a 1:2,400 scale. A wetland delineations map 2014-2017-2019 map is provided as Figure 3 at a 1:2,400 scale.

6.2 Project Plan Drawings

Below are project plan drawings in support of the materials described in this application.

Off-site Alternatives

An off-site alternatives map is provided as Figure 4.

On-site Alternatives

An on-site alternatives map is provided as Figure 5.

Site Map

A map of the preferred alternative design drawings is provided as Figure 6. A map of the preferred alternative design drawings with delineated wetlands and streams is provided as Figure 7.

Cross Sections of Structures, Features and/or Details of the Project

Cross sectional views of the Site are provided in Figure 8.

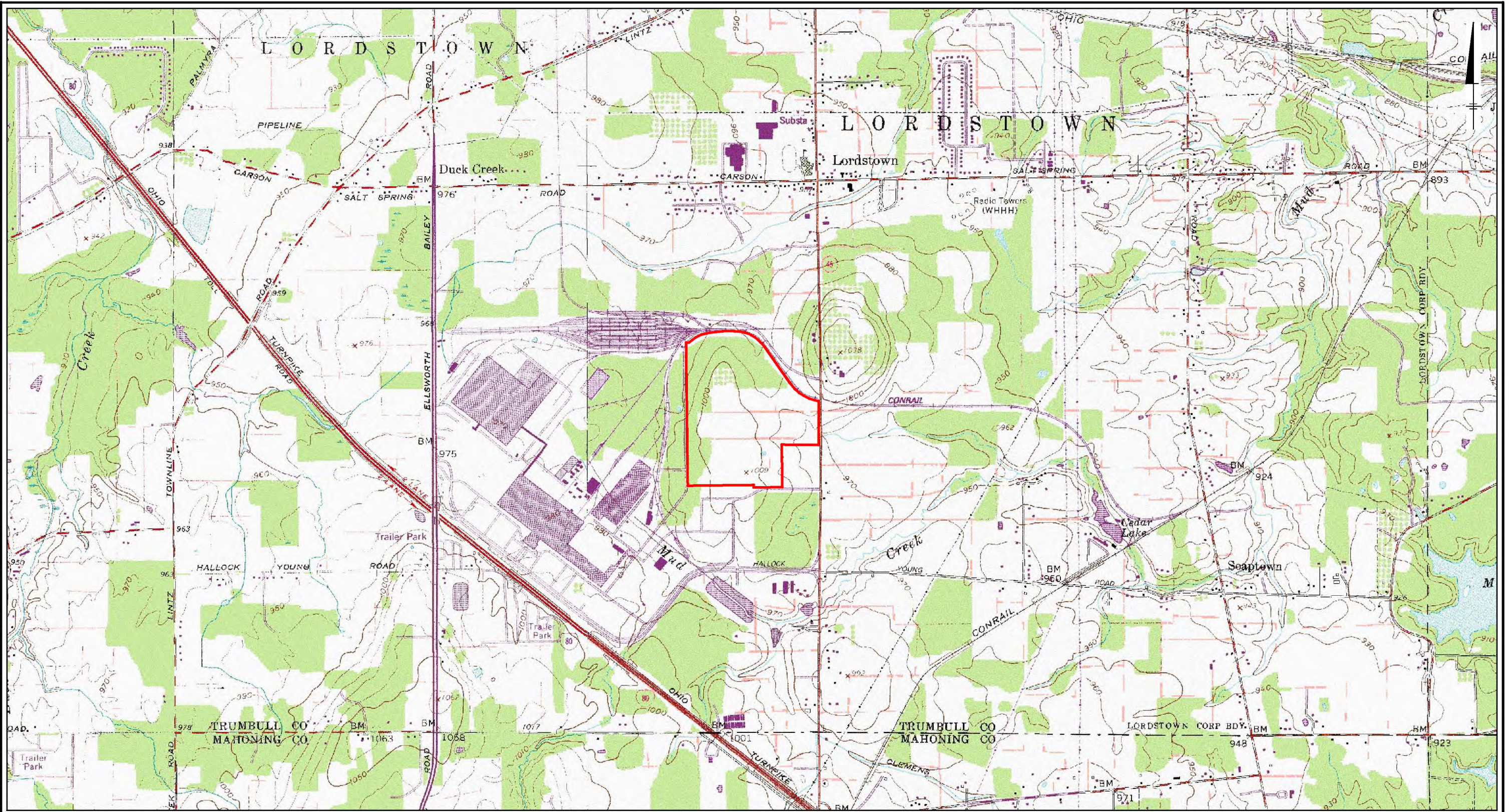
7 PROPOSED MITIGATION PLAN

A mitigation plan is required for this Project as part of OAC 3745-1-54. The proposed mitigation plan follows the standards and criteria outlined in 33 CFR 332 for compensatory mitigation. There are no mitigation bank credits available in the Mahoning River watershed. The Applicant proposes to develop Permittee-Responsible Mitigation on an approximately 180-acre site near Mosquito Creek Lake. Additionally, the Applicant proposes to purchase in-lieu fee stream credits from the Stream + Wetland Foundation. The proposed mitigation plan is included in Appendix I.

FIGURES

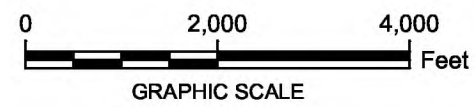


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Project (Project #): C:\Users\bgraives\Documents\General Motors\Magellan - Privileged and Confidential\GIS\MXDs\401\Figure 1.1.1- Topo.mxd 1/6/2020 12:55:51 PM



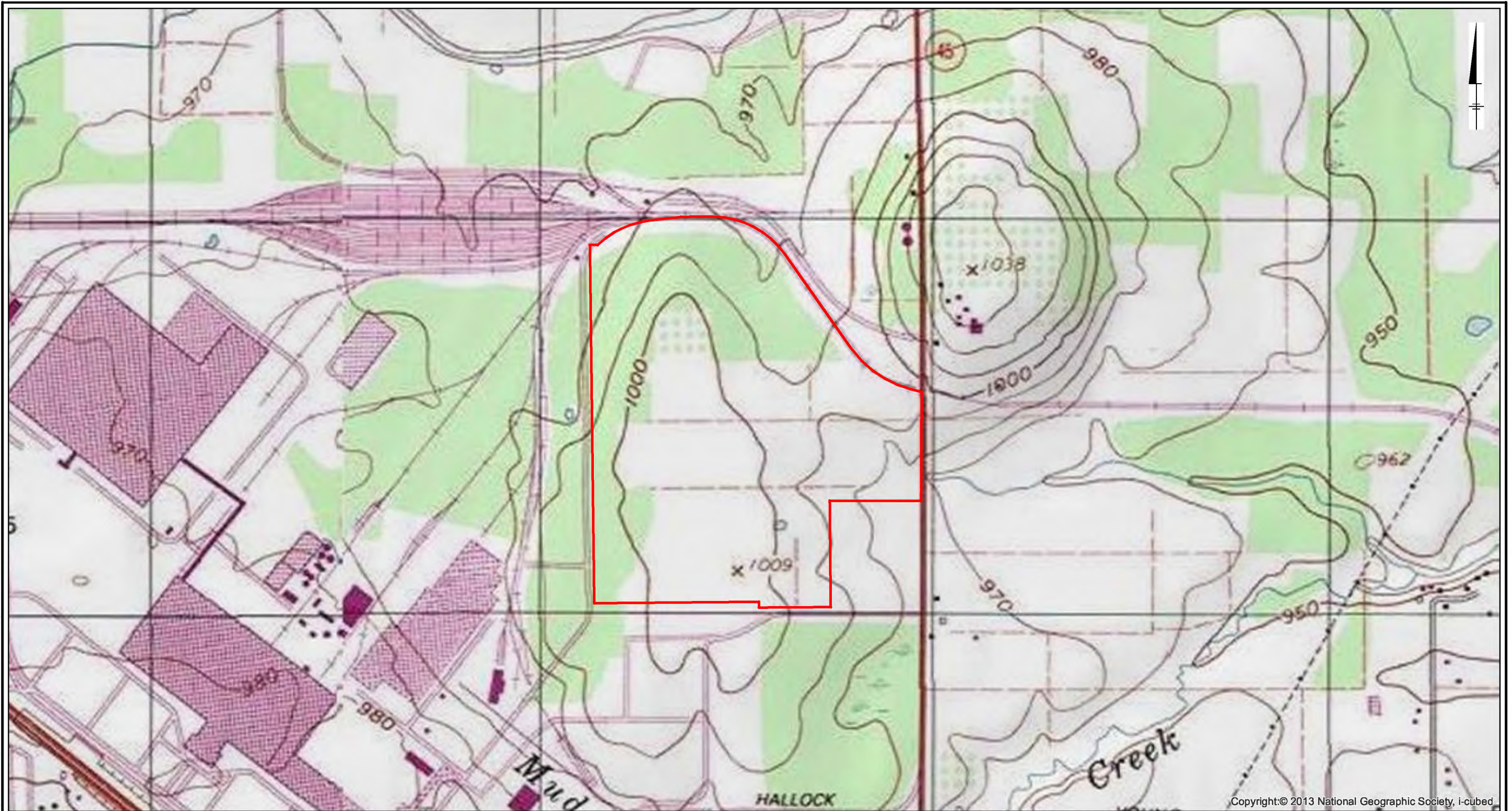
Legend
 Proposed Site Location

NOTES:
1. USGS TOPOGRAPHIC QUADRANGLE FOR WARREN, OH
OBTAINED FROM ESRI IMAGE SERVICE



GENERAL MOTORS, LLC LORDSTOWN, OHIO LORDSTOWN BATTERY CELL PLANT PROJECT	
TOPOGRAPHIC MAP	
 ARCADIS Design & Consultancy for natural and built assets	FIGURE 1.1.1

City: Div/Group: Created By: Last Saved By: BGraves
Project (Project #): C:\Users\bgraves\Documents\General Motors\Magellan - Privileged and Confidential\GIS\MXDs\401\Figure 1.1.2 - Topo Close Up.mxd 1/6/2020 12:56:41 PM



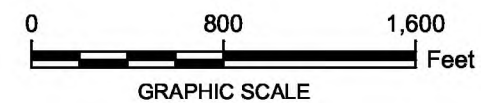
Copyright:© 2013 National Geographic Society, i-cubed

Legend

 Proposed Site Location

NOTES:

1. USGS TOPOGRAPHIC QUADRANGLE FOR WARREN, OH
OBTAINED FROM ESRI IMAGE SERVICE

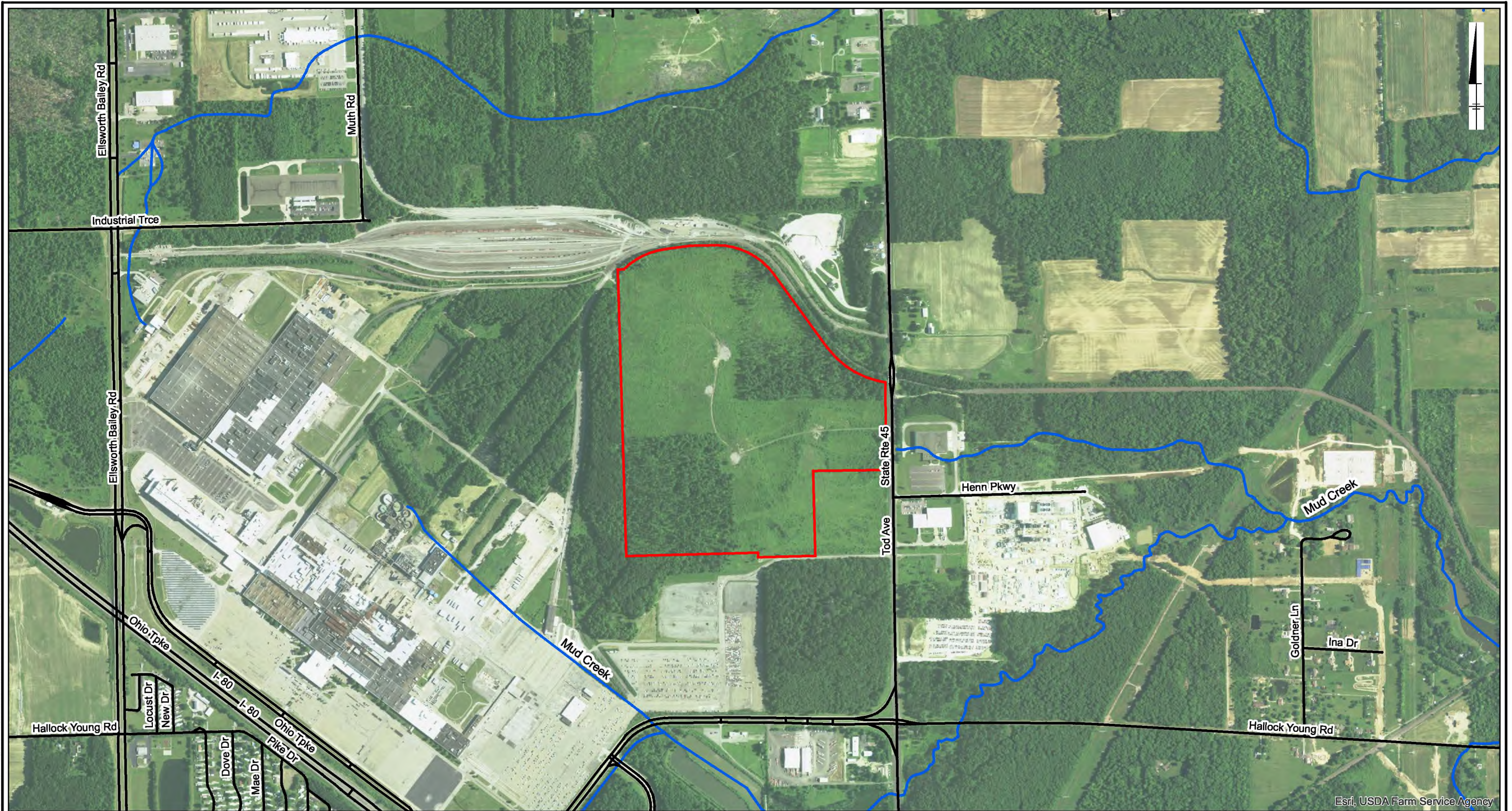


GENERAL MOTORS, LLC
LORDSTOWN, OHIO
LORDSTOWN BATTERY CELL PLANT PROJECT

TOPOGRAPHIC MAP




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for natural and built assets

**FIGURE
1.1.2**



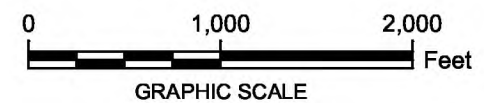
Esri, USDA Farm Service Agency

Legend

-  Proposed Site Location
-  Road
-  NHD-Mapped Stream

NOTES:

- 2017 Aerial Imagery Obtained from National Agriculture Imagery Program



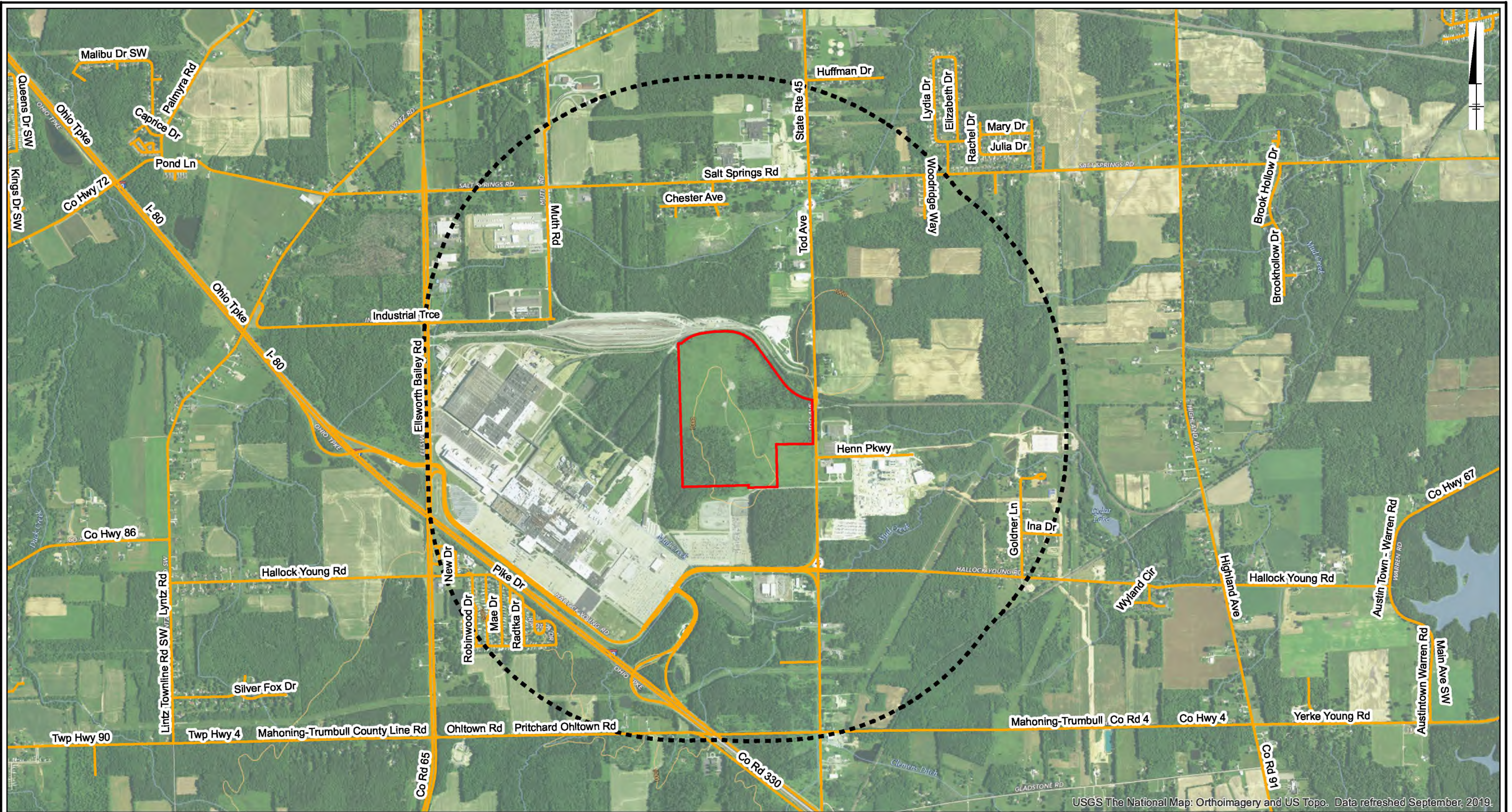
GENERAL MOTORS, LLC
LORDSTOWN, OHIO
LORDSTOWN BATTERY CELL PLANT PROJECT

AERIAL PHOTOGRAPHY MAP

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for natural and built assets

FIGURE 1.2

City: Div/Group: Created By: Last Saved By: BGraves
 Project (Project #): C:\Users\graves\Documents\General Motors\Magellan - Privileged and Confidential\GIS\MXDs\401\Figure 1.3.1- Vicinity Map 11x17.mxd 1/6/2020 12:59:42 PM

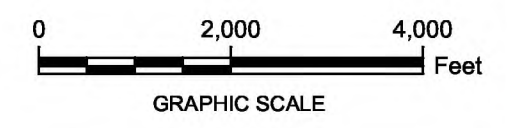


USGS The National Map: Orthoimagery and US Topo. Data refreshed September, 2019.

NOTES:
 1. 2017 Aerial Imagery Obtained from National Agriculture Imagery Program

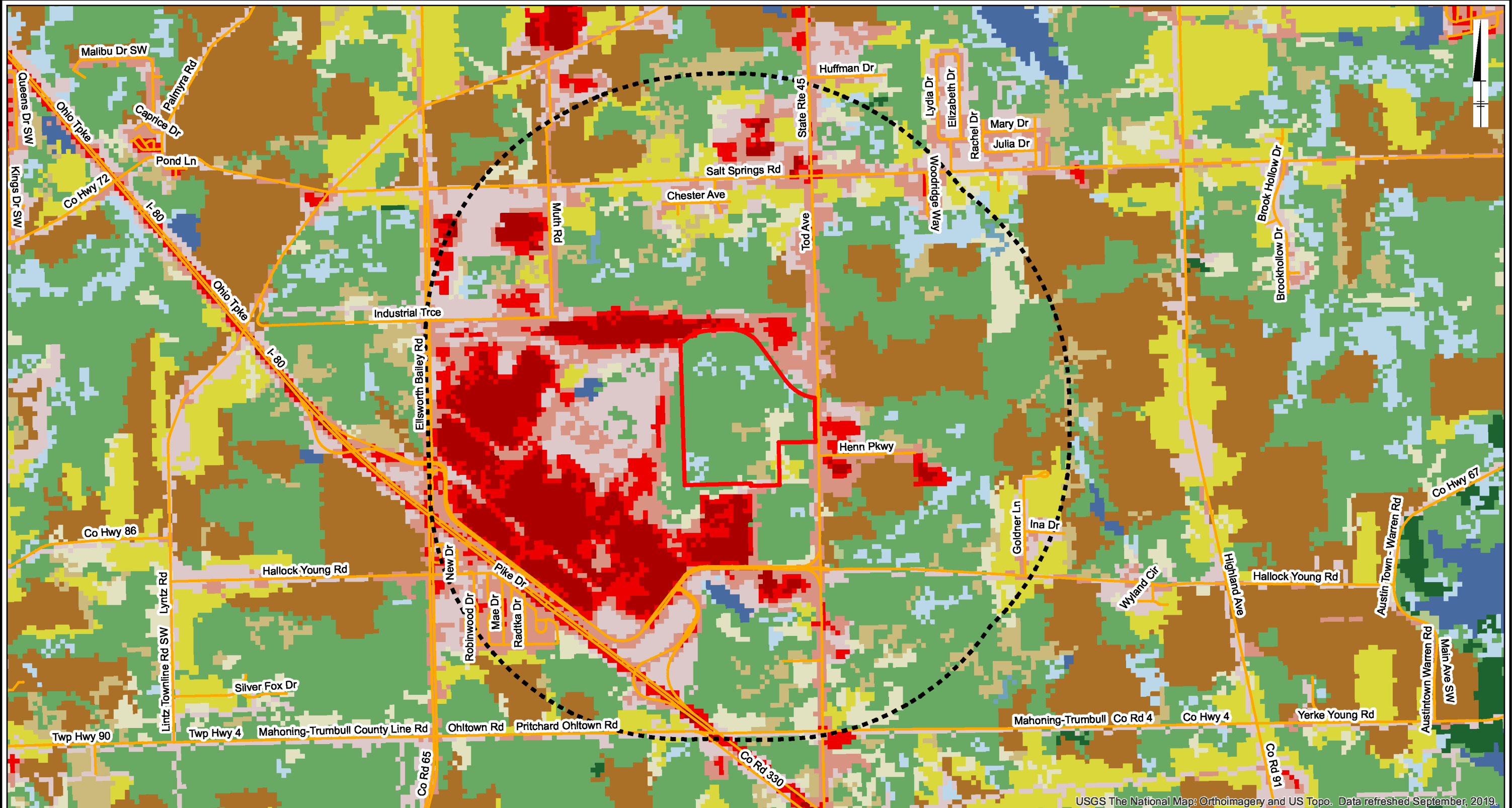
Legend

- Proposed Site Location
- Project Area 1-Mile Buffer
- Road



GENERAL MOTORS, LLC LORDSTOWN, OHIO LORDSTOWN BATTERY CELL PLANT PROJECT	
VICINITY AERIAL MAP	
ARCADIS <small>Design & Consultancy for natural and built assets</small>	FIGURE 1.3.1

City: Div/Group: Created By: Last Saved By: BGraves
 Project (Project #): C:\Users\bgaves\Documents\General Motors\Magellan - Privileged and Confidential\GIS\MXDs\401\Figure 1.3.2 - Vicinity Map 11x17.mxd 1/6/2020 1:00:38 PM



USGS The National Map: Orthoimagery and US Topo. Data refreshed September, 2019.

Legend

- Proposed Site Location
- Project Area 1-Mile Buffer
- Road

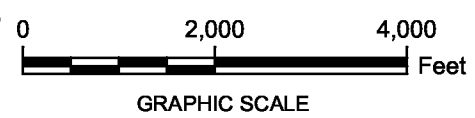
Land Cover (Acres within 1-Mile Buffer)

 Woody Wetlands (94 Acres)
 Shrub/Scrub (107 Acres)
 Open Water (11 Acres)
 Mixed Forest (1 Acre)
 Herbaceous (171 Acres)

 Hay/Pasture (196 Acres)
 Evergreen Forest (0 Acres)
 Emergent Herbaceous Wetlands (5 Acres)
 Developed, Open Space (366 Acres)
 Developed, Medium Intensity (270 Acres)

 Developed, Low Intensity (481 Acres)
 Developed, High Intensity (314 Acres)
 Deciduous Forest (1096 Acres)
 Cultivated Crops (324 Acres)
 Barren Land (0 Acres)

NOTES: 1. National Land Cover Data for Trumbull County, OH
 2. Acreages are for Land Cover Data within 1-Mile Buffer



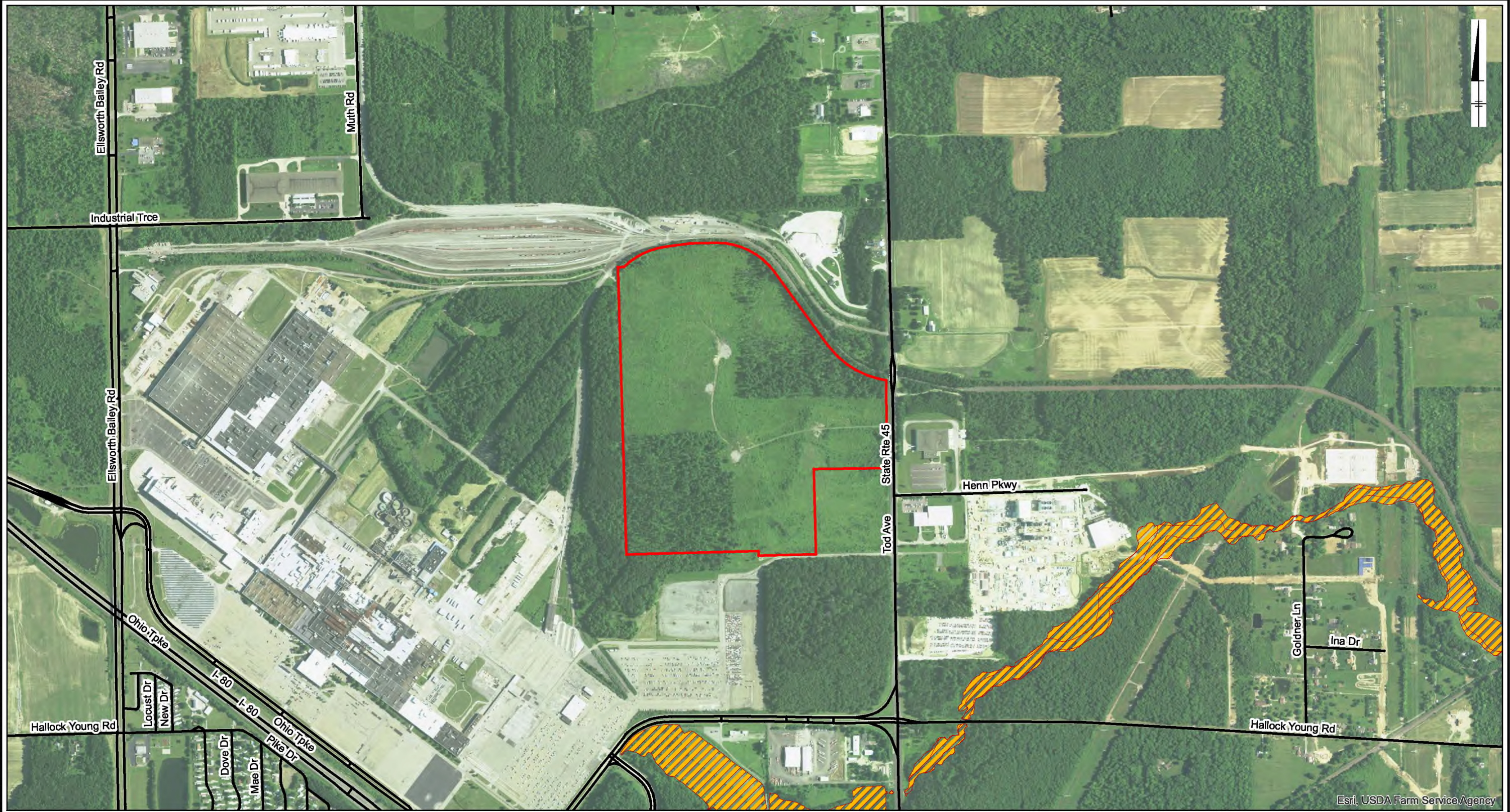
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 LORDSTOWN, OHIO
LORDSTOWN BATTERY CELL PLANT PROJECT

VICINITY LAND USE MAP

Design & Consultancy
 for natural and
 built assets

FIGURE
1.3.2


City: Div/Group: Created By: Last Saved By: BGraves
Project (Project #): C:\Users\bgraves\Documents\General Motors\Magellan - Privileged and Confidential\GIS\MXDs\401\Figure 1.4- Flood Map 11x17.mxd 1/6/2020 1:01:39 PM



Esri, USDA Farm Service Agency

Legend

 Proposed Site Location

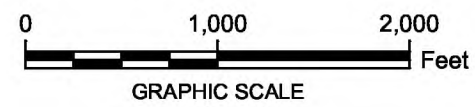
 Road

Flood Hazard Zone

 AE (1% Annual Chance Flooding)

NOTES:

- 1. 2017 Aerial Imagery Obtained from National Agriculture Imagery Program
- 2. FEMA Flood Zone Data Obtained from <https://msc.fema.gov>



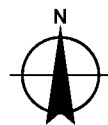
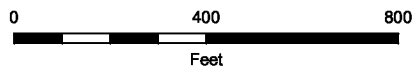
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LORDSTOWN BATTERY CELL PLANT PROJECT

FEMA FLOOD HAZARD ZONE MAP

 **ARCADIS** Design & Consultancy for natural and built assets **FIGURE 1.4**



Paper Size 11X17



LEGEND

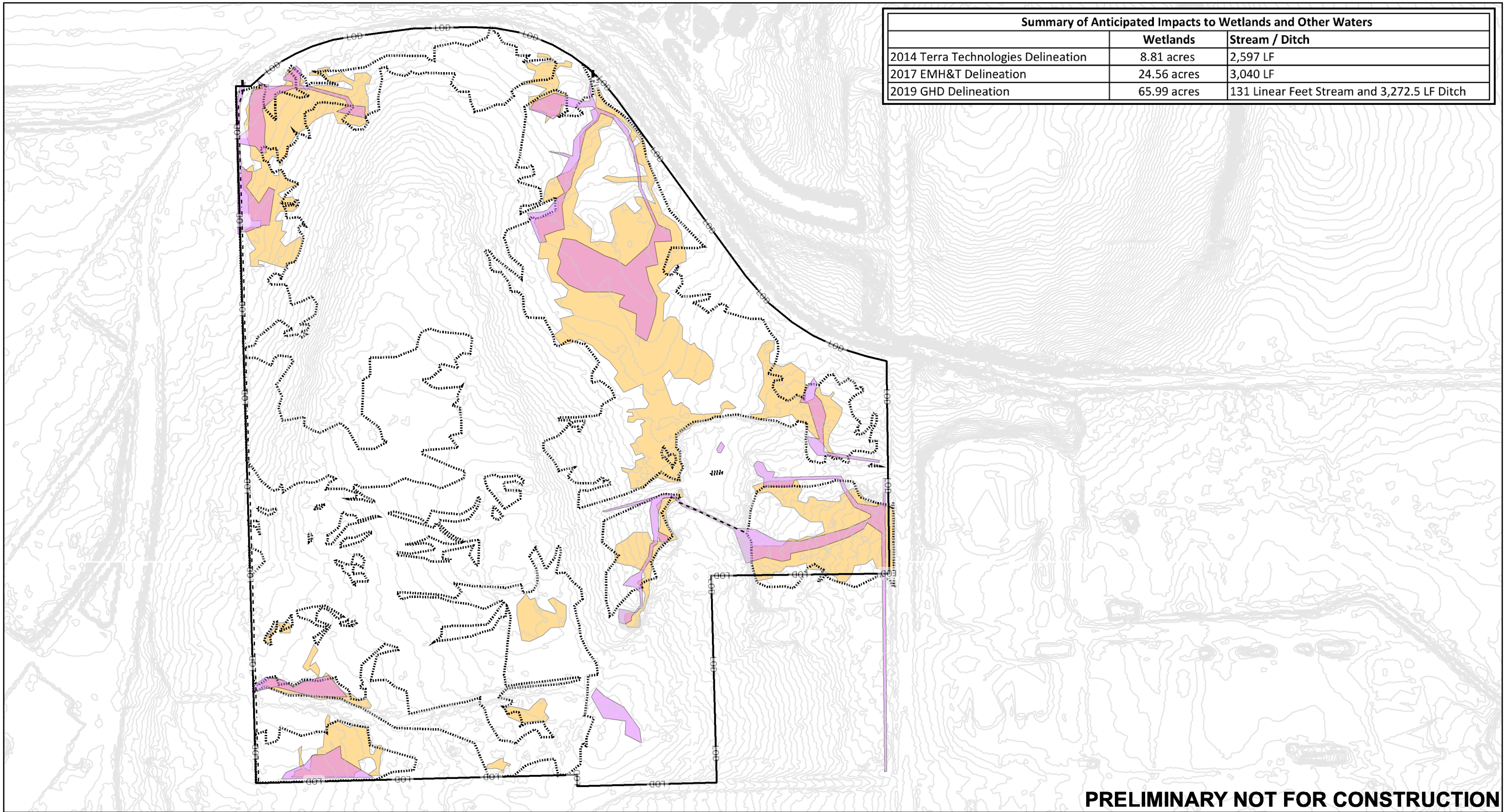


PROJECT MAGELLAN
WETLAND LOCATION MAP

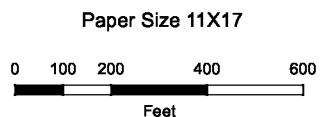
GENERAL MOTORS, LLC
VILLAGE OF LORDSTOWN, TRUMBULL COUNTY, OHIO

Job Number	11181610
Revision	A
Date	Jan 06, 2020

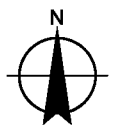
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PRELIMINARY NOT FOR CONSTRUCTION



Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane Ohio North FIPS 3401 Feet



LEGEND

WETLANDS 2014	-LOD- LIMIT OF DISTURBANCE (LOD)
WETLANDS 2017	— ELEVATION CONTOUR
WETLANDS 2019	- - - STREAM
SITE BOUNDARY	- - - DITCH



PROJECT MAGELLAN
WETLAND DELINEATIONS
2014 - 2017 - 2019
 GENERAL MOTORS, LLC
 CITY OF LORDSTOWN, TRUMBULL COUNTY, OH

Job Number | 112044289
 Revision | A
 Date | Dec 23, 2019

M:\0_Kunka\GM Lordstown OH\Parcel 4 Lordstown OH Preliminary Wetland Impact Map.mxd
 © 2019. While every care has been taken to prepare this map, GHD make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.



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**Lordstown Battery
Cell Plant Project**

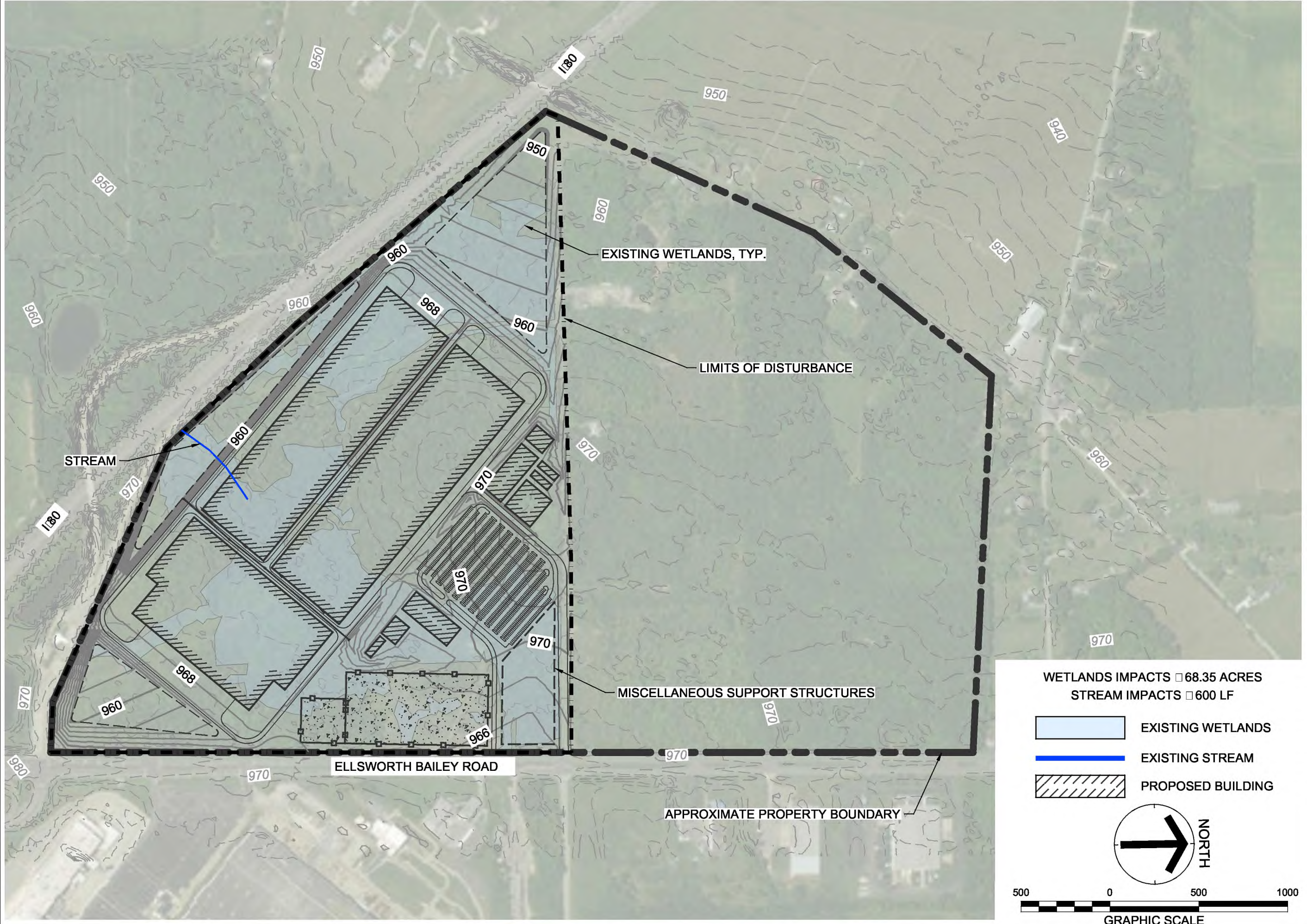
**NOT FOR
CONSTRUCTION**

Revision

No.	Date	Description

**FIGURE 4
OFF-SITE
ALTERNATIVES**

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01.08.2020



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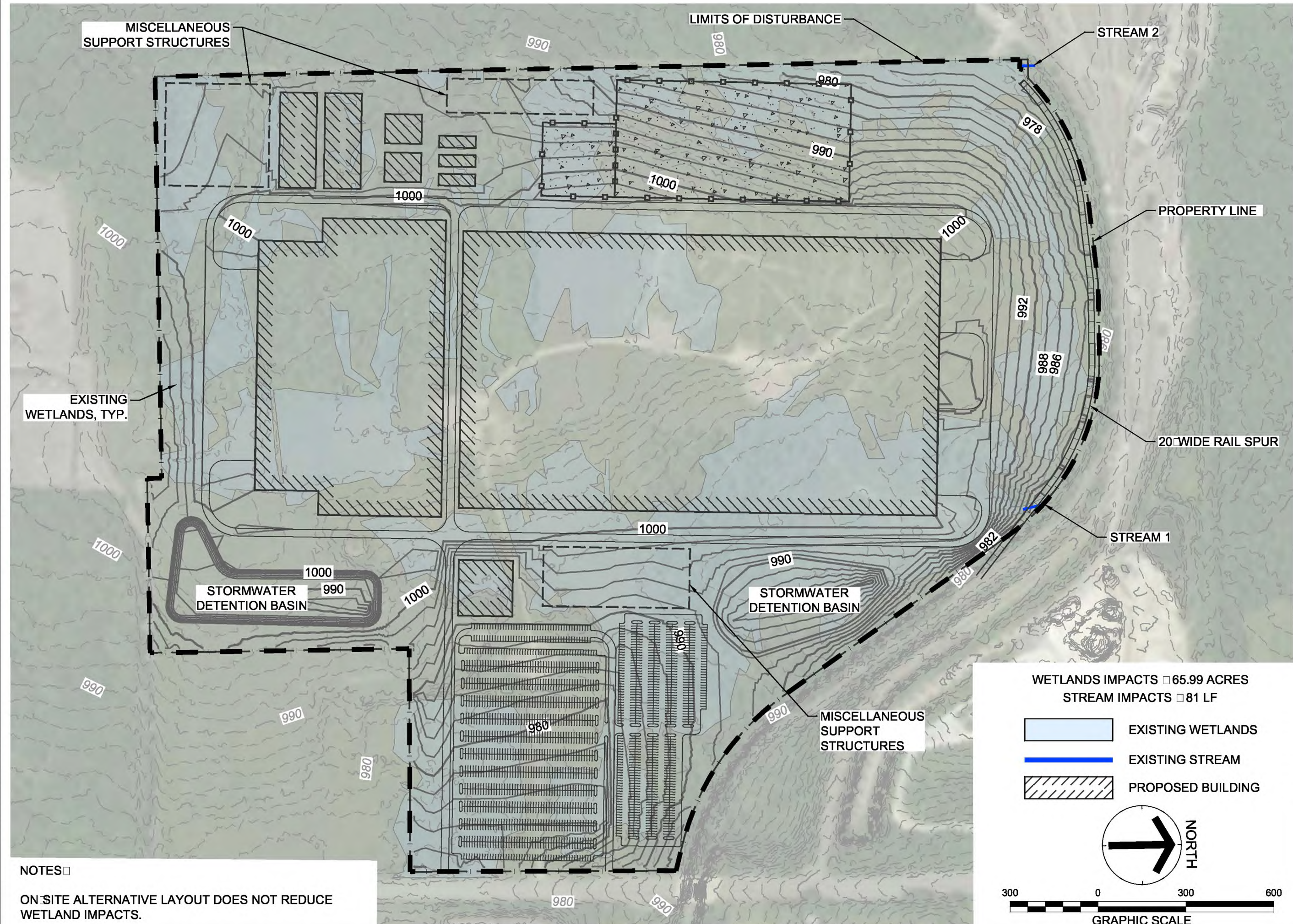
**Lordstown Battery
Cell Plant Project**

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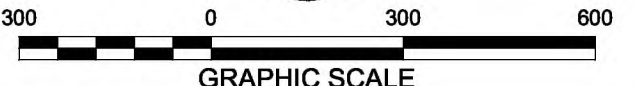
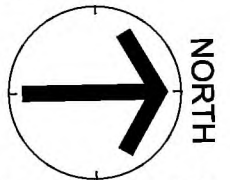
No.	Date	Description

**FIGURE 5
ON-SITE
ALTERNATIVES**



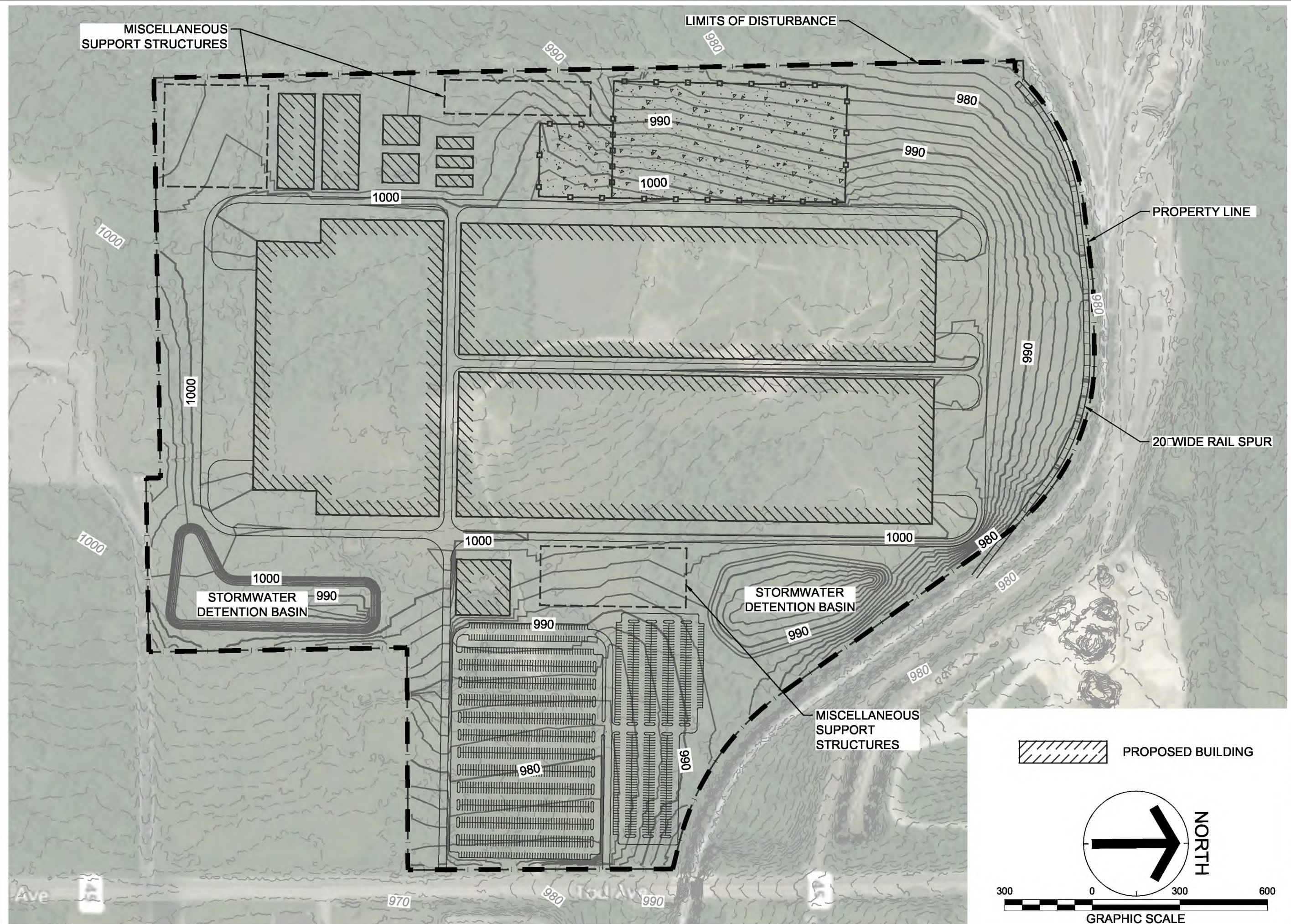
WETLANDS IMPACTS □ 65.99 ACRES
STREAM IMPACTS □ 81 LF

EXISTING WETLANDS
 EXISTING STREAM
 PROPOSED BUILDING



NOTES □
ON-SITE ALTERNATIVE LAYOUT DOES NOT REDUCE WETLAND IMPACTS.

I:\global_gsp\data\infra_infra_inf054405400\01\work\01\CAD\06LPX\ren\Wellands Exhibits\USACE Welland Mitigation Exhibits\Figure 6.dwg - Dove, Michelle - 1/8/2020 4:23:11 PM



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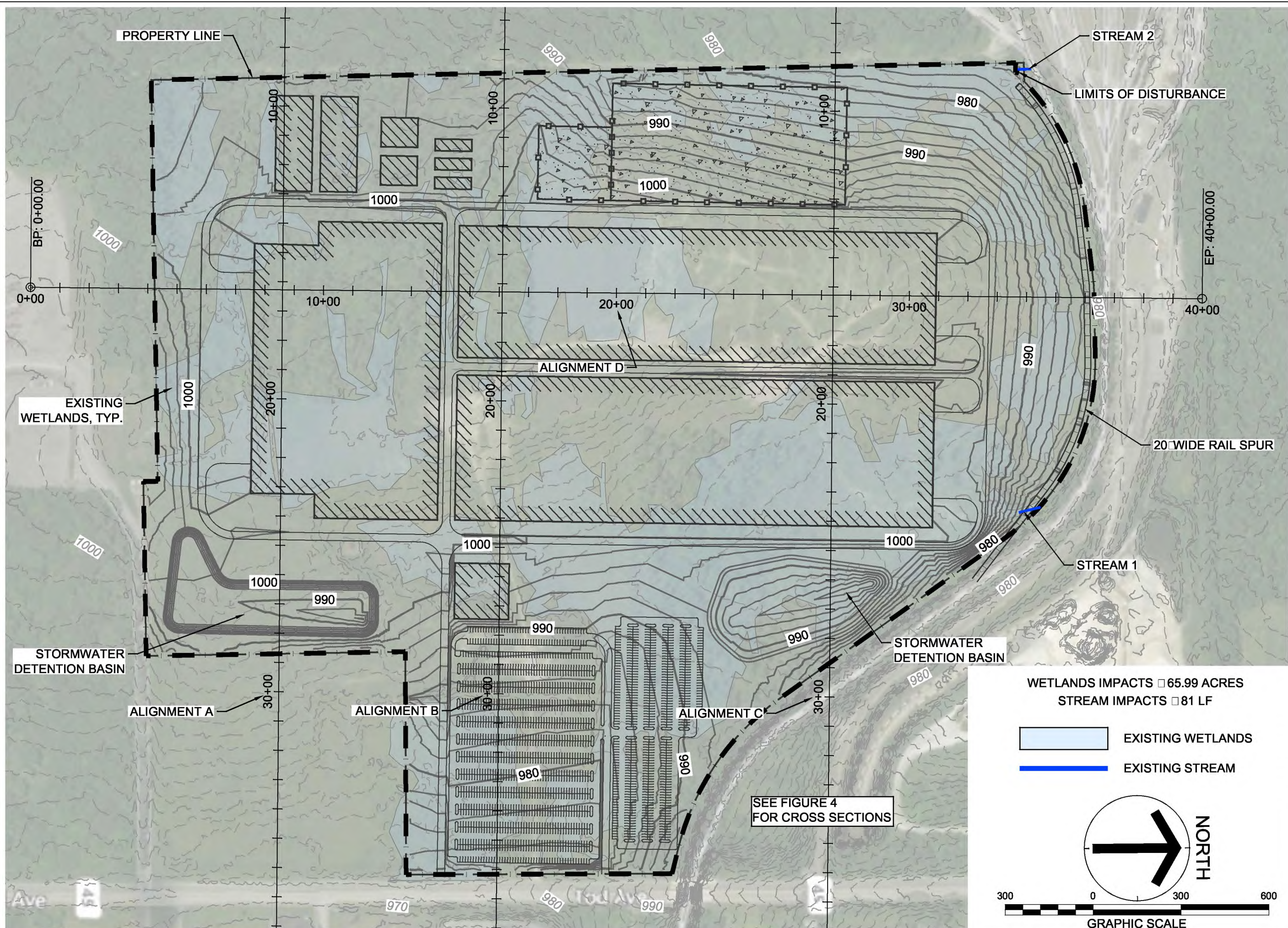
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No.	Date	Description

FIGURE 6
PROJECT SITE MAP

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01.08.2020

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EXISTING WETLANDS, TYP.

STORMWATER DETENTION BASIN

ALIGNMENT A

ALIGNMENT B

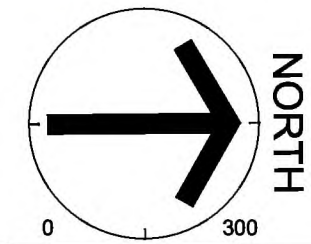
ALIGNMENT C

ALIGNMENT D

SEE FIGURE 4 FOR CROSS SECTIONS

WETLANDS IMPACTS □ 65.99 ACRES
STREAM IMPACTS □ 81 LF

- EXISTING WETLANDS
- EXISTING STREAM



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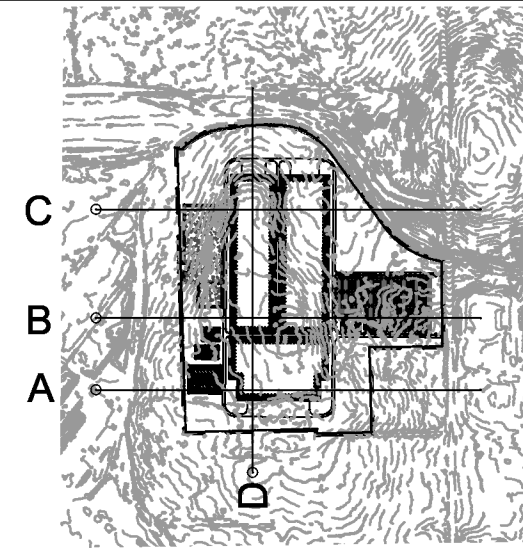
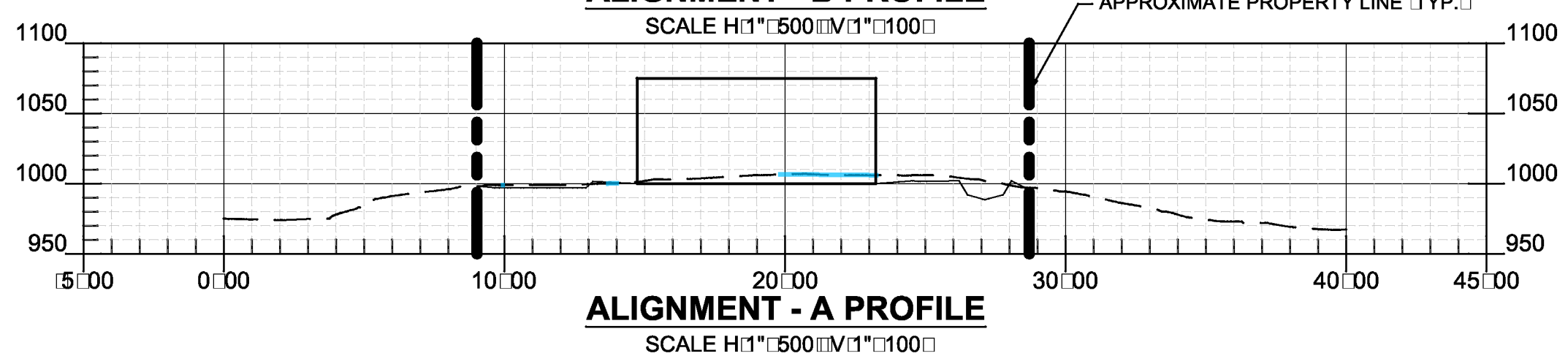
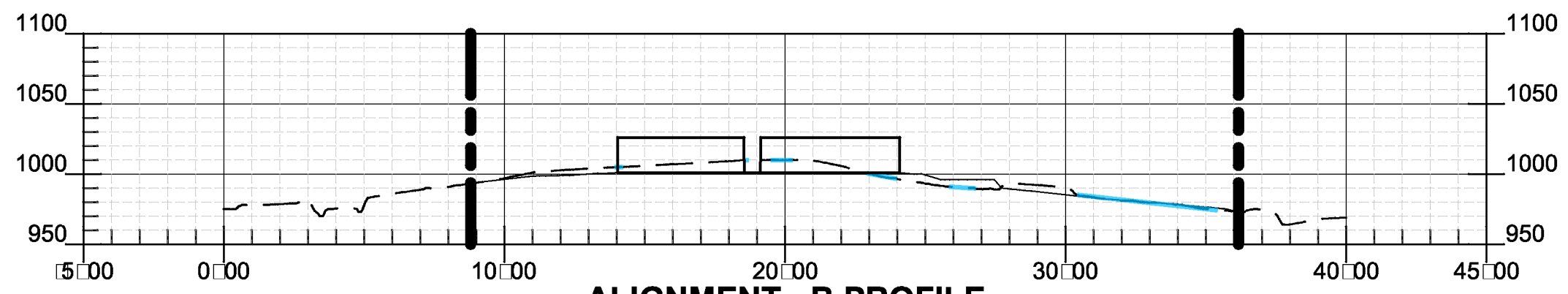
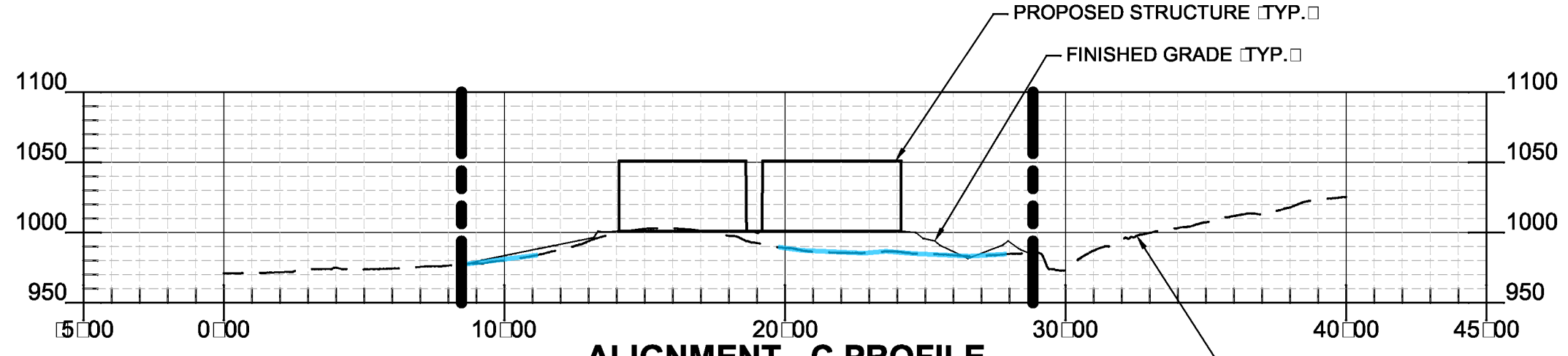
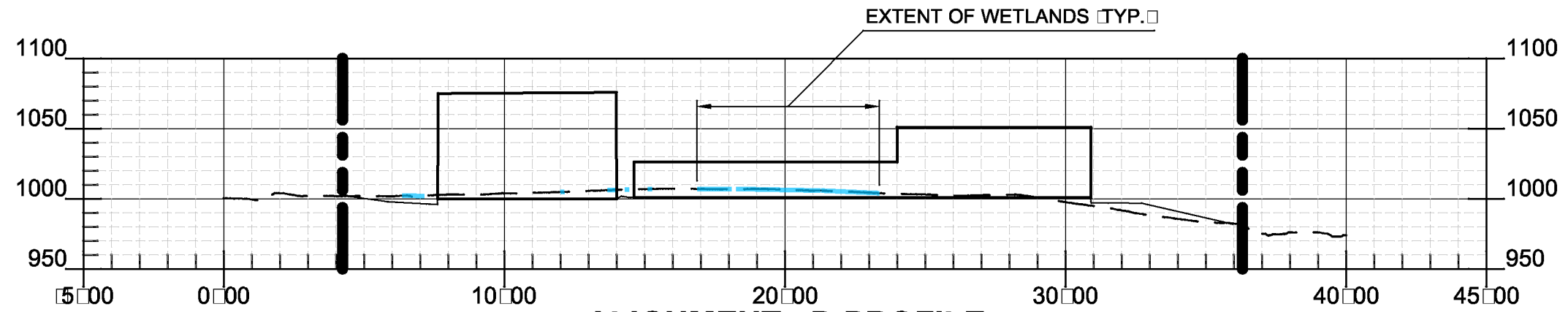
Revision		
No.	Date	Description

FIGURE 7
PROJECT SITE MAP WITH DELINEATED WETLANDS

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No.	Date	Description

**FIGURE 8
CROSS SECTIONS**

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01.08.2020

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GreshamSmith.com

222 Second Avenue South
Suite 1400
Nashville, TN 37201
615.770.8100

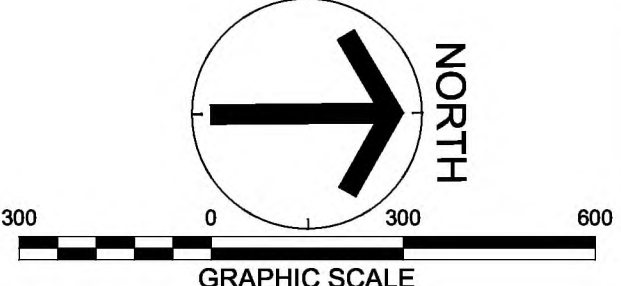
Lordstown Battery Cell Plant Project

**NOT FOR
CONSTRUCTION**

Revision

No.	Date	Description

FIGURE 9
CONCEPTUAL
CONSTRUCTION
SWPPP



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APPENDIX A

A1 – Application for Section 401 Water Quality Certification

A2 – Ohio EPA Wetland Impacts Tables

A3 – Ohio EPA Stream Impacts Tables



APPENDIX A1

Application for Section 401 Water Quality Certification





Application for Section 401 Water Quality Certification

Division of Surface Water 401 Water Quality Certification and Isolated Wetland Permitting Unit

Section 1: Applicant and Agent Information		
	Applicant:	Agent:
Company/ Agency Name:	General Motors LLC on behalf of GigaPower LLC	Arcadis
Name of Contact:	James F. Hartnett	Vinnie Tremante
Title:	Remediation Team Manager	Senior Ecologist
Technical Point of Contact:	Click here to enter text.	Click here to enter text.
Address:	300 Renaissance Center	100 E. Campus View Blvd., Suite 230
City, State, Zip:	Detroit, MI, 48265-3000	Columbus, Ohio 43235
Phone Number(s):	315-856-2011	614-985-9186
Email Address:	Jim.f.hartnett@gm.com	vinnie.tremante@arcadis.com

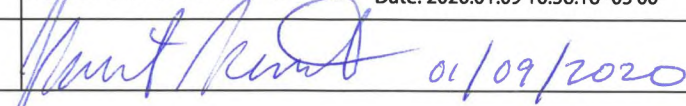
Section 2: Project Information		
A. Project Name: Lordstown Battery Cell Plant Project		
B Has Pre-App. Coordination occurred? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Indicate the 401 reviewer: Boyles DATE: 11/25/2019		
C. Brief Project Description/Purpose: Construct a mass-production battery cell manufacturing facility for future electric vehicles		
D. Construction Timeframe (Provide ~start and end dates): April 2020 January 2022		
E. Is any portion of the activity complete now? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Is this an "After-The-Fact" permit application? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If YES to either, describe the extent of completed portion of the activity below and the unauthorized impacts on waters of the state: Click here to enter text.		
F. Coordinates (degree, minutes, seconds): 41°09' 09.83" N - 80° 51' 46.85" W		
G. Project Address: Street: Tod Avenue SW		City or Town: Lordstown
Zip Code: 44481	Township: Lordstown	County: Trumbull
H. 12 Digit HUC No.: 050301030602	I. Watershed Name: Mud Creek	J. Corps District: Pittsburgh
K. Proposed impacts to "waters of the state": <input type="checkbox"/> Beach Nourish <input type="checkbox"/> Levees/Berms <input type="checkbox"/> Blasting <input type="checkbox"/> Mine Through <input type="checkbox"/> Breakwater <input type="checkbox"/> Revetment <input type="checkbox"/> Bulkhead <input type="checkbox"/> Bank Stabilization <input type="checkbox"/> Bridge/Culvert <input type="checkbox"/> Stream Channeliz. <input type="checkbox"/> Dam <input type="checkbox"/> Stream Relocation <input type="checkbox"/> Dredge <input type="checkbox"/> Water Body Cross <input checked="" type="checkbox"/> Fill <input type="checkbox"/> Weirs <input type="checkbox"/> Groin/Jetty <input type="checkbox"/> Other		L. Other water related permits issued or required include: <input checked="" type="checkbox"/> Individual 404 Permit – Public Notice # Click here to enter text. <input type="checkbox"/> Nationwide Permit # Choose an item. Choose an item. Click here to enter a date. <input type="checkbox"/> Section 10 Permit - Choose an item. Click here to enter a date. <input type="checkbox"/> Section 9 Permit - Click here to enter text. <input type="checkbox"/> Iso. Wetland Permit Choose an item. Click here to enter a date. Choose an item. <input checked="" type="checkbox"/> NPDES Permit – General Will be Submitted Click here to enter a date. <input type="checkbox"/> Oil & Gas Storm Water General Permit –Choose an item. Click here to enter a date. <input checked="" type="checkbox"/> Permit to Install – Will be Submitted : Click here to enter a date. <input type="checkbox"/> ODNR Choose an item. Permit - Choose an item. Click here to enter a date. <input type="checkbox"/> ODNR Coastal Permit - Choose an item. Click here to enter a date. <input type="checkbox"/> Regional Permit - Choose an item. Click here to enter a date.

Application for Section 401 Water Quality Certification

Section 3: Fees				
Are you exempt from fees? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO (If YES, leave fee section blank)				
Application Fee =				\$ 200.00
Review Fee				
Wetland	Acres Impacted	65.99	x \$500 =	\$ 32,995.00
Ephemeral Stream	Linear Feet Impacted	81.00	x \$5.00 =	\$ 405.00 (\$200.00 minimum)
Intermittent Stream	Linear Feet Impacted		x \$10.00 =	\$ 0.00 (\$200.00 minimum)
Perennial Stream	Linear Feet Impacted		x \$15.00 =	\$ 0.00 (\$200.00 minimum)
Lake	Cubic Yards		x \$3.00 =	\$ 0.00
Total Review Fees =				\$ 33,400.00
Total Fees (\$200 Application Fee + Total Review Fees) =				\$ 33,600.00
Standard Applicant - Is the fee cap (\$25,000) exceeded? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				
If YES, \$12,600 is due with application and \$12,400 is due at time of 401 WQC issuance				
County, Township or Municipal Corp. – Is the fee cap (\$5,000) exceeded? <input type="checkbox"/> YES <input type="checkbox"/> NO				
If YES, \$2,600 is due with application and \$2,400 is due at time of 401 WQC issuance				
If fee cap is not exceeded:				
DUE AT TIME OF 401 WQC APP. SUBMITTAL – APPLICATION FEE AND ½ OF REVIEW FEE =				\$ 16,900.00
DUE AT TIME OF 401 WQC ISSUANCE – ½ OF REVIEW FEE (Invoice will be sent) =				\$ 16,700.00
PLEASE MAKE FEE CHECK PAYABLE TO: "TREASURER, STATE OF OHIO"				

Section 4: Submitted Documentation		
Check all documents/items that have been submitted which must be included for a complete application:		
<input checked="" type="checkbox"/> Investigation report of waters of the U.S.	<input checked="" type="checkbox"/> Site photographs	<input checked="" type="checkbox"/> 10 page ORAM forms - impacted wetlands
<input checked="" type="checkbox"/> Data supporting existing aquatic life use for each undesignated stream ¹	<input checked="" type="checkbox"/> U.S. ACOE JD letter	<input checked="" type="checkbox"/> US ACOE 404 Permit Public Notice or Provisional NWP
<input checked="" type="checkbox"/> USFWS & ODNR T&E coordination	<input checked="" type="checkbox"/> Antidegradation alternatives analysis ²	<input checked="" type="checkbox"/> A specific & detailed mitigation plan
<input checked="" type="checkbox"/> Applicable fees		

¹ See pages 6 and 10 in the instructions ² See page 12 in the instructions

Section 5: Applicant and Agent Signature			
<i>I hereby designate and authorize the agent/consultant identified in Section 1 to act on my behalf in the processing of this permit application, and to furnish, upon request, supplemental information in support of the application:</i>			
Applicant Name	James F. Hartnett	Applicant Signature	James F. Hartnett Digitally signed by James F. Hartnett Date: 2020.01.09 10:55:56 -05'00'
<i>Application is hereby made for a Section 401 Water Quality Certification. I certify that the information provided on this form and all attachments related to this project are true and accurate to the best of my knowledge:</i>			
Applicant Name	James F. Hartnett	Applicant Signature	James F. Hartnett Digitally signed by James F. Hartnett Date: 2020.01.09 10:56:16 -05'00'
Agent Name	Vinnie Tremante	Agent Signature	 01/09/2020

Please submit the completed application package and fees to:

Ohio EPA
 Division of Surface Water
 Attn: 401/IWP/Mitigation Section Manager
 P.O. Box 1049
 Columbus, OH 43216-1049

For Internal Ohio EPA Use	
Reviewer:	
Project ID #	
Date Received:	
CR Due:	

APPENDIX A2

Ohio EPA Wetland Impacts Tables





Application for Section 401 Water Quality Certification — Proposed Wetland Impacts and Mitigation

Division of Surface Water 401 Water Quality Certification and Isolated Wetland Permitting Unit

Wetland ID	ORAM Score	Category	Cat. Verified by Ohio EPA?	Ohio EPA Staff Who Verified	Acreage Onsite	Proposed Impacts		
						Impact Acreage		Impact Type
						Forested	Non	
Wetland A	28.00	1	<input checked="" type="checkbox"/>	Boyles	9.37	0.30	9.07	Fill
Wetland B	26.50	1	<input checked="" type="checkbox"/>	Boyles	8.82	0.00	8.82	Fill
Wetland C-F, I-R, T, V	33.0	2	<input checked="" type="checkbox"/>	Boyles	1.83	0.66	1.17	Fill
Wetland H	40.50	2	<input checked="" type="checkbox"/>	Boyles	2.86	1.69	1.17	Fill
Wetland S	36.0	2	<input checked="" type="checkbox"/>	Boyles	9.44	3.70	5.74	Fill
Wetland U	25.00	1	<input checked="" type="checkbox"/>	Boyles	2.00	0.00	2.00	Fill
Wetland W	14.00	1	<input checked="" type="checkbox"/>	Boyles	0.01	0.00	0.01	Fill
Wetland X	31.00	2	<input checked="" type="checkbox"/>	Boyles	4.86	0.00	4.86	Fill
Wetland Y	18.50	1	<input checked="" type="checkbox"/>	Boyles	0.01	0.00	0.01	Fill
Wetland Z	35.00	2	<input checked="" type="checkbox"/>	Boyles	26.79	10.43	16.36	Fill
Click here to enter text.		1	<input type="checkbox"/>	Choose an item.				Choose an item.
Click here to enter text.		1	<input type="checkbox"/>	Choose an item.				Choose an item.
Wetland Acreage Totals					65.99	16.78	49.44	
Totals – Category 1 Wetlands					20.21	0.30	20.14	
Totals – Category 2 Wetlands					45.78	16.48	29.30	
Totals – Category 3 Wetlands					0.00	0.00	0.00	

Proposed Wetland Mitigation (Check All That Apply)			
<input type="checkbox"/> Wetland Mitigation Bank Mitigation Bank: Choose an item.	Number of Forested Credits: Number of Non-Forested Credits: Number of Buffer Credits:	Type of Credits (if applicable): Choose an item. Type of Credits (if applicable): Choose an item. Type of Credits (if applicable): Choose an item.	Proof of Reservation? <input type="checkbox"/>
<input type="checkbox"/> In-Lieu Fee Program	ILF Sponsor: Choose an item.	Number of Wetland Credits: Number of Buffer Credits:	Proof of Reservation? <input type="checkbox"/>
<input checked="" type="checkbox"/> Permittee-Responsible Mitigation	<input checked="" type="checkbox"/> Reestablishment (Restoration) Choose an item. 130.19 Acres <input type="checkbox"/> Preservation Choose an item. Acres <input type="checkbox"/> Other Click here to enter text.	<input type="checkbox"/> Rehabilitation (Enhancement) Choose an item. Acres <input type="checkbox"/> Establishment (Creation) Choose an item. Acres	

APPENDIX A3

Ohio EPA Stream Impacts Tables





Application for Section 401 Water Quality Certification — Proposed Stream Impacts and Mitigation

Division of Surface Water 401 Water Quality Certification and Isolated Wetland Permitting Unit

Stream ID	Jurisdictional?	Flow	Aquatic Life Use Designation in 3745-1	Existing Use?	Length Onsite (linear ft.)	Proposed Impacts	
						Impact Length (linear ft.)	Impact Type
Stream 1	YES	Ephemeral	Undesignated	WWH	81.00	81.00	Fill
Stream 2	YES	Ephemeral	Undesignated	WWH	50.00	0.00	Choose an item.
Click here to enter text.	Choose an item.	Choose an item.	Choose an item.	Choose an item.			Choose an item.
Click here to enter text.	Choose an item.	Choose an item.	Choose an item.	Choose an item.			Choose an item.
Click here to enter text.	Choose an item.	Choose an item.	Choose an item.	Choose an item.			Choose an item.
Click here to enter text.	Choose an item.	Choose an item.	Choose an item.	Choose an item.			Choose an item.
Click here to enter text.	Choose an item.	Choose an item.	Choose an item.	Choose an item.			Choose an item.
Click here to enter text.	Choose an item.	Choose an item.	Choose an item.	Choose an item.			Choose an item.
Click here to enter text.	Choose an item.	Choose an item.	Choose an item.	Choose an item.			Choose an item.
Click here to enter text.	Choose an item.	Choose an item.	Choose an item.	Choose an item.			Choose an item.
Click here to enter text.	Choose an item.	Choose an item.	Choose an item.	Choose an item.			Choose an item.
Click here to enter text.	Choose an item.	Choose an item.	Choose an item.	Choose an item.			Choose an item.
Click here to enter text.	Choose an item.	Choose an item.	Choose an item.	Choose an item.			Choose an item.
Click here to enter text.	Choose an item.	Choose an item.	Choose an item.	Choose an item.			Choose an item.
Click here to enter text.	Choose an item.	Choose an item.	Choose an item.	Choose an item.			Choose an item.
Click here to enter text.	Choose an item.	Choose an item.	Choose an item.	Choose an item.			Choose an item.
Click here to enter text.	Choose an item.	Choose an item.	Choose an item.	Choose an item.			Choose an item.
Click here to enter text.	Choose an item.	Choose an item.	Choose an item.	Choose an item.			Choose an item.
Stream Length Totals					131.00	81.00	

Section 2: Proposed Stream Mitigation (Check All That Apply)				
<input type="checkbox"/>	Stream Mitigation Bank	Mitigation Bank: Choose an item.	Number of Stream Credits:	Number of Buffer Credits: Proof of Reservation? YES <input type="checkbox"/> NO <input type="checkbox"/>
<input checked="" type="checkbox"/>	In-Lieu Fee Program	ILF Sponsor: Stream + Wetlands Foundation	Number of Stream Credits: 81	Number of Buffer Credits: Proof of Reservation? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
<input type="checkbox"/>	Permittee-Responsible Mitigation	<input type="checkbox"/> Reestablishment (Restoration) of Choose an item. linear feet <input type="checkbox"/> Establishment (Creation) of Choose an item. linear feet <input type="checkbox"/> Preservation of Choose an item. linear feet with Choose an item. foot buffers	<input type="checkbox"/> Rehabilitation (Enhancement) of linear feet of a Choose an item. to a WWH through Choose an item.	<input type="checkbox"/> Other Click here to enter text.

APPENDIX B

B – Surface Water Delineation Report





January 7, 2020

No. 11204429.20

Mr. Jim Harnett
General Motors, LLC
jim.f.hartnett@gm.com

Re: Wetland Delineation Report
Project Magellan East
City of Lordstown, Trumbull County, Ohio

Dear Mr. Hartnett:

GHD Services Inc. (GHD) was retained to conduct a wetland delineation at the Project Magellan East property (Site) for a potential new industrial development. GHD's wetland delineation was performed to delineate the current boundaries of wetlands and other waters on the Site. This report provides a discussion of the methodology and results for the wetland delineation.

1. Site Location and History

The Site encompasses approximately 158.215 acres and is located west of the intersection of Tod Avenue SW (State Route 45) and Henn Parkway, approximately 1 mile north of Ohio Turnpike US Route 80 in the Village of Lordstown, Trumbull County, Ohio. The approximate Center of the Site is located at 41.152200°, -80.862922° WGS 84. A map showing the Site location and boundaries on the Warren, Ohio USGS 7.5-minute quadrant is provided as Figure 1. The Site lies within the Mud Creek drainage basin, a tributary to the Mahoning River. The Site was historically used for agricultural purposes. Farming ceased in the 1970s and 1980s and the land underwent succession from farmland to woodland. The Site was developed for natural gas in the 1990s and three wells were installed on the Site. Two of the gas wells have since been closed and properly abandoned. The remaining well remains active. The Site was logged in 2015, with about 75 percent of the Site being clear-cut and the remainder of the Site being selectively logged. The Site has remained in this condition since 2015. In 2019, a 15 acre parcel located to the southeast of the Site, and which had historically been included as part of the Site, was sold as a separate parcel and has been recently cleared in preparation for site development.

Wetlands on the Site were delineated on September 30, 2014 and October 1, 2014 by Terra Technologies, Inc., a consulting firm based in Leawood, Kansas. Investigators from Terra Technologies identified ten (10) wetlands on the Site totaling 8.81 acres and three (3) stream segment totaling 2,597 linear feet on-site. The delineation was submitted to the U.S. Army Corps of Engineers, Pittsburg District (USACE) in October 2014.

In March 2015, a clearing company cut and harvested most of the trees on Site. The tree stumps were not removed in either uplands or wetlands. The USACE conducted a site visit in June 2015 and requested additional information for the site. The USACE did not verify the results of the Terra Technologies delineation.

In April 2017, EMH&T, Inc. and the USACE conducted a joint Site visit to observe the current Site conditions. During that Site visit, it appeared that wetlands on the Site either had expanded outside their original boundaries or were larger than originally delineated. Some other areas on the Site appeared to be holding water in uplands due to severe rutting caused by equipment used during the 2015 clearing activity. According to the EMH&T 2017 report, it was agreed that these upland areas holding water would not be considered wetlands at the time of the Corps April 2017 Site visit.

On May 22, 2017 through May 24, 2017, EMH&T conducted a wetland delineation of the site. All wetland boundaries were flagged and surveyed using a handheld GPS unit. EMH&T observed that the boundaries of most wetlands had expanded in size since the 2014 Terra Technologies delineation was completed and several additional wetlands were identified and delineated. EMH&T identified 24.56 acres of wetlands on the Site, 0.21 acre of wetland in the right-of-way of Tod Ave SW, and three (3) stream segments totaling 3,040 linear feet on the Site. The USACE issued a preliminary jurisdictional determination (LRP 2014-1077) on December 20, 2017 based on EMH&T's 2017 wetland delineation.

On behalf of General Motors, LLC, GHD conducted a wetland delineation on the Site during the period of October 15 through the 22, 2019. GHD reviewed the Terra Technologies and EMH&T reports prior to conducting our field investigations. GHD observed that most of the Site had been recently logged and severely rutted by logging activities, as noted by EMH&T in their 2017 report. In addition to the wetland areas identified during previous delineations, GHD observed that large parts of the site that were previously identified as uplands, and that were severely rutted in 2015, are now dominated by hydrophytic plants, exhibited indicators of wetland hydrology, and had soils with a depleted matrix and redox features in the upper 10 inches of the soil profile. Based on these observations, GHD delineated 25 wetland areas totaling 65.99 acres on the Site. GHD also identified two ephemeral stream segments (Streams 1 and 2) totaling 131 linear feet on the Site. Two ephemeral man-made ditches (Ditches 1 and 2) were identified on-site. Ditch 1 totals 307.5 linear feet on the Site. Ditch 2 totals 2,965 linear feet on the Site.

2. Wetland Delineation Methodology

GHD's wetland delineation was conducted using the methods in the Corps of Engineers 1987 Wetlands Delineation Manual (Technical Report Y-87-1) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast (Version 2.0, January 2012). According to these methods, wetlands are typically identified by the presence of three parameters: the dominance of hydrophytic vegetation, the presence of hydric soils, and positive indicators of wetland hydrology. Typically, all three parameters must be present for an area to be considered wetlands. However, in areas where one or more of the wetland parameters are significantly disturbed (e.g., recently cleared or graded areas) the undisturbed parameters, examination of similarly situated undisturbed adjoining areas, and professional judgment were used to delineate the extent of wetlands. Other waters (e.g., streams, rivers, ponds, etc.) were delineated by identifying the Ordinary High Water Mark (OHWM) along these water features, where present. Two man-made ditches occur on the Site. While these linear drainage features periodically convey surface water, they were created by excavation and lack a defined streambed containing alluvial substrates and stream banks. Accordingly, these features were identified in this report as man-made ditches.

Prior to conducting our field investigation, GHD reviewed secondary sources of data for the project area including the Warren, Ohio 7.5-minute USGS topographic map (Figure 1), aerial photographs (Figures 2A through 2E), NRCS soil survey (Figure 3), and USFWS National Wetlands Inventory map (Figure 4). These secondary resources are often useful in identifying areas that may contain wetlands or other waters. Following review of secondary resources, GHD then conducted a field investigation to delineate the boundaries of wetlands and other waters on the Site. The vegetation, soil profiles, and hydrologic indicators were examined at locations across the Site and the boundaries between wetlands and uplands were determined based on the USACE methods. Documentation of the wetland parameters at data point locations was recorded on Wetland Determination Data Forms. The wetland boundaries were flagged in the field, surveyed using sub-meter accuracy GPS, and plotted on a topographic base map of the Site. Color photographs were also taken as documentation.

3. RESULTS

3.1 REVIEW OF SECONDARY DATA

Review of the USGS map for the Site (Figure 1) indicates that the Site is gently sloping from a high point in the approximate center of the Site towards the Site boundaries. The highest point is in the south-central part of the Site and is shown with an elevation of 1009 feet above mean sea level. The western half of the Site drains to the west while the eastern half drains to the east. A small square pond is shown in the south center part of the Site. No streams are identified on the Site by the USGS map.

Review of historical and recent aerial photographs (Figure 2A-2E) indicates the Site was historically farmed. Farming ceased in the 1970s and 1980s. The Site underwent succession from farmlands to woodlands over several decades. In 2015, about 75 percent of the property was clear-cut and the remainder was selectively logged. Evidence of significant disturbance (clearing and rutting) across the Site related to the logging is evident in photographs after 2015. The Site is currently vacant. The site is bordered to the west by a wooded area connected to the former Lordstown Assembly Plant, to the east by Tod Avenue SW (State Route 45), to the north by rail lines, and to the south by industrial lands and a wooded area.

Review of the NRCS web soil survey (Figure 3) indicates the following soil series are located in the Site.

Map Unit Symbol	Map Unit Name	NRCS Hydric Status
LrC	Lordstown loam, 6 to 12 percent slopes	Non-Hydric
RsB	Rittman silt loam, 2 to 6 percent slopes	Non-Hydric
Ud	Udorthents, loamy	Non-Hydric
WbA	Wadsworth silt loam, 0 to 2 percent slopes	Predominantly Non-Hydric. May contain up to 10 percent Frenchtown soils (hydric) in depressions.
WbB	Wadsworth silt loam, 2 to 6 percent slopes	Predominantly Non-Hydric. May contain up to 8 percent Frenchtown soils (hydric) in depressions.

Five soil series are mapped on the Site. They are the Rittman silt loam, Udorthents, Lordstown loam, and Wadsworth silt loam (0 to 2 percent slopes and 2 to 6 percent slopes). The Wadsworth silt loam series covers the majority of the Site. The Rittman silt loam series runs northwest to southeast on the higher parts of the Site and connects two areas of Udorthents, which are mapped at the northern Site boundary and the southeast boundary of the Site. The Lordstown loam series occupies a small area at the east-northeast corner of the Site. The Wadsworth silt loam is generally found at lower elevations while the Rittman and Lordstown loam generally occupy higher elevations on the Site.

Review of the USFWS NWI map (Figure 4) maps a small freshwater emergent wetland in the north-central portion of the Site. The NWI map does not show any other wetlands or riverine systems on the Site.

3.2 Results of Wetland Delineation

GHD delineated 25 areas of wetlands totaling 65.99 acres and two watercourses totaling 131 linear feet on the Site. The boundaries of wetlands and watercourses delineated by GHD are shown on the Wetland Location Map in Appendix A and are discussed below. A summary of the delineated wetlands and other waters is provided on the Wetland Location Plan in Appendix A.

3.2.1 Area A

Area A is a 9.37-acre palustrine emergent (PEM) wetland with a small component of forested wetland located at lower elevations along the northern and western Site boundaries. Much of Area A appears to have formed in depressions and poorly drained, rutted compacted soils as a result of logging in 2015. Dominant species in Area A included dark-green bulrush (*Scirpus atrovirens*), cottongrass bulrush (*Scirpus cyperinus*), fragile-stem american-aster (*Symphyotrichum racemosum*), northern spicebush (*Lindera benzoin*), reed canary grass (*Phalaris arundinacea*), parasol white-top (*Doellingeria umbellata*), american wild mint (*Mentha arvensis*), common fox sedge (*Carex vulpinoidea*), wrinkle-leaf goldenrod (*Solidago rugosa*), lamp rush (*Juncus effuses*), rice cut grass (*Leersia oryzoides*), rambler rose (*Rosa multiflora*), glossy false buckthorn (*Frangula alnus* syn. *Rhamnus frangula*), red maple (*Acer rubrum*) saplings, pin oak (*Quercus palustris*) saplings, and silky dogwood (*Cornus amomum*). Soils in Area A are variable due to disturbances associated with the logging in 2015. Soils generally exhibited a very dark brown (10YR 2/2) to dark grayish brown (10YR 4/2) A horizon underlain by dark grayish brown (10YR 4/2) and 10YR 5/1 (gray) soils containing between 5% and 40% prominent redox concentrations in the matrix and pore linings. These conditions meet the depleted matrix (F3) hydric soil criteria. At the time of the investigation, primary indicators of hydrology were only present at DP23. All data points sampled in Area A met at least two secondary indicators of wetland hydrology including geomorphic position (D2) and passing FAC-Neutral Test (D5). Area A is documented on Data Forms DP16, DP17, DP18, DP19, and DP23 in Appendix B and the color photographs in Appendix C.

3.2.2 Area B

Area B is a 8.82-acre PEM wetland located along the western Site boundary. Area B appears to have recently formed on depressions and poorly drained, compacted soils resulting from logging in 2015. Area B is dominated by glossy false buckthorn, cottongrass bulrush (*Scirpus cyperinus*), lamp rush, and rambler rose. Soils in Area B exhibited a dark gray (10YR 4/1) matrix with 7% to 20% dark yellowish brown (10YR 4/4 and 10YR 4/6) redox concentrations in the matrix and pore linings in the

upper 12 inches. This meets the F3 hydric soil indicator. Wetland hydrology present included areas of shallow surface water (Indicator A1), geomorphic position (D2), microtopographic relief (D4), and passing FAC-Neutral Test (D5). Area B is documented on Data Form DP20 and DP25 included in Appendix B and the color photographs in Appendix C.

3.2.3 Area H

Area H is a 2.86-acre palustrine forested (PFO) and emergent / scrub-shrub (PEM/SS) wetland located in the southwestern corner of the Site. Area H was selectively logged in 2015 and thus contains some areas with an open canopy and some areas with a tree canopy where trees remained after the logging. Area H is bordered on the south and west by a chainlink perimeter fence. Dominant species in Area H included shag-bark hickory (*Carya ovata*), northern spicebush, red maple, lamp rush, dark-green bulrush, arrow-leaf tearthumb (*Persicaria sagittata*), and rambler rose. Soils in Area H generally exhibited a very dark gray (10YR 3/1) surface layer from 0" to 2" which was underlain from 2" to 9" by a dark grayish brown (10YR 4/2) matrix containing 5% dark yellowish brown (10YR 4/4) redox concentrations in the matrix. This meets the F3 hydric soil criteria. At the time of the investigation, primary indicators of hydrology included saturation (A3) at the surface. Secondary indicators of wetland hydrology present included geomorphic position (D2) and a passing FAC-Neutral Test (D5). Area H is documented on Data Form DP40 included in Appendix B and the color photographs in Appendix C.

3.2.4 Area S

Area S is a 9.44-acre PEM and PFO wetland located in the southern portion of the Site. Area S occupies parts of the Site that were clear-cut and partially clear-cut in 2015. Much of Area S appears to have recently formed in areas severely disturbed during the 2015 logging. The eastern portions of Area S are primarily PEM wetlands (clear-cut areas). The western portions are PFO wetlands (selectively cut areas). Dominant species in Area S include red maple, northern spicebush, canada goldenrod (*Solidago canadensis*), lamp rush, gray dogwood (*Cornus racemosa*), wrinkle-leaf goldenrod, shag-bark hickory, dark-green bulrush, arrow-leaf tearthumb, and rambler rose. Soils in Area S generally exhibited a dark gray (10YR 4/1) to dark grayish brown (10YR 4/2) matrix (F3) from 0" to 9" with 6% to 9% dark yellowish brown (10YR 4/4) to yellowish brown (10YR 5/6) redox concentrations in the matrix, meeting the F3 hydric soil criteria. At the time of the investigation, saturation (A3), a primary indicator of wetland hydrology, was found at the surface. Secondary indicators of wetland hydrology present in Area S included geomorphic position (D2) and a passing FAC-Neutral Test (D5). Area S is documented on Data Forms DP35, DP37, and DP39 included in Appendix B. Color photographs are provided in Appendix C.

3.2.5 Area U

Area U is a 2.0-acre PEM wetland located in the south-central portion of the Site. Area U occupies a part of the Site that was clear-cut in 2015. Dominant species in Area U include rambler rose, quaking aspen (*Populus tremuloides*), lamp rush, wrinkle-leaf goldenrod, and fragile-stem american aster. Soils in Area U generally exhibited a very dark grayish brown (10YR 3/2) surface layer to a depth of 5" which contained 4% dark yellowish brown (10YR 4/4) redox concentration in the matrix. From a depth of 5" to 15" soils exhibited a dark gray (10YR 4/1) matrix with 5% yellowish brown (10YR 4/6) redox concentrations in the matrix., meeting the F3 hydric soil criteria. At the time of the investigation, saturation (A3), a primary indicator of wetland hydrology, was found at the surface. Geomorphic

position (D2), a secondary indicator of wetland hydrology, was the only secondary indicator found in Area U. Area U is documented on Data Form DP28 included in Appendix B and the color photographs in Appendix C.

3.2.6 Area W

Area W is a 0.01-acre PEM wetland located in a small depression abutting the existing access road in the east-central portion of the Site. Area W likely formed as a direct result of former logging activities in 2015. Area W is sparsely vegetated and dominated by narrow-leaf cattail (*Typha angustifolia*). Soil in Area W exhibited a dark grayish brown (10YR 4/2) matrix containing 2% dark yellowish brown (10YR 4/4) redox concentrations in the matrix, meeting the F3 hydric soil criteria. Auger refusal occurred at a depth of 8" due to a rock or gravel layer likely associated with the gas pad at this location. At the time of the investigation, primary indicators of hydrology were surface water (A1) and saturation (A3). Area W is documented in the color photographs in Appendix C.

3.2.7 Area X

Area X is a 4.86-acre PEM and PEM/SS wetland located in the eastern part of the Site along Tod Ave SW. Dominant vegetation in Area X included silky dogwood, glossy false buckthorn, lamp rush, wrinkle-leaf goldenrod, and common reed (*Phragmites australis*). Soil in Area X generally exhibited a very dark grayish brown (10YR 3/2) surface layer to 3" underlain by an 8" layer of dark grayish brown (10YR 4/2) matrix with 4% dark yellowish brown (10YR 4/6) redox concentrations. At the time of the investigation, portions of Area X were saturated at the surface. Secondary indicators of wetland hydrology present included geomorphic position (D2) and a passing FAC-Neutral Test (D5). Area X is documented on Data Forms DP30 included in Appendix B and the color photographs in Appendix C.

3.2.8 Area Y

Area Y is a 0.01-acre PEM wetland located in a small depression abutting the north side of the driveway to the Site off Tod Ave SW. Dominant vegetation in Area Y included narrow-leaf cattail, gray dogwood, and rambler rose. Soil in Area W exhibited a dark grayish brown (10YR 4/2) depleted matrix containing 2% dark yellowish brown (10YR 4/4) redox concentrations in the matrix, meeting the F3 hydric soil criteria. At the time of the investigation, primary indicators of hydrology were surface water (A1) and saturation (A3). Area Y is documented in the color photographs in Appendix C.

3.2.9 Area Z

Area Z is a 26.79-acre PEM and PFO wetland located in the eastern and northeaster portions of the Site. Area Z occupies land that was both clear cut and selectively logged in 2015, with the PEM wetlands occurring on areas that were clear-cut and PFO wetlands occurring on areas that were selectively logged. Large parts of Area Z appear to have recently formed on rutting and in depressions and compacted soils resulting from the logging in 2015. Dominant vegetation in Area Z included pin oak, red maple, silky dogwood, quaking aspen, american hornbeam, american elm, glossy false buckthorn, northern spicebush, reed canary grass, fragile-stem american aster, lamp rush, tall goldenrod (*Solidago altissima*), wrinkle-leaf goldenrod, halberd-leaf tearthumb, rambler rose, dark-green bulrush, broad-leaf cattail, arrow-leaf tearthumb, and japanese stilt grass. Soils in Area Z generally exhibited a dark gray (10YR 4/1) to dark grayish brown surface layer underlain by a dark gray matrix with 2% to 20% dark yellowish brown (10YR 4/4 and 10YR 4/6) redox concentrations. This profile meets the F3 hydric soil indicator. Primary indicators of wetland hydrology were largely

absent at data points examined in Area Z at the time of our investigation. However, surface water (A1) 1" deep was observed at DP24 and secondary indicators of wetland hydrology present among all sampling locations in Area Z included drainage patterns (B10), geomorphic position (D2), passing the FAC-Neutral Test (D5). Area Z is documented on Data Forms DP01, DP03, DP04, DP06, DP08, DP09, DP11, DP13, DP14, DP15, and DP24 included in Appendix B and the color photographs in Appendix C.

3.2.10 Areas C-F, I-R, T, and V

Areas C-F, I-R, T, and V are a mosaic of small wetlands in the southwestern and south-central part of the Site that appear to be predominantly the result of rutting, soil compaction, and access roads from the logging in 2015. Areas C-F, I-R, T, and V includes PFO wetland Areas C, D, E, F, I, J, K, L, M, N, and P totaling 0.66 acre, PEM/SS wetland Areas O, Q, and R totaling 0.83 acre, and PEM wetland Areas T and V totaling 0.34 acre. Dominant vegetation in Areas C-F, I-R, T, and V included red maple, pin oak, shag-bark hickory, northern spicebush, gray dogwood, glossy false buckthorn, Rambler rose, lamp rush, Japanese honeysuckle, dark-green bulrush, sensitive fern, jumpseed, narrow-leaf cattail, and reed canary grass. Soil observed in Area C-F, I-R, T, and V is variable but generally exhibited a dark grayish brown (10YR 4/2) surface with 2% to 3% dark yellowish brown (10YR 4/4) redox concentrations in the matrix meeting the F3 hydric soil criteria. The underlying soil to at least 12" generally exhibited a gray (10YR 5/1) to grayish brown (10YR 4/2) matrix with between 10% and 30% yellowish brown (10YR 5/6) redox concentrations in the matrix. At the time of the investigation, saturation (A3) was found at most locations within Areas C-F, I-R, T, and V. All sampling locations in Area C-F, I-R, T, and V exhibited the secondary indicators geomorphic position (D2) and passing FAC-Neutral Test (D5). Area C-F, I-R, T, and V is documented on Data Forms DP27, DP32, DP33, and DP34 included in Appendix B and the color photographs in Appendix C.

3.2.11 Stream 1

Stream 1 is an ephemeral first order unnamed tributary (UNT) to Mud Creek in the northeastern portion of the Site. Stream 1 receives surface runoff from Area Z and the surrounding uplands on the Site. The segment of Stream 1 on the Site begins in Wetland Z and extends approximately 81 linear feet LF to the northern property line. The channel is approximately 1.5 meters wide at maximum bank full width, has a low gradient and no sinuosity. Stream 1 appears to be highly influenced by stormwater runoff and was dry at the time of our investigation. The on-Site segment of Stream 1 does not support fish, long-lived aquatic macroinvertebrates, or other aquatic organisms that rely on perennial or seasonal flow. Stream 1 flows off-Site to the east in a railroad side ditch and then north in a culvert beneath the existing rail lines. Stream 1 is documented in the color photographs in Appendix C.

3.2.12 Stream 2

Stream 2 is an ephemeral first order UNT to Mud Creek in the northwest corner of the Site. Stream 2 originates in Area A and extends 50 feet to the northern property boundary. Stream 2 receives surface run-off from Area A, the surrounding uplands, and Ditch 2. Stream 2 appears to be highly influenced by stormwater runoff and is dry most of the year. The on-Site segment of Stream 2 does not support fish, long-lived aquatic macroinvertebrates, or other aquatic organisms that rely on perennial or seasonal flow. At the time of the investigation, Stream 2 lacked flowing water but areas of shallow standing water were present in isolated spots. Stream 2 has a maximum bankfull width of

approximately 1 meter, has a low gradient, and no sinuosity. Stream 2 flows off-Site and into a culvert that flows northwest under the existing rail lines. The watercourse is documented in the color photographs in Appendix C.

3.2.13 Ditches

GHD identified two man-made ditches (Ditch 1 and 2) on the Site as identified on the map in Appendix A. Ditch 1 occurs in the southeastern portion of the Site and conveys surface water from Wetland Area U through a culvert to Wetland Area X. Ditch 2 occurs along the western property line. The southern portion of Ditch 2 flows south along the fence and onto the former GM Lordstown Facility. The northern portion of Ditch 2 flows north through Wetland B and A and discharges to Stream 2. Both ditches flow in response to rainfall and appeared to lack a baseflow.

3.2.14 Uplands

Uplands on the Site total 92.225 acres and consist of open field, gravel access roads, and selectively logged woods. Evidence of the 2015 logging operations are evident throughout the uplands on the Site. Dominant upland vegetation included northern white oak (*Quercus alba*), black cherry (*Prunus serotina*), pin oak, black locust (*Robinia pseudoacacia*), northern spicebush, bristly dewberry (*Rubus hispidus*), rambler rose, autumn olive (*Elaeagnus umbellata*), glossy false buckthorn, parasol white-top, reed canary grass, lamp rush, silky dogwood, woodland strawberry, orchard grass (*Dactylis glomerata*), garlic-mustard (*Alliaria petiolata*), jumpseed, white avens (*Geum canadense*), fragile-stem american-aster, tall goldenrod, wrinkle-leaf goldenrod, and quaking aspen. Upland soils observed to a depth of 18" generally ranged from a brown (10YR 4/3 or 10YR 5/3) to very dark brown (10YR 3/2) silt loam matrix with mostly absent but at most 1% redox concentrations. All soils observed exhibited a silt loam texture. Primary indicators of wetland hydrology were generally absent in the uplands. However, one secondary indicator of wetland hydrology, a passing FAC-Neutral Test (D5), was observed at data point locations DP12, DP22, DP29, and DP41.

The uplands are documented on Data Forms DP02, DP05, DP07, DP10, DP12, DP21, DP22, DP26, DP29, DP31, DP36, and DP41 included in Appendix B and the color photographs in Appendix C.

4. ORAM Scoring

Wetlands present on the Site were evaluated on December 2, 2019 using the Ohio Environmental Protection Agency's (OEPA) Ohio Rapid Assessment Method (ORAM) for Wetlands version 5.0. The following qualitative metrics were evaluated using the ORAM methodology.

- Metric 1. Wetland Area (size)
- Metric 2. Upland buffers and surrounding land use
- Metric 3. Hydrology
- Metric 4. Habitat Alteration and Development
- Metric 5. Special Wetlands
- Metric 6. Plant communities, interspersions, and microtopography

Ohio Environmental Protection Agency (OEPA) inspected the site and verified the ORAM scoring on the wetlands on the Site as shown in the following table.

Wetland ID	Metric						Grand Total (max 100)	Category
	1	2	3	4	5	6		
A	3	6	6.5	6.5	0	6	28	1
B	3	7	6.5	6.5	0	4	26.5	1
C-F, I-R, T, V	2	10	6.5	6.5	0	8	33	2
H	2	11	9.5	8	0	10	40.5	2
S	3	7	6.5	7.5	0	12	36	2
U	2	7	6.5	6.5	0	3	25	1
W	0	3	5	6	0	0	14	1
X	3	7	6.5	6.5	0	8	31	2
Y	0	4	8	5.5	0	1	18.5	1
Z	5	6	6.5	7.5	0	10	35	2

5. SUMMARY AND DISCUSSION


GHD conducted a wetland delineation at the 158.215-acre Site located in the City of Lordstown, Trumbull County, Ohio in September 2019. The wetland delineation was conducted in accordance with the U.S. Army Corps of Engineers 1987 Wetland Delineation Manual and supplemental regional manual methods. GHD identified and delineated 25 wetland areas totaling 65.99 acres on the Site. The remaining 92.225 acres were identified as uplands. GHD also identified two ephemeral stream segments (Streams 1 and 2) totaling 131 linear feet on the Site. Two ephemeral man-made ditches (Ditches 1 and 2) were identified on-site. Ditch 1 totals 307.5 linear feet on the Site. Ditch 2 totals 2,965 linear feet on the Site. Wetlands and streams delineated within the Study Area are shown on the Wetland Location Map in Appendix A. All of the wetlands and streams identified by GHD are likely to be jurisdictional under Section 404.

Logging activities on the Site in 2015 caused significant alterations to the Site topography, surface drainage, and soil compaction, which were apparent during GHD's field investigation. These disturbances created conditions conducive to the temporary ponding and perching of precipitation in areas that were previously identified as uplands. It is GHD's opinion that these logging disturbances, co-occurring with successive years of well above normal precipitation, resulted in the expansion of wetlands and the formation of new wetlands in former upland areas on the Site. Based on previous wetland delineations completed on the Site in 2014 and 2017 as compared to GHD's 2019 delineation, approximately 41.43 acres of wetlands have formed since the 2017 PJD was issued by the USACE in areas previously identified as uplands.

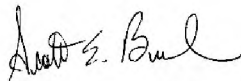
Wetlands that form on uplands as a result of recent disturbances, such as logging, usually exhibit lower wetland functions and societal values. They often exhibit lower species richness and diversity, higher susceptibility to invasion by non-native species, and limited habitat values. Based on the extent of disturbance that occurred in 2015 and our current observations of these areas, it is our opinion that the majority of the recently formed wetlands on the Site would be unlikely to provide a high level of wetland function and value over time.

Both the USACE and OEPA have completed an inspection of the Site. The results presented in this letter are consistent with the findings of their inspection. If you have any questions, please do not hesitate to contact us.

Sincerely,



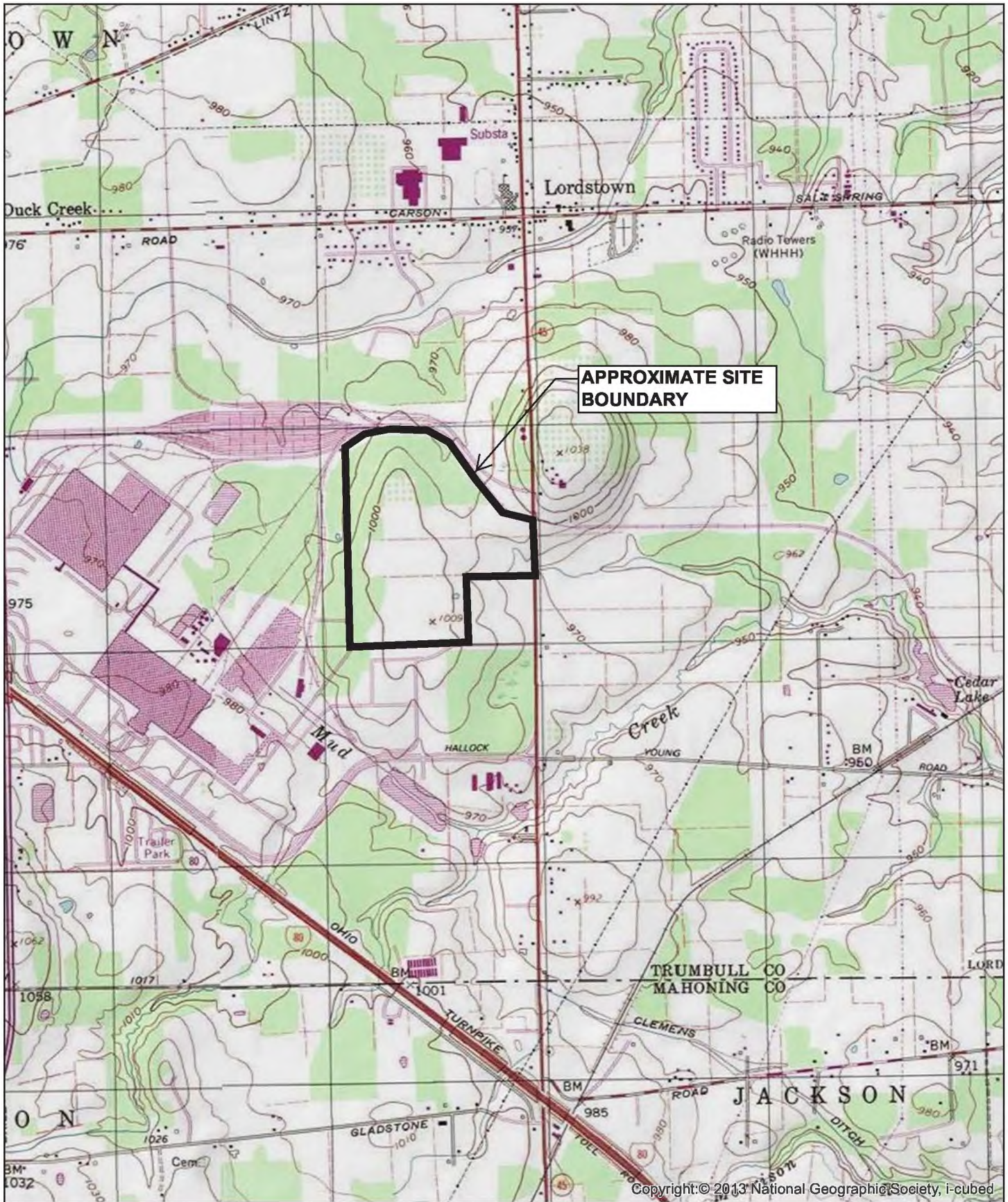
Gregory Kunka
Environmental Scientist



Scott E. Bush, P.W.S.
Senior Ecologist

FIGURES

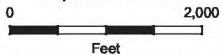
FIGURE 1



APPROXIMATE SITE BOUNDARY

Copyright: © 2013 National Geographic Society, i-cubed

Paper Size 8.5 x 11



Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane Ohio North FIPS 3401 Feet



MEGELLAN EAST - PARCEL 4
USGS TOPOGRAPHIC LOCATION MAP

CITY OF LORDSTOWN, TRUMBULL COUNTY, OH
USGS QUAD: WARREN

Job Number | 11204429
Revision | A
Date | Dec 12, 2019

M:\0_Kunka\GHD-Permit\Map_Template_OH.mxd
© 2019. While every care has been taken to prepare this map, GHD (and DATA CUSTODIAN) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.



SITE

Figure 2A

INQUIRY #: 2614661.5

YEAR: 1965

| = 500'





Figure 2B

INQUIRY #: 2614661.5

YEAR: 1977

|—————| = 1000'



Project Magellan

2014

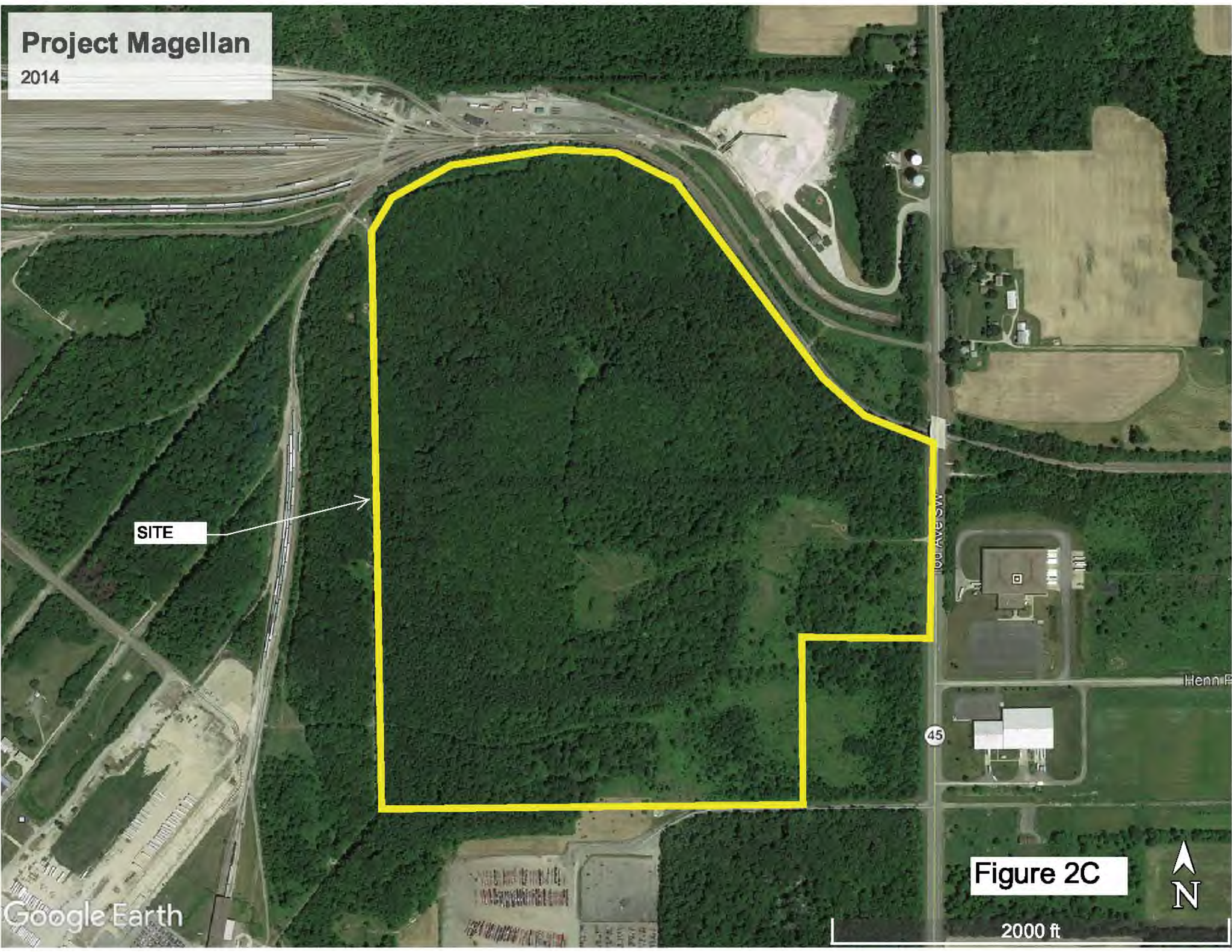
SITE

Figure 2C



2000 ft

Google Earth



Project Magellan

2015

SITE

Tod Ave SW

45

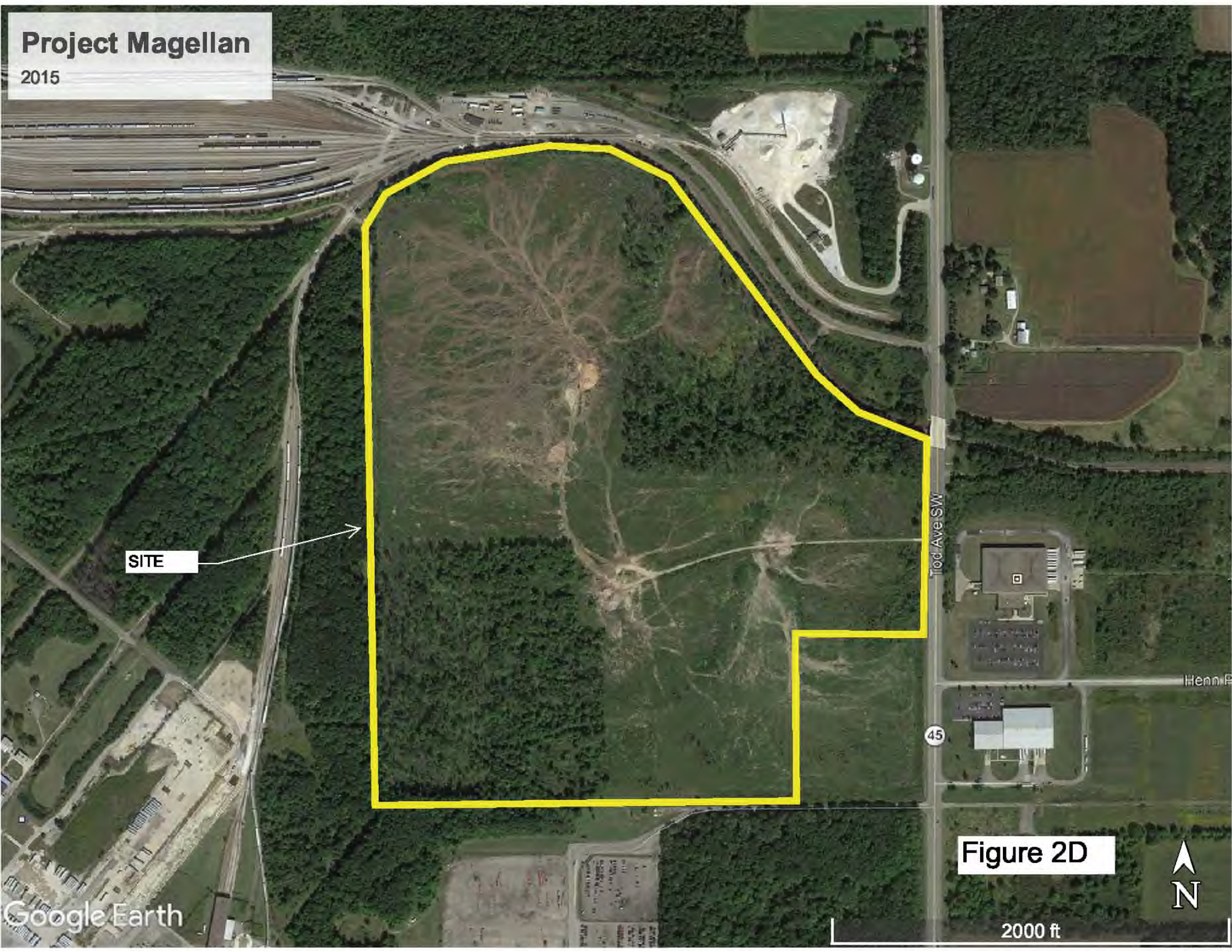
Hennip

Figure 2D



2000 ft

Google Earth



Project Magellan

2016

SITE

1000 AVE SW

45

Henn P

Figure 2E



2000 ft

Google Earth

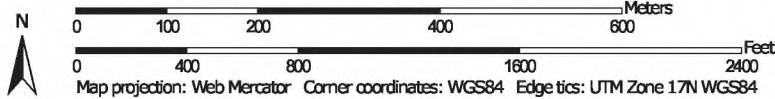
© 2018 Google



Hydric Rating by Map Unit—Trumbull County, Ohio



Map Scale: 1:8,310 if printed on A portrait (8.5" x 11") sheet.




Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84









MAP LEGEND

Area of Interest (AOI)







 Area of Interest (AOI)

Soils







Soil Rating Polygons

 Hydric (100%)
 Hydric (66 to 99%)
 Hydric (33 to 65%)
 Hydric (1 to 32%)
 Not Hydric (0%)
 Not rated or not available


Soil Rating Lines

 Hydric (100%)
 Hydric (66 to 99%)
 Hydric (33 to 65%)
 Hydric (1 to 32%)
 Not Hydric (0%)
 Not rated or not available

Soil Rating Points

 Hydric (100%)
 Hydric (66 to 99%)
 Hydric (33 to 65%)
 Hydric (1 to 32%)
 Not Hydric (0%)
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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: Trumbull County, Ohio
 Survey Area Data: Version 17, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 7, 2009—Mar 21, 2017

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.

Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
LrB	Lordstown loam, 2 to 6 percent slopes	0	10.4	3.3%
LrC	Lordstown loam, 6 to 12 percent slopes	0	16.3	5.2%
LyB	Loudonville silt loam, 2 to 6 percent slopes	0	2.7	0.9%
RsB	Rittman silt loam, 2 to 6 percent slopes	0	21.0	6.7%
Sc	Sebring silt loam, till substratum, 0 to 2 percent slopes	90	4.0	1.3%
Ud	Udorthents, loamy	0	53.0	16.9%
Ur	Urban land	0	0.8	0.2%
WbA	Wadsworth silt loam, 0 to 2 percent slopes	10	94.1	30.1%
WbB	Wadsworth silt loam, 2 to 6 percent slopes	8	110.7	35.4%
Totals for Area of Interest			313.0	100.0%



FIGURE 4

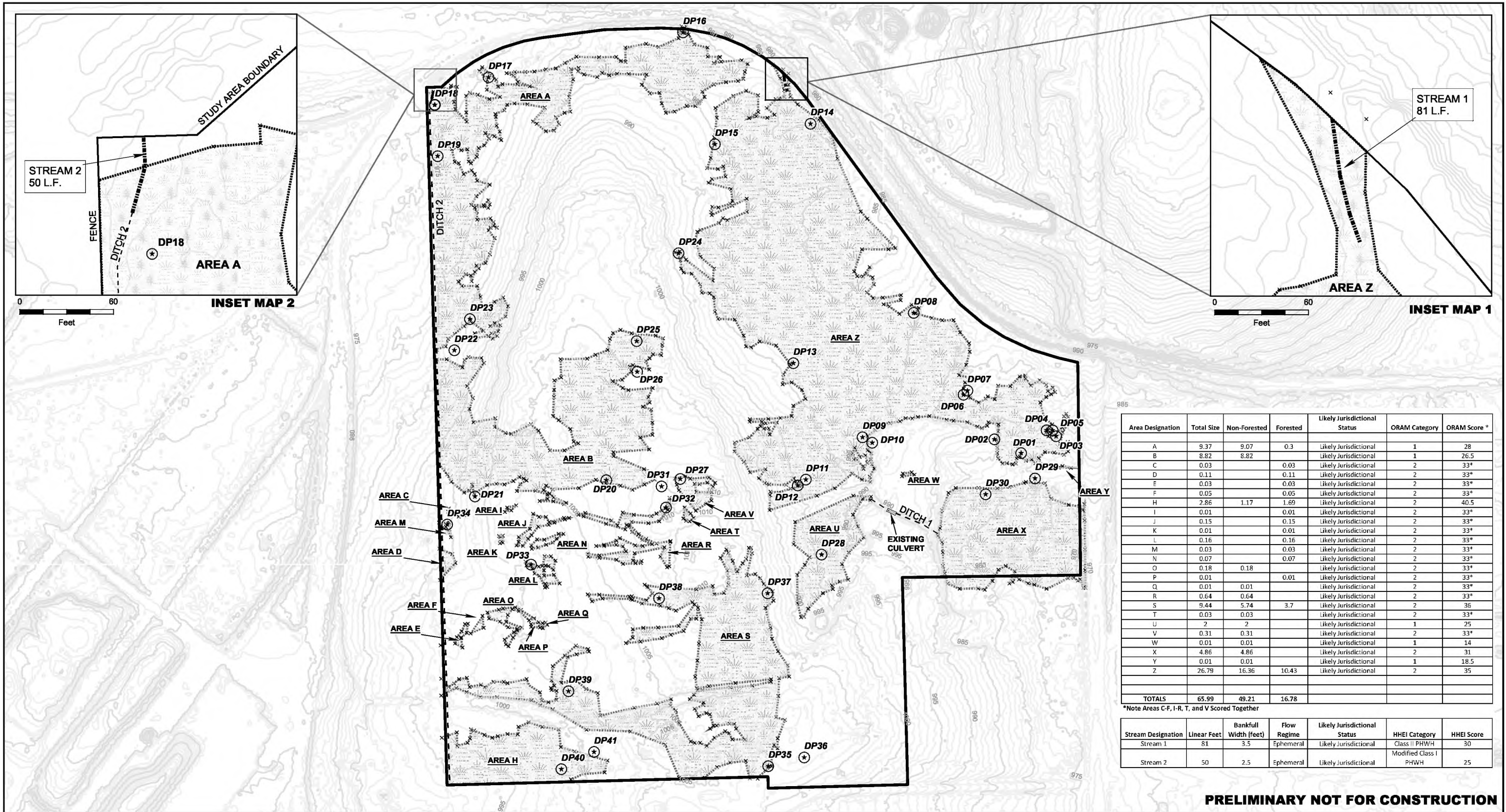
December 12, 2019

Wetlands

- Estuarine and Marine Deepwater
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Lake
- Estuarine and Marine Wetland
- Freshwater Pond
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

APPENDIX A
WETLAND
LOCATION MAP

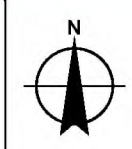
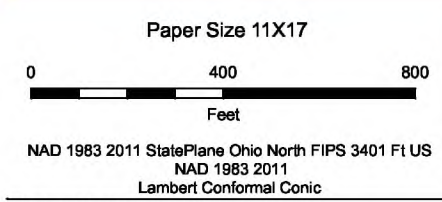


Area Designation	Total Size	Non-Forested	Forested	Likely Jurisdictional Status	ORAM Category	ORAM Score *
A	9.37	9.07	0.3	Likely Jurisdictional	1	28
B	8.82	8.82		Likely Jurisdictional	1	26.5
C	0.03		0.03	Likely Jurisdictional	2	33*
D	0.11		0.11	Likely Jurisdictional	2	33*
E	0.03		0.03	Likely Jurisdictional	2	33*
F	0.05		0.05	Likely Jurisdictional	2	33*
H	2.86	1.17	1.69	Likely Jurisdictional	2	40.5
I	0.01		0.01	Likely Jurisdictional	2	33*
J	0.15		0.15	Likely Jurisdictional	2	33*
K	0.01		0.01	Likely Jurisdictional	2	33*
L	0.16		0.16	Likely Jurisdictional	2	33*
M	0.03		0.03	Likely Jurisdictional	2	33*
N	0.07		0.07	Likely Jurisdictional	2	33*
O	0.18	0.18		Likely Jurisdictional	2	33*
P	0.01		0.01	Likely Jurisdictional	2	33*
Q	0.01	0.01		Likely Jurisdictional	2	33*
R	0.64	0.64		Likely Jurisdictional	2	33*
S	9.44	5.74	3.7	Likely Jurisdictional	2	36
T	0.03	0.03		Likely Jurisdictional	2	33*
U	2	2		Likely Jurisdictional	1	25
V	0.31	0.31		Likely Jurisdictional	2	33*
W	0.01	0.01		Likely Jurisdictional	1	14
X	4.86	4.86		Likely Jurisdictional	2	31
Y	0.01	0.01		Likely Jurisdictional	1	18.5
Z	26.79	16.36	10.43	Likely Jurisdictional	2	35
TOTALS	65.99	49.21	16.78			

*Note Areas C-F, I-R, T, and V Scored Together

Stream Designation	Linear Feet	Bankfull Width (feet)	Flow Regime	Likely Jurisdictional Status	HHEI Category	HHEI Score
Stream 1	81	3.5	Ephemeral	Likely Jurisdictional	Class II PHWH	30
Stream 2	50	2.5	Ephemeral	Likely Jurisdictional	PHWH	25

PRELIMINARY NOT FOR CONSTRUCTION



LEGEND

SITE BOUNDARY	DATA POINT	DITCH	ELEVATION CONTOUR
WETLAND FLAG	WETLAND	STREAM	



PROJECT MAGELLAN
WETLAND LOCATION MAP
 GENERAL MOTORS, LLC
 VILLAGE OF LORDSTOWN, TRUMBULL COUNTY, OHIO

Job Number | 11181610
 Revision | A
 Date | Jan 06, 2020

M:\10_Kunka\GM Lordstown OH\Lordstown.aprx
 © 2020. While every care has been taken to prepare this map, GHD make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

APPENDIX B
DATA FORMS

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/15/2019
 Applicant/Owner: GM State: OH Sampling Point: DP01
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.152210 Long: -80.858222 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP01

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30'</u>)																		
1. <u>Quercus palustris (Pin Oak)</u>	<u>10</u>	<u>YES</u>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)														
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>10</u> = Total Cover																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. <u>Acer rubrum (Red Maple)</u>	<u>15</u>	<u>YES</u>	<u>FAC</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
2. <u>Cornus amomum (Silky Dogwood)</u>	<u>10</u>	<u>YES</u>	<u>FACW</u>															
3. <u>Quercus palustris (Pin Oak)</u>	<u>5</u>	<u>NO</u>	<u>FACW</u>															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>30</u> = Total Cover																	
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Phalaris arundinacea (Reed Canary Grass)</u>	<u>40</u>	<u>YES</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Symphotrichum racemosum (Fragile-Stem American Aster)</u>	<u>35</u>	<u>YES</u>	<u>FACW</u>															
3. <u>Juncus effusus (Lamp Rush)</u>	<u>35</u>	<u>YES</u>	<u>OBL</u>															
4. <u>Scirpus atrovirens (Dark-Green Bulrush)</u>	<u>25</u>	<u>NO</u>	<u>OBL</u>															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
8. _____	-	-	-															
9. _____	-	-	-															
10. _____	-	-	-															
11. _____	-	-	-															
12. _____	-	-	-															
50% = _____ 20% = _____	<u>135</u> = Total Cover																	
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	-	-	-															
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
50% = _____ 20% = _____	<u>0</u> = Total Cover																	
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																		
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____																		
Remarks: (Include photo numbers here or on a separate sheet.) Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		

SOIL

Sampling Point: DP01

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 3/1	100					SiL	
6 - 14	10YR 3/1	98	10YR 4/4	2	C	M	SiL	
14 - 18	10YR 3/1	30	10YR 4/1	66	D	M	CL	
			10YR 4/6	4	C	M		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/15/2019
 Applicant/Owner: GM State: OH Sampling Point: DP02
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3-6
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.152377 Long: -80.858633 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP02

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	-	-	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50.0%</u> (A/B)														
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>70</u></td> <td>x 3 = <u>210</u></td> </tr> <tr> <td>FACU species <u>95</u></td> <td>x 4 = <u>380</u></td> </tr> <tr> <td>UPL species <u>30</u></td> <td>x 5 = <u>150</u></td> </tr> <tr> <td>Column Totals: <u>195</u> (A)</td> <td><u>740</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.79</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>70</u>	x 3 = <u>210</u>	FACU species <u>95</u>	x 4 = <u>380</u>	UPL species <u>30</u>	x 5 = <u>150</u>	Column Totals: <u>195</u> (A)	<u>740</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>0</u>	x 2 = <u>0</u>																	
FAC species <u>70</u>	x 3 = <u>210</u>																	
FACU species <u>95</u>	x 4 = <u>380</u>																	
UPL species <u>30</u>	x 5 = <u>150</u>																	
Column Totals: <u>195</u> (A)	<u>740</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. <u>Elaeagnus umbellata (Autumn Olive)*</u>	<u>15</u>	<u>YES</u>	<u>FACU</u>															
2. <u>Frangula alnus (Glossy False Buckthorn)</u>	<u>5</u>	<u>YES</u>	<u>FAC</u>															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>20</u>	= Total Cover																
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Solidago altissima (Tall Goldenrod)</u>	<u>65</u>	<u>YES</u>	<u>FACU</u>															
2. <u>Frangula alnus (Glossy False Buckthorn)</u>	<u>60</u>	<u>YES</u>	<u>FAC</u>															
3. <u>Daucus carota (Queen Anne's-Lace)</u>	<u>30</u>	<u>NO</u>	<u>UPL</u>															
4. <u>Dipsacus fullonum (Fuller's Teasel)</u>	<u>15</u>	<u>NO</u>	<u>FACU</u>															
5. <u>Toxicodendron radicans (Eastern Poison Ivy)</u>	<u>5</u>	<u>NO</u>	<u>FAC</u>															
6. _____	_____	-	-															
7. _____	_____	-	-															
8. _____	_____	-	-															
9. _____	_____	-	-															
10. _____	_____	-	-															
11. _____	_____	-	-															
12. _____	_____	-	-															
50% = _____ 20% = _____	<u>175</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	_____	-	-															
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Remarks: (Include photo numbers here or on a separate sheet.) Does not pass FAC-Neutral Test (Secondary Hydrology Indicator [D5]). *E. umbellata assigned indicator status of FACU based on indicator status of E. angustifolia.																		
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)																		
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																		
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																		
Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>																		

SOIL

Sampling Point: DP02

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 18	10YR 4/2	80	10YR 4/1	20	C	M	SiL	Stony/fill layer

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/15/2019
 Applicant/Owner: GM State: OH Sampling Point: DP03
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression/Rut Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.152400 Long: -80.857676 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP03

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	-	-	
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
5. _____	_____	-	-	
6. _____	_____	-	-	
7. _____	_____	-	-	
50% = _____ 20% = _____	<u>0</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Populus tremuloides (Quaking Aspen)</u>	<u>30</u>	<u>YES</u>	<u>FACU</u>	
2. <u>Quercus palustris (Pin Oak)</u>	<u>10</u>	<u>YES</u>	<u>FACW</u>	
3. _____	_____	-	-	
4. _____	_____	-	-	
5. _____	_____	-	-	
6. _____	_____	-	-	
7. _____	_____	-	-	
50% = _____ 20% = _____	<u>40</u>	= Total Cover		
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Solidago altissima (Tall Goldenrod)</u>	<u>30</u>	<u>YES</u>	<u>FACU</u>	
2. <u>Solidago rugosa (Wrinkle-Leaf Goldenrod)</u>	<u>25</u>	<u>YES</u>	<u>FAC</u>	
3. <u>Juncus effusus (Lamp Rush)</u>	<u>20</u>	<u>NO</u>	<u>OBL</u>	
4. <u>Penstemon digitalis (Foxglove Beardtongue)</u>	<u>15</u>	<u>NO</u>	<u>FAC</u>	
5. <u>Scirpus atrovirens (Dark-Green Bulrush)</u>	<u>10</u>	<u>NO</u>	<u>OBL</u>	
6. <u>Typha latifolia (Broad-Leaf Cat-Tail)</u>	<u>5</u>	<u>NO</u>	<u>OBL</u>	
7. <u>Rosa multiflora (Rambler Rose)</u>	<u>5</u>	<u>NO</u>	<u>FACU</u>	
8. _____	_____	-	-	
9. _____	_____	-	-	
10. _____	_____	-	-	
11. _____	_____	-	-	
12. _____	_____	-	-	
50% = _____ 20% = _____	<u>110</u>	= Total Cover		
Woody Vine Stratum (Plot size: <u>15'</u>)				
1. _____	_____	-	-	
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
50% = _____ 20% = _____	<u>0</u>	= Total Cover		
Remarks: (Include photo numbers here or on a separate sheet.)				
OBL/FACW: 4 UPL/FACU: 3				
Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).				

Dominance Test worksheet:	
Number of Dominant Species That Are OBL, FACW, or FAC:	<u>2</u> (A)
Total Number of Dominant Species Across All Strata:	<u>4</u> (B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>50.0%</u> (A/B)
Prevalence Index worksheet:	
Total % Cover of:	Multiply by:
OBL species <u>35</u>	x 1 = <u>35</u>
FACW species <u>10</u>	x 2 = <u>20</u>
FAC species <u>40</u>	x 3 = <u>120</u>
FACU species <u>65</u>	x 4 = <u>260</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>150</u> (A)	<u>435</u> (B)
Prevalence Index = B/A = <u>2.90</u>	
Hydrophytic Vegetation Indicators:	
<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation	
<input type="checkbox"/> 2 - Dominance Test is >50%	
<input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹	
<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
Definitions of Vegetation Strata:	
Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.	
Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.	
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.	
Woody vines – All woody vines greater than 3.28 ft in height.	
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

SOIL

Sampling Point: DP03

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 8	10YR 4/1	98	10YR 4/4	2	C	M	SiL	
8 - 18	10YR 4/1	30	10YR 5/1	62	D	M	SiL	
			10YR 4/6	8	C	M		

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/15/2019
 Applicant/Owner: GM State: OH Sampling Point: DP04
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Toe Local relief (concave, convex, none): concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.152472 Long: -80.857821 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP04

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30'</u>)																		
1. <u>Populus tremuloides (Quaking Aspen)</u>	<u>15</u>	<u>YES</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66.7%</u> (A/B)														
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>15</u>	= Total Cover																
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. <u>Populus tremuloides (Quaking Aspen)</u>	<u>25</u>	<u>YES</u>	<u>FACU</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
2. <u>Quercus palustris (Pin Oak)</u>	<u>10</u>	<u>YES</u>	<u>FACW</u>															
3. <u>Cornus amomum (Silky Dogwood)</u>	<u>10</u>	<u>YES</u>	<u>FACW</u>															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>45</u>	= Total Cover																
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Juncus effusus (Lamp Rush)</u>	<u>55</u>	<u>YES</u>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Symphotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>35</u>	<u>YES</u>	<u>FACW</u>															
3. <u>Scirpus atrovirens (Dark-Green Bulrush)</u>	<u>25</u>	<u>NO</u>	<u>OBL</u>															
4. <u>Solidago altissima (Tall Goldenrod)</u>	<u>15</u>	<u>NO</u>	<u>FACU</u>															
5. <u>Persicaria sagittata (Arrow-Leaf Tearthumb)</u>	<u>15</u>	<u>NO</u>	<u>OBL</u>															
6. <u>Quercus palustris (Pin Oak)</u>	<u>15</u>	<u>NO</u>	<u>FACW</u>															
7. <u>Frangula alnus (Glossy False Buckthorn)</u>	<u>10</u>	<u>NO</u>	<u>FAC</u>															
8. <u>Ulmus americana (American Elm)</u>	<u>5</u>	<u>NO</u>	<u>FACW</u>															
9. _____	-	-	-															
10. _____	-	-	-															
11. _____	-	-	-															
12. _____	-	-	-															
50% = _____ 20% = _____	<u>175</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	-	-	-															
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 4 UPL/FACU: 2 Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		
				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														

SOIL

Sampling Point: DP04

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR4/2	97	10YR 4/4	3	C	PL	SiL	
6 - 18	10YR 4/2	88	10YR 4/4	12	C	M	SiL	

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

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

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

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

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/15/2019
 Applicant/Owner: GM State: OH Sampling Point: DP05
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Field Local relief (concave, convex, none): Flat Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.152471 Long: -80.857728 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP05

	Absolute % Cover	Dominant Species?	Indicator Status																	
Tree Stratum (Plot size: <u>30'</u>)																				
1. <u>Populus tremuloides (Quaking Aspen)</u>	<u>10</u>	<u>YES</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33.3%</u> (A/B)																
2. _____	-	-	-																	
3. _____	-	-	-																	
4. _____	-	-	-																	
5. _____	-	-	-																	
6. _____	-	-	-																	
7. _____	-	-	-																	
50% = _____ 20% = _____	<u>10</u> = Total Cover																			
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																				
1. <u>Populus tremuloides (Quaking Aspen)</u>	<u>80</u>	<u>YES</u>	<u>FACU</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>35</u></td> <td>x 1 = <u>35</u></td> </tr> <tr> <td>FACW species <u>15</u></td> <td>x 2 = <u>30</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>120</u></td> <td>x 4 = <u>480</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>170</u> (A)</td> <td><u>545</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align:center;">Prevalence Index = B/A = <u>3.21</u></td> </tr> </table> Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	Total % Cover of:	Multiply by:	OBL species <u>35</u>	x 1 = <u>35</u>	FACW species <u>15</u>	x 2 = <u>30</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>120</u>	x 4 = <u>480</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>170</u> (A)	<u>545</u> (B)	Prevalence Index = B/A = <u>3.21</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>35</u>	x 1 = <u>35</u>																			
FACW species <u>15</u>	x 2 = <u>30</u>																			
FAC species <u>0</u>	x 3 = <u>0</u>																			
FACU species <u>120</u>	x 4 = <u>480</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>170</u> (A)	<u>545</u> (B)																			
Prevalence Index = B/A = <u>3.21</u>																				
2. <u>Rosa multiflora (Rambler Rose)</u>	<u>20</u>	<u>NO</u>	<u>FACU</u>																	
3. <u>Cornus amomum (Silky Dogwood)</u>	<u>5</u>	<u>NO</u>	<u>FACW</u>																	
4. _____	-	-	-																	
5. _____	-	-	-																	
6. _____	-	-	-																	
7. _____	-	-	-																	
50% = _____ 20% = _____	<u>105</u> = Total Cover																			
Herb Stratum (Plot size: <u>5'</u>)																				
1. <u>Scirpus cyperinus (Cottongrass Bulrush)</u>	<u>35</u>	<u>YES</u>	<u>OBL</u>	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																
2. <u>Symphotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>10</u>	<u>NO</u>	<u>FACW</u>																	
3. <u>Rosa multiflora (Rambler Rose)</u>	<u>10</u>	<u>NO</u>	<u>FACU</u>																	
4. _____	-	-	-																	
5. _____	-	-	-																	
6. _____	-	-	-																	
7. _____	-	-	-																	
8. _____	-	-	-																	
9. _____	-	-	-																	
10. _____	-	-	-																	
11. _____	-	-	-																	
12. _____	-	-	-																	
50% = _____ 20% = _____	<u>55</u> = Total Cover																			
Woody Vine Stratum (Plot size: <u>15'</u>)																				
1. _____	-	-	-																	
2. _____	-	-	-																	
3. _____	-	-	-																	
4. _____	-	-	-																	
50% = _____ 20% = _____	<u>0</u> = Total Cover																			
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 1 UPL/FACU: 2 Does not pass FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																				

SOIL

Sampling Point: DP05

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 12	10YR 2/1	99	10YR 4/4	1	C	M	SiL	
12 - 18	10YR 3/1	96	10YR 4/4	4	C	M	SiL	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/15/2019
 Applicant/Owner: GM State: OH Sampling Point: DP06
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Sloped Slope (%): 1-3
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.152907 Long: -80.859099 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP06

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30'</u>)																		
1. <u>Quercus palustris (Pin Oak)</u>	<u>45</u>	<u>YES</u>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)														
2. <u>Carpinus caroliniana (American Hornbeam)</u>	<u>25</u>	<u>YES</u>	<u>FAC</u>															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>70</u> = Total Cover																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. <u>Quercus palustris (Pin Oak)</u>	<u>35</u>	<u>YES</u>	<u>FACW</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
2. <u>Frangula alnus (Glossy False Buckthorn)</u>	<u>20</u>	<u>NO</u>	<u>FAC</u>															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>55</u> = Total Cover																	
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Persicaria arifolia (Halberd-Leaf Tearthumb)</u>	<u>45</u>	<u>YES</u>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Phalaris arundinacea (Reed Canary Grass)</u>	<u>35</u>	<u>YES</u>	<u>FACW</u>															
3. <u>Juncus effusus (Lamp Rush)</u>	<u>30</u>	<u>YES</u>	<u>OBL</u>															
4. <u>Scirpus cyperinus (Cottongrass Bulrush)</u>	<u>25</u>	<u>NO</u>	<u>OBL</u>															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
8. _____	-	-	-															
9. _____	-	-	-															
10. _____	-	-	-															
11. _____	-	-	-															
12. _____	-	-	-															
50% = _____ 20% = _____	<u>135</u> = Total Cover																	
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	-	-	-	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
50% = _____ 20% = _____	<u>0</u> = Total Cover																	
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____																		
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 5 UPL/FACU: 0 Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		

SOIL

Sampling Point: DP06

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 18	10YR 4/1	65	10YR 4/6	35	C	M	SiL	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/15/2019
 Applicant/Owner: GM State: OH Sampling Point: DP07
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Sloped Slope (%): 1-3
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.152954 Long: -80.859037 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP07

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30'</u>)																		
1. <u>Quercus alba (Northern White Oak)</u>	<u>25</u>	<u>YES</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>57.1%</u> (A/B)														
2. <u>Quercus palustris (Pin Oak)</u>	<u>15</u>	<u>YES</u>	<u>FACW</u>															
3. <u>Prunus serotina (Black Cherry)</u>	<u>15</u>	<u>YES</u>	<u>FACU</u>															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>55</u> = Total Cover																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. <u>Rosa multiflora (Rambler Rose)</u>	<u>30</u>	<u>YES</u>	<u>FACU</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
2. <u>Frangula alnus (Glossy False Buckthorn)</u>	<u>10</u>	<u>YES</u>	<u>FAC</u>															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>40</u> = Total Cover																	
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Solidago rugosa (Wrinkle-Leaf Goldenrod)</u>	<u>45</u>	<u>YES</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Frangula alnus (Glossy False Buckthorn)</u>	<u>25</u>	<u>YES</u>	<u>FAC</u>															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
8. _____	-	-	-															
9. _____	-	-	-															
10. _____	-	-	-															
11. _____	-	-	-															
12. _____	-	-	-															
50% = _____ 20% = _____	<u>70</u> = Total Cover																	
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	-	-	-	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
50% = _____ 20% = _____	<u>0</u> = Total Cover																	
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 1 UPL/FACU: 3 Does not pass FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		
				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														

SOIL

Sampling Point: DP07

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 18	10YR 4/2	100					SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/15/2019
 Applicant/Owner: GM State: OH Sampling Point: DP08
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): slight depression Local relief (concave, convex, none): concave Slope (%): 0-3
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.153877 Long: -80.859846 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP08

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum (Red Maple)</u>	<u>40</u>	<u>YES</u>	<u>FAC</u>
2. <u>Ulmus americana (American Elm)</u>	<u>30</u>	<u>YES</u>	<u>FACW</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
50% = _____ 20% = _____	<u>70</u> = Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Rosa multiflora (Rambler Rose)</u>	<u>15</u>	<u>YES</u>	<u>FACU</u>
2. <u>Ulmus americana (American Elm)</u>	<u>15</u>	<u>YES</u>	<u>FACW</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
50% = _____ 20% = _____	<u>30</u> = Total Cover		
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Scirpus atrovirens (Dark-Green Bulrush)</u>	<u>60</u>	<u>YES</u>	<u>OBL</u>
2. <u>Solidago rugosa (Wrinkle-Leaf Goldenrod)</u>	<u>25</u>	<u>YES</u>	<u>FAC</u>
3. <u>Juncus effusus (Lamp Rush)</u>	<u>10</u>	<u>NO</u>	<u>OBL</u>
4. <u>Symphotrichum racemosum (Fragile-Stem American Aster)</u>	<u>5</u>	<u>NO</u>	<u>FACW</u>
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
50% = _____ 20% = _____	<u>100</u> = Total Cover		
Woody Vine Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
50% = _____ 20% = _____	<u>0</u> = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = <u>0</u>
FACW species _____	x 2 = <u>0</u>
FAC species _____	x 3 = <u>0</u>
FACU species _____	x 4 = <u>0</u>
UPL species _____	x 5 = <u>0</u>
Column Totals: <u>0</u> (A)	<u>0</u> (B)

Prevalence Index = B/A = _____

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

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No _____

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

OBL/FACW: 3
UPL/FACU: 1

Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).

SOIL

Sampling Point: DP08

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 18	10YR 4/1	96	10YR 4/4	4	C	M	SiL	

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

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

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

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

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/15/2019
 Applicant/Owner: GM State: OH Sampling Point: DP09
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.152431 Long: -80.860676 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbA) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP09

<u>Tree Stratum</u> (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	-	-	
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
5. _____	_____	-	-	
6. _____	_____	-	-	
7. _____	_____	-	-	
50% = _____ 20% = _____	<u>0</u>	= Total Cover		
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15'</u>)				
1. _____	_____	-	-	
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
5. _____	_____	-	-	
6. _____	_____	-	-	
7. _____	_____	-	-	
50% = _____ 20% = _____	<u>0</u>	= Total Cover		
<u>Herb Stratum</u> (Plot size: <u>5'</u>)				
1. <u>Phalaris arundinacea (Reed Canary Grass)</u>	<u>45</u>	<u>YES</u>	<u>FACW</u>	
2. <u>Typha latifolia (Broad-Leaf Cat-Tail)</u>	<u>40</u>	<u>YES</u>	<u>OBL</u>	
3. <u>Solidago rugosa (Wrinkle-Leaf Goldenrod)</u>	<u>30</u>	<u>NO</u>	<u>FAC</u>	
4. <u>Scirpus cyperinus (Cottongrass Bulrush)</u>	<u>30</u>	<u>NO</u>	<u>OBL</u>	
5. <u>Verbena hastata (Simpler's-Joy)</u>	<u>15</u>	<u>NO</u>	<u>FACW</u>	
6. _____	_____	-	-	
7. _____	_____	-	-	
8. _____	_____	-	-	
9. _____	_____	-	-	
10. _____	_____	-	-	
11. _____	_____	-	-	
12. _____	_____	-	-	
50% = _____ 20% = _____	<u>160</u>	= Total Cover		
<u>Woody Vine Stratum</u> (Plot size: <u>15'</u>)				
1. _____	_____	-	-	
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
50% = _____ 20% = _____	<u>0</u>	= Total Cover		
Remarks: (Include photo numbers here or on a separate sheet.)				
OBL/FACW: <u>2</u>				
UPL/FACU: <u>0</u>				
Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).				

Dominance Test worksheet:	
Number of Dominant Species That Are OBL, FACW, or FAC:	<u>2</u> (A)
Total Number of Dominant Species Across All Strata:	<u>2</u> (B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>100.0%</u> (A/B)
Prevalence Index worksheet:	
Total % Cover of:	Multiply by:
OBL species _____	x 1 = <u>0</u>
FACW species _____	x 2 = <u>0</u>
FAC species _____	x 3 = <u>0</u>
FACU species _____	x 4 = <u>0</u>
UPL species _____	x 5 = <u>0</u>
Column Totals: <u>0</u> (A)	<u>0</u> (B)
Prevalence Index = B/A = _____	
Hydrophytic Vegetation Indicators:	
<input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation	
<input type="checkbox"/> 2 - Dominance Test is >50%	
<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹	
<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
Definitions of Vegetation Strata:	
Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.	
Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.	
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.	
Woody vines – All woody vines greater than 3.28 ft in height.	
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	

SOIL

Sampling Point: DP09

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 3/1	99	10YR 4/4	1	C	M	SiL	
2 - 8	10YR 3/1	96	10YR 4/4	4	C	M	SiL	
8 - 14	10YR 4/1	85	10YR 4/6	15	C	M	SiL	
14 - 18	10YR 5/1	80	10YR 4/6	20	C	M	SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/15/2019
 Applicant/Owner: GM State: OH Sampling Point: DP10
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1-3
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.152365 Long: -80.860528 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbA) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP10

<u>Tree Stratum</u> (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Robinia pseudoacacia (Black Locust)</u>	<u>85</u>	<u>YES</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33.3%</u> (A/B)														
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>85</u> = Total Cover			Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>10</u></td> <td>x 2 = <u>20</u></td> </tr> <tr> <td>FAC species <u>42</u></td> <td>x 3 = <u>126</u></td> </tr> <tr> <td>FACU species <u>210</u></td> <td>x 4 = <u>840</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>262</u> (A)</td> <td><u>986</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.76</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>10</u>	x 2 = <u>20</u>	FAC species <u>42</u>	x 3 = <u>126</u>	FACU species <u>210</u>	x 4 = <u>840</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>262</u> (A)	<u>986</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>10</u>	x 2 = <u>20</u>																	
FAC species <u>42</u>	x 3 = <u>126</u>																	
FACU species <u>210</u>	x 4 = <u>840</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>262</u> (A)	<u>986</u> (B)																	
<u>70</u> = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. <u>Robinia pseudoacacia (Black Locust)</u>	<u>70</u>	<u>YES</u>	<u>FACU</u>															
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>70</u> = Total Cover																	
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Alliaria petiolata (Garlic-Mustard)</u>	<u>30</u>	<u>YES</u>	<u>FACU</u>															
2. <u>Persicaria virginiana (Jumpseed)</u>	<u>20</u>	<u>YES</u>	<u>FAC</u>															
3. <u>Rosa multiflora (Rambler Rose)</u>	<u>15</u>	<u>YES</u>	<u>FACU</u>															
4. <u>Geum canadense (White Avens)</u>	<u>15</u>	<u>YES</u>	<u>FAC</u>															
5. <u>Phytolacca americana (American Pokeweed)</u>	<u>10</u>	<u>NO</u>	<u>FACU</u>															
6. <u>Symphotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>10</u>	<u>NO</u>	<u>FACW</u>															
7. <u>Toxicodendron radicans (Eastern Poison Ivy)</u>	<u>5</u>	<u>NO</u>	<u>FAC</u>															
8. _____	-	-	-															
9. _____	-	-	-															
10. _____	-	-	-															
11. _____	-	-	-															
12. _____	-	-	-															
50% = _____ 20% = _____	<u>105</u> = Total Cover																	
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. <u>Toxicodendron radicans (Eastern Poison Ivy)</u>	<u>2</u>	<u>NO</u>	<u>FAC</u>															
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
50% = _____ 20% = _____	<u>2</u> = Total Cover																	
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 0 UPL/FACU: 4 Does not pass FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

SOIL

Sampling Point: DP10

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 12	10YR 3/3	100					SiL	Fill

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

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

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

Restrictive Layer (if observed):	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Type: <u>Stones, concrete</u>	
Depth (inches): <u>12"</u>	

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/15/2019
 Applicant/Owner: GM State: OH Sampling Point: DP11
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.151948 Long: -80.861567 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbA) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP11

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	-	-	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75.0%</u> (A/B)														
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. <u>Populus tremuloides (Quaking Aspen)</u>	<u>5</u>	YES	FACU															
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>5</u>	= Total Cover																
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Juncus effusus (Lamp Rush)</u>	<u>40</u>	YES	OBL															
2. <u>Solidago rugosa (Wrinkle-Leaf Goldenrod)</u>	<u>35</u>	YES	FAC															
3. <u>Symphotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>30</u>	YES	FACW															
4. <u>Carex vulpinoidea (Common Fox Sedge)</u>	<u>15</u>	NO	OBL															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
8. _____	_____	-	-															
9. _____	_____	-	-															
10. _____	_____	-	-															
11. _____	_____	-	-															
12. _____	_____	-	-															
50% = _____ 20% = _____	<u>120</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	_____	-	-															
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 2 UPL/FACU: 1 Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		

SOIL

Sampling Point: DP11

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 3/2	96	10YR 4/4	4	C	M	SiL	
6 - 14	10YR 4/1	95	10YR 4/4	5	C	M	SiL	
14 - 18	10YR 4/1	92	10YR 4/6	8	C	M	SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/15/2019
 Applicant/Owner: GM State: OH Sampling Point: DP12
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): Flat Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.151881 Long: -80.861694 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbA) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Point taken in old road bed.	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP12

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	-	-	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)														
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. _____	_____	-	-															
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Symphotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>35</u>	<u>YES</u>	<u>FACW</u>															
2. <u>Solidago rugosa (Wrinkle-Leaf Goldenrod)</u>	<u>25</u>	<u>YES</u>	<u>FAC</u>															
3. <u>Carex vulpinoidea (Common Fox Sedge)</u>	<u>15</u>	<u>NO</u>	<u>OBL</u>															
4. <u>Juncus effusus (Lamp Rush)</u>	<u>5</u>	<u>NO</u>	<u>OBL</u>															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
8. _____	_____	-	-															
9. _____	_____	-	-															
10. _____	_____	-	-															
11. _____	_____	-	-															
12. _____	_____	-	-															
50% = _____ 20% = _____	<u>80</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	_____	-	-															
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 1 UPL/FACU: 0 Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/15/2019
 Applicant/Owner: GM State: OH Sampling Point: DP13
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): slight depression Local relief (concave, convex, none): concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.153314 Long: -80.861726 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbA) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes _____ No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP13

<u>Tree Stratum</u> (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Acer rubrum (Red Maple)</u>	<u>75</u>	<u>YES</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83.3%</u> (A/B)														
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>75</u> = Total Cover																	
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15'</u>)				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
1. <u>Rosa multiflora (Rambler Rose)</u>	<u>30</u>	<u>YES</u>	<u>FACU</u>															
2. <u>Frangula alnus (Glossy False Buckthorn)</u>	<u>15</u>	<u>YES</u>	<u>FAC</u>															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>45</u> = Total Cover																	
<u>Herb Stratum</u> (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
1. <u>Persicaria sagittata (Arrow-Leaf Tearthumb)</u>	<u>60</u>	<u>YES</u>	<u>OBL</u>															
2. <u>Persicaria arifolia (Halberd-Leaf Tearthumb)</u>	<u>30</u>	<u>YES</u>	<u>OBL</u>															
3. <u>Microstegium vimineum (Japanese Stilt Grass)</u>	<u>30</u>	<u>YES</u>	<u>FAC</u>															
4. <u>Solidago rugosa (Wrinkle-Leaf Goldenrod)</u>	<u>20</u>	<u>NO</u>	<u>FAC</u>															
5. <u>Symphotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>15</u>	<u>NO</u>	<u>FACW</u>															
6. <u>Quercus rubra (Northern Red Oak)</u>	<u>5</u>	<u>NO</u>	<u>FACU</u>															
7. <u>Doellingeria umbellata (Parasol White-Top)</u>	<u>5</u>	<u>NO</u>	<u>FACW</u>															
8. _____	-	-	-															
9. _____	-	-	-															
10. _____	-	-	-															
11. _____	-	-	-															
12. _____	-	-	-															
50% = _____ 20% = _____	<u>165</u> = Total Cover																	
<u>Woody Vine Stratum</u> (Plot size: <u>15'</u>)				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
1. _____	-	-	-															
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
50% = _____ 20% = _____	<u>0</u> = Total Cover																	
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 2 UPL/FACU: 1 Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														

SOIL

Sampling Point: DP13

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 8	10YR 4/2	97	10YR 4/4	3	C	M	SiL	
8 - 18	10YR 5/1	92	10YR 4/4	8	C	M	SiL	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/15/2019
 Applicant/Owner: GM State: OH Sampling Point: DP14
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.156115 Long: -80.861390 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP14

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30'</u>)																		
1. <u>Acer rubrum (Red Maple)</u>	<u>15</u>	<u>YES</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)														
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>15</u> = Total Cover																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. <u>Lindera benzoin (Northern Spicebush)</u>	<u>40</u>	<u>YES</u>	<u>FACW</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
2. <u>Frangula alnus (Glossy False Buckthorn)</u>	<u>35</u>	<u>YES</u>	<u>FAC</u>															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>75</u> = Total Cover																	
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Persicaria sagittata (Arrow-Leaf Tearthumb)</u>	<u>50</u>	<u>YES</u>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Symphotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>45</u>	<u>YES</u>	<u>FACW</u>															
3. <u>Rosa multiflora (Rambler Rose)</u>	<u>20</u>	<u>NO</u>	<u>FACU</u>															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
8. _____	-	-	-															
9. _____	-	-	-															
10. _____	-	-	-															
11. _____	-	-	-															
12. _____	-	-	-															
50% = _____ 20% = _____	<u>115</u> = Total Cover																	
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	-	-	-															
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
50% = _____ 20% = _____	<u>0</u> = Total Cover																	
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																		
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____																		
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 3 UPL/FACU: 0 Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		

SOIL

Sampling Point: DP14

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 3	10YR 3/2	100					SiL	
3 - 16	10YR 4/1	92	10YR 4/4	8	C	M	SiL	
16 - 18	10YR 5/1	90	10YR 4/6	10	C	M	SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/15/2019
 Applicant/Owner: GM State: OH Sampling Point: DP15
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): slight depression Local relief (concave, convex, none): concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.155897 Long: -80.862879 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP15

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	-	-	
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
5. _____	_____	-	-	
6. _____	_____	-	-	
7. _____	_____	-	-	
50% = _____ 20% = _____	<u>0</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Rosa multiflora (Rambler Rose)</u>	<u>15</u>	<u>YES</u>	<u>FACU</u>	
2. <u>Lindera benzoin (Northern Spicebush)</u>	<u>5</u>	<u>YES</u>	<u>FACW</u>	
3. <u>Ulmus americana (American Elm)</u>	<u>5</u>	<u>YES</u>	<u>FACW</u>	
4. _____	_____	-	-	
5. _____	_____	-	-	
6. _____	_____	-	-	
7. _____	_____	-	-	
50% = _____ 20% = _____	<u>25</u>	= Total Cover		
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Persicaria sagittata (Arrow-Leaf Tearthumb)</u>	<u>45</u>	<u>YES</u>	<u>OBL</u>	
2. <u>Juncus effusus (Lamp Rush)</u>	<u>45</u>	<u>YES</u>	<u>OBL</u>	
3. <u>Solidago rugosa (Wrinkle-Leaf Goldenrod)</u>	<u>30</u>	<u>YES</u>	<u>FAC</u>	
4. <u>Symphyotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>30</u>	<u>YES</u>	<u>FACW</u>	
5. <u>Lindera benzoin (Northern Spicebush)</u>	<u>10</u>	<u>NO</u>	<u>FACW</u>	
6. <u>Toxicodendron radicans (Eastern Poison Ivy)</u>	<u>10</u>	<u>NO</u>	<u>FAC</u>	
7. <u>Ludwigia alternifolia (Seedbox)</u>	<u>7</u>	<u>NO</u>	<u>OBL</u>	
8. <u>Eupatorium perfoliatum (Common Boneset)</u>	<u>5</u>	<u>NO</u>	<u>FACW</u>	
9. _____	_____	-	-	
10. _____	_____	-	-	
11. _____	_____	-	-	
12. _____	_____	-	-	
50% = _____ 20% = _____	<u>182</u>	= Total Cover		
Woody Vine Stratum (Plot size: <u>15'</u>)				
1. _____	_____	-	-	
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
50% = _____ 20% = _____	<u>0</u>	= Total Cover		
Remarks: (Include photo numbers here or on a separate sheet.)				
OBL/FACW: 5				
UPL/FACU: 1				
Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).				

Dominance Test worksheet:	
Number of Dominant Species That Are OBL, FACW, or FAC:	<u>6</u> (A)
Total Number of Dominant Species Across All Strata:	<u>7</u> (B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>85.7%</u> (A/B)
Prevalence Index worksheet:	
Total % Cover of:	Multiply by:
OBL species _____	x 1 = <u>0</u>
FACW species _____	x 2 = <u>0</u>
FAC species _____	x 3 = <u>0</u>
FACU species _____	x 4 = <u>0</u>
UPL species _____	x 5 = <u>0</u>
Column Totals: <u>0</u> (A)	<u>0</u> (B)
Prevalence Index = B/A = _____	
Hydrophytic Vegetation Indicators:	
<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation	
<input checked="" type="checkbox"/> 2 - Dominance Test is >50%	
<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹	
<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
Definitions of Vegetation Strata:	
Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.	
Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.	
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.	
Woody vines – All woody vines greater than 3.28 ft in height.	
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

SOIL

Sampling Point: DP15

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 7	10YR 4/2	93	10YR 4/4	7	C	M	SiL	
7 - 17	10YR 4/1	93	10YR 4/4	7	C	M	SiL	
17 - 18	10YR 5/1	91	10YR 4/4	9	C	M	SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/17/2019
 Applicant/Owner: GM State: OH Sampling Point: DP16
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.157214 Long: -80.863341 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Point taken near railroad tracks.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: DP16

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30'</u>)																		
1. <u>Acer rubrum (Red Maple)</u>	<u>55</u>	<u>YES</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80.0%</u> (A/B)														
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>55</u>	= Total Cover																
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. <u>Rosa multiflora (Rambler Rose)</u>	<u>35</u>	<u>YES</u>	<u>FACU</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
2. <u>Frangula alnus (Glossy False Buckthorn)</u>	<u>15</u>	<u>YES</u>	<u>FAC</u>															
3. <u>Ulmus americana (American Elm)</u>	<u>10</u>	<u>NO</u>	<u>FACW</u>															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>60</u>	= Total Cover																
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Scirpus atrovirens (Dark-Green Bulrush)</u>	<u>45</u>	<u>YES</u>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Symphotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>30</u>	<u>YES</u>	<u>FACW</u>															
3. <u>Carex vulpinoidea (Common Fox Sedge)</u>	<u>20</u>	<u>NO</u>	<u>OBL</u>															
4. <u>Ludwigia alternifolia (Seedbox)</u>	<u>5</u>	<u>NO</u>	<u>OBL</u>															
5. <u>Scirpus cyperinus (Cottongrass Bulrush)</u>	<u>5</u>	<u>NO</u>	<u>OBL</u>															
6. <u>Onoclea sensibilis (Sensitive Fern)</u>	<u>5</u>	<u>NO</u>	<u>FACW</u>															
7. _____	-	-	-															
8. _____	-	-	-															
9. _____	-	-	-															
10. _____	-	-	-															
11. _____	-	-	-															
12. _____	-	-	-															
50% = _____ 20% = _____	<u>110</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	-	-	-															
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 2 UPL/FACU: 1 Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		
				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>														

SOIL

Sampling Point: DP16

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 8	10YR 4/2	85	10YR 4/6	15	C	M	SiL	
8 - 18	10YR 6/1	92	10YR 4/6	8	C	M	SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/17/2019
 Applicant/Owner: GM State: OH Sampling Point: DP17
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.156730 Long: -80.866369 Datum: WGS84
 Soil Map Unit Name: Rittman silt loam (RsB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP17

<u>Tree Stratum</u> (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Acer rubrum (Red Maple)</u>	<u>20</u>	<u>YES</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83.3%</u> (A/B)														
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>20</u>	= Total Cover																
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Lindera benzoin (Northern Spicebush)</u>	<u>30</u>	<u>YES</u>	<u>FACW</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u> (A)</td> <td><u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u> (A)	<u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u> (A)	<u>0</u> (B)																	
2. <u>Rosa multiflora (Rambler Rose)</u>	<u>15</u>	<u>YES</u>	<u>FACU</u>															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>45</u>	= Total Cover																
<u>Herb Stratum</u> (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Phalaris arundinacea (Reed Canary Grass)</u>	<u>65</u>	<u>YES</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Doellingeria umbellata (Parasol White-Top)</u>	<u>35</u>	<u>YES</u>	<u>FACW</u>															
3. <u>Mentha arvensis (American Wild Mint)</u>	<u>35</u>	<u>YES</u>	<u>FACW</u>															
4. <u>Symphotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>25</u>	<u>NO</u>	<u>FACW</u>															
5. <u>Solidago altissima (Tall Goldenrod)</u>	<u>25</u>	<u>NO</u>	<u>FACU</u>															
6. <u>Solidago rugosa (Wrinkle-Leaf Goldenrod)</u>	<u>20</u>	<u>NO</u>	<u>FAC</u>															
7. _____	-	-	-															
8. _____	-	-	-															
9. _____	-	-	-															
10. _____	-	-	-															
11. _____	-	-	-															
12. _____	-	-	-															
50% = _____ 20% = _____	<u>205</u>	= Total Cover																
<u>Woody Vine Stratum</u> (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	-	-	-															
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 4 UPL/FACU: 1 Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>														

SOIL

Sampling Point: DP17

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 1	10YR 2/2	100					SiL	
1 - 9	10YR 4/2	95	10YR 4/6	5	C	M	SiL	
9 - 18	10YR 6/1	90	10YR 4/6	10	C	PL	SiL	

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

<p>Hydric Soil Indicators:</p> <p><input type="checkbox"/> Histosol (A1)</p> <p><input type="checkbox"/> Histic Epipedon (A2)</p> <p><input type="checkbox"/> Black Histic (A3)</p> <p><input type="checkbox"/> Hydrogen Sulfide (A4)</p> <p><input type="checkbox"/> Stratified Layers (A5)</p> <p><input type="checkbox"/> Depleted Below Dark Surface (A11)</p> <p><input type="checkbox"/> Thick Dark Surface (A12)</p> <p><input type="checkbox"/> Sandy Mucky Mineral (S1)</p> <p><input type="checkbox"/> Sandy Gleyed Matrix (S4)</p> <p><input type="checkbox"/> Sandy Redox (S5)</p> <p><input type="checkbox"/> Stripped Matrix (S6)</p> <p><input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B)</p>	<p><input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B)</p> <p><input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)</p> <p><input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)</p> <p><input type="checkbox"/> Loamy Gleyed Matrix (F2)</p> <p><input checked="" type="checkbox"/> Depleted Matrix (F3)</p> <p><input type="checkbox"/> Redox Dark Surface (F6)</p> <p><input type="checkbox"/> Depleted Dark Surface (F7)</p> <p><input type="checkbox"/> Redox Depressions (F8)</p>	<p>Indicators for Problematic Hydric Soils³:</p> <p><input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)</p> <p><input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)</p> <p><input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)</p> <p><input type="checkbox"/> Dark Surface (S7) (LRR K, L)</p> <p><input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)</p> <p><input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)</p> <p><input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)</p> <p><input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B)</p> <p><input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)</p> <p><input type="checkbox"/> Red Parent Material (F21)</p> <p><input type="checkbox"/> Very Shallow Dark Surface (TF12)</p> <p><input type="checkbox"/> Other (Explain in Remarks)</p>
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³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

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

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/17/2019
 Applicant/Owner: GM State: OH Sampling Point: DP18
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): Flat Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.156419 Long: -80.867210 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbA) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Point taken near ditch.	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP18

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Acer rubrum (Red Maple)</u>	<u>25</u>	<u>YES</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>8</u> (A) Total Number of Dominant Species Across All Strata: <u>9</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>88.9%</u> (A/B)														
2. <u>Quercus palustris (Pin Oak)</u>	<u>15</u>	<u>YES</u>	<u>FACW</u>															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>40</u> = Total Cover																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. <u>Acer rubrum (Red Maple)</u>	<u>20</u>	<u>YES</u>	<u>FAC</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
2. <u>Cornus amomum (Silky Dogwood)</u>	<u>10</u>	<u>YES</u>	<u>FACW</u>															
3. <u>Frangula alnus (Glossy False Buckthorn)</u>	<u>8</u>	<u>YES</u>	<u>FAC</u>															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>38</u> = Total Cover																	
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Doellingeria umbellata (Parasol White-Top)</u>	<u>45</u>	<u>YES</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Carex vulpinoidea (Common Fox Sedge)</u>	<u>35</u>	<u>YES</u>	<u>OBL</u>															
3. <u>Symphotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>30</u>	<u>YES</u>	<u>FACW</u>															
4. <u>Rosa multiflora (Rambler Rose)</u>	<u>30</u>	<u>YES</u>	<u>FACU</u>															
5. <u>Frangula alnus (Glossy False Buckthorn)</u>	<u>25</u>	<u>NO</u>	<u>FAC</u>															
6. <u>Quercus rubra (Northern Red Oak)</u>	<u>10</u>	<u>NO</u>	<u>FACU</u>															
7. _____	-	-	-															
8. _____	-	-	-															
9. _____	-	-	-															
10. _____	-	-	-															
11. _____	-	-	-															
12. _____	-	-	-															
50% = _____ 20% = _____	<u>175</u> = Total Cover																	
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	-	-	-	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
50% = _____ 20% = _____	<u>0</u> = Total Cover																	
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____																		
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 5 UPL/FACU: 1 Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		

SOIL

Sampling Point: DP18

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 4/4	100					SiL	
2 - 10	10YR 5/1	92	10YR 4/6	8	C	M	SiL	
10 - 12	GLE Y 1 4/10Y	97	10YR 4/6	3	C	M	SiL	
12 - 18	10YR 5/1	92	10YR 4/6	8	C	M	SiL	

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

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

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

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

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/17/2019
 Applicant/Owner: GM State: OH Sampling Point: DP19
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): Flat Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.155817 Long: -80.867180 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbA) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Point taken near ditch.	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP19

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum (Red Maple)</u>	<u>25</u>	<u>YES</u>	<u>FAC</u>
2. <u>Quercus palustris (Pin Oak)</u>	<u>15</u>	<u>YES</u>	<u>FACW</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
50% = _____ 20% = _____	<u>40</u> = Total Cover		

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Frangula alnus (Glossy False Buckthorn)</u>	<u>25</u>	<u>YES</u>	<u>FAC</u>
2. <u>Quercus palustris (Pin Oak)</u>	<u>15</u>	<u>YES</u>	<u>FACW</u>
3. <u>Lindera benzoin (Northern Spicebush)</u>	<u>15</u>	<u>YES</u>	<u>FACW</u>
4. <u>Rosa multiflora (Rambler Rose)</u>	<u>5</u>	<u>NO</u>	<u>FACU</u>
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
50% = _____ 20% = _____	<u>60</u> = Total Cover		

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Symphotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>35</u>	<u>YES</u>	<u>FACW</u>
2. <u>Solidago rugosa (Wrinkle-Leaf Goldenrod)</u>	<u>30</u>	<u>YES</u>	<u>FAC</u>
3. <u>Rosa multiflora (Rambler Rose)</u>	<u>25</u>	<u>YES</u>	<u>FACU</u>
4. <u>Carex vulpinoidea (Common Fox Sedge)</u>	<u>20</u>	<u>NO</u>	<u>OBL</u>
5. <u>Doellingeria umbellata (Parasol White-Top)</u>	<u>15</u>	<u>NO</u>	<u>FACW</u>
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
50% = _____ 20% = _____	<u>125</u> = Total Cover		

Woody Vine Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
50% = _____ 20% = _____	<u>0</u> = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 87.5% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = <u>0</u>
FACW species _____	x 2 = <u>0</u>
FAC species _____	x 3 = <u>0</u>
FACU species _____	x 4 = <u>0</u>
UPL species _____	x 5 = <u>0</u>
Column Totals: <u>0</u> (A)	<u>0</u> (B)

Prevalence Index = B/A = _____

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

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

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

OBL/FACW: 4
UPL/FACU: 1

Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).

SOIL

Sampling Point: DP19

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 2/1	98	10YR 4/6	2	C	M	SiL	Organic
2 - 4	10YR 4/1	96	10YR 4/6	4	C	M	SiL	
4 - 16	10YR 5/2	99	10YR 5/6	1	C	M	SiL	
16 - 18	10YR 5/1	60	10YR 6/6	40	C	M	SiL	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/17/2019
 Applicant/Owner: GM State: OH Sampling Point: DP20
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.151985 Long: -80.864660 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) _____ Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) _____ Shallow Aquitard (D3) <input checked="" type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>1</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: Rained last night.	

VEGETATION – Use scientific names of plants.

Sampling Point: DP20

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	-	-	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)														
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. <u>Frangula alnus (Glossy False Buckthorn)</u>	<u>15</u>	<u>YES</u>	<u>FAC</u>															
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>15</u>	= Total Cover																
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Scirpus cyperinus (Cottongrass Bulrush)</u>	<u>60</u>	<u>YES</u>	<u>OBL</u>															
2. <u>Juncus effusus (Lamp Rush)</u>	<u>45</u>	<u>YES</u>	<u>OBL</u>															
3. <u>Symphotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>35</u>	<u>NO</u>	<u>FACW</u>															
4. <u>Solidago rugosa (Wrinkle-Leaf Goldenrod)</u>	<u>30</u>	<u>NO</u>	<u>FAC</u>															
5. <u>Rosa multiflora (Rambler Rose)</u>	<u>15</u>	<u>NO</u>	<u>FACU</u>															
6. <u>Ludwigia alternifolia (Seedbox)</u>	<u>8</u>	<u>NO</u>	<u>OBL</u>															
7. _____	_____	-	-															
8. _____	_____	-	-															
9. _____	_____	-	-															
10. _____	_____	-	-															
11. _____	_____	-	-															
12. _____	_____	-	-															
50% = _____ 20% = _____	<u>193</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	_____	-	-															
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: <u>2</u> UPL/FACU: <u>0</u> Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		

SOIL

Sampling Point: DP20

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 1	10YR 2/2	100					SiL	
1 - 10	10YR 4/1	93	10YR 4/6	7	C	PL	SiL	
10 - 18	10YR 4/1	80	10YR 4/4	20	C	PL	SiL	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/17/2019
 Applicant/Owner: GM State: OH Sampling Point: DP21
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Mound Local relief (concave, convex, none): Convex Slope (%): 1-3
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.151823 Long: -80.866701 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP21

<u>Tree Stratum</u> (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Carya ovata (Shag-Bark Hickory)</u>	<u>45</u>	<u>YES</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>40.0%</u> (A/B)																
2. _____	-	-	-																	
3. _____	-	-	-																	
4. _____	-	-	-																	
5. _____	-	-	-																	
6. _____	-	-	-																	
7. _____	-	-	-																	
50% = _____ 20% = _____	<u>45</u> = Total Cover																			
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15'</u>)				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>40</u></td> <td>x 2 = <u>80</u></td> </tr> <tr> <td>FAC species <u>30</u></td> <td>x 3 = <u>90</u></td> </tr> <tr> <td>FACU species <u>155</u></td> <td>x 4 = <u>620</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>225</u> (A)</td> <td><u>790</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align:center;">Prevalence Index = B/A = <u>3.51</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>40</u>	x 2 = <u>80</u>	FAC species <u>30</u>	x 3 = <u>90</u>	FACU species <u>155</u>	x 4 = <u>620</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>225</u> (A)	<u>790</u> (B)	Prevalence Index = B/A = <u>3.51</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>40</u>	x 2 = <u>80</u>																			
FAC species <u>30</u>	x 3 = <u>90</u>																			
FACU species <u>155</u>	x 4 = <u>620</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>225</u> (A)	<u>790</u> (B)																			
Prevalence Index = B/A = <u>3.51</u>																				
1. <u>Frangula alnus (Glossy False Buckthorn)</u>	<u>30</u>	<u>YES</u>	<u>FAC</u>																	
2. <u>Quercus alba (Northern White Oak)</u>	<u>10</u>	<u>YES</u>	<u>FACU</u>																	
3. <u>Fraxinus pennsylvanica (Green Ash)</u>	<u>5</u>	<u>NO</u>	<u>FACW</u>																	
4. _____	-	-	-																	
5. _____	-	-	-																	
6. _____	-	-	-																	
7. _____	-	-	-																	
50% = _____ 20% = _____	<u>45</u> = Total Cover																			
<u>Herb Stratum</u> (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)																
1. <u>Rosa multiflora (Rambler Rose)</u>	<u>65</u>	<u>YES</u>	<u>FACU</u>																	
2. <u>Symphotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>35</u>	<u>YES</u>	<u>FACW</u>																	
3. <u>Quercus alba (Northern White Oak)</u>	<u>25</u>	<u>NO</u>	<u>FACU</u>																	
4. <u>Sassafras albidum (Sassafras)</u>	<u>10</u>	<u>NO</u>	<u>FACU</u>																	
5. _____	-	-	-																	
6. _____	-	-	-																	
7. _____	-	-	-																	
8. _____	-	-	-																	
9. _____	-	-	-																	
10. _____	-	-	-																	
11. _____	-	-	-																	
12. _____	-	-	-																	
50% = _____ 20% = _____	<u>135</u> = Total Cover																			
<u>Woody Vine Stratum</u> (Plot size: <u>15'</u>)				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																
1. _____	-	-	-																	
2. _____	-	-	-																	
3. _____	-	-	-																	
4. _____	-	-	-																	
50% = _____ 20% = _____	<u>0</u> = Total Cover																			
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 1 UPL/FACU: 3 Does not pass FAC-Neutral Test (Secondary Hydrology Indicator [D5]).				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>																

SOIL

Sampling Point: DP21

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 2/2	100					SiL	
2 - 5	10YR 4/3	100					SiL	
5 - 18	10YR 5/3	100					SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/17/2019
 Applicant/Owner: GM State: OH Sampling Point: DP22
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): Flat Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.153540 Long: -80.866977 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbA) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP22

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	-	-	
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
5. _____	_____	-	-	
6. _____	_____	-	-	
7. _____	_____	-	-	
50% = _____ 20% = _____	<u>0</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Lindera benzoin (Northern Spicebush)</u>	<u>15</u>	<u>YES</u>	<u>FACW</u>	
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
5. _____	_____	-	-	
6. _____	_____	-	-	
7. _____	_____	-	-	
50% = _____ 20% = _____	<u>15</u>	= Total Cover		
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Rubus hispidus (Bristly Dewberry)</u>	<u>45</u>	<u>YES</u>	<u>FACW</u>	
2. <u>Symphotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>40</u>	<u>YES</u>	<u>FACW</u>	
3. <u>Doellingeria umbellata (Parasol White-Top)</u>	<u>15</u>	<u>NO</u>	<u>FACW</u>	
4. <u>Acer rubrum (Red Maple)</u>	<u>15</u>	<u>NO</u>	<u>FAC</u>	
5. <u>Juncus effusus (Lamp Rush)</u>	<u>10</u>	<u>NO</u>	<u>OBL</u>	
6. _____	_____	-	-	
7. _____	_____	-	-	
8. _____	_____	-	-	
9. _____	_____	-	-	
10. _____	_____	-	-	
11. _____	_____	-	-	
12. _____	_____	-	-	
50% = _____ 20% = _____	<u>125</u>	= Total Cover		
Woody Vine Stratum (Plot size: <u>15'</u>)				
1. _____	_____	-	-	
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
50% = _____ 20% = _____	<u>0</u>	= Total Cover		
Remarks: (Include photo numbers here or on a separate sheet.)				
OBL/FACW: 3				
UPL/FACU: 0				
Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).				

Dominance Test worksheet:	
Number of Dominant Species That Are OBL, FACW, or FAC: _____	(A)
Total Number of Dominant Species Across All Strata: _____	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u>	(A/B)
Prevalence Index worksheet:	
Total % Cover of:	Multiply by:
OBL species _____	x 1 = <u>0</u>
FACW species _____	x 2 = <u>0</u>
FAC species _____	x 3 = <u>0</u>
FACU species _____	x 4 = <u>0</u>
UPL species _____	x 5 = <u>0</u>
Column Totals: <u>0</u>	(A) <u>0</u> (B)
Prevalence Index = B/A = _____	
Hydrophytic Vegetation Indicators:	
<input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation	
<input type="checkbox"/> 2 - Dominance Test is >50%	
<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹	
<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
Definitions of Vegetation Strata:	
Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.	
Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.	
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.	
Woody vines – All woody vines greater than 3.28 ft in height.	
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	

SOIL

Sampling Point: DP22

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 1	10YR 2/2	100					SiL	
1 - 2	10YR 3/2	100					SiL	
2 - 14	10YR 5/3	100					SiL	
14 - 18	10YR 5/6	100					SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/17/2019
 Applicant/Owner: GM State: OH Sampling Point: DP23
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.153902 Long: -80.866727 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbA) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Taken in and near ruts.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) _____ Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) _____ Shallow Aquitard (D3) <input checked="" type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>1</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: Rained last night.	

VEGETATION – Use scientific names of plants.

Sampling Point: DP23

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	-	-	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66.7%</u> (A/B)
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
5. _____	_____	-	-	
6. _____	_____	-	-	
7. _____	_____	-	-	
50% = _____ 20% = _____	<u>0</u>	= Total Cover		Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = <u>0</u> FACW species _____ x 2 = <u>0</u> FAC species _____ x 3 = <u>0</u> FACU species _____ x 4 = <u>0</u> UPL species _____ x 5 = <u>0</u> Column Totals: <u>0</u> (A) <u>0</u> (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Rosa multiflora (Rambler Rose)</u>	<u>10</u>	YES	FACU	
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
5. _____	_____	-	-	
50% = _____ 20% = _____	<u>10</u>	= Total Cover		
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Juncus effusus (Lamp Rush)</u>	<u>45</u>	YES	OBL	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Leersia oryzoides (Rice Cut Grass)</u>	<u>35</u>	YES	OBL	
3. <u>Ludwigia alternifolia (Seedbox)</u>	<u>25</u>	NO	OBL	
4. <u>Scirpus atrovirens (Dark-Green Bulrush)</u>	<u>20</u>	NO	OBL	
5. <u>Scirpus cyperinus (Cottongrass Bulrush)</u>	<u>20</u>	NO	OBL	
6. <u>Eupatorium perfoliatum (Common Boneset)</u>	<u>5</u>	NO	FACW	
7. _____	_____	-	-	
8. _____	_____	-	-	
9. _____	_____	-	-	
10. _____	_____	-	-	
11. _____	_____	-	-	
12. _____	_____	-	-	
50% = _____ 20% = _____	<u>150</u>	= Total Cover		
Woody Vine Stratum (Plot size: <u>15'</u>)				
1. _____	_____	-	-	
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
50% = _____ 20% = _____	<u>0</u>	= Total Cover		
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 2 UPL/FACU: 1 Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).				

SOIL

Sampling Point: DP23

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 2/1	100					SiL	
2 - 6	10YR 4/2	93	10YR 4/6	7	C	PL	SiL	
6 - 14	10YR 4/1	88	10YR 4/6	12	C	PL	SiL	
14 - 18	10YR 5/1	80	10YR 5/4	20	C	PL	SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/17/2019
 Applicant/Owner: GM State: OH Sampling Point: DP24
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.154627 Long: -80.863474 Datum: WGS84
 Soil Map Unit Name: Rittman silt loam (RsB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Taken in and near ruts.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ _____ High Water Table (A2) _____ _____ Saturation (A3) _____ _____ Water Marks (B1) _____ _____ Sediment Deposits (B2) _____ _____ Drift Deposits (B3) _____ _____ Algal Mat or Crust (B4) _____ _____ Iron Deposits (B5) _____ _____ Inundation Visible on Aerial Imagery (B7) _____ _____ Sparsely Vegetated Concave Surface (B8) _____ _____ Water-Stained Leaves (B9) _____ _____ Aquatic Fauna (B13) _____ _____ Marl Deposits (B15) _____ _____ Hydrogen Sulfide Odor (C1) _____ _____ Oxidized Rhizospheres on Living Roots (C3) _____ _____ Presence of Reduced Iron (C4) _____ _____ Recent Iron Reduction in Tilled Soils (C6) _____ _____ Thin Muck Surface (C7) _____ _____ Other (Explain in Remarks) _____	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) _____ Shallow Aquitard (D3) <input checked="" type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>1</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: Rained last night.	

VEGETATION – Use scientific names of plants.

Sampling Point: DP24

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	-	-	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u> (A/B)														
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. _____	_____	-	-															
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Phragmites australis (Common Reed)</u>	<u>85</u>	<u>YES</u>	<u>FACW</u>															
2. <u>Phalaris arundinacea (Reed Canary Grass)</u>	<u>45</u>	<u>YES</u>	<u>FACW</u>															
3. <u>Scirpus atrovirens (Dark-Green Bulrush)</u>	<u>20</u>	<u>NO</u>	<u>OBL</u>															
4. <u>Ludwigia alternifolia (Seedbox)</u>	<u>5</u>	<u>NO</u>	<u>OBL</u>															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
8. _____	_____	-	-															
9. _____	_____	-	-															
10. _____	_____	-	-															
11. _____	_____	-	-															
12. _____	_____	-	-															
50% = _____ 20% = _____	<u>155</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	_____	-	-															
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: <u>2</u> UPL/FACU: <u>0</u> Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is >50%
 3 - Prevalence Index is ≤3.0¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

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

Hydrophytic Vegetation Present? Yes No

SOIL

Sampling Point: DP24

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 2/2	100					SiL	
2 - 6	10YR 4/1	92	10YR 4/4	8	C	M	SiL	
6 - 16	10YR 5/1	92	10YR 4/6	8	C	M	SiL	
16 - 18	10YR 5/1	80	10YR 4/6	20	C	M	SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/17/2019
 Applicant/Owner: GM State: OH Sampling Point: DP25
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.153607 Long: -80.864149 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Taken in and near ruts.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ <input type="checkbox"/> High Water Table (A2) _____ <input checked="" type="checkbox"/> Saturation (A3) _____ <input type="checkbox"/> Water Marks (B1) _____ <input type="checkbox"/> Sediment Deposits (B2) _____ <input type="checkbox"/> Drift Deposits (B3) _____ <input type="checkbox"/> Algal Mat or Crust (B4) _____ <input type="checkbox"/> Iron Deposits (B5) _____ <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) _____ <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) _____ <input type="checkbox"/> Water-Stained Leaves (B9) _____ <input type="checkbox"/> Aquatic Fauna (B13) _____ <input type="checkbox"/> Marl Deposits (B15) _____ <input type="checkbox"/> Hydrogen Sulfide Odor (C1) _____ <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) _____ <input type="checkbox"/> Presence of Reduced Iron (C4) _____ <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) _____ <input type="checkbox"/> Thin Muck Surface (C7) _____ <input type="checkbox"/> Other (Explain in Remarks) _____	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) _____ <input type="checkbox"/> Drainage Patterns (B10) _____ <input type="checkbox"/> Moss Trim Lines (B16) _____ <input type="checkbox"/> Dry-Season Water Table (C2) _____ <input type="checkbox"/> Crayfish Burrows (C8) _____ <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) _____ <input type="checkbox"/> Stunted or Stressed Plants (D1) _____ <input checked="" type="checkbox"/> Geomorphic Position (D2) _____ <input type="checkbox"/> Shallow Aquitard (D3) _____ <input checked="" type="checkbox"/> Microtopographic Relief (D4) _____ <input checked="" type="checkbox"/> FAC-Neutral Test (D5) _____
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>1</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>13</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>Surface</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: Rained last night.	

VEGETATION – Use scientific names of plants.

Sampling Point: DP25

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	-	-	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u> (A/B)														
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. _____	_____	-	-															
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Scirpus cyperinus (Cottongrass Bulrush)</u>	<u>70</u>	<u>YES</u>	<u>OBL</u>															
2. <u>Juncus effusus (Lamp Rush)</u>	<u>40</u>	<u>YES</u>	<u>OBL</u>															
3. <u>Carex vulpinoidea (Common Fox Sedge)</u>	<u>20</u>	<u>NO</u>	<u>OBL</u>															
4. <u>Symphotrichum racemosum (Fragile-Stem American Aster)</u>	<u>15</u>	<u>NO</u>	<u>FACW</u>															
5. <u>Ludwigia alternifolia (Seedbox)</u>	<u>15</u>	<u>NO</u>	<u>OBL</u>															
6. _____	_____	-	-															
7. _____	_____	-	-															
8. _____	_____	-	-															
9. _____	_____	-	-															
10. _____	_____	-	-															
11. _____	_____	-	-															
12. _____	_____	-	-															
50% = _____ 20% = _____	<u>160</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	_____	-	-															
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: <u>2</u> UPL/FACU: <u>0</u> Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		

Hydrophytic Vegetation Present? Yes No _____

SOIL

Sampling Point: DP25

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 18	10YR 4/1	80	10YR 4/6	20	C	M	SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/17/2019
 Applicant/Owner: GM State: OH Sampling Point: DP26
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): flat Slope (%): 0-1
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.153247 Long: -80.864151 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP26

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	-	-	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u> (A/B)														
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. _____	_____	-	-															
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Phalaris arundinacea (Reed Canary Grass)</u>	<u>35</u>	<u>YES</u>	<u>FACW</u>															
2. <u>Juncus effusus (Lamp Rush)</u>	<u>30</u>	<u>YES</u>	<u>OBL</u>															
3. <u>Rosa multiflora (Ramber Rose)</u>	<u>20</u>	<u>NO</u>	<u>FACU</u>															
4. <u>Symphotrichum racemosum (Fragile-Stem American Aster)</u>	<u>15</u>	<u>NO</u>	<u>FACW</u>															
5. <u>Doellingeria umbellata (Parasol White-Top)</u>	<u>5</u>	<u>NO</u>	<u>FACW</u>															
6. <u>Scirpus cyperinus (Cottongrass Bulrush)</u>	<u>3</u>	<u>NO</u>	<u>OBL</u>															
7. _____	_____	-	-															
8. _____	_____	-	-															
9. _____	_____	-	-															
10. _____	_____	-	-															
11. _____	_____	-	-															
12. _____	_____	-	-															
50% = _____ 20% = _____	<u>108</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	_____	-	-															
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: <u>2</u> UPL/FACU: <u>0</u> Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/17/2019
 Applicant/Owner: GM State: OH Sampling Point: DP27
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 2-3
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.151982 Long: -80.863514 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Point taken near old road bed.	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP27

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	-	-	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u> (A/B)														
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. _____	_____	-	-															
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Typha angustifolia (Narrowleaf Cattail)</u>	<u>25</u>	<u>YES</u>	<u>FACW</u>															
2. <u>Phalaris arundinacea (Reed Canary Grass)</u>	<u>25</u>	<u>YES</u>	<u>FACW</u>															
3. <u>Phragmites australis (Common Reed)</u>	<u>15</u>	<u>NO</u>	<u>FACW</u>															
4. <u>Symphyotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>10</u>	<u>NO</u>	<u>FAC</u>															
5. <u>Solidago rugosa (Wrinkle-Leaf Goldenrod)</u>	<u>10</u>	<u>NO</u>	<u>FAC</u>															
6. <u>Juncus effusus (Lamp Rush)</u>	<u>10</u>	<u>NO</u>	<u>OBL</u>															
7. _____	_____	-	-															
8. _____	_____	-	-															
9. _____	_____	-	-															
10. _____	_____	-	-															
11. _____	_____	-	-															
12. _____	_____	-	-															
50% = _____ 20% = _____	<u>95</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	_____	-	-															
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 2 UPL/FACU: 0 Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		

SOIL

Sampling Point: DP27

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 5	10YR 4/2	97	10YR 4/4	3	C	M	SiL	
5 - 18	10YR 5/2	90	10YR 5/6	10	C	M	SiL	

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

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

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

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

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/15/2019
 Applicant/Owner: GM State: OH Sampling Point: DP28
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.151065 Long: -80.861345 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbA) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: Recharge observed from the surface -- raining.	

VEGETATION – Use scientific names of plants.

Sampling Point: DP28

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	-	-	
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
5. _____	_____	-	-	
6. _____	_____	-	-	
7. _____	_____	-	-	
50% = _____ 20% = _____	<u>0</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Rosa multiflora (Rambler Rose)</u>	<u>15</u>	<u>YES</u>	<u>FACU</u>	
2. <u>Populus tremuloides (Quaking Aspen)</u>	<u>8</u>	<u>YES</u>	<u>FACU</u>	
3. <u>Acer rubrum (Red Maple)</u>	<u>5</u>	<u>NO</u>	<u>FAC</u>	
4. _____	_____	-	-	
5. _____	_____	-	-	
6. _____	_____	-	-	
7. _____	_____	-	-	
50% = _____ 20% = _____	<u>28</u>	= Total Cover		
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Juncus effusus (Lamp Rush)</u>	<u>45</u>	<u>YES</u>	<u>OBL</u>	
2. <u>Solidago rugosa (Wrinkle-Leaf Goldenrod)</u>	<u>25</u>	<u>YES</u>	<u>FAC</u>	
3. <u>Symphotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>25</u>	<u>YES</u>	<u>FACW</u>	
4. <u>Carex vulpinoidea (Common Fox Sedge)</u>	<u>15</u>	<u>NO</u>	<u>OBL</u>	
5. <u>Toxicodendron radicans (Eastern Poison-Ivy)</u>	<u>15</u>	<u>NO</u>	<u>FAC</u>	
6. <u>Phalaris arundinacea (Reed Canary Grass)</u>	<u>5</u>	<u>NO</u>	<u>FACW</u>	
7. _____	_____	-	-	
8. _____	_____	-	-	
9. _____	_____	-	-	
10. _____	_____	-	-	
11. _____	_____	-	-	
12. _____	_____	-	-	
50% = _____ 20% = _____	<u>130</u>	= Total Cover		
Woody Vine Stratum (Plot size: <u>15'</u>)				
1. _____	_____	-	-	
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
50% = _____ 20% = _____	<u>0</u>	= Total Cover		
Remarks: (Include photo numbers here or on a separate sheet.)				
OBL/FACW: 2				
UPL/FACU: 2				
Does not pass FAC-Neutral Test (Secondary Hydrology Indicator [D5]).				

Dominance Test worksheet:	
Number of Dominant Species That Are OBL, FACW, or FAC:	<u>3</u> (A)
Total Number of Dominant Species Across All Strata:	<u>5</u> (B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>60.0%</u> (A/B)
Prevalence Index worksheet:	
Total % Cover of:	Multiply by:
OBL species _____	x 1 = <u>0</u>
FACW species _____	x 2 = <u>0</u>
FAC species _____	x 3 = <u>0</u>
FACU species _____	x 4 = <u>0</u>
UPL species _____	x 5 = <u>0</u>
Column Totals: <u>0</u> (A)	<u>0</u> (B)
Prevalence Index = B/A = _____	
Hydrophytic Vegetation Indicators:	
<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation	
<input checked="" type="checkbox"/> 2 - Dominance Test is >50%	
<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹	
<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
Definitions of Vegetation Strata:	
Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.	
Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.	
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.	
Woody vines – All woody vines greater than 3.28 ft in height.	
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

SOIL

Sampling Point: DP28

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 5	10YR 3/2	96	10YR 4/4	4	C	M	SiL	
5- 15	10YR 4/1	95	10YR 4/4	5	C	M	SiL	
15- 18	10YR 4/1	92	10YR 4/6	8	C	M	SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/21/2019
 Applicant/Owner: GM State: OH Sampling Point: DP29
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0-3
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.151910 Long: -80.858015 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP29

<u>Tree Stratum</u> (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	-	-	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75.0%</u> (A/B)														
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;"><u> </u> Total % Cover of:</td> <td style="width:50%;"><u> </u> Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	<u> </u> Total % Cover of:	<u> </u> Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
<u> </u> Total % Cover of:	<u> </u> Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15'</u>)																		
1. <u>Cornus amomum (Silky Dogwood)</u>	<u>15</u>	<u>YES</u>	<u>FACW</u>															
2. <u>Rosa multiflora (Rambler Rose)</u>	<u>15</u>	<u>YES</u>	<u>FACU</u>															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>30</u>	= Total Cover																
<u>Herb Stratum</u> (Plot size: <u>5'</u>)																		
1. <u>Phalaris arundinacea (Reed Canary Grass)</u>	<u>90</u>	<u>YES</u>	<u>FACW</u>															
2. <u>Solidago rugosa (Wrinkle-Leaf Goldenrod)</u>	<u>10</u>	<u>YES</u>	<u>FAC</u>															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
8. _____	_____	-	-															
9. _____	_____	-	-															
10. _____	_____	-	-															
11. _____	_____	-	-															
12. _____	_____	-	-															
50% = _____ 20% = _____	<u>100</u>	= Total Cover																
<u>Woody Vine Stratum</u> (Plot size: <u>15'</u>)																		
1. _____	_____	-	-															
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 2 UPL/FACU: 1 Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		

SOIL

Sampling Point: DP29

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	10YR 3/2	100					SiL	
4 - 18	10YR 3/2	99	10YR 3/3	1	C	M	SiL	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/21/2019
 Applicant/Owner: GM State: OH Sampling Point: DP30
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.151735 Long: -80.858785 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p><u>Primary Indicators (minimum of one is required; check all that apply)</u></p> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<p><u>Secondary Indicators (minimum of two required)</u></p> ___ Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<p>Field Observations:</p> Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	<p>Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____</p>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: DP30

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	-	-	
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
5. _____	_____	-	-	
6. _____	_____	-	-	
7. _____	_____	-	-	
50% = _____ 20% = _____	<u>0</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Cornus amomum (Silky Dogwood)</u>	<u>35</u>	<u>YES</u>	<u>FACW</u>	
2. <u>Quercus palustris (Pin Oak)</u>	<u>5</u>	<u>NO</u>	<u>FACW</u>	
3. _____	_____	-	-	
4. _____	_____	-	-	
5. _____	_____	-	-	
6. _____	_____	-	-	
7. _____	_____	-	-	
50% = _____ 20% = _____	<u>40</u>	= Total Cover		
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Juncus effusus (Lamp Rush)</u>	<u>55</u>	<u>YES</u>	<u>OBL</u>	
2. <u>Solidago rugosa (Wrinkle-Leaf Goldenrod)</u>	<u>25</u>	<u>YES</u>	<u>FAC</u>	
3. <u>Scirpus cyperinus (Cottongrass Bulrush)</u>	<u>15</u>	<u>NO</u>	<u>OBL</u>	
4. <u>Typha latifolia (Broad-Leaf Cat-Tail)</u>	<u>10</u>	<u>NO</u>	<u>OBL</u>	
5. <u>Agrimonia parviflora (Harvestlice)</u>	<u>10</u>	<u>NO</u>	<u>FAC</u>	
6. <u>Eupatorium perfoliatum (Common Boneset)</u>	<u>10</u>	<u>NO</u>	<u>FACW</u>	
7. <u>Geum canadense (White Avens)</u>	<u>10</u>	<u>NO</u>	<u>FAC</u>	
8. <u>Symphotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>5</u>	<u>NO</u>	<u>FACW</u>	
9. <u>Dipsacus fullonum (Fuller's Teasel)</u>	<u>5</u>	<u>NO</u>	<u>FACU</u>	
10. _____	_____	-	-	
11. _____	_____	-	-	
12. _____	_____	-	-	
50% = _____ 20% = _____	<u>145</u>	= Total Cover		
Woody Vine Stratum (Plot size: <u>15'</u>)				
1. _____	_____	-	-	
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
50% = _____ 20% = _____	<u>0</u>	= Total Cover		
Remarks: (Include photo numbers here or on a separate sheet.)				
OBL/FACW: 2				
UPL/FACU: 0				
Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).				

Dominance Test worksheet:	
Number of Dominant Species That Are OBL, FACW, or FAC:	<u>3</u> (A)
Total Number of Dominant Species Across All Strata:	<u>3</u> (B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>100.0%</u> (A/B)
Prevalence Index worksheet:	
Total % Cover of:	Multiply by:
OBL species _____	x 1 = <u>0</u>
FACW species _____	x 2 = <u>0</u>
FAC species _____	x 3 = <u>0</u>
FACU species _____	x 4 = <u>0</u>
UPL species _____	x 5 = <u>0</u>
Column Totals: <u>0</u> (A)	<u>0</u> (B)
Prevalence Index = B/A = _____	
Hydrophytic Vegetation Indicators:	
<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation	
<input checked="" type="checkbox"/> 2 - Dominance Test is >50%	
<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹	
<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
Definitions of Vegetation Strata:	
Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.	
Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.	
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.	
Woody vines – All woody vines greater than 3.28 ft in height.	
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

SOIL

Sampling Point: DP30

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 3	10YR 3/2	100					SiL	
3 - 11	10YR 4/2	96	10YR 4/6	4	C	PL	SiL	
11 - 18	10YR 4/2	60	10YR 5/2	29	D	M	SiL	
			10YR 4/6	11	C	M		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/21/2019
 Applicant/Owner: GM State: OH Sampling Point: DP31
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.151899 Long: -80.863805 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Point taken near old road bed.	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP31

	Absolute % Cover	Dominant Species?	Indicator Status																																	
Tree Stratum (Plot size: <u>30'</u>)																																				
1. <u>Acer rubrum (Red Maple)</u>	<u>45</u>	<u>YES</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50.0%</u> (A/B)																																
2. _____	-	-	-																																	
3. _____	-	-	-																																	
4. _____	-	-	-																																	
5. _____	-	-	-																																	
6. _____	-	-	-																																	
7. _____	-	-	-																																	
50% = _____ 20% = _____	<u>45</u> = Total Cover																																			
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																																				
1. <u>Rosa multiflora (Rambler Rose)</u>	<u>40</u>	<u>YES</u>	<u>FACU</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;"></td> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%;"></td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td style="text-align:center;"><u>10</u></td> <td>x 1 =</td> <td style="text-align:center;"><u>10</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align:center;"><u>35</u></td> <td>x 2 =</td> <td style="text-align:center;"><u>70</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align:center;"><u>90</u></td> <td>x 3 =</td> <td style="text-align:center;"><u>270</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align:center;"><u>75</u></td> <td>x 4 =</td> <td style="text-align:center;"><u>300</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align:center;"><u>30</u></td> <td>x 5 =</td> <td style="text-align:center;"><u>150</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align:center;"><u>240</u></td> <td>(A)</td> <td style="text-align:center;"><u>800</u></td> (B) </tr> <tr> <td colspan="4" style="text-align:right;">Prevalence Index = B/A = <u>3.33</u></td> </tr> </table>		Total % Cover of:		Multiply by:	OBL species	<u>10</u>	x 1 =	<u>10</u>	FACW species	<u>35</u>	x 2 =	<u>70</u>	FAC species	<u>90</u>	x 3 =	<u>270</u>	FACU species	<u>75</u>	x 4 =	<u>300</u>	UPL species	<u>30</u>	x 5 =	<u>150</u>	Column Totals:	<u>240</u>	(A)	<u>800</u>	Prevalence Index = B/A = <u>3.33</u>			
	Total % Cover of:		Multiply by:																																	
OBL species	<u>10</u>	x 1 =	<u>10</u>																																	
FACW species	<u>35</u>	x 2 =	<u>70</u>																																	
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UPL species	<u>30</u>	x 5 =	<u>150</u>																																	
Column Totals:	<u>240</u>	(A)	<u>800</u>																																	
Prevalence Index = B/A = <u>3.33</u>																																				
2. <u>Frangula alnus (Glossy False Buckthorn)</u>	<u>25</u>	<u>YES</u>	<u>FAC</u>																																	
3. _____	-	-	-																																	
4. _____	-	-	-																																	
5. _____	-	-	-																																	
6. _____	-	-	-																																	
7. _____	-	-	-																																	
50% = _____ 20% = _____	<u>65</u> = Total Cover																																			
Herb Stratum (Plot size: <u>5'</u>)																																				
1. <u>Rosa multiflora (Rambler Rose)</u>	<u>35</u>	<u>YES</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)																																
2. <u>Symphotrichum racemosum (Fragile-Stem American-Aster)</u>	<u>25</u>	<u>YES</u>	<u>FACW</u>																																	
3. <u>Fragaria vesca (Woodland Strawberry)</u>	<u>25</u>	<u>YES</u>	<u>UPL</u>																																	
4. <u>Toxicodendron radicans (Eastern Poison Ivy)</u>	<u>20</u>	<u>NO</u>	<u>FAC</u>																																	
5. <u>Onoclea sensibilis (Sensitive Fern)</u>	<u>10</u>	<u>NO</u>	<u>FACW</u>																																	
6. <u>Carex vulpinoidea (Common Fox Sedge)</u>	<u>10</u>	<u>NO</u>	<u>OBL</u>																																	
7. <u>Daucus carota (Queen Anne's-Lace)</u>	<u>5</u>	<u>NO</u>	<u>UPL</u>																																	
8. _____	-	-	-																																	
9. _____	-	-	-																																	
10. _____	-	-	-																																	
11. _____	-	-	-																																	
12. _____	-	-	-																																	
50% = _____ 20% = _____	<u>130</u> = Total Cover																																			
Woody Vine Stratum (Plot size: <u>15'</u>)																																				
1. _____	-	-	-																																	
2. _____	-	-	-																																	
3. _____	-	-	-																																	
4. _____	-	-	-																																	
50% = _____ 20% = _____	<u>0</u> = Total Cover																																			
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																																				
Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>																																				
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 1 UPL/FACU: 3 Does not pass FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																																				

SOIL

Sampling Point: DP31

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 3/2	100					SiL	
2 - 12	10YR 4/2	99	10YR 3/3	1	C	M	SiL	
12 - 18	10YR 4/2	70	10YR 4/6	30	C	M	SiL	

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

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/21/2019
 Applicant/Owner: GM State: OH Sampling Point: DP32
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-3
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.151651 Long: -80.863743 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Point taken near old road bed.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: DP32

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30'</u>)																		
1. <u>Acer rubrum (Red Maple)</u>	<u>80</u>	<u>YES</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)														
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>80</u> = Total Cover																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. <u>Frangula alnus (Glossy False Buckthorn)</u>	<u>15</u>	<u>YES</u>	<u>FAC</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>15</u> = Total Cover																	
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Onoclea sensibilis (Sensitive Fern)</u>	<u>15</u>	<u>YES</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Persicaria virginiana (Jumpseed)</u>	<u>15</u>	<u>YES</u>	<u>FAC</u>															
3. <u>Rosa multiflora (Rambler Rose)</u>	<u>5</u>	<u>NO</u>	<u>FACU</u>															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
8. _____	-	-	-															
9. _____	-	-	-															
10. _____	-	-	-															
11. _____	-	-	-															
12. _____	-	-	-															
50% = _____ 20% = _____	<u>35</u> = Total Cover																	
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	-	-	-															
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
50% = _____ 20% = _____	<u>0</u> = Total Cover																	
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 1 UPL/FACU: 0 Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		

SOIL

Sampling Point: DP32

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	GLE Y 1 2.5/10Y	100					Si	
4 - 18	10YR 5/1	70	10YR 5/6	30	C	M	SiL	

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 Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Dark Surface (S7) (LRR K, L)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B)
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)	
<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

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

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

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/21/2019
 Applicant/Owner: GM State: OH Sampling Point: DP33
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.151012 Long: -80.865851 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbA) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Point taken near old road bed.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>1</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: DP33

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30'</u>)																		
1. <u>Acer rubrum (Red Maple)</u>	<u>5</u>	<u>YES</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>42.9%</u> (A/B)														
2. <u>Quercus palustris (Pin Oak)</u>	<u>5</u>	<u>YES</u>	<u>FACW</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
50% = _____ 20% = _____	<u>10</u> = Total Cover																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. <u>Rosa multiflora (Rambler Rose)</u>	<u>5</u>	<u>YES</u>	<u>FACU</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>75</u></td> <td>x 1 = <u>75</u></td> </tr> <tr> <td>FACW species <u>25</u></td> <td>x 2 = <u>50</u></td> </tr> <tr> <td>FAC species <u>8</u></td> <td>x 3 = <u>24</u></td> </tr> <tr> <td>FACU species <u>35</u></td> <td>x 4 = <u>140</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>143</u> (A)</td> <td><u>289</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.02</u>	Total % Cover of:	Multiply by:	OBL species <u>75</u>	x 1 = <u>75</u>	FACW species <u>25</u>	x 2 = <u>50</u>	FAC species <u>8</u>	x 3 = <u>24</u>	FACU species <u>35</u>	x 4 = <u>140</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>143</u> (A)	<u>289</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>75</u>	x 1 = <u>75</u>																	
FACW species <u>25</u>	x 2 = <u>50</u>																	
FAC species <u>8</u>	x 3 = <u>24</u>																	
FACU species <u>35</u>	x 4 = <u>140</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>143</u> (A)	<u>289</u> (B)																	
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
50% = _____ 20% = _____	<u>5</u> = Total Cover																	
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Juncus effusus (Lamp Rush)</u>	<u>60</u>	<u>YES</u>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Lonicera japonica (Japanese Honeysuckle)</u>	<u>15</u>	<u>YES</u>	<u>FACU</u>															
3. <u>Scirpus atrovirens (Dark-Green Bulrush)</u>	<u>15</u>	<u>YES</u>	<u>OBL</u>															
4. <u>Rosa multiflora (Rambler Rose)</u>	<u>15</u>	<u>YES</u>	<u>FACU</u>															
5. <u>Phalaris arundinacea (Reed Canary Grass)</u>	<u>10</u>	<u>NO</u>	<u>FACW</u>															
6. <u>Symphotrichum racemosum (Fragile-Stem American Aster)</u>	<u>5</u>	<u>NO</u>	<u>FACW</u>															
7. <u>Quercus palustris (Pin Oak)</u>	<u>5</u>	<u>NO</u>	<u>FACW</u>															
8. <u>Toxicodendron radicans (Eastern Poison Ivy)</u>	<u>3</u>	<u>NO</u>	<u>FAC</u>															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
50% = _____ 20% = _____	<u>128</u> = Total Cover																	
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	_____	_____	_____	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
50% = _____ 20% = _____	<u>0</u> = Total Cover																	
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																		
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 2 UPL/FACU: 3 Does not pass FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		

SOIL

Sampling Point: DP33

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 8	10YR 4/2	98	10YR 4/4	2	C	M	SiL	
8 - 18	10YR 5/1	92	10YR 4/4	10	C	M	SiL	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/21/2019
 Applicant/Owner: GM State: OH Sampling Point: DP34
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.151500 Long: -80.867139 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbA) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: 	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: DP34

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30'</u>)																		
1. <u>Carya ovata (Shag-Bark Hickory)</u>	<u>25</u>	YES	FACU	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>8</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>62.5%</u> (A/B)														
2. <u>Acer rubrum (Red Maple)</u>	<u>5</u>	NO	FAC															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>30</u> = Total Cover																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. <u>Lindera benzoin (Northern Spicebush)</u>	<u>10</u>	YES	FACW	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u> (A)</td> <td><u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u> (A)	<u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u> (A)	<u>0</u> (B)																	
2. <u>Rosa multiflora (Rambler Rose)</u>	<u>5</u>	YES	FAC															
3. <u>Cornus racemosa (Gray Dogwood)</u>	<u>5</u>	YES	FAC															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>20</u> = Total Cover																	
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Quercus rubra (Red Oak)</u>	<u>20</u>	YES	FACU	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Juncus effusus (Lamp Rush)</u>	<u>15</u>	YES	OBL															
3. <u>Scirpus atrovirens (Dark-Green Bulrush)</u>	<u>15</u>	YES	OBL															
4. <u>Rosa multiflora (Rambler Rose)</u>	<u>15</u>	YES	FACU															
5. <u>Phalaris arundinacea (Reed Canary Grass)</u>	<u>10</u>	NO	FACW															
6. <u>Smilax rotundifolia (Horsebrier)</u>	<u>10</u>	NO	FAC															
7. <u>Symphotrichum racemosum (Fragile-Stem American Aster)</u>	<u>5</u>	NO	FACW															
8. <u>Quercus palustris (Pin Oak)</u>	<u>3</u>	NO	FACW															
9. <u>Toxicodendron radicans (Eastern Poison Ivy)</u>	<u>3</u>	NO	FAC															
10. _____	-	-	-															
11. _____	-	-	-															
12. _____	-	-	-															
50% = _____ 20% = _____	<u>96</u> = Total Cover																	
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	-	-	-	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
50% = _____ 20% = _____	<u>0</u> = Total Cover																	
Hydrophytic Vegetation Present?				Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>														
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 4 UPL/FACU: 1 Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		

SOIL

Sampling Point: DP34

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 7	10YR 4/2	98	10YR 4/4	2	C	M	SiL	
7 - 18	10YR 5/3	90	10YR 5/6	10	C	M	SiL	

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

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

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

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

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/22/2019
 Applicant/Owner: GM State: OH Sampling Point: DP35
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1-3
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.148598 Long: -80.862234 Datum: WGS84
 Soil Map Unit Name: Udorthents (Ud) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: DP35

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	-	-	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)														
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Cornus racemosa (Gray Dogwood)</u>	<u>20</u>	<u>YES</u>	<u>FACW</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
5. _____	_____	-	-															
6. _____	_____	-	-															
7. _____	_____	-	-															
50% = _____ 20% = _____	<u>20</u>	= Total Cover																
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Solidago rugosa (Wrinkle-Leaf Goldenrod)</u>	<u>30</u>	<u>YES</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Juncus effusus (Lamp Rush)</u>	<u>25</u>	<u>YES</u>	<u>OBL</u>															
3. <u>Cornus racemosa (Gray Dogwood)</u>	<u>25</u>	<u>YES</u>	<u>FACW</u>															
4. <u>Dactylis glomerata (Orchard Grass)</u>	<u>10</u>	<u>NO</u>	<u>FACU</u>															
5. <u>Cirsium arvense (Canada Thistle)</u>	<u>8</u>	<u>NO</u>	<u>FACU</u>															
6. <u>Doellingeria umbellata (Parasol White-Top)</u>	<u>5</u>	<u>NO</u>	<u>FACW</u>															
7. <u>Rosa multiflora (Rambler Rose)</u>	<u>5</u>	<u>NO</u>	<u>FACU</u>															
8. _____	_____	-	-															
9. _____	_____	-	-															
10. _____	_____	-	-															
11. _____	_____	-	-															
12. _____	_____	-	-															
50% = _____ 20% = _____	<u>108</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	-	-	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____	_____	-	-															
3. _____	_____	-	-															
4. _____	_____	-	-															
50% = _____ 20% = _____	<u>0</u>	= Total Cover																
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														
OBL/FACW: 3																		
UPL/FACU: 0																		
Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		

SOIL

Sampling Point: DP35

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 7	10YR 4/2	94	10YR 4/4	6	C	M	SiL	
7 - 18	10YR 5/1	93	10YR 5/6	7	C	M	SiL	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

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

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/22/2019
 Applicant/Owner: GM State: OH Sampling Point: DP36
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 1-3
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.148692 Long: -80.861673 Datum: WGS84
 Soil Map Unit Name: Udorthents (Ud) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP36

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. _____	_____	-	-	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>25.0%</u> (A/B)																
2. _____	_____	-	-																	
3. _____	_____	-	-																	
4. _____	_____	-	-																	
5. _____	_____	-	-																	
6. _____	_____	-	-																	
7. _____	_____	-	-																	
50% = _____ 20% = _____	<u>0</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>2</u></td> <td>x 2 = <u>4</u></td> </tr> <tr> <td>FAC species <u>45</u></td> <td>x 3 = <u>135</u></td> </tr> <tr> <td>FACU species <u>120</u></td> <td>x 4 = <u>480</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>167</u> (A)</td> <td><u>619</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align:center;">Prevalence Index = B/A = <u>3.71</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>2</u>	x 2 = <u>4</u>	FAC species <u>45</u>	x 3 = <u>135</u>	FACU species <u>120</u>	x 4 = <u>480</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>167</u> (A)	<u>619</u> (B)	Prevalence Index = B/A = <u>3.71</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>2</u>	x 2 = <u>4</u>																			
FAC species <u>45</u>	x 3 = <u>135</u>																			
FACU species <u>120</u>	x 4 = <u>480</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>167</u> (A)	<u>619</u> (B)																			
Prevalence Index = B/A = <u>3.71</u>																				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																				
1. <u>Frangula alnus (Glossy False Buckthorn)</u>	<u>25</u>	<u>YES</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)																
2. _____	_____	-	-																	
3. _____	_____	-	-																	
4. _____	_____	-	-																	
5. _____	_____	-	-																	
6. _____	_____	-	-																	
7. _____	_____	-	-																	
50% = _____ 20% = _____	<u>25</u>	= Total Cover																		
Herb Stratum (Plot size: <u>5'</u>)																				
1. <u>Solidago canadensis (Canada Goldenrod)</u>	<u>60</u>	<u>YES</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																
2. <u>Dactylis glomerata (Orchard Grass)</u>	<u>25</u>	<u>YES</u>	<u>FACU</u>																	
3. <u>Rosa multiflora (Rambler Rose)</u>	<u>25</u>	<u>YES</u>	<u>FACU</u>																	
4. <u>Solidago rugosa (Wrinkle-Leaf Goldenrod)</u>	<u>15</u>	<u>NO</u>	<u>FAC</u>																	
5. <u>Cirsium arvense (Canada Thistle)</u>	<u>10</u>	<u>NO</u>	<u>FACU</u>																	
6. <u>Frangula alnus (Glossy False Buckthorn)</u>	<u>5</u>	<u>NO</u>	<u>FAC</u>																	
7. <u>Doellingeria umbellata (Parasol White-Top)</u>	<u>2</u>	<u>NO</u>	<u>FACW</u>																	
8. _____	_____	-	-																	
9. _____	_____	-	-																	
10. _____	_____	-	-																	
11. _____	_____	-	-																	
12. _____	_____	-	-																	
50% = _____ 20% = _____	<u>142</u>	= Total Cover																		
Woody Vine Stratum (Plot size: <u>15'</u>)																				
1. _____	_____	-	-																	
2. _____	_____	-	-																	
3. _____	_____	-	-																	
4. _____	_____	-	-																	
50% = _____ 20% = _____	<u>0</u>	= Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 1 UPL/FACU: 3 Does not pass FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																				
Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>																				

SOIL

Sampling Point: DP36

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 10	10YR 3/2	100					SiL	
10 - 18	10YR 5/3	100					SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None

Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/22/2019
 Applicant/Owner: GM State: OH Sampling Point: DP37
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 2-4
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.150624 Long: -80.862193 Datum: WGS84
 Soil Map Unit Name: Rittman silt loam (RsB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: DP37

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	-	-	
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
5. _____	_____	-	-	
6. _____	_____	-	-	
7. _____	_____	-	-	
50% = _____ 20% = _____	<u>0</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Acer rubrum (Red Maple)</u>	<u>15</u>	<u>YES</u>	<u>FAC</u>	
2. <u>Lindera benzoin (Northern Spicebush)</u>	<u>15</u>	<u>YES</u>	<u>FACW</u>	
3. _____	_____	-	-	
4. _____	_____	-	-	
5. _____	_____	-	-	
6. _____	_____	-	-	
7. _____	_____	-	-	
50% = _____ 20% = _____	<u>30</u>	= Total Cover		
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Solidago canadensis (Canada Goldenrod)</u>	<u>30</u>	<u>YES</u>	<u>FACU</u>	
2. <u>Juncus effusus (Lamp Rush)</u>	<u>30</u>	<u>YES</u>	<u>OBL</u>	
3. <u>Doellingeria umbellata (Parasol White-Top)</u>	<u>15</u>	<u>NO</u>	<u>FACW</u>	
4. <u>Rosa multiflora (Rambler Rose)</u>	<u>10</u>	<u>NO</u>	<u>FACU</u>	
5. <u>Scirpus cyperinus (Cottongrass Bulrush)</u>	<u>10</u>	<u>NO</u>	<u>OBL</u>	
6. <u>Scirpus atrovirens (Dark-Green Bulrush)</u>	<u>10</u>	<u>NO</u>	<u>OBL</u>	
7. <u>Lonicera japonica (Japanese Honeysuckle)</u>	<u>5</u>	<u>NO</u>	<u>FACU</u>	
8. <u>Toxicodendron radicans (Eastern Poison Ivy)</u>	<u>3</u>	<u>NO</u>	<u>FAC</u>	
9. _____	_____	-	-	
10. _____	_____	-	-	
11. _____	_____	-	-	
12. _____	_____	-	-	
50% = _____ 20% = _____	<u>113</u>	= Total Cover		
Woody Vine Stratum (Plot size: <u>15'</u>)				
1. _____	_____	-	-	
2. _____	_____	-	-	
3. _____	_____	-	-	
4. _____	_____	-	-	
50% = _____ 20% = _____	<u>0</u>	= Total Cover		
Remarks: (Include photo numbers here or on a separate sheet.)				
OBL/FACW: 2				
UPL/FACU: 1				
Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).				

Dominance Test worksheet:	
Number of Dominant Species That Are OBL, FACW, or FAC:	<u>3</u> (A)
Total Number of Dominant Species Across All Strata:	<u>4</u> (B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>75.0%</u> (A/B)
Prevalence Index worksheet:	
Total % Cover of:	Multiply by:
OBL species _____	x 1 = <u>0</u>
FACW species _____	x 2 = <u>0</u>
FAC species _____	x 3 = <u>0</u>
FACU species _____	x 4 = <u>0</u>
UPL species _____	x 5 = <u>0</u>
Column Totals: <u>0</u> (A)	<u>0</u> (B)
Prevalence Index = B/A = _____	
Hydrophytic Vegetation Indicators:	
<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation	
<input checked="" type="checkbox"/> 2 - Dominance Test is >50%	
<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹	
<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
Definitions of Vegetation Strata:	
Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.	
Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.	
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.	
Woody vines – All woody vines greater than 3.28 ft in height.	
Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

SOIL

Sampling Point: DP37

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 9	10YR 4/1	94	10YR 4/6	6	C	M	SiL	
9 - 18	10YR 5/2	85	10YR 5/6	15	C	M	SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/22/2019
 Applicant/Owner: GM State: OH Sampling Point: DP38
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 2-4
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.150588 Long: -80.863877 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbB) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Point taken near old road bed.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ _____ High Water Table (A2) _____ _____ Saturation (A3) _____ _____ Water Marks (B1) _____ _____ Sediment Deposits (B2) _____ _____ Drift Deposits (B3) _____ _____ Algal Mat or Crust (B4) _____ _____ Iron Deposits (B5) _____ _____ Inundation Visible on Aerial Imagery (B7) _____ _____ Sparsely Vegetated Concave Surface (B8) _____ _____ Water-Stained Leaves (B9) _____ _____ Aquatic Fauna (B13) _____ _____ Marl Deposits (B15) _____ _____ Hydrogen Sulfide Odor (C1) _____ _____ Oxidized Rhizospheres on Living Roots (C3) _____ _____ Presence of Reduced Iron (C4) _____ _____ Recent Iron Reduction in Tilled Soils (C6) _____ _____ Thin Muck Surface (C7) _____ _____ Other (Explain in Remarks) _____	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ _____ Drainage Patterns (B10) _____ _____ Moss Trim Lines (B16) _____ _____ Dry-Season Water Table (C2) _____ _____ Crayfish Burrows (C8) _____ _____ Saturation Visible on Aerial Imagery (C9) _____ _____ Stunted or Stressed Plants (D1) _____ <input checked="" type="checkbox"/> Geomorphic Position (D2) _____ _____ Shallow Aquitard (D3) _____ _____ Microtopographic Relief (D4) _____ <input checked="" type="checkbox"/> FAC-Neutral Test (D5) _____
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: DP38

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30'</u>)																		
1. <u>Acer rubrum (Red Maple)</u>	<u>80</u>	<u>YES</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)														
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>80</u> = Total Cover																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. <u>Acer rubrum (Red Maple)</u>	<u>10</u>	<u>YES</u>	<u>FAC</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
2. <u>Lindera benzoin (Northern Spicebush)</u>	<u>5</u>	<u>YES</u>	<u>FACW</u>															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>15</u> = Total Cover																	
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Juncus effusus (Lamp Rush)</u>	<u>30</u>	<u>YES</u>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Toxicodendron radicans (Eastern Poison Ivy)</u>	<u>20</u>	<u>YES</u>	<u>FAC</u>															
3. <u>Smilax rotundifolia (Horsebrier)</u>	<u>15</u>	<u>NO</u>	<u>FAC</u>															
4. <u>Rosa multiflora (Rambler Rose)</u>	<u>10</u>	<u>NO</u>	<u>FACU</u>															
5. <u>Lindera benzoin (Northern Spicebush)</u>	<u>10</u>	<u>NO</u>	<u>OBL</u>															
6. <u>Scirpus cyperinus (Cottongrass Bulrush)</u>	<u>5</u>	<u>NO</u>	<u>OBL</u>															
7. <u>Ludwigia alternifolia (Seedbox)</u>	<u>5</u>	<u>NO</u>	<u>OBL</u>															
8. _____	-	-	-															
9. _____	-	-	-															
10. _____	-	-	-															
11. _____	-	-	-															
12. _____	-	-	-															
50% = _____ 20% = _____	<u>95</u> = Total Cover																	
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	-	-	-															
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
50% = _____ 20% = _____	<u>0</u> = Total Cover																	
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 2 UPL/FACU: 0 Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		
				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														

SOIL

Sampling Point: DP38

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 10	10YR 4/2	97	10YR 4/4	3	C	M	SiL	
10 - 18	10YR 5/2	92	10YR 5/4	8	C	M	SiL	

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

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/22/2019
 Applicant/Owner: GM State: OH Sampling Point: DP39
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.149520 Long: -80.865308 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbA) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: 	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: DP39

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30'</u>)																		
1. <u>Acer rubrum (Red Maple)</u>	<u>25</u>	<u>YES</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>71.4%</u> (A/B)														
2. <u>Carya ovata (Shag-Bark Hickory)</u>	<u>10</u>	<u>YES</u>	<u>FACU</u>															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>35</u> = Total Cover																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. <u>Lindera benzoin (Northern Spicebush)</u>	<u>10</u>	<u>YES</u>	<u>FACW</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>10</u> = Total Cover																	
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Juncus effusus (Lamp Rush)</u>	<u>20</u>	<u>YES</u>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Scirpus atrovirens (Dark-Green Bulrush)</u>	<u>15</u>	<u>YES</u>	<u>OBL</u>															
3. <u>Persicaria sagittata (Arrow-Leaf Tearthumb)</u>	<u>15</u>	<u>YES</u>	<u>OBL</u>															
4. <u>Rosa multiflora (Rambler Rose)</u>	<u>15</u>	<u>YES</u>	<u>FACU</u>															
5. <u>Scirpus cyperinus (Cottongrass Bulrush)</u>	<u>10</u>	<u>NO</u>	<u>OBL</u>															
6. <u>Lindera benzoin (Northern Spicebush)</u>	<u>3</u>	<u>NO</u>	<u>FACW</u>															
7. <u>Toxicodendron radicans (Eastern Poison Ivy)</u>	<u>3</u>	<u>NO</u>	<u>FAC</u>															
8. _____	-	-	-															
9. _____	-	-	-															
10. _____	-	-	-															
11. _____	-	-	-															
12. _____	-	-	-															
50% = _____ 20% = _____	<u>81</u> = Total Cover																	
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	-	-	-	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
50% = _____ 20% = _____	<u>0</u> = Total Cover																	
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____																		
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 4 UPL/FACU: 2 Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		

SOIL

Sampling Point: DP39

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 1	10YR 3/2	100					SiL	
1 - 10	10YR 4/1	97	10YR 4/4	3	C	M	SiL	
10 - 18	10YR 5/3	95	10YR 5/6	5	C	M	SiL	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/22/2019
 Applicant/Owner: GM State: OH Sampling Point: DP40
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-1
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.148609 Long: -80.865441 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbA) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p><u>Primary Indicators (minimum of one is required; check all that apply)</u></p> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<p><u>Secondary Indicators (minimum of two required)</u></p> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<p>Field Observations:</p> Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	<p>Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____</p>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: DP40

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30'</u>)																		
1. <u>Carya ovata (Shag-Bark Hickory)</u>	<u>10</u>	<u>YES</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>85.7%</u> (A/B)														
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>10</u> = Total Cover																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. <u>Lindera benzoin (Northern Spicebush)</u>	<u>10</u>	<u>YES</u>	<u>FACW</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
2. <u>Acer rubrum (Red Maple)</u>	<u>5</u>	<u>YES</u>	<u>FAC</u>															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>15</u> = Total Cover																	
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Juncus effusus (Lamp Rush)</u>	<u>30</u>	<u>YES</u>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Scirpus atrovirens (Dark-Green Bulrush)</u>	<u>15</u>	<u>YES</u>	<u>OBL</u>															
3. <u>Persicaria sagittata (Arrow-Leaf Tearthumb)</u>	<u>15</u>	<u>YES</u>	<u>OBL</u>															
4. <u>Rosa multiflora (Rambler Rose)</u>	<u>15</u>	<u>YES</u>	<u>FAC</u>															
5. <u>Onoclea sensibilis (Sensitive Fern)</u>	<u>10</u>	<u>NO</u>	<u>FACW</u>															
6. <u>Solidago canadensis (Canada Goldenrod)</u>	<u>5</u>	<u>NO</u>	<u>FACU</u>															
7. <u>Toxicodendron radicans (Eastern Poison Ivy)</u>	<u>3</u>	<u>NO</u>	<u>FAC</u>															
8. <u>Quercus alba (White Oak)</u>	<u>3</u>	<u>NO</u>	<u>FACU</u>															
9. _____	-	-	-															
10. _____	-	-	-															
11. _____	-	-	-															
12. _____	-	-	-															
50% = _____ 20% = _____	<u>96</u> = Total Cover																	
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	-	-	-															
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
50% = _____ 20% = _____	<u>0</u> = Total Cover																	
1Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 4 UPL/FACU: 1 Passes FAC-Neutral Test (Secondary Hydrology Indicator [D5]).																		
				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														

SOIL

Sampling Point: DP40

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 3/1	100					SiL	
2 - 9	10YR 4/2	95	10YR 4/4	5	C	M	SiL	
9 - 18	10YR 5/2	90	10YR 5/6	10	C	M	SiL	

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

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

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

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

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: GM Lordstown - Parcel 4 City/County: Warren / Trumbull Sampling Date: 10/22/2019
 Applicant/Owner: GM State: OH Sampling Point: DP41
 Investigator(s): GK, MH Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): slight hillslope Local relief (concave, convex, none): none Slope (%): 0-1
 Subregion (LRR or MLRA): LRR-R; MLRA-139 Lat: 41.148723 Long: -80.865083 Datum: WGS84
 Soil Map Unit Name: Wadsworth silt loam (WbA) NWI classification: Not Mapped

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

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

VEGETATION – Use scientific names of plants.

Sampling Point: DP41

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30'</u>)																		
1. <u>Acer rubrum (Red Maple)</u>	<u>15</u>	<u>YES</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66.7%</u> (A/B)														
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>15</u> = Total Cover																	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																		
1. <u>Acer rubrum (Red Maple)</u>	<u>5</u>	<u>YES</u>	<u>FAC</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x 1 = <u>0</u>																	
FACW species _____	x 2 = <u>0</u>																	
FAC species _____	x 3 = <u>0</u>																	
FACU species _____	x 4 = <u>0</u>																	
UPL species _____	x 5 = <u>0</u>																	
Column Totals: <u>0</u>	(A) <u>0</u> (B)																	
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
5. _____	-	-	-															
6. _____	-	-	-															
7. _____	-	-	-															
50% = _____ 20% = _____	<u>5</u> = Total Cover																	
Herb Stratum (Plot size: <u>5'</u>)																		
1. <u>Rosa multiflora (Rambler Rose)</u>	<u>40</u>	<u>YES</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Dactylis glomerata (Orchard Grass)</u>	<u>15</u>	<u>NO</u>	<u>FACU</u>															
3. <u>Smilax rotundifolia (Horsebrier)</u>	<u>10</u>	<u>NO</u>	<u>FAC</u>															
4. <u>Quercus alba (White Oak)</u>	<u>10</u>	<u>NO</u>	<u>FACU</u>															
5. <u>Toxicodendron radicans (Eastern Poison Ivy)</u>	<u>5</u>	<u>NO</u>	<u>FAC</u>															
6. _____	-	-	-															
7. _____	-	-	-															
8. _____	-	-	-															
9. _____	-	-	-															
10. _____	-	-	-															
11. _____	-	-	-															
12. _____	-	-	-															
50% = _____ 20% = _____	<u>80</u> = Total Cover																	
Woody Vine Stratum (Plot size: <u>15'</u>)																		
1. _____	-	-	-															
2. _____	-	-	-															
3. _____	-	-	-															
4. _____	-	-	-															
50% = _____ 20% = _____	<u>0</u> = Total Cover																	
Remarks: (Include photo numbers here or on a separate sheet.) OBL/FACW: 0 UPL/FACU: 1 Does not pass FAC-Neutral Test (Secondary Hydrology Indicator [D5]).				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														

SOIL

Sampling Point: DP41

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 11	10YR 4/3	99	10YR 4/4	1	C	M	SiL	
11 - 18	10YR 5/3	85	10YR 5/4	15	C	M	SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

APPENDIX C
PHOTOGRAPHS

Photo Location Key Map

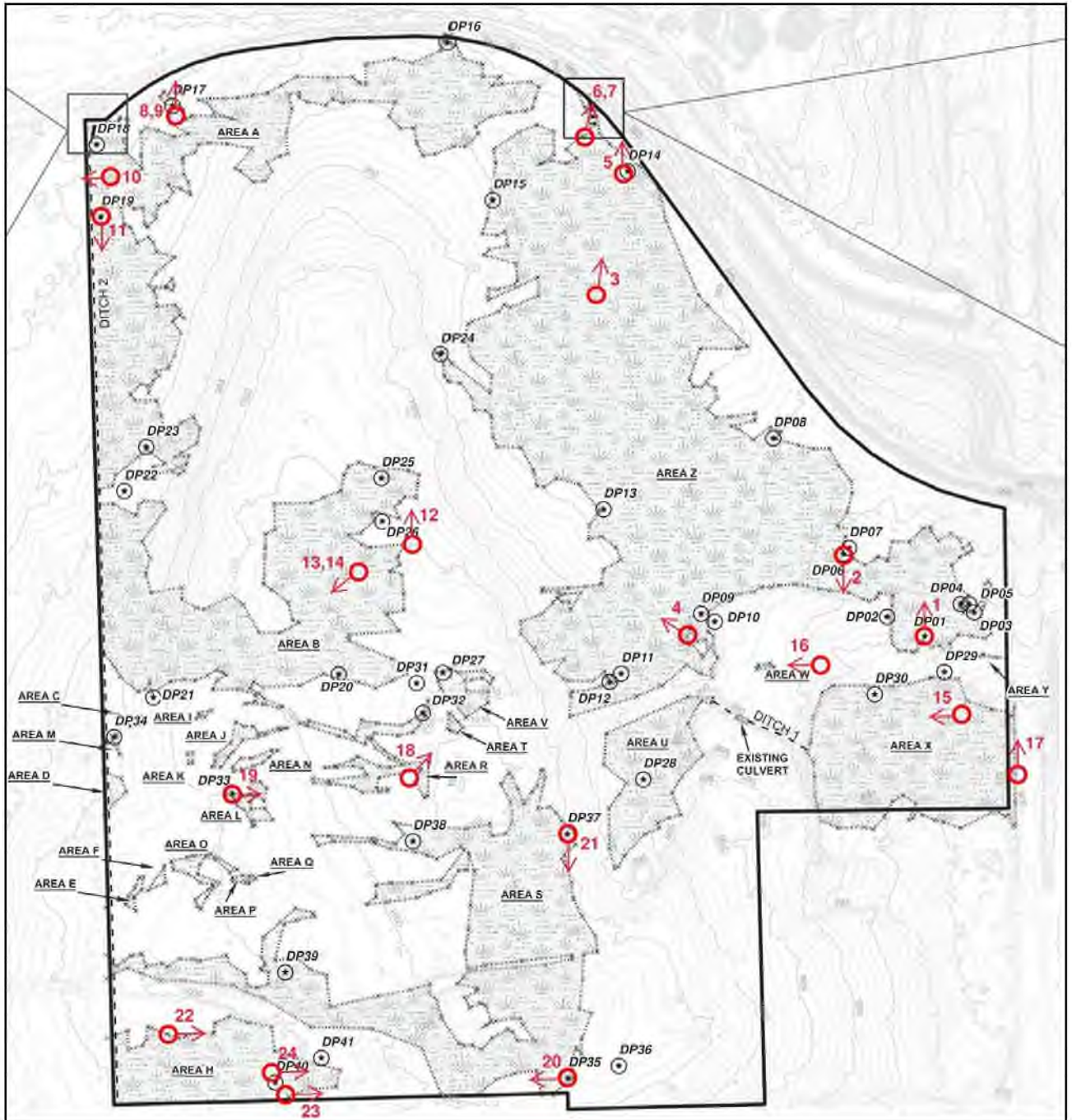




Photo 1: Facing N from DP01 towards emergent wetland in Area Z. (Photo taken 10/15/2019)



Photo 2: Facing S from DP06 towards wool grass and pin oak in Area Z. (Photo taken 10/15/2019)



Photo 3: View of emergent wetland in northcentral portion of Area Z. (Photo taken 10/15/2019)



Photo 4: View of large depression in Area Z near flag WLA1026 (Photo taken 10/15/2019)



Photo 5: Facing N from DP14 towards arrow-leaved tearthumb. (Photo taken 10/16/2019)



Photo 6: View of Stream 1 as it leaves the Site. Train tracks in distance. (Photo taken 10/16/2019)



Photo 7: View of incised banks of Stream 1. (Photo taken 10/16/2019)



Photo 8: Facing N from DP17 towards emergent wetland vegetation. (Photo taken 10/17/2019)



Photo 9: Depleted matrix (F3) soil profile at DP17 which is typical for wetland areas throughout the Site. (Photo taken 10/17/2019)



Photo 10: View of Stream 2 in the northwest corner of the Site. (Photo taken 10/17/2019)



Photo 11: Facing S from DP19 towards wool grass on left and Site boundary on right (Photo taken 10/17/2019)



Photo 12: Facing N from border of Area B (on left) and existing gravel access road (on right) (Photo taken 10/17/2019)



Photo 13: View of typical vegetation in Area B. (Photo taken 10/17/2019)



Photo 14: View of Depleted matrix (F3) soil profile in Area B. (Photo taken 10/17/2019)



Photo 15: Facing W towards wool grass in Area X. (Photo taken 10/18/2019)



Photo 16: Facing W towards Area W (on right) and access road (on left). (Photo taken 10/18/2019)



Photo 17: Facing N from border of Area X (on left) and Tod Ave (on right). (Photo taken 10/21/2019)



Photo 18: Facing NE on old access road near DP32 in Area R (Photo taken 10/21/2019)



Photo 19: Facing E from DP33 in Area L. (Photo taken 10/21/2019)



Photo 20: Facing W from DP35 towards Area A. (Photo taken 10/22/2019)



Photo 21: Facing S from DP37 towards Area S. (Photo taken 10/22/2019)



Photo 22: Facing E from flag WLG1708 in Area H (on right). (Photo taken 10/23/2019)



Photo 23: Facing E towards upland from edge of Area H and property boundary (on right) (Photo taken 10/23/2019)



Photo 24: Facing E from DP40 in Area H. (Photo taken 10/23/2019)



January 8, 2020

No. 11204429.20

Mr. Jim Harnett
General Motors, LLC
jim.f.hartnett@gm.com

Re: Wetland Delineation Report Supplement
Project Magellan East
City of Lordstown, Trumbull County, Ohio

Dear Mr. Hartnett:

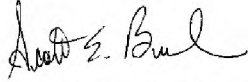
This letter serves as a supplement to GHD’s Wetland Delineation Report of January 7, 2020 for the Project Magellan East Site (a.k.a. Lordstown Battery Plant) located in the Village of Lordstown, Trumbull County, Ohio. The OEPA inspected the Site on December 2, 2019 along with the Corps of Engineers, Pittsburgh District. During this site inspection, the OEPA verified the Ohio Rapid Assessment Methodology (ORAM 5.0) scoring for the wetlands on the site. OEPA also inspected the streams (Stream 1 and Stream 2) on the site. Attached are the OEPA verified ORAM 5.0 forms for the wetlands delineated on the Site. Also attached are the Headwater Habitat Evaluation Index (HHEI) forms for Streams 1 and 2 on the Site. A summary of both the ORAM and HHEI evaluations is provided below.

Wetland ID	ORAM 5.0 Category
A	1
B	1
C-F, I-R, T, V	2
H	2
S	2
U	1
W	1
X	2
Y	1
Z	2
Stream ID	HHEI Score
Stream 1	30 Class II Modified
Stream 2	25 Class I modified

Neither of these streams have the potential to support aquatic life due to their intermittency.

The results presented in this letter are consistent with the findings of OEPA and the Corps of Engineers based upon their inspection of the Site. If you have any questions, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott E. Bush". The signature is fluid and cursive, with the first name "Scott" and last name "Bush" clearly legible.

**Scott E. Bush, P.W.S.
Senior Ecologist**

Version 5.0	Ohio Rapid Assessment Method for Wetlands 10 Page Form for Wetland Categorization	
	Background Information Scoring Boundary Worksheet Narrative Rating Field Form Quantitative Rating ORAM Summary Worksheet Wetland Categorization Worksheet	Ohio EPA, Division of Surface Water Final: February 1, 2001

Instructions

The investigator is *STRONGLY URGED* to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is *VERY IMPORTANT* to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at: <http://www.epa.ohio.gov/dsw/wetlands/WetlandEcologySection.aspx>

Background Information

Name: Scott Bush, PWS	
Date: 12-2-2019	
Affiliation: GHD Services Inc.	
Address: 410 Eagleview Blvd., STE 110. Exton, PA 19341	
Phone Number: 610-646-7486	
e-mail address: scott.bush@ghd.com	
Name of Wetland: <small>Wetland A</small>	
Vegetation Communit(ies): PEM	
HGM Class(es): Depression / slope	
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. See attached wetland location map.	
Lat/Long or UTM Coordinate	41.156136, -80.867062
USGS Quad Name	Warren, OH
County	Trumbull
Township	Lordstown
Section and Subsection	
Hydrologic Unit Code	05030103 Mahoning
Site Visit	October and November 2019
National Wetland Inventory Map	USFWS Wetlands Mapper
Ohio Wetland Inventory Map	ODNR GIS
Soil Survey	NRCS Web Soil Survey
Delineation report/map	GHD Dec. 2019

Name of Wetland: Area A	
Wetland Size (acres, hectares):	9.37 acres
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc. See attached site plan.	
Comments, Narrative Discussion, Justification of Category Changes: From at least 1903, the site was historically used for agriculture but contained some small wooded areas. Agriculture appears to have ceased in the 1980s. The site was developed for natural gas in the mid 1990s. Currently, the only structures onsite are a natural gas well, a gas collection lines, a gas meter, and a small oil collection tank. The entire site was logged in 2015. About 75% of the site was clear cut and 25% was selectively logged. The logging resulted in significant rutting and disturbance of the site. The rutting and other logging activities have created depressions and disturbance of the surficial hydrology on the site resulting in newly formed areas of wetland in pockets across the site. These areas are all recovering from the logging in 2015 across the site. Additionally, most of the wetlands are dominated by early successional species typical of recently disturbed sites. All of Area A was clear cut in 2015.	
Final score : 28	Category: 1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	Oak Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Wetland A	Rater(s): Scott Bush, PWS	Date: 12/2/2019
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3	3
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- >50 acres (>20.2ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- 10 to <25 acres (4 to <10.1ha) (4 pts)
- 3 to <10 acres (1.2 to <4ha) (3 pts)
- 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- <0.1 acres (0.04ha) (0 pts)

6	9
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

6.5	15.5
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3)
- Precipitation (1)
- Seasonal/Intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- >0.7 (27.6in) (3)
- 0.4 to 0.7m (15.7 to 27.6in) (2)
- <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- 100 year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g. forest), complex (1)
- Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3)
- Seasonally inundated (2)
- Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed	
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input 	<ul style="list-style-type: none"> <input type="checkbox"/> point source (nonstormwater) <input checked="" type="checkbox"/> filling/grading <input type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input checked="" type="checkbox"/> other <u>Rutting from logging</u>

6.5	22
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed	
<ul style="list-style-type: none"> <input type="checkbox"/> mowing <input type="checkbox"/> grazing <input checked="" type="checkbox"/> clearcutting <input type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input checked="" type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment

22

subtotal this page

Site: Wetland A	Rater(s): Scott Bush, PWS	Date: 12/2/2019
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22

subtotal first page

0

22

max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

6

28

max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- 0 Aquatic bed
- 1 Emergent
- 1 Shrub
- 1 Forest
- 0 Mudflats
- 0 Open water
- 0 Other _____

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- Vegetated hummocks/tussocks
- 2 Coarse woody debris >15cm (6in)
- Standing dead >25cm (10in) dbh
- Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

28

GRAND TOTAL (max 100 pts)

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <input checked="" type="radio"/> NO	If yes, Category 1.
	Question 6. Bogs	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 7. Fens	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
Question 10. Oak Openings	YES NO	If yes, Category 3	
Question 11. Relict Wet Prairies	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	3	
	Metric 2. Buffers and surrounding land use	6	
	Metric 3. Hydrology	6.5	
	Metric 4. Habitat	6.5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	6	
	TOTAL SCORE	28	Category based on score breakpoints 1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one	Evaluation of Categorization Result of ORAM
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10</p>	<p>YES</p> <p>Wetland is categorized as a Category 3 wetland</p>	<p><input checked="" type="radio"/> NO</p> <p>Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM</p>
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 1, 8b, 9b, 9e, 11</p>	<p>YES</p> <p>Wetland should be evaluated for possible Category 3 status</p>	<p><input checked="" type="radio"/> NO</p> <p>Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.</p>
<p>Did you answer "Yes" to</p> <p>Narrative Rating No. 5</p>	<p>YES</p> <p>Wetland is categorized as a Category 1 wetland</p>	<p><input checked="" type="radio"/> NO</p> <p>Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM</p>
<p>Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?</p>	<p><input checked="" type="radio"/> YES</p> <p>Wetland is assigned to the appropriate category based on the scoring range</p>	<p>NO</p> <p>If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.</p>
<p>Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?</p>	<p>YES</p> <p>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria</p>	<p><input checked="" type="radio"/> NO</p> <p>Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc. and a consideration of the narrative criteria in OAC rule 3745-1-54(C).</p>
<p>Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?</p>	<p>YES</p> <p>Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form</p>	<p><input checked="" type="radio"/> NO</p> <p>Wetland is assigned to category as determined by the ORAM.</p> <p>A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.</p>

Final Category

Choose one **Category 1** Category 2 Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Version 5.0	Ohio Rapid Assessment Method for Wetlands 10 Page Form for Wetland Categorization	
	Background Information Scoring Boundary Worksheet Narrative Rating Field Form Quantitative Rating ORAM Summary Worksheet Wetland Categorization Worksheet	Ohio EPA, Division of Surface Water Final: February 1, 2001

Instructions

The investigator is *STRONGLY URGED* to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is *VERY IMPORTANT* to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at: <http://www.epa.ohio.gov/dsw/wetlands/WetlandEcologySection.aspx>

Background Information

Name: Scott Bush, PWS	
Date: 12-2-2019	
Affiliation: GHD Services Inc.	
Address: 410 Eagleview Blvd., STE 110. Exton, PA 19341	
Phone Number: 610-646-7486	
e-mail address: scott.bush@ghd.com	
Name of Wetland: <small>Wetland B</small>	
Vegetation Communit(ies): PEM/PSS	
HGM Class(es): Depression / slope	
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. See attached wetland location map.	
Lat/Long or UTM Coordinate	41.152253, -80.866243
USGS Quad Name	Warren, OH
County	Trumbull
Township	Lordstown
Section and Subsection	
Hydrologic Unit Code	05030103 Mahoning
Site Visit	October and November 2019
National Wetland Inventory Map	USFWS Wetlands Mapper
Ohio Wetland Inventory Map	ODNR GIS
Soil Survey	NRCS Web Soil Survey
Delineation report/map	GHD Dec. 2019

Name of Wetland: Area B	
Wetland Size (acres, hectares):	8.82 acres
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc. See attached site plan.	
Comments, Narrative Discussion, Justification of Category Changes: <p>From at least 1903, the site was historically used for agriculture but contained some small wooded areas. Agriculture appears to have ceased in the 1980s. The site was developed for natural gas in the mid 1990s. Currently, the only structures onsite are a natural gas well, a gas collection lines, a gas meter, and a small oil collection tank. The entire site was logged in 2015. About 75% of the site was clear cut and 25% was selectively logged. The logging resulted in significant rutting and disturbance of the site. The rutting and other logging activities have created depressions and disturbance of the surficial hydrology on the site resulting in newly formed areas of wetland in pockets across the site. These areas are all recently recovering from the logging in 2015. Additionally, most of the wetlands are dominated by early successional species typical of recently disturbed sites.</p> <p>All of Area B was clear cut in 2015 resulting in extensive disturbance of this area. Wetlands have formed in the disturbed areas.</p>	
Final score : 27	Category: 1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	Oak Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Wetland B	Rater(s): Scott Bush, PWS	Date: 12/2/2019
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3	3
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- >50 acres (>20.2ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- 10 to <25 acres (4 to <10.1ha) (4 pts)
- 3 to <10 acres (1.2 to <4ha) (3 pts)
- 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- <0.1 acres (0.04ha) (0 pts)

7	10
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

6.5	16.5
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3)
- Precipitation (1)
- Seasonal/Intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- >0.7 (27.6in) (3)
- 0.4 to 0.7m (15.7 to 27.6in) (2)
- <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- 100 year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g. forest), complex (1)
- Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3)
- Seasonally inundated (2)
- Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed	
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input 	<ul style="list-style-type: none"> <input type="checkbox"/> point source (nonstormwater) <input checked="" type="checkbox"/> filling/grading <input type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input checked="" type="checkbox"/> other <u>Rutting</u>

6.5	23
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed	
<ul style="list-style-type: none"> <input type="checkbox"/> mowing <input type="checkbox"/> grazing <input checked="" type="checkbox"/> clearcutting <input type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment

23

subtotal this page

Site: Wetland B	Rater(s): Scott Bush, PWS	Date: 12/2/2019
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23

subtotal first page

0	23
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max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

4	27
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max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- 0 Aquatic bed
- 1 Emergent
- 1 Shrub
- 0 Forest
- 0 Mudflats
- 0 Open water
- 0 Other _____

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- Vegetated hummocks/tussocks
- 2 Coarse woody debris >15cm (6in)
- Standing dead >25cm (10in) dbh
- Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

27

GRAND TOTAL (max 100 pts)

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <input checked="" type="radio"/> NO	If yes, Category 1.
	Question 6. Bogs	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 7. Fens	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
Question 10. Oak Openings	YES NO	If yes, Category 3	
Question 11. Relict Wet Prairies	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	3	
	Metric 2. Buffers and surrounding land use	7	
	Metric 3. Hydrology	6.5	
	Metric 4. Habitat	6.5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	4	
	TOTAL SCORE	27	Category based on score breakpoints 1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10</p>	<p>YES</p> <p>Wetland is categorized as a Category 3 wetland</p>	<input checked="" type="radio"/> NO	<p>Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM</p>
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 1, 8b, 9b, 9e, 11</p>	<p>YES</p> <p>Wetland should be evaluated for possible Category 3 status</p>	<input checked="" type="radio"/> NO	<p>Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.</p>
<p>Did you answer "Yes" to</p> <p>Narrative Rating No. 5</p>	<p>YES</p> <p>Wetland is categorized as a Category 1 wetland</p>	<input checked="" type="radio"/> NO	<p>Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM</p>
<p>Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?</p>	<p><input checked="" type="radio"/> YES</p> <p>Wetland is assigned to the appropriate category based on the scoring range</p>	<input type="radio"/> NO	<p>If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.</p>
<p>Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?</p>	<p>YES</p> <p>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria</p>	<input checked="" type="radio"/> NO	<p>Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc. and a consideration of the narrative criteria in OAC rule 3745-1-54(C).</p>
<p>Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?</p>	<p>YES</p> <p>Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form</p>	<input checked="" type="radio"/> NO	<p>A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.</p>

Final Category

Choose one **Category 1** Category 2 Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Version 5.0	Ohio Rapid Assessment Method for Wetlands 10 Page Form for Wetland Categorization	
	Background Information Scoring Boundary Worksheet Narrative Rating Field Form Quantitative Rating ORAM Summary Worksheet Wetland Categorization Worksheet	Ohio EPA, Division of Surface Water Final: February 1, 2001

Instructions

The investigator is *STRONGLY URGED* to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is *VERY IMPORTANT* to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at: <http://www.epa.ohio.gov/dsw/wetlands/WetlandEcologySection.aspx>

Background Information

Name: Scott Bush, PWS	
Date: 12-2-2019	
Affiliation: GHD Services Inc.	
Address: 410 Eagleview Blvd., STE 110. Exton, PA 19341	
Phone Number: 610-646-7486	
e-mail address: scott.bush@ghd.com	
Name of Wetland: <small>Wetland C-G, HR, T, V</small>	
Vegetation Communit(ies): PEM	
HGM Class(es): Depression	
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. See attached wetland location map.	
Lat/Long or UTM Coordinate	41.150745, -80.865644
USGS Quad Name	Warren, OH
County	Trumbull
Township	Lordstown
Section and Subsection	
Hydrologic Unit Code	05030103 Mahoning
Site Visit	October and November 2019
National Wetland Inventory Map	USFWS Wetlands Mapper
Ohio Wetland Inventory Map	ODNR GIS
Soil Survey	NRCS Web Soil Survey
Delineation report/map	GHD Dec. 2019

Name of Wetland: Area C-F, I-R, T, V	
Wetland Size (acres, hectares):	1.83 acres
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc. See attached site plan.	
Comments, Narrative Discussion, Justification of Category Changes: From at least 1903, the site was historically used for agriculture but contained some small wooded areas. Agriculture appears to have ceased in the 1980s. The site was developed for natural gas in the mid 1990s. Currently, the only structures onsite are a natural gas well, a gas collection lines, a gas meter, and a small oil collection tank. The entire site was logged in 2015. About 75% of the site was clear cut and 25% was selectively logged. The logging resulted in significant rutting and disturbance of the site. The rutting and other logging activities have created depressions and disturbance of the surficial hydrology on the site resulting in newly formed areas of wetland in pockets across the site. These areas are all recently recovering from the logging in 2015. Areas C-F, I-R, T, V were subject to logging in 2015. Roads were cut to extract the trees and the landscape was rutted. Areas C-G, I-R, T, V were scored as a mosaic group.	
Final score : 33	Category: 2

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.	X	
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	Oak Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Area C-F, I-R, T, V	Rater(s): Scott Bush	Date: 12/2/2019
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2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- >50 acres (>20.2ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- 10 to <25 acres (4 to <10.1ha) (4 pts)
- 3 to <10 acres (1.2 to <4ha) (3 pts)
- 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- <0.1 acres (0.04ha) (0 pts)

10	12
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE.** Buffers average 50m (164ft) or more around wetland perimeter (7)
- MEDIUM.** Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- NARROW.** Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- VERY NARROW.** Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW.** 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW.** Old field (>10 years), shrubland, young second growth forest. (5)
- MODERATELY HIGH.** Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- HIGH.** Urban, industrial, open pasture, row cropping, mining, construction. (1)

6.5	18.5
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3)
- Precipitation (1)
- Seasonal/Intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- >0.7 (27.6in) (3)
- 0.4 to 0.7m (15.7 to 27.6in) (2)
- <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- 100 year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g. forest), complex (1)
- Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3)
- Seasonally inundated (2)
- Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed	
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input 	<ul style="list-style-type: none"> <input type="checkbox"/> point source (nonstormwater) <input checked="" type="checkbox"/> filling/grading <input type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input checked="" type="checkbox"/> other <u>Rutting</u>

6.5	25
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed	
<ul style="list-style-type: none"> <input type="checkbox"/> mowing <input type="checkbox"/> grazing <input type="checkbox"/> clearcutting <input checked="" type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment

25

subtotal this page

Site: Area C-F, I-R, T, V	Rater(s): Scott Bush	Date: 12/2/2019
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25

subtotal first page

0	25
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max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

8	33
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max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- 0 Aquatic bed
- 1 Emergent
- 1 Shrub
- 1 Forest
- 0 Mudflats
- 0 Open water
- 0 Other _____

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- 1 Vegetated hummocks/tussocks
- Coarse woody debris >15cm (6in)
- 1 Standing dead >25cm (10in) dbh
- 1 Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

33

GRAND TOTAL (max 100 pts)

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <input checked="" type="radio"/> NO	If yes, Category 1.
	Question 6. Bogs	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 7. Fens	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
Question 10. Oak Openings	YES <input checked="" type="radio"/> NO	If yes, Category 3	
Question 11. Relict Wet Prairies	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	2	
	Metric 2. Buffers and surrounding land use	10	
	Metric 3. Hydrology	6.5	
	Metric 4. Habitat	6.5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersions, microtopography	8	
	TOTAL SCORE	33	Category based on score breakpoints 2

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one	Evaluation of Categorization Result of ORAM
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10</p>	<p>YES</p> <p>Wetland is categorized as a Category 3 wetland</p>	<p><input checked="" type="radio"/> NO</p> <p>Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM</p>
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 1, 8b, 9b, 9e, 11</p>	<p>YES</p> <p>Wetland should be evaluated for possible Category 3 status</p>	<p><input checked="" type="radio"/> NO</p> <p>Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.</p>
<p>Did you answer "Yes" to</p> <p>Narrative Rating No. 5</p>	<p>YES</p> <p>Wetland is categorized as a Category 1 wetland</p>	<p><input checked="" type="radio"/> NO</p> <p>Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM</p>
<p>Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?</p>	<p><input checked="" type="radio"/> YES</p> <p>Wetland is assigned to the appropriate category based on the scoring range</p>	<p>NO</p> <p>If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.</p>
<p>Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?</p>	<p>YES</p> <p>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria</p>	<p><input checked="" type="radio"/> NO</p> <p>Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc. and a consideration of the narrative criteria in OAC rule 3745-1-54(C).</p>
<p>Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?</p>	<p>YES</p> <p>Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form</p>	<p><input checked="" type="radio"/> NO</p> <p>Wetland is assigned to category as determined by the ORAM.</p> <p>A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.</p>

Final Category
 Choose one Category 1 Category 2 Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Version 5.0	Ohio Rapid Assessment Method for Wetlands 10 Page Form for Wetland Categorization	
	Background Information Scoring Boundary Worksheet Narrative Rating Field Form Quantitative Rating ORAM Summary Worksheet Wetland Categorization Worksheet	Ohio EPA, Division of Surface Water Final: February 1, 2001

Instructions

The investigator is *STRONGLY URGED* to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is *VERY IMPORTANT* to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at: <http://www.epa.ohio.gov/dsw/wetlands/WetlandEcologySection.aspx>

Background Information

Name: Scott Bush, PWS	
Date: 12-2-2019	
Affiliation: GHD Services Inc.	
Address: 410 Eagleview Blvd., STE 110. Exton, PA 19341	
Phone Number: 610-646-7486	
e-mail address: scott.bush@ghd.com	
Name of Wetland: <small>Wetland H</small>	
Vegetation Communit(ies): PEM/SS/FO	
HGM Class(es): Depression / slope	
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. See attached wetland location map.	
Lat/Long or UTM Coordinate	41.1148831, -80.866436
USGS Quad Name	Warren, OH
County	Trumbull
Township	Lordstown
Section and Subsection	
Hydrologic Unit Code	05030103 Mahoning
Site Visit	October and November 2019
National Wetland Inventory Map	USFWS Wetlands Mapper
Ohio Wetland Inventory Map	ODNR GIS
Soil Survey	NRCS Web Soil Survey
Delineation report/map	GHD Dec. 2019

Name of Wetland: Area H	
Wetland Size (acres, hectares):	2.86 acres
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc. See attached site plan.	
Comments, Narrative Discussion, Justification of Category Changes: From at least 1903, the site was historically used for agriculture but contained some small wooded areas. Agriculture appears to have ceased in the 1980s. The site was developed for natural gas in the mid 1990s. Currently, the only structures onsite are a natural gas well, a gas collection lines, a gas meter, and a small oil collection tank. The entire site was logged in 2015. About 75% of the site was clear cut and 25% was selectively logged. The logging resulted in significant rutting and disturbance of the site. The rutting and other logging activities have created depressions and disturbance of the surficial hydrology on the site resulting in newly formed areas of wetland in pockets across the site. These areas are all recovering from the logging in 2015 across the site. Additionally, most of the wetlands are dominated by early successional species typical of recently disturbed sites. Area H was subject to heavy selective logging in 2015.	
Final score : 40.5	Category: 2

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	Oak Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Wetland H	Rater(s): Scott Bush, PWS	Date: 12/2/2019
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2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- >50 acres (>20.2ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- 10 to <25 acres (4 to <10.1ha) (4 pts)
- 3 to <10 acres (1.2 to <4ha) (3 pts)
- 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- <0.1 acres (0.04ha) (0 pts)

11	13
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE.** Buffers average 50m (164ft) or more around wetland perimeter (7)
- MEDIUM.** Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- NARROW.** Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- VERY NARROW.** Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW.** 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW.** Old field (>10 years), shrubland, young second growth forest. (5)
- MODERATELY HIGH.** Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- HIGH.** Urban, industrial, open pasture, row cropping, mining, construction. (1)

9.5	22.5
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3)
- Precipitation (1)
- Seasonal/Intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- >0.7 (27.6in) (3)
- 0.4 to 0.7m (15.7 to 27.6in) (2)
- <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- 100 year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g. forest), complex (1)
- Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3)
- Seasonally inundated (2)
- Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed	
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input 	<ul style="list-style-type: none"> <input type="checkbox"/> point source (nonstormwater) <input checked="" type="checkbox"/> filling/grading <input checked="" type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input checked="" type="checkbox"/> other <u>Rutting</u>

8	30.5
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed	
<ul style="list-style-type: none"> <input type="checkbox"/> mowing <input type="checkbox"/> grazing <input type="checkbox"/> clearcutting <input checked="" type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment

30.5

subtotal this page

Site: Wetland H	Rater(s): Scott Bush, PWS	Date: 12/2/2019
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30.5

subtotal first page

0

30.5

max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

10

40.5

max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- Aquatic bed
- 2 Emergent
- 1 Shrub
- 2 Forest
- Mudflats
- Open water
- Other _____

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- 1 Vegetated hummocks/tussocks
- 2 Coarse woody debris >15cm (6in)
- Standing dead >25cm (10in) dbh
- 1 Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

40.5

GRAND TOTAL (max 100 pts)

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <input checked="" type="radio"/> NO	If yes, Category 1.
	Question 6. Bogs	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 7. Fens	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES <input checked="" type="radio"/> NO	If yes, Category 3
Question 11. Relict Wet Prairies	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	2	
	Metric 2. Buffers and surrounding land use	11	
	Metric 3. Hydrology	9.5	
	Metric 4. Habitat	8	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	10	
	TOTAL SCORE	40.5	Category based on score breakpoints 2

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10</p>	<p>YES</p> <p>Wetland is categorized as a Category 3 wetland</p>	<input checked="" type="radio"/> NO	<p>Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM</p>
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 1, 8b, 9b, 9e, 11</p>	<p>YES</p> <p>Wetland should be evaluated for possible Category 3 status</p>	<input checked="" type="radio"/> NO	<p>Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.</p>
<p>Did you answer "Yes" to</p> <p>Narrative Rating No. 5</p>	<p>YES</p> <p>Wetland is categorized as a Category 1 wetland</p>	<input checked="" type="radio"/> NO	<p>Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM</p>
<p>Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?</p>	<p><input checked="" type="radio"/> YES</p> <p>Wetland is assigned to the appropriate category based on the scoring range</p>	<input type="radio"/> NO	<p>If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.</p>
<p>Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?</p>	<p>YES</p> <p>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria</p>	<input checked="" type="radio"/> NO	<p>Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc. and a consideration of the narrative criteria in OAC rule 3745-1-54(C).</p>
<p>Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?</p>	<p>YES</p> <p>Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form</p>	<input checked="" type="radio"/> NO	<p>A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.</p>

Final Category

Choose one Category 1 Category 2 Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Version 5.0	Ohio Rapid Assessment Method for Wetlands 10 Page Form for Wetland Categorization	
	Background Information Scoring Boundary Worksheet Narrative Rating Field Form Quantitative Rating ORAM Summary Worksheet Wetland Categorization Worksheet	Ohio EPA, Division of Surface Water Final: February 1, 2001

Instructions

The investigator is *STRONGLY URGED* to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is *VERY IMPORTANT* to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at: <http://www.epa.ohio.gov/dsw/wetlands/WetlandEcologySection.aspx>

Background Information

Name: Scott Bush, PWS	
Date: 12-2-2019	
Affiliation: GHD Services Inc.	
Address: 410 Eagleview Blvd., STE 110. Exton, PA 19341	
Phone Number: 610-646-7486	
e-mail address: scott.bush@ghd.com	
Name of Wetland: <small>Wetland S</small>	
Vegetation Communit(ies): PEM/SS/FO	
HGM Class(es): Depression	
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. See attached wetland location map.	
Lat/Long or UTM Coordinate	41.149802, -80.862538
USGS Quad Name	Warren, OH
County	Trumbull
Township	Lordstown
Section and Subsection	
Hydrologic Unit Code	05030103 Mahoning
Site Visit	October and November 2019
National Wetland Inventory Map	USFWS Wetlands Mapper
Ohio Wetland Inventory Map	ODNR GIS
Soil Survey	NRCS Web Soil Survey
Delineation report/map	GHD Dec. 2019

Name of Wetland: Area S	
Wetland Size (acres, hectares):	9.44 acres
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc. See attached site plan. Wetland extends slightly off site.	
Comments, Narrative Discussion, Justification of Category Changes: From at least 1903, the site was historically used for agriculture but contained some small wooded areas. Agriculture appears to have ceased in the 1980s. The site was developed for natural gas in the mid 1990s. Currently, the only structures onsite are a natural gas well, a gas collection lines, a gas meter, and a small oil collection tank. The entire site was logged in 2015. About 75% of the site was clear cut and 25% was selectively logged. The logging resulted in significant rutting and disturbance of the site. The rutting and other logging activities have created depressions and disturbance of the surficial hydrology on the site resulting in newly formed areas of wetland in pockets across the site. These areas are all recently recovering from the logging in 2015. Additionally, most of the wetlands are dominated by early successional species typical of recently disturbed sites. Area S was subject to clear cutting and heavy selective logging in 2015.	
Final score : 36	Category: 2

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	Oak Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Wetland S	Rater(s): Scott Bush, PWS	Date: 12/2/2019
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3	3
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

- Select one size class and assign score.
- >50 acres (>20.2ha) (6 pts)
 - 25 to <50 acres (10.1 to <20.2ha) (5 pts)
 - 10 to <25 acres (4 to <10.1ha) (4 pts)
 - 3 to <10 acres (1.2 to <4ha) (3 pts)
 - 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
 - 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
 - <0.1 acres (0.04ha) (0 pts)

7	10
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

- 2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
 - MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
 - NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
 - VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)
- 2b. Intensity of surrounding land use. Select one or double check and average.
- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
 - LOW. Old field (>10 years), shrubland, young second growth forest. (5)
 - MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
 - HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

6.5	16.5
max 30 pts.	subtotal

Metric 3. Hydrology.

- 3a. Sources of Water. Score all that apply.
- High pH groundwater (5)
 - Other groundwater (3)
 - Precipitation (1)
 - Seasonal/Intermittent surface water (3)
 - Perennial surface water (lake or stream) (5)
- 3b. Connectivity. Score all that apply.
- 100 year floodplain (1)
 - Between stream/lake and other human use (1)
 - Part of wetland/upland (e.g. forest), complex (1)
 - Part of riparian or upland corridor (1)
- 3c. Maximum water depth. Select only one and assign score.
- >0.7 (27.6in) (3)
 - 0.4 to 0.7m (15.7 to 27.6in) (2)
 - <0.4m (<15.7in) (1)
- 3d. Duration inundation/saturation. Score one or dbl check.
- Semi- to permanently inundated/saturated (4)
 - Regularly inundated/saturated (3)
 - Seasonally inundated (2)
 - Seasonally saturated in upper 30cm (12in) (1)
- 3e. Modifications to natural hydrologic regime. Score one or double check and average.
- None or none apparent (12)
 - Recovered (7)
 - Recovering (3)
 - Recent or no recovery (1)
- Check all disturbances observed

<ul style="list-style-type: none"> <input type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input 	<ul style="list-style-type: none"> <input type="checkbox"/> point source (nonstormwater) <input checked="" type="checkbox"/> filling/grading <input type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input checked="" type="checkbox"/> other_Rutting
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7.5	24
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

- 4a. Substrate disturbance. Score one or double check and average.
- None or none apparent (4)
 - Recovered (3)
 - Recovering (2)
 - Recent or no recovery (1)
- 4b. Habitat development. Select only one and assign score.
- Excellent (7)
 - Very good (6)
 - Good (5)
 - Moderately good (4)
 - Fair (3)
 - Poor to fair (2)
 - Poor (1)
- 4c. Habitat alteration. Score one or double check and average.
- None or none apparent (9)
 - Recovered (6)
 - Recovering (3)
 - Recent or no recovery (1)

Check all disturbances observed

<ul style="list-style-type: none"> <input type="checkbox"/> mowing <input type="checkbox"/> grazing <input checked="" type="checkbox"/> clearcutting <input checked="" type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment
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24

subtotal this page

Site: Wetland S	Rater(s): Scott Bush, PWS	Date: 12/2/2019
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24

subtotal first page

0	24
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max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

12	36
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max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- Aquatic bed
- 2 Emergent
- 1 Shrub
- 2 Forest
- Mudflats
- Open water
- Other _____

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- 1 Vegetated hummocks/tussocks
- 2 Coarse woody debris >15cm (6in)
- Standing dead >25cm (10in) dbh
- 2 Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

36 **GRAND TOTAL (max 100 pts)**

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <input checked="" type="radio"/> NO	If yes, Category 1.
	Question 6. Bogs	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 7. Fens	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Question 10. Oak Openings	YES <input checked="" type="radio"/> NO	If yes, Category 3	
Question 11. Relict Wet Prairies	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	3	
	Metric 2. Buffers and surrounding land use	7	
	Metric 3. Hydrology	6.5	
	Metric 4. Habitat	7.5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	12	
	TOTAL SCORE	36	Category based on score breakpoints 2

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one	Evaluation of Categorization Result of ORAM
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10</p>	<p>YES</p> <p>Wetland is categorized as a Category 3 wetland</p>	<p><input checked="" type="radio"/> NO</p> <p>Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM</p>
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 1, 8b, 9b, 9e, 11</p>	<p>YES</p> <p>Wetland should be evaluated for possible Category 3 status</p>	<p><input checked="" type="radio"/> NO</p> <p>Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.</p>
<p>Did you answer "Yes" to</p> <p>Narrative Rating No. 5</p>	<p>YES</p> <p>Wetland is categorized as a Category 1 wetland</p>	<p><input checked="" type="radio"/> NO</p> <p>Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM</p>
<p>Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?</p>	<p><input checked="" type="radio"/> YES</p> <p>Wetland is assigned to the appropriate category based on the scoring range</p>	<p>NO</p> <p>If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.</p>
<p>Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?</p>	<p>YES</p> <p>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria</p>	<p><input checked="" type="radio"/> NO</p> <p>Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc. and a consideration of the narrative criteria in OAC rule 3745-1-54(C).</p>
<p>Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?</p>	<p>YES</p> <p>Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form</p>	<p><input checked="" type="radio"/> NO</p> <p>Wetland is assigned to category as determined by the ORAM.</p> <p>A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.</p>

Final Category

Choose one Category 1 Category 2 Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Version 5.0	Ohio Rapid Assessment Method for Wetlands 10 Page Form for Wetland Categorization	
	Background Information Scoring Boundary Worksheet Narrative Rating Field Form Quantitative Rating ORAM Summary Worksheet Wetland Categorization Worksheet	Ohio EPA, Division of Surface Water Final: February 1, 2001

Instructions

The investigator is *STRONGLY URGED* to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is *VERY IMPORTANT* to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at: <http://www.epa.ohio.gov/dsw/wetlands/WetlandEcologySection.aspx>

Background Information

Name: Scott Bush, PWS	
Date: 12-2-2019	
Affiliation: GHD Services Inc.	
Address: 410 Eagleview Blvd., STE 110. Exton, PA 19341	
Phone Number: 610-646-7486	
e-mail address: scott.bush@ghd.com	
Name of Wetland: <small>Wetland U</small>	
Vegetation Communit(ies): PEM	
HGM Class(es): Depression	
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. See attached wetland location map.	
Lat/Long or UTM Coordinate	41.151305, -80.861213
USGS Quad Name	Warren, OH
County	Trumbull
Township	Lordstown
Section and Subsection	
Hydrologic Unit Code	05030103 Mahoning
Site Visit	October and November 2019
National Wetland Inventory Map	USFWS Wetlands Mapper
Ohio Wetland Inventory Map	ODNR GIS
Soil Survey	NRCS Web Soil Survey
Delineation report/map	GHD Dec. 2019

Name of Wetland: Area U	
Wetland Size (acres, hectares):	2.0 acres
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc. See attached site plan.	
Comments, Narrative Discussion, Justification of Category Changes: From at least 1903, the site was historically used for agriculture but contained some small wooded areas. Agriculture appears to have ceased in the 1980s. The site was developed for natural gas in the mid 1990s. Currently, the only structures onsite are a natural gas well, a gas collection lines, a gas meter, and a small oil collection tank. The entire site was logged in 2015. About 75% of the site was clear cut and 25% was selectively logged. The logging resulted in significant rutting and disturbance of the site. The rutting and other logging activities have created depressions and disturbance of the surficial hydrology on the site resulting in newly formed areas of wetland in pockets across the site. These areas are all recovering from the logging in 2015 across the site. Additionally, most of the wetlands are dominated by early successional species typical of recently disturbed sites. Area U was subject to clear cutting in 2015 and was heavily rutted.	
Final score : 25	Category: 1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	Oak Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Wetland U	Rater(s): Scott Bush, PWS	Date: 12/2/2019
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2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- >50 acres (>20.2ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- 10 to <25 acres (4 to <10.1ha) (4 pts)
- 3 to <10 acres (1.2 to <4ha) (3 pts)
- 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- <0.1 acres (0.04ha) (0 pts)

7	9
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

6.5	15.5
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3)
- Precipitation (1)
- Seasonal/Intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- >0.7 (27.6in) (3)
- 0.4 to 0.7m (15.7 to 27.6in) (2)
- <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- 100 year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g. forest), complex (1)
- Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3)
- Seasonally inundated (2)
- Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed	
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input 	<ul style="list-style-type: none"> <input type="checkbox"/> point source (nonstormwater) <input checked="" type="checkbox"/> filling/grading <input type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input checked="" type="checkbox"/> other <u>Rutting</u>

6.5	22
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed	
<ul style="list-style-type: none"> <input type="checkbox"/> mowing <input type="checkbox"/> grazing <input checked="" type="checkbox"/> clearcutting <input type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment

22

subtotal this page

Site: Wetland U	Rater(s): Scott Bush, PWS	Date: 12/2/2019
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22

subtotal first page

0	22
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max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

3	25
---	----

max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- 0 Aquatic bed
- 1 Emergent
- 1 Shrub
- 0 Forest
- 0 Mudflats
- 0 Open water
- 0 Other _____

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- 0 Vegetated hummocks/tussocks
- 1 Coarse woody debris >15cm (6in)
- 0 Standing dead >25cm (10in) dbh
- 0 Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

25

GRAND TOTAL (max 100 pts)

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <input checked="" type="radio"/> NO	If yes, Category 1.
	Question 6. Bogs	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 7. Fens	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Question 10. Oak Openings	YES <input checked="" type="radio"/> NO	If yes, Category 3	
Question 11. Relict Wet Prairies	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	2	
	Metric 2. Buffers and surrounding land use	7	
	Metric 3. Hydrology	6.5	
	Metric 4. Habitat	6.5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	3	
	TOTAL SCORE	25	Category based on score breakpoints 1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one	Evaluation of Categorization Result of ORAM
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10</p>	<p>YES</p> <p>Wetland is categorized as a Category 3 wetland</p>	<p><input checked="" type="radio"/> NO</p> <p>Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM</p>
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 1, 8b, 9b, 9e, 11</p>	<p>YES</p> <p>Wetland should be evaluated for possible Category 3 status</p>	<p><input checked="" type="radio"/> NO</p> <p>Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.</p>
<p>Did you answer "Yes" to</p> <p>Narrative Rating No. 5</p>	<p>YES</p> <p>Wetland is categorized as a Category 1 wetland</p>	<p><input checked="" type="radio"/> NO</p> <p>Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM</p>
<p>Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?</p>	<p><input checked="" type="radio"/> YES</p> <p>Wetland is assigned to the appropriate category based on the scoring range</p>	<p>NO</p> <p>If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.</p>
<p>Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?</p>	<p>YES</p> <p>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria</p>	<p><input checked="" type="radio"/> NO</p> <p>Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc. and a consideration of the narrative criteria in OAC rule 3745-1-54(C).</p>
<p>Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?</p>	<p>YES</p> <p>Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form</p>	<p><input checked="" type="radio"/> NO</p> <p>Wetland is assigned to category as determined by the ORAM.</p> <p>A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.</p>

Final Category

Choose one **Category 1** Category 2 Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Version 5.0	Ohio Rapid Assessment Method for Wetlands 10 Page Form for Wetland Categorization	
	Background Information Scoring Boundary Worksheet Narrative Rating Field Form Quantitative Rating ORAM Summary Worksheet Wetland Categorization Worksheet	Ohio EPA, Division of Surface Water Final: February 1, 2001

Instructions

The investigator is *STRONGLY URGED* to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is *VERY IMPORTANT* to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at: <http://www.epa.ohio.gov/dsw/wetlands/WetlandEcologySection.aspx>

Background Information

Name: Scott Bush, PWS	
Date: 12-2-2019	
Affiliation: GHD Services Inc.	
Address: 410 Eagleview Blvd., STE 110. Exton, PA 19341	
Phone Number: 610-646-7486	
e-mail address: scott.bush@ghd.com	
Name of Wetland: <small>Wetland W</small>	
Vegetation Communit(ies): PEM	
HGM Class(es): Depression	
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. See attached wetland location map.	
Lat/Long or UTM Coordinate	41.151946, -80.860003
USGS Quad Name	Warren, OH
County	Trumbull
Township	Lordstown
Section and Subsection	
Hydrologic Unit Code	05030103 Mahoning
Site Visit	October and November 2019
National Wetland Inventory Map	USFWS Wetlands Mapper
Ohio Wetland Inventory Map	ODNR GIS
Soil Survey	NRCS Web Soil Survey
Delineation report/map	GHD Dec. 2019

Name of Wetland: Area W	
Wetland Size (acres, hectares):	0.01 acres
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc. See attached site plan.	
Comments, Narrative Discussion, Justification of Category Changes: From at least 1903, the site was historically used for agriculture but contained some small wooded areas. Agriculture appears to have ceased in the 1980s. The site was developed for natural gas in the mid 1990s. Currently, the only structures onsite are a natural gas well, a gas collection lines, a gas meter, and a small oil collection tank. The entire site was logged in 2015. About 75% of the site was clear cut and 25% was selectively logged. The logging resulted in significant rutting and disturbance of the site. The rutting and other logging activities have created depressions and disturbance of the surficial hydrology on the site resulting in newly formed areas of wetland in pockets across the site. These areas are all recovering from the logging in 2015 across the site. Additionally, most of the wetlands are dominated by early successional species typical of recently disturbed sites. Area W is a small wetland formed in depression on gas well pad.	
Final score : 14	Category: 1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	Oak Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinaratum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Wetland W	Rater(s): Scott Bush, PWS	Date: 12/2/2019
------------------------	----------------------------------	------------------------

0	0
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- >50 acres (>20.2ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- 10 to <25 acres (4 to <10.1ha) (4 pts)
- 3 to <10 acres (1.2 to <4ha) (3 pts)
- 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- <0.1 acres (0.04ha) (0 pts)

3	3
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

5	8
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3)
- Precipitation (1)
- Seasonal/Intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- >0.7 (27.6in) (3)
- 0.4 to 0.7m (15.7 to 27.6in) (2)
- <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- 100 year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g. forest), complex (1)
- Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3)
- Seasonally inundated (2)
- Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed	
<ul style="list-style-type: none"> <input type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input 	<ul style="list-style-type: none"> <input type="checkbox"/> point source (nonstormwater) <input checked="" type="checkbox"/> filling/grading <input type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input type="checkbox"/> other <u>gas pad</u>

6	14
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed	
<ul style="list-style-type: none"> <input type="checkbox"/> mowing <input type="checkbox"/> grazing <input type="checkbox"/> clearcutting <input type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment

14

subtotal this page

Site: Wetland W	Rater(s): Scott Bush, PWS	Date: 12/2/2019
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14

subtotal first page

0	14
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max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

0	14
---	----

max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- 0 Aquatic bed
- 1 Emergent
- 0 Shrub
- 0 Forest
- 0 Mudflats
- 0 Open water
- 0 Other _____

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- 0 Vegetated hummocks/tussocks
- 0 Coarse woody debris >15cm (6in)
- 0 Standing dead >25cm (10in) dbh
- 0 Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

14

GRAND TOTAL (max 100 pts)

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <input checked="" type="radio"/> NO	If yes, Category 1.
	Question 6. Bogs	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 7. Fens	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Question 10. Oak Openings	YES <input checked="" type="radio"/> NO	If yes, Category 3	
Question 11. Relict Wet Prairies	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	0	
	Metric 2. Buffers and surrounding land use	3	
	Metric 3. Hydrology	5	
	Metric 4. Habitat	6	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	0	
	TOTAL SCORE	14	Category based on score breakpoints 1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10</p>	<p>YES</p> <p>Wetland is categorized as a Category 3 wetland</p>	<input checked="" type="radio"/> NO	<p>Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM</p>
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 1, 8b, 9b, 9e, 11</p>	<p>YES</p> <p>Wetland should be evaluated for possible Category 3 status</p>	<input checked="" type="radio"/> NO	<p>Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.</p>
<p>Did you answer "Yes" to</p> <p>Narrative Rating No. 5</p>	<p>YES</p> <p>Wetland is categorized as a Category 1 wetland</p>	<input checked="" type="radio"/> NO	<p>Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM</p>
<p>Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?</p>	<p><input checked="" type="radio"/> YES</p> <p>Wetland is assigned to the appropriate category based on the scoring range</p>	<input type="radio"/> NO	<p>If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.</p>
<p>Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?</p>	<p>YES</p> <p>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria</p>	<input checked="" type="radio"/> NO	<p>Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc. and a consideration of the narrative criteria in OAC rule 3745-1-54(C).</p>
<p>Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?</p>	<p>YES</p> <p>Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form</p>	<input checked="" type="radio"/> NO	<p>A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.</p>

Final Category
 Choose one **Category 1** Category 2 Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Version 5.0	Ohio Rapid Assessment Method for Wetlands 10 Page Form for Wetland Categorization	
	Background Information Scoring Boundary Worksheet Narrative Rating Field Form Quantitative Rating ORAM Summary Worksheet Wetland Categorization Worksheet	Ohio EPA, Division of Surface Water Final: February 1, 2001

Instructions

The investigator is *STRONGLY URGED* to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is *VERY IMPORTANT* to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at: <http://www.epa.ohio.gov/dsw/wetlands/WetlandEcologySection.aspx>

Background Information

Name: Scott Bush, PWS	
Date: 12-2-2019	
Affiliation: GHD Services Inc.	
Address: 410 Eagleview Blvd., STE 110. Exton, PA 19341	
Phone Number: 610-646-7486	
e-mail address: scott.bush@ghd.com	
Name of Wetland: <small>Wetland H</small>	
Vegetation Communit(ies): PEM/SS	
HGM Class(es): Depression	
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. See attached wetland location map.	
Lat/Long or UTM Coordinate	41.151255, -80.858283
USGS Quad Name	Warren, OH
County	Trumbull
Township	Lordstown
Section and Subsection	
Hydrologic Unit Code	05030103 Mahoning
Site Visit	October and November 2019
National Wetland Inventory Map	USFWS Wetlands Mapper
Ohio Wetland Inventory Map	ODNR GIS
Soil Survey	NRCS Web Soil Survey
Delineation report/map	GHD Dec. 2019

Name of Wetland: Area X	
Wetland Size (acres, hectares):	4.86 acres
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc. See attached site plan.	
Comments, Narrative Discussion, Justification of Category Changes: From at least 1903, the site was historically used for agriculture but contained some small wooded areas. Agriculture appears to have ceased in the 1980s. The site was developed for natural gas in the mid 1990s. Currently, the only structures onsite are a natural gas well, a gas collection lines, a gas meter, and a small oil collection tank. The entire site was logged in 2015. About 75% of the site was clear cut and 25% was selectively logged. The logging resulted in significant rutting and disturbance of the site. The rutting and other logging activities have created depressions and disturbance of the surficial hydrology on the site resulting in newly formed areas of wetland in pockets across the site. These areas are all recovering from the logging in 2015 across the site. Additionally, most of the wetlands are dominated by early successional species typical of recently disturbed sites. Area H was subject to clear cutting in 2015.	
Final score : 31	Category: 2

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	Oak Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Wetland X	Rater(s): Scott Bush, PWS	Date: 12/2/2019
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3	3
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- >50 acres (>20.2ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- 10 to <25 acres (4 to <10.1ha) (4 pts)
- 3 to <10 acres (1.2 to <4ha) (3 pts)
- 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- <0.1 acres (0.04ha) (0 pts)

7	10
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

6.5	16.5
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3)
- Precipitation (1)
- Seasonal/Intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- >0.7 (27.6in) (3)
- 0.4 to 0.7m (15.7 to 27.6in) (2)
- <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- 100 year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g. forest), complex (1)
- Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3)
- Seasonally inundated (2)
- Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed	
<input type="checkbox"/> ditch	<input type="checkbox"/> point source (nonstormwater)
<input type="checkbox"/> tile	<input checked="" type="checkbox"/> filling/grading
<input type="checkbox"/> dike	<input type="checkbox"/> road bed/RR track
<input type="checkbox"/> weir	<input type="checkbox"/> dredging
<input type="checkbox"/> stormwater input	<input checked="" type="checkbox"/> other <u>Rutting</u>

6.5	23
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed	
<input type="checkbox"/> mowing	<input checked="" type="checkbox"/> shrub/sapling removal
<input type="checkbox"/> grazing	<input type="checkbox"/> herbaceous/aquatic bed removal
<input checked="" type="checkbox"/> clearcutting	<input type="checkbox"/> sedimentation
<input type="checkbox"/> selective cutting	<input type="checkbox"/> dredging
<input type="checkbox"/> woody debris removal	<input type="checkbox"/> farming
<input type="checkbox"/> toxic pollutants	<input type="checkbox"/> nutrient enrichment

23

subtotal this page

Site: Wetland X	Rater(s): Scott Bush, PWS	Date: 12/2/2019
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23

subtotal first page

0	23
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max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

8	31
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max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- 0 Aquatic bed
- 2 Emergent
- 2 Shrub
- 0 Forest
- 0 Mudflats
- 0 Open water
- 0 Other _____

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- 0 Vegetated hummocks/tussocks
- 1 Coarse woody debris >15cm (6in)
- 0 Standing dead >25cm (10in) dbh
- 1 Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

31

GRAND TOTAL (max 100 pts)

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <input checked="" type="radio"/> NO	If yes, Category 1.
	Question 6. Bogs	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 7. Fens	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Question 10. Oak Openings	YES <input checked="" type="radio"/> NO	If yes, Category 3	
Question 11. Relict Wet Prairies	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	3	
	Metric 2. Buffers and surrounding land use	7	
	Metric 3. Hydrology	6.5	
	Metric 4. Habitat	6.5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	8	
	TOTAL SCORE	31	Category based on score breakpoints 2

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10</p>	<p>YES</p> <p>Wetland is categorized as a Category 3 wetland</p>	<input checked="" type="radio"/> NO	<p>Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM</p>
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 1, 8b, 9b, 9e, 11</p>	<p>YES</p> <p>Wetland should be evaluated for possible Category 3 status</p>	<input checked="" type="radio"/> NO	<p>Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.</p>
<p>Did you answer "Yes" to</p> <p>Narrative Rating No. 5</p>	<p>YES</p> <p>Wetland is categorized as a Category 1 wetland</p>	<input checked="" type="radio"/> NO	<p>Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM</p>
<p>Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?</p>	<p><input checked="" type="radio"/> YES</p> <p>Wetland is assigned to the appropriate category based on the scoring range</p>	<input type="radio"/> NO	<p>If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.</p>
<p>Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?</p>	<p>YES</p> <p>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria</p>	<input checked="" type="radio"/> NO	<p>Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc. and a consideration of the narrative criteria in OAC rule 3745-1-54(C).</p>
<p>Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?</p>	<p>YES</p> <p>Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form</p>	<input checked="" type="radio"/> NO	<p>A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.</p>

Final Category

Choose one
 Category 1
 Category 2
 Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Version 5.0	Ohio Rapid Assessment Method for Wetlands 10 Page Form for Wetland Categorization	
	Background Information Scoring Boundary Worksheet Narrative Rating Field Form Quantitative Rating ORAM Summary Worksheet Wetland Categorization Worksheet	Ohio EPA, Division of Surface Water Final: February 1, 2001

Instructions

The investigator is *STRONGLY URGED* to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is *VERY IMPORTANT* to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at: <http://www.epa.ohio.gov/dsw/wetlands/WetlandEcologySection.aspx>

Background Information

Name: Scott Bush, PWS	
Date: 12-2-2019	
Affiliation: GHD Services Inc.	
Address: 410 Eagleview Blvd., STE 110. Exton, PA 19341	
Phone Number: 610-646-7486	
e-mail address: scott.bush@ghd.com	
Name of Wetland: <small>Wetland Y</small>	
Vegetation Communit(ies): PEM	
HGM Class(es): Depression	
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. See attached wetland location map.	
Lat/Long or UTM Coordinate	41.151991, -80.857533
USGS Quad Name	Warren, OH
County	Trumbull
Township	Lordstown
Section and Subsection	
Hydrologic Unit Code	05030103 Mahoning
Site Visit	October and November 2019
National Wetland Inventory Map	USFWS Wetlands Mapper
Ohio Wetland Inventory Map	ODNR GIS
Soil Survey	NRCS Web Soil Survey
Delineation report/map	GHD Dec. 2019

Name of Wetland: Area Y	
Wetland Size (acres, hectares):	0.01 acres
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc. See attached site plan.	
Comments, Narrative Discussion, Justification of Category Changes: From at least 1903, the site was historically used for agriculture but contained some small wooded areas. Agriculture appears to have ceased in the 1980s. The site was developed for natural gas in the mid 1990s. Currently, the only structures onsite are a natural gas well, a gas collection lines, a gas meter, and a small oil collection tank. The entire site was logged in 2015. About 75% of the site was clear cut and 25% was selectively logged. The logging resulted in significant rutting and disturbance of the site. The rutting and other logging activities have created depressions and disturbance of the surficial hydrology on the site resulting in newly formed areas of wetland in pockets across the site. These areas are all recovering from the logging in 2015 across the site. Additionally, most of the wetlands are dominated by early successional species typical of recently disturbed sites. Area Y is located in ditch along the access road.	
Final score : 18.5	Category: 1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	Oak Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Wetland Y	Rater(s): Scott Bush, PWS	Date: 12/2/2019
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0	0
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- >50 acres (>20.2ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- 10 to <25 acres (4 to <10.1ha) (4 pts)
- 3 to <10 acres (1.2 to <4ha) (3 pts)
- 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- <0.1 acres (0.04ha) (0 pts)

4	4
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

8	12
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3)
- Precipitation (1)
- Seasonal/Intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- >0.7 (27.6in) (3)
- 0.4 to 0.7m (15.7 to 27.6in) (2)
- <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- 100 year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g. forest), complex (1)
- Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3)
- Seasonally inundated (2)
- Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed	
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input 	<ul style="list-style-type: none"> <input type="checkbox"/> point source (nonstormwater) <input type="checkbox"/> filling/grading <input checked="" type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input checked="" type="checkbox"/> other_ in roadside ditch

5.5	17.5
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed	
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> mowing <input type="checkbox"/> grazing <input checked="" type="checkbox"/> clearcutting <input type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants 	<ul style="list-style-type: none"> <input type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment

17.5
subtotal this page

Site: Wetland Y	Rater(s): Scott Bush, PWS	Date: 12/2/2019
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17.5

subtotal first page

0

17.5

max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

1

18.5

max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- 0 Aquatic bed
- 1 Emergent
- 0 Shrub
- 0 Forest
- 0 Mudflats
- 0 Open water
- 0 Other _____

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- 0 Vegetated hummocks/tussocks
- 0 Coarse woody debris >15cm (6in)
- 0 Standing dead >25cm (10in) dbh
- 0 Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

18.5

GRAND TOTAL (max 100 pts)

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <input checked="" type="radio"/> NO	If yes, Category 1.
	Question 6. Bogs	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 7. Fens	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Question 10. Oak Openings	YES <input checked="" type="radio"/> NO	If yes, Category 3	
Question 11. Relict Wet Prairies	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	0	
	Metric 2. Buffers and surrounding land use	4	
	Metric 3. Hydrology	8	
	Metric 4. Habitat	5.5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	1	
	TOTAL SCORE	18.5	Category based on score breakpoints ¹

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one	Evaluation of Categorization Result of ORAM
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10</p>	<p>YES</p> <p>Wetland is categorized as a Category 3 wetland</p>	<p><input checked="" type="radio"/> NO</p> <p>Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM</p>
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 1, 8b, 9b, 9e, 11</p>	<p>YES</p> <p>Wetland should be evaluated for possible Category 3 status</p>	<p><input checked="" type="radio"/> NO</p> <p>Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.</p>
<p>Did you answer "Yes" to</p> <p>Narrative Rating No. 5</p>	<p>YES</p> <p>Wetland is categorized as a Category 1 wetland</p>	<p><input checked="" type="radio"/> NO</p> <p>Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM</p>
<p>Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?</p>	<p><input checked="" type="radio"/> YES</p> <p>Wetland is assigned to the appropriate category based on the scoring range</p>	<p>NO</p> <p>If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.</p>
<p>Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?</p>	<p>YES</p> <p>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria</p>	<p><input checked="" type="radio"/> NO</p> <p>Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc. and a consideration of the narrative criteria in OAC rule 3745-1-54(C).</p>
<p>Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?</p>	<p>YES</p> <p>Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form</p>	<p><input checked="" type="radio"/> NO</p> <p>Wetland is assigned to category as determined by the ORAM.</p> <p>A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.</p>

Final Category

Choose one **Category 1** Category 2 Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Version 5.0	Ohio Rapid Assessment Method for Wetlands 10 Page Form for Wetland Categorization	
	Background Information Scoring Boundary Worksheet Narrative Rating Field Form Quantitative Rating ORAM Summary Worksheet Wetland Categorization Worksheet	Ohio EPA, Division of Surface Water Final: February 1, 2001

Instructions

The investigator is *STRONGLY URGED* to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is *VERY IMPORTANT* to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at: <http://www.epa.ohio.gov/dsw/wetlands/WetlandEcologySection.aspx>

Background Information

Name: Scott Bush, PWS	
Date: 12-2-2019	
Affiliation: GHD Services Inc.	
Address: 410 Eagleview Blvd., STE 110. Exton, PA 19341	
Phone Number: 610-646-7486	
e-mail address: scott.bush@ghd.com	
Name of Wetland: <small>Wetland Z</small>	
Vegetation Communit(ies): PEM/FO	
HGM Class(es): Depression	
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. See attached wetland location map.	
Lat/Long or UTM Coordinate	41.154086, -80.861590
USGS Quad Name	Warren, OH
County	Trumbull
Township	Lordstown
Section and Subsection	
Hydrologic Unit Code	05030103 Mahoning
Site Visit	October and November 2019
National Wetland Inventory Map	USFWS Wetlands Mapper
Ohio Wetland Inventory Map	ODNR GIS
Soil Survey	NRCS Web Soil Survey
Delineation report/map	GHD Dec. 2019

Name of Wetland: Area Z	
Wetland Size (acres, hectares):	26.79 acres
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc. See attached site plan.	
Comments, Narrative Discussion, Justification of Category Changes: From at least 1903, the site was historically used for agriculture but contained some small wooded areas. Agriculture appears to have ceased in the 1980s. The site was developed for natural gas in the mid 1990s. Currently, the only structures onsite are a natural gas well, a gas collection lines, a gas meter, and a small oil collection tank. The entire site was logged in 2015. About 75% of the site was clear cut and 25% was selectively logged. The logging resulted in significant rutting and disturbance of the site. The rutting and other logging activities have created depressions and disturbance of the surficial hydrology on the site resulting in newly formed areas of wetland in pockets across the site. These areas are all recovering from the logging in 2015 across the site. Additionally, most of the wetlands are dominated by early successional species typical of recently disturbed sites. Area Z was subject to clear cutting and heavy selective logging in 2015. Drains via ephemeral channel to rail road ditch to the north.	
Final score : 35	Category: 2

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	Oak Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Wetland Z	Rater(s): Scott Bush, PWS	Date: 12/2/2019
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5	5
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- >50 acres (>20.2ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- 10 to <25 acres (4 to <10.1ha) (4 pts)
- 3 to <10 acres (1.2 to <4ha) (3 pts)
- 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- <0.1 acres (0.04ha) (0 pts)

6	11
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

6.5	17.5
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3)
- Precipitation (1)
- Seasonal/Intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- >0.7 (27.6in) (3)
- 0.4 to 0.7m (15.7 to 27.6in) (2)
- <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- 100 year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g. forest), complex (1)
- Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3)
- Seasonally inundated (2)
- Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed	
<input type="checkbox"/> ditch	<input type="checkbox"/> point source (nonstormwater)
<input type="checkbox"/> tile	<input checked="" type="checkbox"/> filling/grading
<input type="checkbox"/> dike	<input checked="" type="checkbox"/> road bed/RR track
<input type="checkbox"/> weir	<input type="checkbox"/> dredging
<input type="checkbox"/> stormwater input	<input checked="" type="checkbox"/> other <u>Rutting</u>

7.5	25
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed	
<input type="checkbox"/> mowing	<input checked="" type="checkbox"/> shrub/sapling removal
<input type="checkbox"/> grazing	<input type="checkbox"/> herbaceous/aquatic bed removal
<input checked="" type="checkbox"/> clearcutting	<input type="checkbox"/> sedimentation
<input checked="" type="checkbox"/> selective cutting	<input type="checkbox"/> dredging
<input type="checkbox"/> woody debris removal	<input type="checkbox"/> farming
<input type="checkbox"/> toxic pollutants	<input type="checkbox"/> nutrient enrichment

25

subtotal this page

Site: Wetland Z	Rater(s): Scott Bush, PWS	Date: 12/2/2019
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25

subtotal first page

0	25
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max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

10	35
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max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- 0 Aquatic bed
- 2 Emergent
- 1 Shrub
- 1 Forest
- 0 Mudflats
- 0 Open water
- 0 Other _____

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- 1 Vegetated hummocks/tussocks
- 2 Coarse woody debris >15cm (6in)
- 0 Standing dead >25cm (10in) dbh
- 1 Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

35

GRAND TOTAL (max 100 pts)

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <input checked="" type="radio"/> NO	If yes, Category 1.
	Question 6. Bogs	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 7. Fens	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Question 10. Oak Openings	YES <input checked="" type="radio"/> NO	If yes, Category 3	
Question 11. Relict Wet Prairies	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	5	
	Metric 2. Buffers and surrounding land use	6	
	Metric 3. Hydrology	6.5	
	Metric 4. Habitat	7.5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	10	
	TOTAL SCORE	35	Category based on score breakpoints 2

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10</p>	<p>YES</p> <p>Wetland is categorized as a Category 3 wetland</p>	<input checked="" type="radio"/> NO	<p>Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM</p>
<p>Did you answer "Yes" to any of the following questions:</p> <p>Narrative Rating Nos. 1, 8b, 9b, 9e, 11</p>	<p>YES</p> <p>Wetland should be evaluated for possible Category 3 status</p>	<input checked="" type="radio"/> NO	<p>Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.</p>
<p>Did you answer "Yes" to</p> <p>Narrative Rating No. 5</p>	<p>YES</p> <p>Wetland is categorized as a Category 1 wetland</p>	<input checked="" type="radio"/> NO	<p>Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM</p>
<p>Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?</p>	<p><input checked="" type="radio"/> YES</p> <p>Wetland is assigned to the appropriate category based on the scoring range</p>	<input type="radio"/> NO	<p>If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.</p>
<p>Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?</p>	<p>YES</p> <p>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria</p>	<input checked="" type="radio"/> NO	<p>Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc. and a consideration of the narrative criteria in OAC rule 3745-1-54(C).</p>
<p>Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?</p>	<p>YES</p> <p>Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form</p>	<input checked="" type="radio"/> NO	<p>A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.</p>

Final Category
 Choose one Category 1 Category 2 Category 3

End of Ohio Rapid Assessment Method for Wetlands.

SITE NAME/LOCATION Project Magellan East. Lordstown, Trumbull County, OH
Class II Modified SITE NUMBER 1 RIVER BASIN Mahoning DRAINAGE AREA (mi²) 0.097
 LENGTH OF STREAM REACH (ft) 155 LAT. 41.15564 LONG. -80.86178 RIVER CODE _____ RIVER MILE 0.00
 DATE Dec 2, 2019 SCORER Scott Bush COMMENTS HHEI Score

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY
 Channel along tracks and culvert under railroad bed

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<u>0.0%</u>	<input type="checkbox"/> SILT [3 pt]	<u>10.0%</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<u>0.0%</u>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<u>5.0%</u>
<input type="checkbox"/> BEDROCK [16 pt]	<u>0.0%</u>	<input type="checkbox"/> FINE DETRITUS [3 pts]	<u>0.0%</u>
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>5.0%</u>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<u>30.0%</u>
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<u>30.0%</u>	<input type="checkbox"/> MUCK [0 pts]	<u>0.0%</u>
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<u>20.0%</u>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<u>0.0%</u>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 5.0% (A)

Substrate Percentage Check 100% (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9

TOTAL NUMBER OF SUBSTRATE TYPES: 6

HHEI Metric Points

Substrate Max = 40

15

A + B

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS Channel was dry at time of evaluation

MAXIMUM POOL DEPTH (centimeters): 0.0

Pool Depth Max = 30

0

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters [30 pts]	<input checked="" type="checkbox"/> > 1.0 m - 1.5 m [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m [25 pts]	<input type="checkbox"/> ≤ 1.0 m [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m [20 pts]	

COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): 1.25

Bankfull Width Max=30

15

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

RIPARIAN WIDTH		FLOODPLAIN QUALITY			
L	R	L	R	L	R
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(Per Bank)	Wide >10m	(Most Predominant per Bank)	Mature Forest, Wetland	Conservation Tillage	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Moderate 5-10m		Immature Forest, Shrub or Old Field	Urban or Industrial	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Narrow <5m		Residential, Park, New Field	Open Pasture, Row Crop	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	None		Fenced Pasture	Mining or Construction	

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input checked="" type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input checked="" type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - Yes No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Mud Creek Distance from Evaluated Stream 2,250.00
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: Warren NRCS Soil Map Page: 1 NRCS Soil Map Stream Order 1
County: Trumbull Township / City: Lordstown

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: Sep 24, 2019 Quantity: 0.20
Photograph Information: See attached photos
Elevated Turbidity? (Y/N): N Canopy (% open): 5%
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts: _____
Channel is incised and headcutting. Upstream area logged.

BIOTIC EVALUATION

Performed? (Y/N): Y (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N
Comments Regarding Biology: _____
Ephemeral channel. Does not support long lived aquatic organisms.

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW →



PHWH STREAM BIOLOGICAL CHARACTERISTICS FIELD SHEET:

1. Fish: Voucher Specimens Retained? (select) **N** Time Spent (minutes): _____
 Sample Method No Evaluation Stream Length Assessed (meters) _____

Species	Number Caught	Notes
Blank	0	
Blank	0	
Blank	0	
Blank	0	
	0	
	0	
	0	
	0	

2. Salamanders: Voucher Specimens Retained? (circle) **N** Time Spent (minutes): _____
 Sample Method No Evaluation Stream Length Assessed (meters) _____

Species (Genus)	# Larvae	# Juveniles/Adults	Total Number
Mountain Dusky (<i>Desmognathus ochrophaeus</i>)	0	0	0
Northern Dusky (<i>Desmognathus fuscus</i>)	0	0	0
Two-lined (<i>Eurycea bislineata</i>)	0	0	0
Long-tailed (<i>Eurycea longicauda</i>)	0	0	0
Cave (<i>Eurycea lucifuga</i>)	0	0	0
Red (<i>Pseudotriton ruber</i>)	0	0	0
Mud (<i>Pseudotriton montanus</i>)	0	0	0
Spring (<i>Gyrinophilus porphyriticus</i>)	0	0	0
Mole spp. (<i>Ambystoma spp.</i>)	0	0	0
Four-toed (<i>Hemidactylium scutatum</i>)	0	0	0
Other (name)	0	0	0
Total	0	0	0

Notes on Vertebrates: _____

3. Macroinvertebrate Scoring Sheet:

THE HEADWATER MACROINVERTEBRATE FIELD EVALUATION INDEX (HMFEI) SCORING SHEET

Indicate Abundance of Each Taxa Above each White Box.

Record HMFEI Scoring Value Points Within each Box.

For EPT taxa, also indicate the different taxa present.

Key: V = Very Abundant (> 50); A = Abundant (10 -50); C = Common (3 -9); R = Rare (< 3)

Sessile Animals (Porifera, Cnidaria, Bryozoa) NA <input type="text" value="0"/> (HMFEI pts = 1)	Crayfish (Decapoda) NA <input type="text" value="0"/> (HMFEI pts = 2)	Fishfly Larvae (Corydalidae) NA <input type="text" value="0"/> (HMFEI pts = 3)
Aquatic Worms (Turbellaria, Hirudinea, Oligochaeta) NA <input type="text" value="0"/> (HMFEI pts = 1)	Dragonfly Nymphs (Anisoptera) NA <input type="text" value="0"/> (HMFEI pts = 2)	Water Penny Beetles (Psephenidae) NA <input type="text" value="0"/> (HMFEI pts = 3)
Sow Bugs (Isopoda) NA <input type="text" value="0"/> (HMFEI pts = 1)	Riffle Beetles (Dryopidae, Elmidae, Ptilodactylidae) NA <input type="text" value="0"/> (HMFEI pts = 2)	Crane-fly Larvae (Tipulidae) NA <input type="text" value="0"/> (HMFEI pts = 3)
Scuds (Amphipoda) NA <input type="text" value="0"/> (HMFEI pts = 1)	Larvae of other Flies (enter name in comments) (Diptera): NA <input type="text" value="0"/> (HMFEI pts = 1)	EPT TAXA* Total No. EPT Taxa = <input type="text" value="0"/>
Water Mites (Hydracarina) NA <input type="text" value="0"/> (HMFEI pts = 1)	Midges (Chironomidae) NA <input type="text" value="0"/> (HMFEI pts = 1)	Mayfly Nymphs (Ephemeroptera) Taxa Present: <input type="text" value="0"/> HMFEI pts = <input type="text" value="0"/> No. Taxa (x) 3] <input type="text" value="0"/>
Damselfly Nymphs (Zygoptera) NA <input type="text" value="0"/> (HMFEI pts = 1)	Snails (Gastropoda) NA <input type="text" value="0"/> (HMFEI pts = 1)	
Alderfly Larvae (Sialidae) NA <input type="text" value="0"/> (HMFEI pts = 1)	Clams (Bivalvia) NA <input type="text" value="0"/> (HMFEI pts = 1)	Stonefly Nymphs (Plecoptera) Taxa Present: <input type="text" value="0"/> HMFEI pts = <input type="text" value="0"/> No. Taxa (x) 3] <input type="text" value="0"/>
Other Beetles (Coleoptera) NA <input type="text" value="0"/> (HMFEI pts = 1)	Other Taxa :	
Other Taxa:	Other Taxa:	Caddisfly Larvae (Trichoptera) Taxa Present: <input type="text" value="0"/> HMFEI pts = <input type="text" value="0"/> No. Taxa (x) 3] <input type="text" value="0"/>
Other Taxa:	Other Taxa	

*Note: EPT identification based upon Family or Genus level of taxonomy

Voucher Sample ID _____

Time Spent (minutes): _____

Notes on Macroinvertebrates: (Predominant Organisms; Other Common Organisms; Diversity Estimate)

Final HMFEI Calculated Score (Sum of All White Box Scores) =

IF Final HMFEI Score is > 19, Then CLASS III PHWH STREAM
 IF Final HMFEI Score is 7 to 19, Then CLASS II PHWH STREAM
 IF Final HMFEI Score is < 7, Then CLASS I PHWH STREAM

Save Data

Reset Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION Project Magellan East. Lordstown, Trumbull County, OH
Class I Modified SITE NUMBER 2 RIVER BASIN Mahoning DRAINAGE AREA (mi²) 0.100
LENGTH OF STREAM REACH (ft) 50 LAT. 41.15674 LONG. -80.86717 RIVER CODE N/A RIVER MILE 0.00
DATE Dec 13, 2019 SCORER Scott Bush COMMENTS HHEI Score

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

Table with columns: TYPE, PERCENT, TYPE, PERCENT. Rows include BLDR SLABS, BOULDER, BEDROCK, COBBLE, GRAVEL, SAND, SILT, LEAF PACK/WOODY DEBRIS, FINE DETRITUS, CLAY or HARDPAN, MUCK, ARTIFICIAL.

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 5.0%

Substrate Percentage Check 100%

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9

TOTAL NUMBER OF SUBSTRATE TYPES: 6

HHEI Metric Points

Substrate Max = 40

15

A + B

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

Table with columns: TYPE, PERCENT. Rows include > 30 centimeters, > 22.5 - 30 cm, > 10 - 22.5 cm, > 5 cm - 10 cm, < 5 cm, NO WATER OR MOIST CHANNEL.

Pool Depth Max = 30

5

COMMENTS Small ephemeral channel dominated by soil

MAXIMUM POOL DEPTH (centimeters): 5.0

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

Table with columns: TYPE, PERCENT. Rows include > 4.0 meters, > 3.0 m - 4.0 m, > 1.5 m - 3.0 m, > 1.0 m - 1.5 m, < 1.0 m.

Bankfull Width Max=30

5

COMMENTS This is the north end of man-made ditch

AVERAGE BANKFULL WIDTH (meters): 1.25

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

Table with columns: RIPARIAN WIDTH, FLOODPLAIN QUALITY. Rows include Wide >10m, Moderate 5-10m, Narrow <5m, None, Mature Forest, Wetland, Immature Forest, Shrub or Old Field, Residential, Park, New Field, Fenced Pasture, Conservation Tillage, Urban or Industrial, Open Pasture, Row Crop, Mining or Construction.

COMMENTS

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

Table with columns: TYPE, PERCENT. Rows include Stream Flowing, Subsurface flow with isolated pools (Interstitial), Moist Channel, isolated pools, no flow (Intermittent), Dry channel, no water (Ephemeral).

COMMENTS Flowing in response to recent rain events. Channel does not normally have base flow.

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

Table with columns: TYPE, PERCENT. Rows include None, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, >3.

STREAM GRADIENT ESTIMATE

Table with columns: TYPE, PERCENT. Rows include Flat (0.5 ft/100 ft), Flat to Moderate, Moderate (2 ft/100 ft), Moderate to Severe, Severe (10 ft/100 ft).

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - Yes No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Mud Creek Distance from Evaluated Stream 2,250.00
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: Warren NRCS Soil Map Page: 1 NRCS Soil Map Stream Order: 1
 County: Trumbull Township / City: Lordstown

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: Dec 10, 2019 Quantity: 1.00
 Photograph Information: See attached photos
 Elevated Turbidity? (Y/N): N Canopy (% open): 60%
 Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____
 Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____
 Is the sampling reach representative of the stream (Y/N): Y If not, please explain: _____

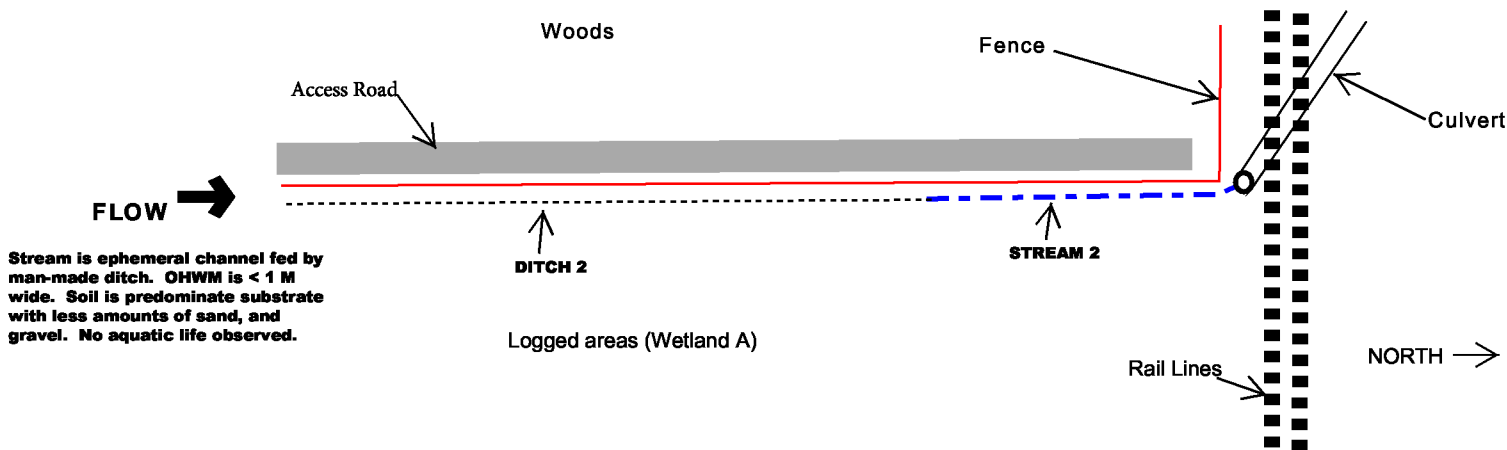
Additional comments/description of pollution impacts: _____
Channel is a historical ditch. Upstream areas logged.

BIOTIC EVALUATION

Performed? (Y/N): Y (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
 Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
 Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N
 Comments Regarding Biology: _____
Ephemeral channel. Does not support long-lived aquatic organisms.

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



Stream is ephemeral channel fed by man-made ditch. OHWM is < 1 M wide. Soil is predominate substrate with less amounts of sand, and gravel. No aquatic life observed.



PHWH STREAM BIOLOGICAL CHARACTERISTICS FIELD SHEET:

1. Fish: Voucher Specimens Retained? (select) **N** Time Spent (minutes): _____
 Sample Method No Evaluation Stream Length Assessed (meters) _____

Species	Number Caught	Notes
Blank	0	
Blank	0	
Blank	0	
Blank	0	
	0	
	0	
	0	
	0	

2. Salamanders: Voucher Specimens Retained? (circle) **N** Time Spent (minutes): _____
 Sample Method No Evaluation Stream Length Assessed (meters) _____

Species (Genus)	# Larvae	# Juveniles/Adults	Total Number
Mountain Dusky (<i>Desmognathus ochrophaeus</i>)	0	0	0
Northern Dusky (<i>Desmognathus fuscus</i>)	0	0	0
Two-lined (<i>Eurycea bislineata</i>)	0	0	0
Long-tailed (<i>Eurycea longicauda</i>)	0	0	0
Cave (<i>Eurycea lucifuga</i>)	0	0	0
Red (<i>Pseudotriton ruber</i>)	0	0	0
Mud (<i>Pseudotriton montanus</i>)	0	0	0
Spring (<i>Gyrinophilus porphyriticus</i>)	0	0	0
Mole spp. (<i>Ambystoma spp.</i>)	0	0	0
Four-toed (<i>Hemidactylium scutatum</i>)	0	0	0
Other (name)	0	0	0
Total	0	0	0

Notes on Vertebrates: _____

3. Macroinvertebrate Scoring Sheet:

THE HEADWATER MACROINVERTEBRATE FIELD EVALUATION INDEX (HMFEI) SCORING SHEET

Indicate Abundance of Each Taxa Above each White Box.

Record HMFEI Scoring Value Points Within each Box.

For EPT taxa, also indicate the different taxa present.

Key: V = Very Abundant (> 50); A = Abundant (10 -50); C = Common (3 -9); R = Rare (< 3)

Sessile Animals (Porifera, Cnidaria, Bryozoa) (HMFEI pts = 1) NA <input type="text" value="0"/>	Crayfish (Decapoda) (HMFEI pts = 2) NA <input type="text" value="0"/>	Fishfly Larvae (Corydalidae) (HMFEI pts = 3) NA <input type="text" value="0"/>
Aquatic Worms (Turbellaria, Hirudinea, Oligochaeta) (HMFEI pts = 1) NA <input type="text" value="0"/>	Dragonfly Nymphs (Anisoptera) (HMFEI pts = 2) NA <input type="text" value="0"/>	Water Penny Beetles (Psephenidae) (HMFEI pts = 3) NA <input type="text" value="0"/>
Sow Bugs (Isopoda) (HMFEI pts = 1) NA <input type="text" value="0"/>	Riffle Beetles (Dryopidae, Elmidae, Ptilodactylidae) (HMFEI pts = 2) NA <input type="text" value="0"/>	Cranefly Larvae (Tipulidae) (HMFEI pts = 3) NA <input type="text" value="0"/>
Scuds (Amphipoda) (HMFEI pts = 1) NA <input type="text" value="0"/>	Larvae of other Flies (enter name in comments) (Diptera): (HMFEI pts = 1) NA <input type="text" value="0"/>	EPT TAXA* Total No. EPT Taxa = <input type="text" value="0"/>
Water Mites (Hydracarina) (HMFEI pts = 1) NA <input type="text" value="0"/>	Midges (Chironomidae) (HMFEI pts = 1) NA <input type="text" value="0"/>	Mayfly Nymphs (Ephemeroptera) Taxa Present: <input type="text" value="0"/> HMFEI pts = <input type="text" value="0"/> No. Taxa (x) 3] NA <input type="text" value="0"/>
Damselfly Nymphs (Zygoptera) (HMFEI pts = 1) NA <input type="text" value="0"/>	Snails (Gastropoda) (HMFEI pts = 1) NA <input type="text" value="0"/>	
Alderfly Larvae (Sialidae) (HMFEI pts = 1) NA <input type="text" value="0"/>	Clams (Bivalvia) (HMFEI pts = 1) NA <input type="text" value="0"/>	Stonefly Nymphs (Plecoptera) Taxa Present: <input type="text" value="0"/> HMFEI pts = <input type="text" value="0"/> No. Taxa (x) 3] NA <input type="text" value="0"/>
Other Beetles (Coleoptera) (HMFEI pts = 1) NA <input type="text" value="0"/>	Other Taxa :	
Other Taxa:	Other Taxa:	Caddisfly Larvae (Trichoptera) Taxa Present: <input type="text" value="0"/> HMFEI pts = <input type="text" value="0"/> No. Taxa (x) 3] NA <input type="text" value="0"/>
Other Taxa:	Other Taxa	

*Note: EPT identification based upon Family or Genus level of taxonomy

Voucher Sample ID _____

Time Spent (minutes): _____

Notes on Macroinvertebrates: (Predominant Organisms; Other Common Organisms; Diversity Estimate)

Final HMFEI Calculated Score (Sum of All White Box Scores) =

IF Final HMFEI Score is > 19, Then CLASS III PHWH STREAM
 IF Final HMFEI Score is 7 to 19, Then CLASS II PHWH STREAM
 IF Final HMFEI Score is < 7, Then CLASS I PHWH STREAM

Save Data

Reset Form

APPENDIX C

C1 – USACE Jurisdictional Determination

C2 – USACE Public Notice



APPENDIX C1

USACE Jurisdictional Determination



The preliminary jurisdictional determination will be provided as soon as it is received from the USACE.

APPENDIX C2

USACE Public Notice



The USACE Public Notice will be provided as soon as it is received from the USACE.

APPENDIX D

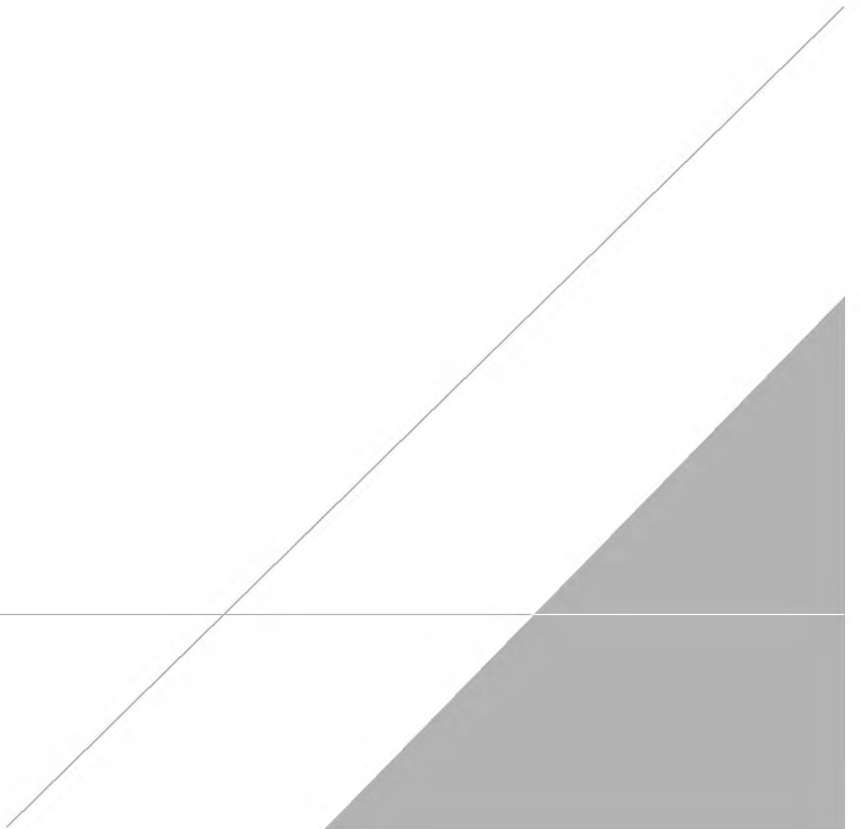
D1 – ODNR Submission Letter

D2 – ODNR Correspondence



APPENDIX D1

ODNR Submission Letter





October 15, 2019

Reference No. 11203468

Ohio Department of Natural Resources, Division of Wildlife
2045 Morse Road, Building G
Columbus, Ohio 43229-6693

Re: Request for Environmental Review
Project Magellan – Parcel B
State Route 25 (Tod Ave SW)
Village of Lordstown, Trumbull County, Ohio

Dear Sir or Madam:

GHD Services Inc. (GHD) has been retained to evaluate a 158.22-acre parcel located on the west side of Tod Ave. in the Village of Lordstown, Trumbull County for potential future industrial development. The use of this Site may require a Department of the Army Section 404 permit and ODNR Water Quality Certification. We are therefore requesting your Environmental Review of the project site.

Site Location

The Site is located in the Village of Lordstown, Trumbull County, Ohio. The location of the Site is shown on the Warren, Ohio USGS quadrangle map provided as Figure 1. The Cartesian coordinates for the approximate center of the Site are 41.152162°, -80.863396° WGS 84. An ALTA survey plan of the property is provided as Figure 2. The Site is identified as Parcel B on Figure 2. The Site is surrounded by industrial uses including the GM Lordstown Assembly Plant to the west, railroad sidings to the north, Magna Seating Systems to the east, and Cassens Transport Company parking areas to the south. A .kmz shape file of the site is attached to this submittal.

Site History

From at least 1903, the site was historically used for row crops but contained some small wooded areas. Agriculture appears to have ceased in the 1980s and the site was colonized by successional trees and shrubs over time. The site was developed for natural gas in the mid 1990s when a well pad and gas collection system were constructed. Currently, the only structures onsite are a natural gas well, gas collection lines, a gas meter, and a small oil collection tank. The entire site was logged in 2015 and significantly disturbed. Most of the site was clear cut and now consists of herbaceous field dominated by native and non-native forbs and successional shrubs. Smaller portions of the Site were selectively logged. The selectively logged areas continue to have some tree and shrub cover but the density of trees was significantly reduced by the 2015 logging. A series of historical aerial photographs depicting the Site history are provided as Figure 3A-3J.

Proposed Work

A new industrial manufacturing facility is contemplated on this Site. Approximately 80 to 90 percent of the Site would be developed. Rail, highway, and secondary access to the Site is nearby and available. Work would include all earthwork, building construction, and stormwater management required for a large industrial development.

Onsite Habitats

Onsite habitats include the following:

- Selectively logged hardwood uplands. Approximately 20 Acres
- Selectively logged palustrine forested wetlands. Approximately 18 Acres
- Early successional palustrine emergent wetlands. Approximately 22.79 Acres
- Early successional upland herbaceous field. Approximately 109.4 Acres
- Three segments of ephemeral watercourse. Stream 1 - 2,598L.F., Stream 2 - 374 L.F., 68 L.F.

All of the habitats onsite have been significantly disturbed by logging conducted under an approved logging plan in 2015. Photographs showing the existing habitats on the Site and a Photograph Key Map are provided in Attachment 1.

Proposed Impacts

The exact extent of proposed wetland impacts has not yet been determined. However, due to the distribution of wetlands across the Site as a result of the previous logging operations, avoidance of wetland impact is not practicable. A Preliminary Jurisdictional Determination (PJD) was issued for the Site in 2017 (Attachment 1). Based on the extent of wetlands identified in the PJD in 2017, it is likely that work in wetlands would be unavoidable. However, wetland impacts would be avoided where practicable and best management practices would be employed to minimize and mitigate potential impacts. A map showing the extent of wetlands identified in the 2017 PJD is provided as Figure 4.

We look forward to your Environmental Review. If you have any questions, please feel free to contact me at (610) 646-7486 or scott.bush@GHD.com.

Yours truly,

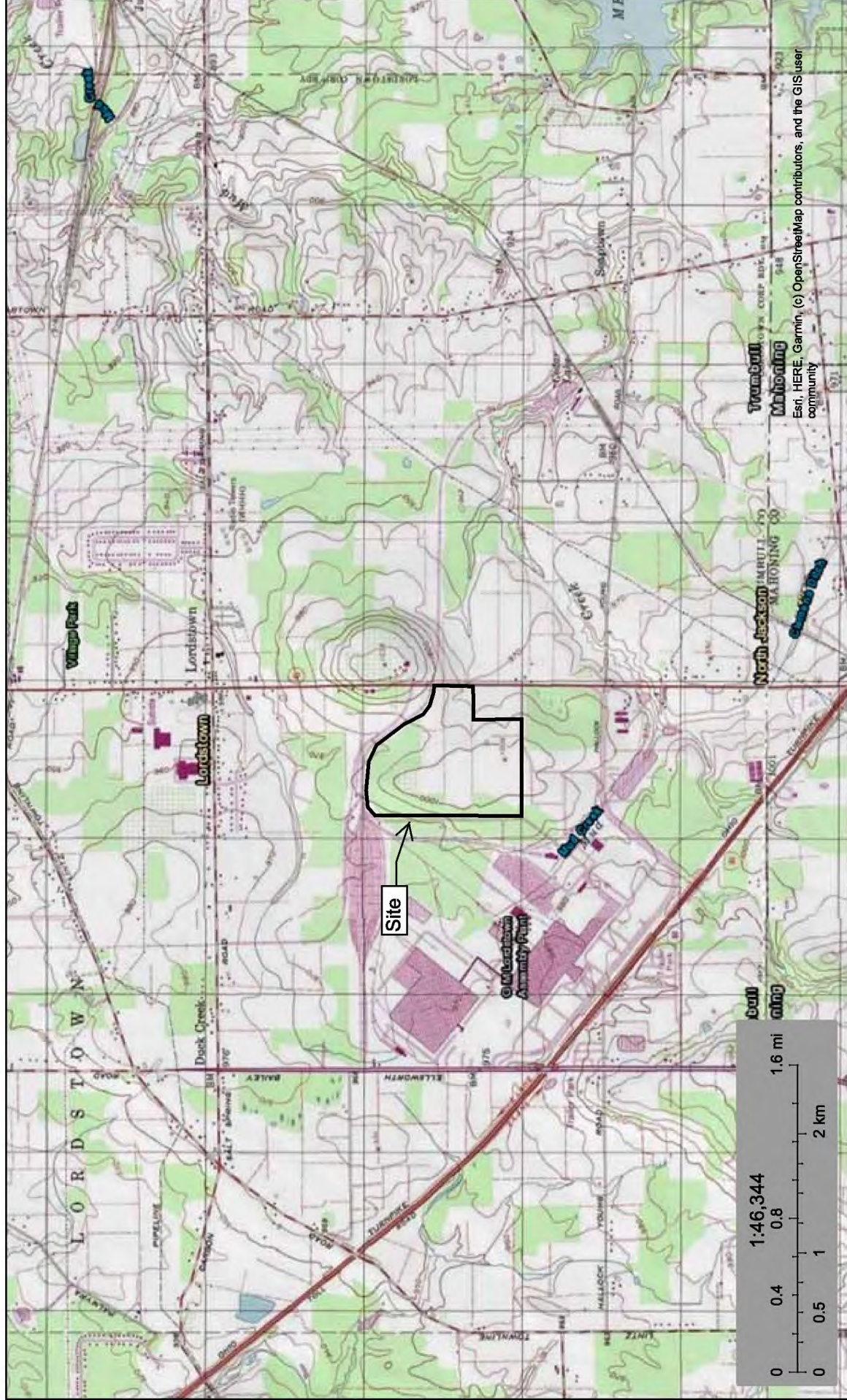


Scott E. Bush, P.W.S.

Enclosures

FIGURES

Project Magellan
Lordstown, Ohio



October 8, 2019

Figure 1
USGS Map

BOUNDARY SURVEY

Situated in the Village of Lordstown, County of Trumbull and State of Ohio, being part of Original Lordstown Township Lot Numbers 64 and 65, and part of Lot No. 1 of the Great Salt Springs Tract

NOTES:

- The monuments referenced herein (found or set) are in good condition and unaltered (unless otherwise noted) as of the recording date. All set pins are 1/4" dia. galv. with an identification cap bearing the number "DENT".
- The monuments referenced herein (found or set) are in good condition and unaltered (unless otherwise noted) as of the recording date. All set pins are 1/4" dia. galv. with an identification cap bearing the number "DENT".
- The surveyor was not provided any documentation, was not made aware, and did not observe, any greater markings on the surveyed property with regard to the environmental assessment or data, was performed on the subject parcel by NVS.
- There are no wetlands on or adjacent to the subject parcel per the National Wetlands Inventory. The subject parcel should not be used as a substitute for an actual field delineation of wetlands.
- Based on Bearings is Grid North, Ohio State Plane Coordinate System, North Zone (S401), NAD 83 (Contus).
- Permitted documents include: Surveys on file at the County Engineer's Office; Deeds and Plats as shown herein; County Tax Maps

ZONING INFORMATION

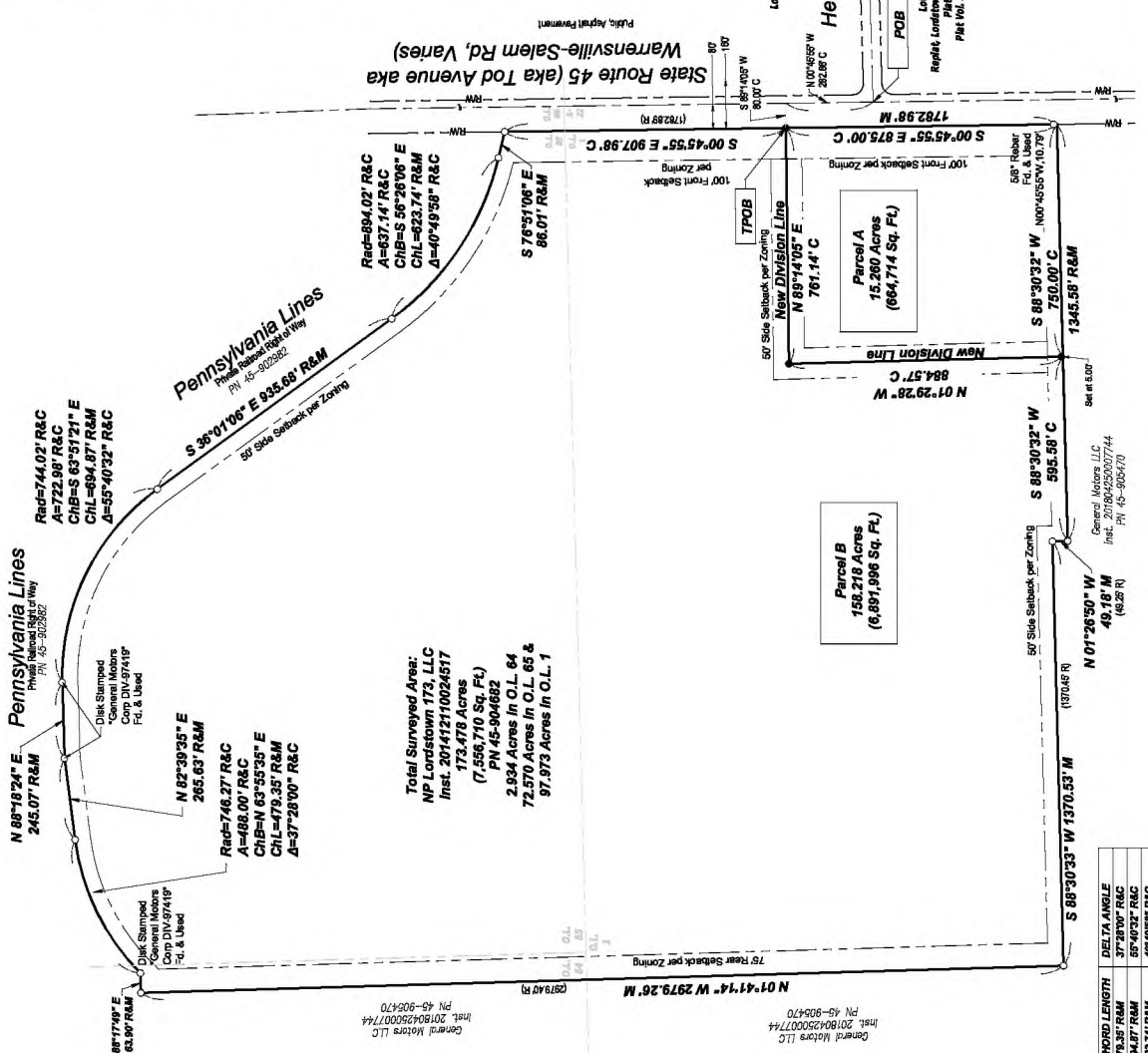
The subject property is zoned "I-1", Industrial District of the Village of Lordstown.

Front Setback: 100'
 Side Setback: 50'
 Rear Setback: 75'

Minimum Lot Area: 150,000 Sq. Ft.
 Maximum Building Height: 100'
 Minimum Lot Depth: 500'
 Minimum Parking: One for each 500 sq. ft. of gross floor area

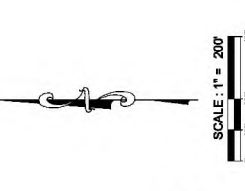
The zoning information shown above was provided by NVZ, Zoning Report, Report No. 20180425007744, having a date of effect of May 9, 2018, pursuant to Item 6B of Table A.

FIGURE 2



SYMBOL LEGEND

- RW - Right of Way
- L - Centeline
- Rel - Reliance
- A - Area
- ChL - Chord Length
- ChB - Chord Bearing
- M - Measured
- R - Record
- Surveyed (Record)
- Iron Pin (I.P.)
- DISVERIFIED
- ENGINEERING - Unless Noted
- 50' Rear w/ Cap Set
- 50' W/ 1/4" S 6625'
- Fence



Survey Prepared By:
Cardinal Precision Surveying, LLC
 2715 Virginia Ridge Road
 Philo, OH 43771
 (330) 333-0264
 www.cardinalprecisionsurveying.com
 adewitt@cardinalprecisionsurveying.com

Survey Prepared For:
NVS
 1-(800)-SURVEYS (787-6397)
 www.nvs-surveying.com

SURVEY - ZONING - ENVIRONMENTAL - ASSESSMENT

Curve Table

Curve	Radius	Arc Length	Chord Bearing	Chord Length	Delta I Angle
C1	746.97' RAC	488.00' RAC	M 53°55'53" E	473.54' RAC	37°31'00" RAC
C2	744.02' RAC	723.88' RAC	S 83°51'21" E	664.67' RAC	55°40'32" RAC
C3	864.02' RAC	637.14' RAC	S 86°05'08" E	407.49' RAC	40°49'58" RAC

Certification:
 I certify that the parcel shown herein has been surveyed by me or under my direct supervision in accordance with the Minimum Standards For Boundary Surveys, Ohio Administrative Code, Chapter 4733.37.

By: **Alina J. Dewitt, P.S.**
 Survey No. S-6625
 Field Date: July 19, 2019
 File No. 10064



SITE

Figure 3A

INQUIRY #: 2614661.5

YEAR: 1965

| = 500'





Figure 3B

INQUIRY #: 2614661.5

YEAR: 1970

| = 500'





SITE

Figure 3C

INQUIRY #: 2614661.5

YEAR: 1977

| = 1000'





Figure 3D

INQUIRY #: 2614661.5

YEAR: 1982

| = 1000'





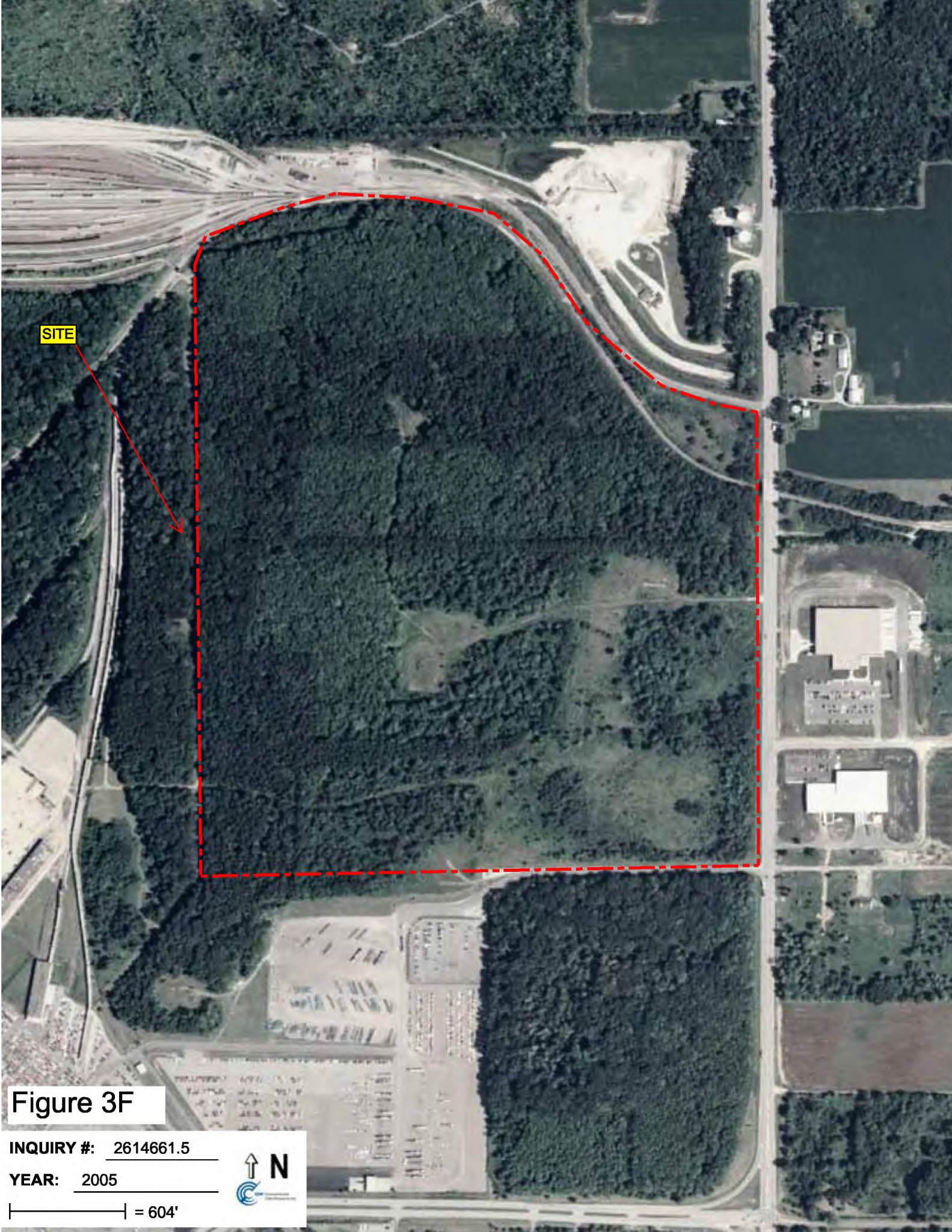
Figure 3E

INQUIRY #: 2614661.5

YEAR: 1994

| = 750'





SITE

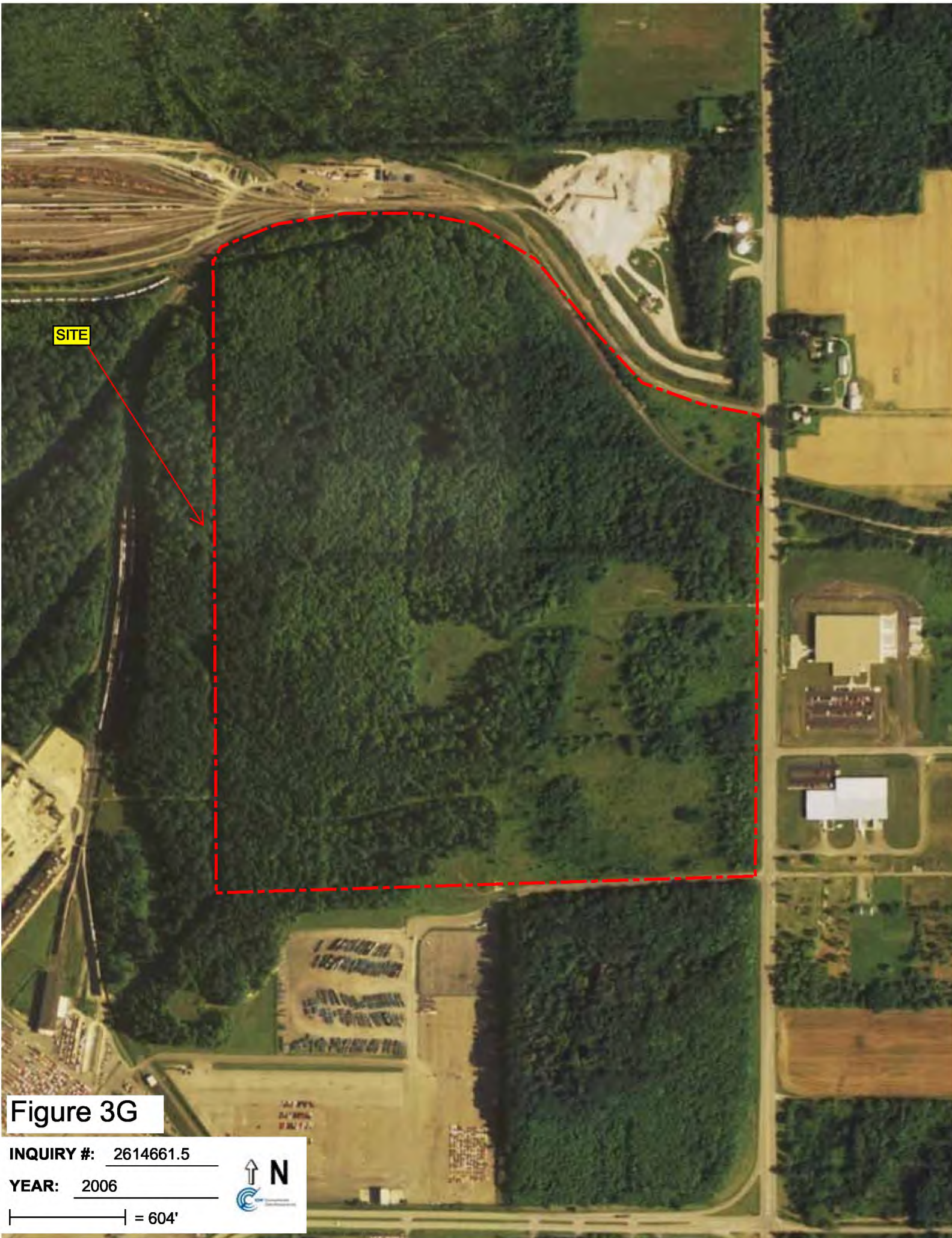
Figure 3F

INQUIRY #: 2614661.5

YEAR: 2005

| = 604'





SITE

Figure 3G

INQUIRY #: 2614661.5

YEAR: 2006

| = 604'



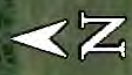
Project Magellan

2014

SITE

Figure 3H

2000 ft



Project Magellan

2015

SITE

Figure 3I

2000 ft

Google Earth



Project Magellan

2016

SITE

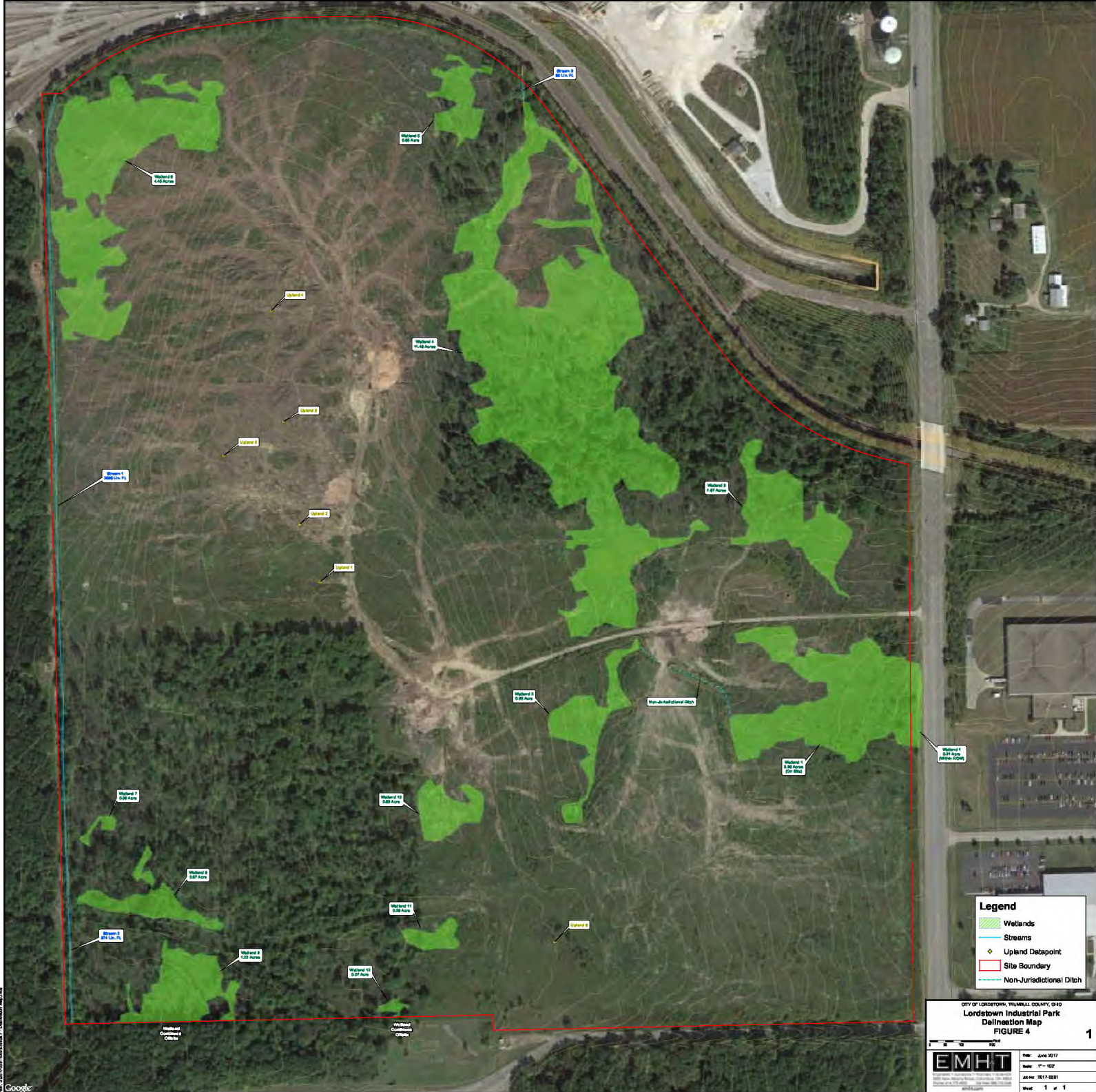
Figure 3J

2000 ft

Google Earth

© 2013 Google





Legend

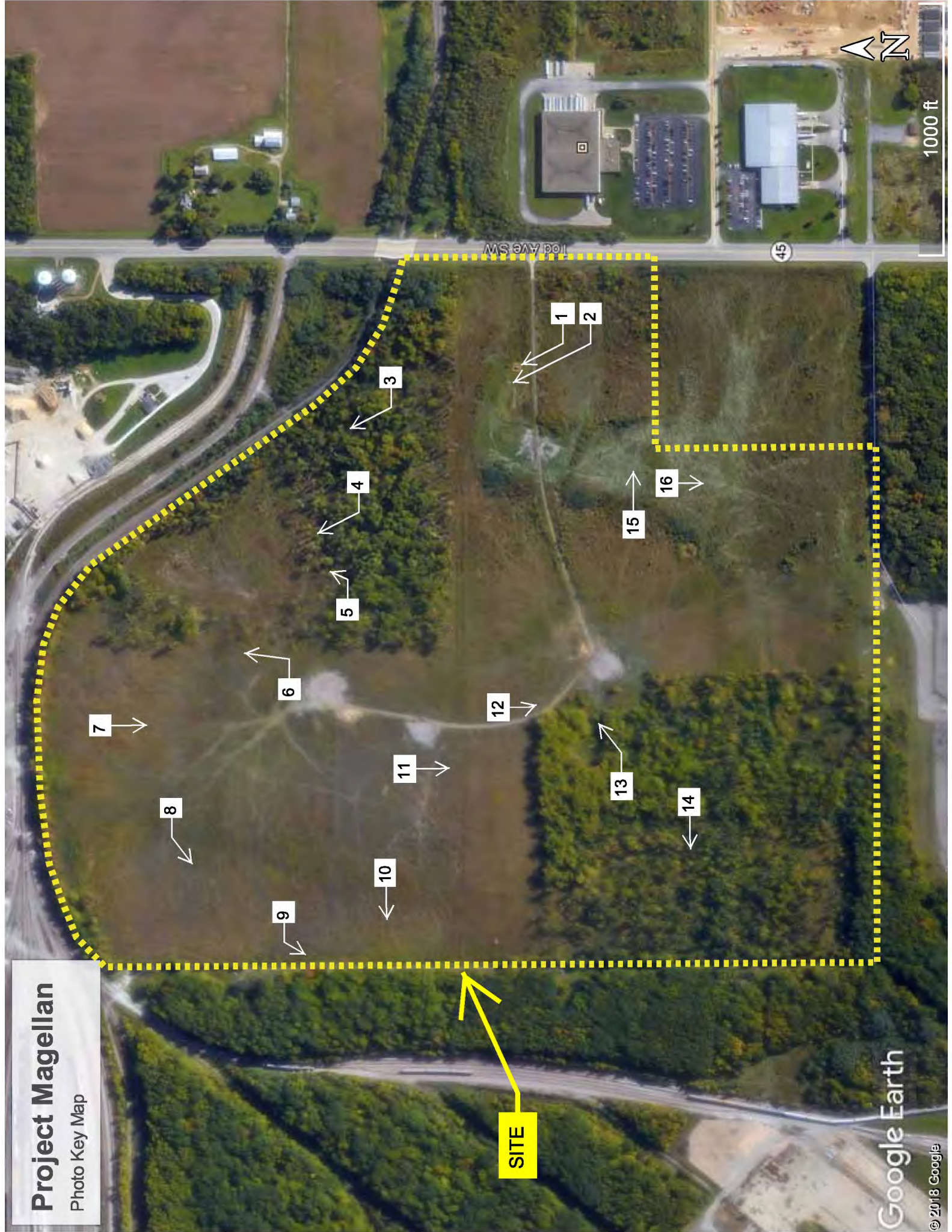
- Wetlands
- Streams
- Upland Datapoint
- Site Boundary
- Non-Jurisdictional Ditch

CITY OF LORDSTOWN, TRUMBULL COUNTY, OHIO
Lordstown Industrial Park
Delineation Map
FIGURE 4

EMHT Date: June 2017
 Scale: 1" = 100'
 Author: 2017 08/01
 Sheet: 1 of 1

Date: 05/11/2017 09:12:28 AM
 User: J. M. H.

ATTACHMENT 1
SITE PHOTOGRAPHS AND KEY MAP



1000 ft

100 AVE SW

45

SITE

Project Magellan

Photo Key Map

Google Earth

© 2018 Google



Photo 1: Looking north at oil collection tank in eastern portion of the Site.



Photo 2: Gas meter in eastern portion of the Site.



Photo 3: Selectively logged area in the eastern portion of the Site.



Photo 4: Clear cut area in the north eastern portion of the Site.



Photo 5: Recently logged area in the north eastern portion of the Site.



Photo 6: Clear cut area in the eastern portion of the Site.



Photo 7: Clear cut area in the center of the Site.



Photo 8: Looking west towards western property line in the northern part of the Site.



Photo 9: Small drainage feature along chain link fence on the western property boundary.



Photo 10: Clear cut area along western property boundary.



Photo 11: Looking south across the center of the Site.



Photo 12: Looking south at gravel logging/access road in southern portion of the Site.



Photo 13: Looking east at recently cut logging access / drainage ditch in southern portion of the Site.



Photo 14: Looking west at logging road and selectively cut woods in the southwestern portion of the Site.



Photo 15: Looking east at south eastern portion of the Site.



Photo 16: Looking south at access road in the southern portion of the Site.

ATTACHMENT 2

2017 PJD AND WETLAND LOCATION PLAN



DEPARTMENT OF THE ARMY
PITTSBURGH DISTRICT, CORPS OF ENGINEERS
WILLIAM S. MOORHEAD FEDERAL BUILDING
1000 LIBERTY AVENUE
PITTSBURGH, PA 15222-4186

REPLY TO
ATTENTION OF

December 20, 2017

Operations Division
Regulatory Branch
LRP 2014-1077

Tim McElroy
NorthPoint Development, LLC
4825 NW 41st St., Suite 500
Riverside, MO 64150

Dear Mr. McElroy:

This letter is in response to your request for a preliminary jurisdictional determination (PJD), received on July 25, 2017 and amended to the report was received on December 7, 2017. This report was prepared by EMH&T. A delineation of the Lordstown Industrial Park located in the Village of Lordstown, Trumbull County, Ohio.

You have requested a preliminary jurisdictional determination (PJD) for the proposed 173.5 Area of Interest. The waters listed below are potentially waters of the United States.

Site Number	Latitude	Longitude	Estimated amount of aquatic resource in review area	Type of aquatic resource	Geographic authority (Section 10/404)
Wetland 1	41.151114°	-80.858450°	3.59 acres	wetland	Section 404
Wetland 2	41.150931°	-80.860754°	0.95 acre	wetland	Section 404
Wetland 3	41.152838°	-80.858363°	1.67 acres	wetland	Section 404
Wetland 4	41.152769°	-80.861602°	11.48 acres	wetland	Section 404
Wetland 5	41.156771°	-80.863166°	0.65 acre	wetland	Section 404
Wetland 6	41.156399°	-80.866614°	4.45 acres	wetland	Section 404
Wetland 7	41.150250°	-80.867006°	0.09 acre	wetland	Section 404
Wetland 8	41.149403°	-80.866661°	0.67 acre	wetland	Section 404
Wetland 9	41.148769°	-80.866451°	1.22 acres	wetland	Section 404
Wetland 10	41.150008°	-80.862374°	1.17 acres	wetland	Section 404
Wetland 11	41.149226°	-80.862656°	0.71 acre	wetland	Section 404
Wetland 12	41.148753°	-80.863487°	0.07 acre	wetland	Section 404
Wetland 13	41.149467°	-80.862839°	0.08 acre	wetland	Section 404
Stream 1	41.152547°	-80.867342°	2,598 linear feet	stream	Section 404
Stream 2	41.148900°	-80.867244°	374 linear feet	stream	Section 404
Stream 3	41.156564°	-80.861772°	68 linear feet	stream	Section 404

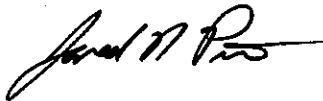
The U.S. Army Corps of Engineers authority to regulate waters of the U.S. is based, in part, on the definitions and limits of jurisdiction contained in 33 CFR 328 and 33 CFR 329. Section 404 of the Clean Water Act (CWA) requires that a Department of the Army (DA) permit be obtained prior to the discharge of dredged or fill material into waters of the U.S., including wetlands.

Based on a review of the information provided, wetlands totaling 26.8 acres and streams totaling 3,040 linear feet are located within the proposed review area. The unnamed tributaries flow into Mud Creek until the waters reach the Mahoning River a section 10 Traditional Navigable Waterway. This office has determined that these waters **may** be jurisdictional waters of the United States in accordance with the Regulatory Guidance Letter for Jurisdictional Determinations issued by the U.S. Army Corps of Engineers in October 2016 (RGL No. 16-01). As indicated in the guidance, this **PJD is non-binding and** cannot be appealed (33 C.F.R. 331.2) and only provides a written indication that waters of the U.S, including wetlands, may be present on-site.

At this time you have requested a Preliminary Jurisdictional Determination with an option to request an approved JD later. However, for the purposes of the determination of impacts, compensatory mitigation, and other resource protection measures for activities that require authorization from this office, the streams and wetlands identified above will be evaluated as if they are jurisdictional waters of the United States.

If you have any questions, please contact Michael Fodse at (412) 395-7575 or email Michael.M.Fodse@usace.army.mil and reference project No. LRP 2014-1077 in all future correspondence with this office regarding this delineation.

Sincerely,



for Nancy Mullen
Chief, Northern Section
Regulatory Branch

Copy Furnished:

Ed Wilk (OEPA)
Eric Nagy (EMH&T)

- 1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.
- 2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there "may be" waters of the U.S. and/or that there "may be" navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for PJD (check all that apply)

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

- Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:

Map: Delineation Report - Loudstown Industrial Park, Trumbull County, Ohio dated July 6, 2017 and Addendum dated December 7, 2017 submitted by EAH/ST for HARP/PS/ Develop

- Data sheets prepared/submitted by or on behalf of the PJD requestor.

Office concurs with data sheets/delineation report.

Office does not concur with data sheets/delineation report. Rationale: _____

Data sheets prepared by the Corps: _____

Corps navigable waters' study: _____

U.S. Geological Survey Hydrologic Atlas: _____

USGS NHD data.

USGS 8 and 12 digit HUC maps.

U.S. Geological Survey map(s). Cite scale & quad name: USGS 7.5 minute Topographic Maps, Warren, Ohio Quadrangle

Natural Resources Conservation Service Soil Survey. Citation: Web Soil Survey for Trumbull County, Ohio

National wetlands inventory map(s). Cite name: National Wetland Inventory (NWI) Warren, Ohio quadrangle (USFWS, 2015)

State/local wetland inventory map(s): _____

FEMA/FIRM maps: FEMA Flood Map #39155C0388D, effective June 18, 2010.

100-year Floodplain Elevation is: _____ (National Geodetic Vertical Datum of 1929)

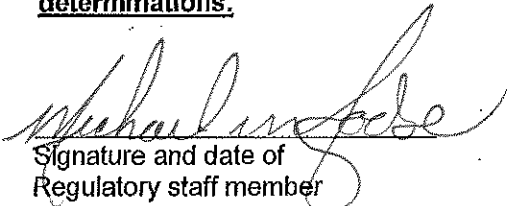
Photographs: Aerial (Name & Date): Google Earth Aerial dated Sept 14, 2015

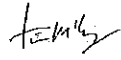
or Other (Name & Date): Photograph Log (May 22 - 24, 2017)

Previous determination(s). File no. and date of response letter: _____

Other information (please specify): Previous Delineation by Terra Technologies submitted in Oct. 2014.

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.


Signature and date of
Regulatory staff member
completing PJD


Signature and date of
person requesting PJD
(REQUIRED, unless obtaining
the signature is impracticable)¹

¹ Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

Table of Aquatic Resources in Review Area which "May Be" Subject to Regulatory Jurisdiction.

Site Number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
Wetland 1	41.151114°	-80.858450°	3.59 acres	wetland	Section 404
Wetland 2	41.150931°	-80.860754°	0.95 acre	wetland	Section 404
Wetland 3	41.152838°	-80.858363°	1.67 acres	wetland	Section 404
Wetland 4	41.152769°	-80.861602°	11.48 acres	wetland	Section 404
Wetland 5	41.156771°	-80.863166°	0.65 acre	wetland	Section 404
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Wetland 10	41.150008°	-80.862374°	1.17 acres	wetland	Section 404
Wetland 11	41.149226°	-80.862656°	0.71 acre	wetland	Section 404
Wetland 12	41.148753°	-80.863487°	0.07 acre	wetland	Section 404
Wetland 13	41.149467°	-80.862839°	0.08 acre	wetland	Section 404
Stream 1	41.152547°	-80.867342°	2,598 linear feet	stream; non-wetland	Section 404
Stream 2	41.148900°	-80.867244°	374 linear feet	stream; non-wetland	Section 404
Stream 3	41.156564°	-80.861772°	68 linear feet	stream; non-wetland	Section 404

APPENDIX D2

ODNR Correspondence





Ohio Department of Natural Resources

MIKE DEWINE, GOVERNOR

MARY MERTZ, DIRECTOR

Office of Real Estate
Paul R. Baldrige, Chief
2045 Morse Road – Bldg. E-2
Columbus, OH 43229
Phone: (614) 265-6649
Fax: (614) 267-4764

November 27, 2019

Scott Bush
GHD Services, Inc.
1801 Old Highway 8 NW, Suite 114
St. Paul, Minnesota 55112

Re: 19-916; Project Magellan - Parcel B

Project: The proposed project involves the construction of an industrial development.

Location: The proposed project is located in the Village of Lordstown, Trumbull County, Ohio.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

Natural Heritage Database: The Natural Heritage Database has the following record at or within a one-mile radius of the project area:

Great blue heron rookery

The review was performed on the project area you specified in your request as well as an additional one-mile radius. Records searched date from 1980. This information is provided to inform you of features present within your project area and vicinity.

Please note that Ohio has not been completely surveyed and we rely on receiving information from many sources. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Although all types of plant communities have been surveyed, we only maintain records on the highest quality areas.

Fish and Wildlife: The Division of Wildlife (DOW) has the following comments.

The DOW recommends that impacts to streams, wetlands and other water resources be avoided and minimized to the fullest extent possible, and that best management practices be utilized to minimize erosion and sedimentation.

The project is within the range of the Indiana bat (*Myotis sodalis*), a state endangered and federally endangered species. The following species of trees have relatively high value as potential Indiana bat roost trees to include: shagbark hickory (*Carya ovata*), shellbark hickory (*Carya laciniosa*), bitternut hickory (*Carya cordiformis*), black ash (*Fraxinus nigra*), green ash (*Fraxinus pennsylvanica*), white ash (*Fraxinus americana*), shingle oak (*Quercus imbricaria*), northern red oak (*Quercus rubra*), slippery elm (*Ulmus rubra*), American elm (*Ulmus americana*), eastern cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*), sassafras (*Sassafras albidum*), post oak (*Quercus stellata*), and white oak (*Quercus alba*). Indiana bat roost trees consists of trees that include dead and dying trees with exfoliating bark, crevices, or cavities in upland areas or riparian corridors and living trees with exfoliating bark, cavities, or hollow areas formed from broken branches or tops. However, Indiana bats are also dependent on the forest structure surrounding roost trees. If suitable habitat occurs within the project area, the DOW recommends trees be conserved. If suitable habitat occurs within the project area and trees must be cut, the DOW recommends cutting occur between October 1 and March 31. If suitable trees must be cut during the summer months, the DOW recommends a net survey be conducted between June 1 and August 15, prior to any cutting. Net surveys should incorporate either nine net nights per square 0.5 kilometer of project area, or four net nights per kilometer for linear projects. If no tree removal is proposed, this project is not likely to impact this species.

The project is within the range of the clubshell (*Pleurobema clava*), a state endangered and federally endangered mussel, and the black sandshell (*Ligumia recta*), a state threatened mussel. Due to the location, and that there is no in-water work proposed in a perennial stream, this project is not likely to impact these species.

The project is within the range of the northern brook lamprey (*Ichthyomyzon fossor*), a state endangered fish, and the mountain brook lamprey (*Ichthyomyzon greeleyi*), a state endangered fish. Due to the location, and that there is no in-water work proposed in a perennial stream, this project is not likely to impact these species.

The project is within the range of the eastern hellbender (*Cryptobranchus alleganiensis alleganiensis*), a state endangered species and a federal species of concern. Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size to provide suitable habitat, this project is not likely to impact this species.

The project is within the range of the eastern massasauga (*Sistrurus catenatus*), a state endangered and a federally threatened snake species. The eastern massasauga uses a range of habitats including wet prairies, fens, and other wetlands, as well as drier upland habitat. Due to the location, and the type of habitat present at the project site and within the vicinity of the project area, this project is not likely to impact this species.

The project is within the range of the spotted turtle (*Clemmys guttata*), a state threatened species. This species prefers fens, bogs and marshes, but also is known to inhabit wet prairies, meadows, pond edges, wet woods, and the shallow sluggish waters of small streams and ditches. Due to the location, and the type of habitat present at the project site and within the vicinity of the project area, this project is not likely to impact this species.

The project is within the range of the northern harrier (*Circus cyaneus*), a state endangered bird. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. If this

type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 15 to August 1. If this habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the upland sandpiper (*Bartramia longicauda*), a state endangered bird. Nesting upland sandpipers utilize dry grasslands including native grasslands, seeded grasslands, grazed and ungrazed pasture, hayfields, and grasslands established through the Conservation Reserve Program (CRP). If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 to July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the least bittern (*Ixobrychus exilis*), a state threatened bird. This secretive marsh species prefers dense emergent wetlands with thick stands of cattails, sedges, sawgrass or other semiaquatic vegetation interspersed with woody vegetation and open water. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 1 to July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

Due to the potential of impacts to federally listed species, as well as to state listed species, we recommend that this project be coordinated with the U.S. Fish & Wildlife Service.

Water Resources: The Division of Water Resources has the following comment.

The local floodplain administrator should be contacted concerning the possible need for any floodplain permits or approvals for this project. Your local floodplain administrator contact information can be found at the website below.

http://water.ohiodnr.gov/portals/soilwater/pdf/floodplain/Floodplain%20Manager%20Community%20Contact%20List_8_16.pdf

ODNR appreciates the opportunity to provide these comments. Please contact Sarah Tebbe, Environmental Specialist, at (614) 265-6397 or Sarah.Tebbe@dnr.state.oh.us if you have questions about these comments or need additional information.

Mike Pettegrew
Environmental Services Administrator (Acting)

APPENDIX E

E1 – USFWS Consultation Letter

E2 – Bat Presence/Probable Absence Survey Report

E3 – USFWS Request for Species Consultation Review Letter

E4 – USFWS Email Correspondence



APPENDIX E1

USFWS Consultation Letter





United States Department of the Interior



FISH AND WILDLIFE SERVICE
Ohio Ecological Services Field Office
4625 Morse Road, Suite 104
Columbus, OH 43230-8355
Phone: (614) 416-8993 Fax: (614) 416-8994

In Reply Refer To:
Consultation Code: 03E15000-2019-SLI-1987
Event Code: 03E15000-2019-E-02231
Project Name: Project Magellen

September 25, 2019

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

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see <http://www.fws.gov/migratorybirds/RegulationsandPolicies.html>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/BirdHazards.html>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <http://www.fws.gov/migratorybirds/AboutUS.html>.

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

Attachment(s):

- Official Species List
-

Official Species List

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

This species list is provided by:

Ohio Ecological Services Field Office

4625 Morse Road, Suite 104

Columbus, OH 43230-8355

(614) 416-8993

Project Summary

Consultation Code: 03E15000-2019-SLI-1987

Event Code: 03E15000-2019-E-02231

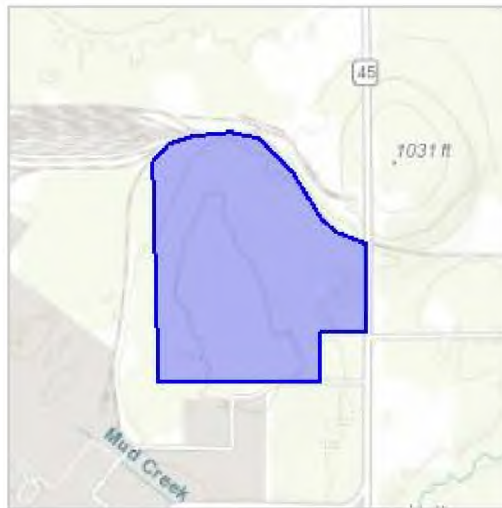
Project Name: Project Magellen

Project Type: DEVELOPMENT

Project Description: New industrial development on 173 Acre parcel. Project planning is being undertaken

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/41.15288572681847N80.86228738786092W>



Counties: Trumbull, OH

Endangered Species Act Species

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

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions.

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

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

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

Mammals

NAME	STATUS
Indiana Bat <i>Myotis sodalis</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: <ul style="list-style-type: none"> ▪ Incidental take of the northern long-eared bat is not prohibited at this location. Federal action agencies may conclude consultation using the streamlined process described at https://www.fws.gov/midwest/endangered/mammals/nleb/s7.html Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Reptiles

NAME	STATUS
Eastern Massasauga (=rattlesnake) <i>Sistrurus catenatus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2202	Threatened

Clams

NAME	STATUS
Clubshell <i>Pleurobema clava</i> Population: Wherever found; Except where listed as Experimental Populations No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3789	Endangered

Critical habitats

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

APPENDIX E2

Bat Presence/Probable Absence Survey Report





COPPERHEAD
ENVIRONMENTAL CONSULTING

**Summer 2018 Indiana Bat Presence/Probable Absence Survey
for the Proposed NorthPoint Development, Lordstown
Industrial Park, Trumbull County, OH**

(Survey Reference #18-012)

TAILS# 03E15000-2018-TA-1201

Eric Nagy
Senior Environmental Scientist
EMH&T
5500 New Albany Road
Columbus, OH, 43054

21 June 2018

COPPERHEAD ENVIRONMENTAL CONSULTING, INC.
P.O. BOX 73 ■ 471 MAIN STREET ■ PAINT LICK, KENTUCKY 40461
(859) 925-9012 OFFICE (859) 925-9816 FAX

www.copperheadconsulting.com

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Appendices

Appendix A: Mist-Net Photographs

Appendix B: Bat Capture and Habitat Datasheets

INTRODUCTION

Copperhead Environmental Consulting, Inc. (Copperhead) has been contracted by EMH&T to conduct a presence/probable absence (P/A) survey for the federally listed Indiana bat (*Myotis sodalis*) at a 173-acre site containing 30 forested acres south of Salt Springs Rd, west of Highway 45, and northwest of Interstate 80 in the Lordstown Industrial Park, Trumbull Co., OH (Figure 1).

Because the project area is within the Indiana bat’s summer range, removal of forested habitat may potentially impact summer populations of the species. To determine the presence or probable absence of this species, Copperhead completed a mist-net survey within the project area.

METHODS

Site Selection/Mist-Netting

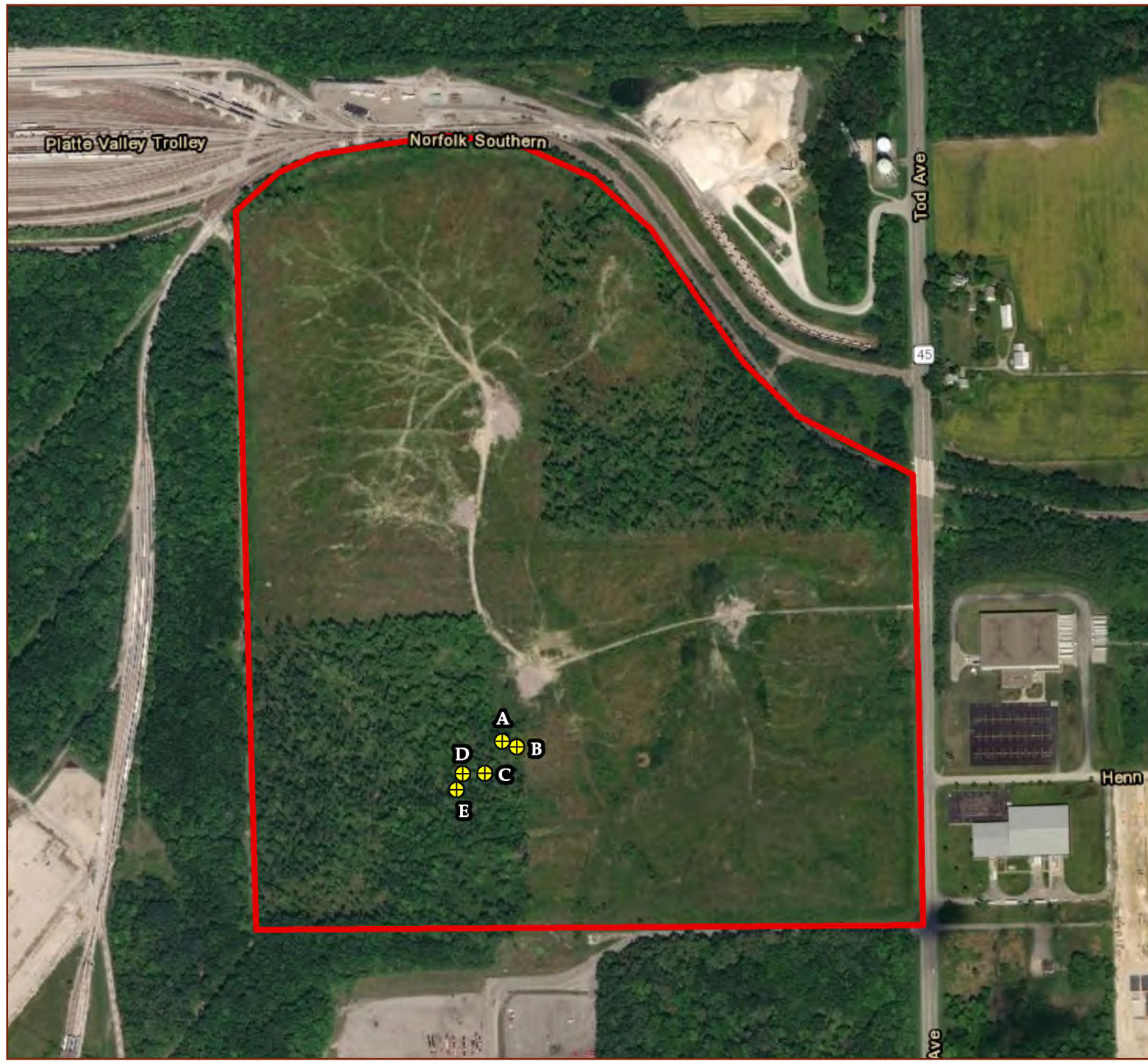
Nine net nights were surveyed within the project area (Table 1; Figure 1) based on estimated forested impacts (30 acres). A study plan was submitted to the U.S. Fish & Wildlife Service (USFWS) Ohio Field Office and Ohio Department of Natural Resources (ODNR) on 15 May 2018 and concurrence was received from USFWS on 16 May 2018. Prior to the survey, Copperhead biologists conducted field reconnaissance of the project area to select mist-net locations (mist-net photographs are provided in Appendix A).

Mist-net surveys were implemented in accordance with guidelines outlined in the *2018 Range-Wide Indiana Bat Survey Guidelines* (USFWS 2018) and the most recent *Ohio Division of Wildlife and USFWS (OH Field Office) Guidance for Bat Permitted Biologist* (ODNR-DOW 2018). Mist-net surveys were conducted under our USFWS Federal Fish and Wildlife Permit #TE94849B-0 and our ODNR Scientific Collecting Permit #20-076.

Table 1. Mist-net locations for the proposed NorthPoint Development of the Lordstown Industrial Park, Trumbull County, Ohio. Summer 2018.

Mist-Net	Dates Surveyed (2018)*	No. of Net Nights	Latitude	Longitude
A	6 June	1	41.15054	-80.86351
B	6-7 June	2	41.15047	-80.86329
C	6-7 June	2	41.15018	-80.86378
D	6-7 June	2	41.15018	-80.86411
E	6-7 June	2	41.15000	-80.86421

* Netting effort was conducted on June 5, but cancelled due to temperatures dropping below 50°C



COPPERHEAD
ENVIRONMENTAL CONSULTING

Lordstown Industrial Park
Study Area



Trumbull County,
Ohio

- Mist-Net Site
- Study Area

1:7,000
or
1 cm = 70 m



0 120
Meters

Coordinate System:
NAD 1983 StatePlane
Ohio South FIPS 3402
Feet
Projection: Lambert
Conformal Conic
Datum: North American
1983
Sources: USDA, ESRI,
USGS
Date: 6/21/2018

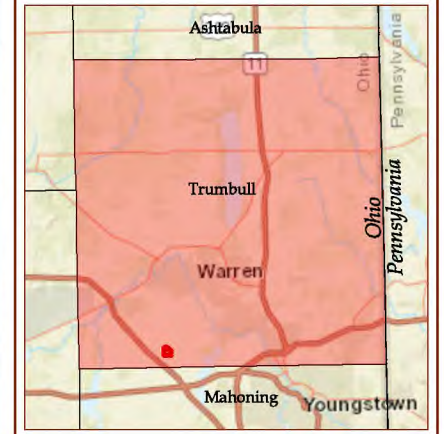


Figure 1. Mist-net locations for the proposed NorthPoint Development of the Lordstown Industrial Park, Trumbull County, Ohio. Summer 2018.

Mist-net locations were recorded using a handheld Global Positioning System (GPS) unit. Mist-nets were set prior to sunset and deployed at dusk. Nets were left open for at least 5 hours after sunset each night and checked every 10 minutes. Disturbance near the nets was kept to a minimum. Weather data, including temperature, relative wind speed, and cloud cover, was recorded on an hourly basis to ensure compliance with mist-netting guidelines (e.g., temperature during survey > 50°F, no rain, etc.).

Low visibility, high-quality nylon nets, 9 to 12 m (~20 – 30 ft) in length (depending upon the width of the corridor) were used for each net set. A two-tier set, at least 6 meters (~20 feet) high, constituted a net set. Netting consisted of 4 mist-net sets erected at one site on the first night and 5 mist-net sets erected at 4 locations on the second night.

Bats were live-caught in mist-nets and released unharmed near the point of capture. Data recorded for each captured individual included time of capture, capture net, capture height, species, sex, age class, reproductive condition, mass, and forearm length. Processing of bats was completed within 30 min from the time the bat was removed from the net.

White-Nose Syndrome Protocol

To minimize the transmission of White-Nose Syndrome (WNS) between captured bats, all netting and field activities followed the most up-to-date USFWS guidelines. All hard, non-porous netting equipment was sanitized with Isopropyl alcohol wipes (70%) prior to arrival at the project site and after each survey night; all other equipment was submersed in hot water (55°C) for a minimum of 20 minutes. Disposable latex gloves were worn over sanitized handling gloves and changed following the handling of each bat. All non-disposable equipment (e.g., PESOLA® scales, rulers, calipers) that came into contact with a bat was sanitized immediately following the handling of each bat. Bats were evaluated for potential WNS infection through wing scoring following the *Wing-Damage Index* (Reichard and Kunz 2009).

RESULTS

Mist-Netting Results

Mist-netting was conducted from 5-7 June, 2018 (Bat Capture and Habitat Datasheets are provided in Appendix B). Survey efforts on 5 June were not counted because the temperature dropped below 50°C during the last hour of the survey. Surveys conducted on 6 and 7 June were completed with no variance from weather guidelines.

In total, 10 bats of 2 species were captured (Table 2). No Indiana bats were captured.

Table 2. Bats captured during the summer 2018 survey for the proposed NorthPoint Development of the Lordstown Industrial Park, Trumbull County, Ohio.

Species	Adult, Male, Non- Reproductive	Adult, Male, Testes Descended	Adult, Female, Pregnant	Unknown*	Total
<i>Eptesicus fuscus</i>	1	2	4	-	7
<i>Lasiurus borealis</i>	1	-	1	1	3
Total	2	2	5	1	10

*Bat escaped before age/sex determination

Habitat

The 30 ac proposed clearing portion of the 173-acre property consists of a small field interspersed with young early successional trees. Dominate tree species include sugar maple (*Acer saccharum*), silver maple (*Acer saccharinum*), red maple (*Acer rubrum*), slippery elm (*Ulmus rubra*), Ohio buckeye (*Aesculus glabra*), and northern red oak (*Quercus rubra*). Trees are present in small clusters or as individuals throughout most of the property. The northern portion of the property includes slightly older trees in larger clusters with interspersed tree falls and forest gaps. No potential roosting habitat was observed. All trees were alive with tight bark. Foraging habitat on the property was of moderate quality. There was an abundance of open space for bats to travel through and forage in but given the surrounding habitat and the quality of the habitat on site it is unlikely that many bats utilize the property for roosting. No water resources were observed on the property.

CONCLUSIONS

Mist-netting efforts provided no evidence that Indiana bats use the project area during summer months. Indiana bat habitat within the project area is of moderate quality. In general, the forest composition and age structure provide unsuitable roosting opportunities for bats. All trees are alive with tight bark; most trees are young. The larger diameter trees of species considered optimal roosting habitat for Indiana bats are absent or few in number and do not exhibit characteristics preferred by Indiana bats based on their lack of exfoliating bark. These findings and the failure to capture listed bats suggest that the target species are not present in the project area during the maternity season or are present in such low densities that current survey techniques failed to detect them.

LITERATURE CITED

Ohio Division of Natural Resources – Division of Wildlife (ODNR-DOW). 2018. Ohio Division of Wildlife and USFWS (OH Field Office) Guidance for Bat Permitted Biologist.

Reichard, J. D. and T. H. Kunz. 2009. White-nose syndrome inflicts lasting injuries to the wings of little brown myotis (*Myotis lucifugus*). *Acta Chiropterologica*, 11(2) 457-464.

United States Fish and Wildlife Service (USFWS). 2018. Range-wide Indiana Bat Survey Guidelines.

APPENDIX A

Mist-Net Photographs



Net A



Net B



Net C



Net D



Net E

APPENDIX B

Bat Capture and Habitat Datasheets

Site No. L1 Project Phase# 711.04 Project Name Lordstown Industrial Park Dates 6/5/2018 + 6/6/18
 Site Location Woodlot off West of CR45 Habitat Type* Bottomland Forest
 County Trumbull State OH Permittee T. Wetzel Technician(s) M. True
 Lat/Lon or UTM (circle one): Easting 41.15018 Northing 80.86378 UTM Zone 18 Datum NAD83



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Comments	Date	Moon%	Moon rise	Moon set	Sunrise	Sunset
1	6/5	2124	LABO	—	—	—	—	—	D	3.5	E	CLAPED	—	—	6/5	55	0120	1204	0551	2051
2	6/5	2124	EPFU	A	M	TD	15	48	D	3	1	—	—	—	6/6	50	0151	1303	0551	2052
3	6/5	2128	LABO	A	M	NR	11	41	C	4	1	—	—	—						
4	6/5	2220	EPFU	A	F	P	28.5	52	D	3	0	—	—	—						
1	6/6	2135	LABO	A	F	NR	16	43	D	4	0	—	—	—						
2	6/6	2145	EPFU	A	F	P	26.25	50	D	5.5	0P	—	—	—						
3	6/6	2210	EPFU	A	F	P	24.75	46.5	E	2.0	0	—	—	—						

Date	Time	Temp (°F)	Sky	Wind	Comments
6/5	2100	58	0	1	
6/5	2200	53	0	0	
6/5	2300	51	0	0	
6/5	0000	51	0	0	
6/5	0100	49	0	0	
6/5	0150	48	0	0	
6/6	2100	56	3	0	
6/6	2200	54	1	0	
6/6	2300	53	0	0	
6/6	0000	53	0	0	
6/6	0100	51	0	0	
6/7	0150	51	0	0	

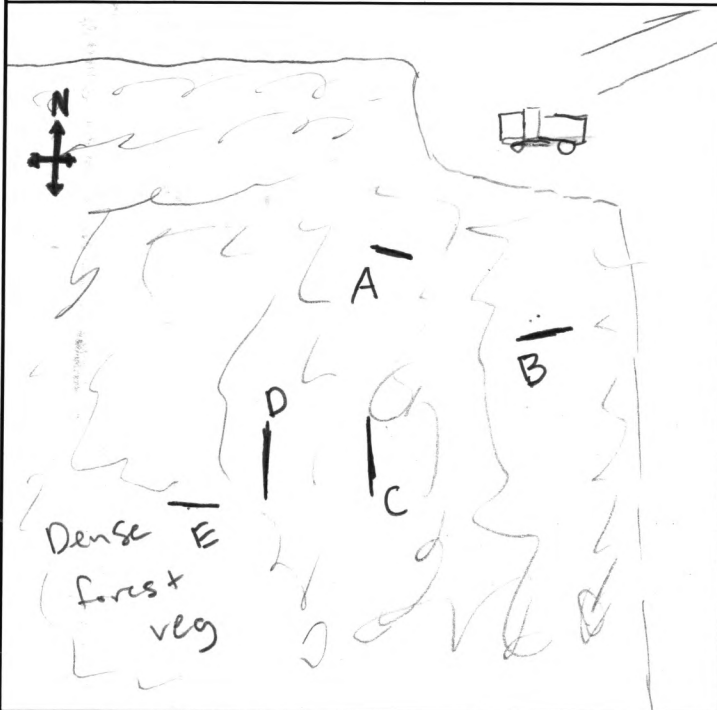
Species Abbreviations: *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasionycteris noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

***Habitat Type:** Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Site No. 1 Project Phase# 711 Project Name Lordstown Industrial Park Dates 6/5, 6/6

Net Site Diagram



Net height x net length (m)	Dates
A = 5.2 x 9	6/5 ●
B = 5.2 x 9	6/5 + 6/6
C = 5.2 x 12	6/5 + 6/6
D = 5.2 x 12	6/5 + 6/6
E = 5.2 x 9	6/5 + 6/6
F = _____ x _____	

Net Set GPS Location (UTM or Lat/Long)	
A = 41.15054	-80.86351
B = 41.15047	-80.86329
C = 41.15018	-80.86378
D = 41.15018	-80.86411
E = 41.15000	-80.86421
F = _____	

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor	X	X	X	X	X	
Road Rut						
Creek						
River						
Pond						
Forest Gap						
Cave						
Mine						
Tree						
Other: list						

Transmitters	
Band# _____	Band# _____
Freq: _____	Freq: _____
Brand _____	Brand _____
Weight _____	Weight _____
#days _____	#days _____

Date	Time nets up	Time nets down
6/5	2051	0153
6/6	2050	0152

Dominant Vegetation	
1. <u>Acer saccharum</u>	4. <u>Ulmus rubra</u>
2. <u>Acer rubrum</u>	5. <u>Aesculus glabra</u>
3. <u>Acer saccharinum</u>	6. <u>Quercus rubra</u>

Potential listed bat habitat at site:

- 2 **Roost habitat:** **1. Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) **2. Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. **3. Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.
- 1 **Water Resources:** **1. Poor:** bat drinking resources not present at the site. **2. Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. **3. Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.
- 3 **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). **1. Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging **2. Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. **3. Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.
- 2 **Land Cover:** **1. Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. **2. Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. **3. Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. _____ Project Phase# _____ Project Name 711 Old Lords town Dates 6/7
 Site Location SEE PG 1 Habitat Type* _____
 County _____ State _____ Permittee _____ Technician(s) _____
 Lat/Lon or UTM (circle one): N/Easting _____ W/Northing _____ UTM Zone _____ Datum _____



#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Comments	Date	Moon%	Moon rise	Moon set	Sunrise	Sunset
1	6/7	2140	EPPVA	A	M	TD	12.75	43	D	3.0	0	—	—	—	6/7	37	0219	1403	0501	2053
2	6/7	2245	EPPVA	A	F	P	23.25	47	C	1.0	0	—	—	—						
3	6/7	0115	EPPVA	A	M	NR	14.5	43	D	2.0	2-P	—	—	—						
															Date	Time	Temp (°F)	Sky	Wind	Comments
															6/7	2100	65	1	0	—
															6/7	2200	64	1	0	—
															6/7	2300	64	1	0	—
															6/7	0000	63	1	0	—
															6/7	0100	62	0	0	—
															6/7	0150	61	0	0	—

Species Abbreviations: *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPPVA); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasionycteris noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)
Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U
***Habitat Type:** Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Sky Code	
0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or overcast
4	Fog or smoke
5	Drizzle or light rain
6	Heavy rain - thunder storm

Beaufort Wind Scale	
0	Calm: <1 mph
1	Light air: 1-3 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

Dates _____

Site No. _____

Project Phase# _____

Project Name _____

Net Site Diagram

See pg 1
for other details

Net height x net length (m)	Dates
A = _____ x _____	6/7
B = _____ x _____	6/7
C = _____ x _____	6/7
D = _____ x _____	6/7
E = _____ x _____	6/7
F = _____ x _____	

Net Set GPS Location (UTM or Lat/Long)

A = _____	_____
B = _____	_____
C = _____	_____
D = _____	_____
E = _____	_____
F = _____	_____

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor						
Road Rut						
Creek						
River						
Pond						
Forest Gap						
Cave						
Mine						
Tree						
Other: list						
Date	Time nets up		Time nets down			
6/7	20:53		01:54			

Transmitters

Band# _____	Band# _____
Freq. _____	Freq. _____
Brand _____	Brand _____
Weight _____	Weight _____
#days _____	#days _____

Dominant Vegetation

1. _____	4. _____
2. _____	5. _____
3. _____	6. _____

Potential listed bat habitat at site:

Roost habitat: **1. Poor:** No or few snags \geq ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) **2. Moderate:** Snags with sloughing bark or other roost features present $>$ ~15 inch DBH within 1000 feet of forested areas. **3. Optimal:** Snags with sloughing bark or other roost features present $>$ ~15 inch DBH within 1000 feet of forested areas.

Water Resources: **1. Poor:** bat drinking resources not present at the site. **2. Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. **3. Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). **1. Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging **2. Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. **3. Optimal:** Mature forest. Diverse age classes of trees present. Trees $>$ 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

Land Cover: **1. Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. **2. Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. **3. Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

APPENDIX E3

Request for Species Consultation Review Letter





January 2, 2020

Reference No. 11203468

Mr. Jeromy Applegate
Fish and Wildlife Biologist
U S Fish and Wildlife Service
Ohio Ecological Services Field Office
4625 Morse Rd., Suite 104
Columbus, OH 43230

Subject: Request for Species Consultation Review Letter
Consultation Code: 03E15000-2019-SLI-1987
Event Code: 03E15000-2020-E-00712
Project Name: Project Magellan East
Village of Lordstown, Trumbull County, Ohio

Dear Mr. Applegate:

On June 26, 2018, the USFWS completed a review of an Indiana Bat Presence / Probable Absence Survey Report prepared by Copperhead Environmental Consulting on June 21, 2018 for the proposed North Point Industrial Development site in Lordstown, Trumbull County, Ohio. In an email from Suzann Zimmermann on June 26, 2018, the USFWS transmitted the results of their review, concurring with the negative findings of the report and that tree clearing could occur on the Site at any time of the year until March 31, 2024. The correspondence also indicated that due to the size and scope of the project, Service did not anticipate adverse effects to any other federally endangered, threatened, proposed, or candidate species. Copies of the Copperhead report and USFWS correspondence is provided in Attachment 1.

The proposed North Point Industrial Development project did not move forward. However, the Site is currently proposed for Project Magellan, an industrial development to manufacture automotive electric battery cells. We are requesting an updated project review letter from the Service verifying that the Service's previous project clearance remains valid as discussed with the you during our pre-application meeting. The following sections provide Site information on Project Magellan.

1. Site Location

The Site encompasses approximately 158.215 acres and is located west of the intersection of Tod Avenue SW (State Route 45) and Henn Parkway, approximately 1 mile north of Ohio Turnpike US Route 80 in the Village of Lordstown, Trumbull County, Ohio. The approximate Center of the Site is located at 41.152200°, -80.862922° WGS 84. A map showing the Site location and boundaries on the Warren, Ohio USGS 7.5-

minute quadrant is provided as Figure 1. The Site lies within the Mud Creek drainage basin, a tributary to the Mahoning River. The Site was historically used for agricultural purposes. Farming ceased in the 1970s and 1980s and the land underwent succession from farmland to woodland. The Site was developed for natural gas in the 1990s and three wells were installed on the Site. Two of the gas wells have since been closed and properly abandoned. The remaining well remains active. The Site was logged in 2015, with about 75 percent of the Site being clear-cut and the remainder of the Site being selectively logged. The Site has remained in this condition since 2015. In 2019, a 15 acre parcel located to the southeast of the Site, and which had historically been included as part of the Site, was sold as a separate parcel and has been recently cleared in preparation for site development.

2. Action Area and Proposed Work

Project Magellan proposes a new industrial manufacturing facility at this location. Detailed construction plans, including the construction footprint, have not yet been finalized. However, due to the size and scope of this project, we anticipate the entire Site will be required to construct the project.

3. Onsite Habitats

Onsite habitats have not changes since the 2018 survey completed by Copperhead and the Service's review. About 75 percent of the Site consists of recently logged areas now dominated by early successional meadow habitats. The remaining 25 percent of the Site consists of selectively logged areas. Both upland and wetland habitats are present on the Site. Other minor cover types include gas well sites and an access lane from Tod Ave. Sw. Two ephemeral watercourses are located on the Site. Both watercourses lacked flow at the time of our site visit in September 2019 but had a small flow in December following a wet period.

Representative site photographs are provided in Attachment 2.

4. Official Species List and Evaluation

The Official Species List provided pursuant to Section 7 of the Endangered Species Act by the USFWS, Ohio Ecological Services Field Office is shown in Attachment 3 and includes the following species, critical habitat and status:

- Indiana Bat (*Myotis sodalist*) There is final critical habitat for this species. Your location is outside the critical habitat. Status: Endangered
- Northern Long-eared Bat (*Myotis septentrionalis*) No critical habitat has been designated for this species. Status: Threatened
- Eastern Massasauga (*Sistrurus catenatus*) No critical habitat has been designated for this specie:. Threatened

- Clubshell (*Pleurobema clava*) No critical habitat has been designated for this species.
Status: Endangered

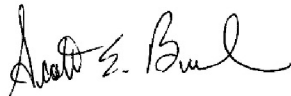
Caves or other structures that could potentially serve as bat hibernacula were not observed on the Site. About 25 percent of the Site is selectively logged woods (40 acres). Tree species greater than 3 inches in diameter are present in these areas. A bat survey was completed in 2018 by Copperhead. Indiana bat and northern long-ear bat were not identified onsite by the survey.

Massasaugas live in wet areas including wet prairies, marshes and low areas along rivers and lakes. In many areas massasaugas also use adjacent uplands during part of the year. They often hibernate in crayfish burrows but may also be found under logs and tree roots or in small mammal burrows. The snake's habitat needs vegetation control such as prescribed fire and mowing to prevent invasion of shrubs, trees and non-native plants. Woody plant invasion is reducing the amount of available habitat in some areas. While wetlands are present on the Site, they are either forested wetlands, recently logged wetlands, or wetlands that have formed in uplands as a result of the logging of the Site in 2015. These wetlands are not associated with wet prairie, marshes, or along a river or lake and are not suitable habitat for the eastern massasauga.

Aquatic habitat on the Site is limited to two ephemeral watercourses and two man-made ditches. These aquatic habitats are not suitable to support the clubshell clam.

We look forward to your review and consultation. If you have any questions, please feel free to contact me at [\(610\) 646-7486](tel:6106467486) or scott.bush@GHD.com.

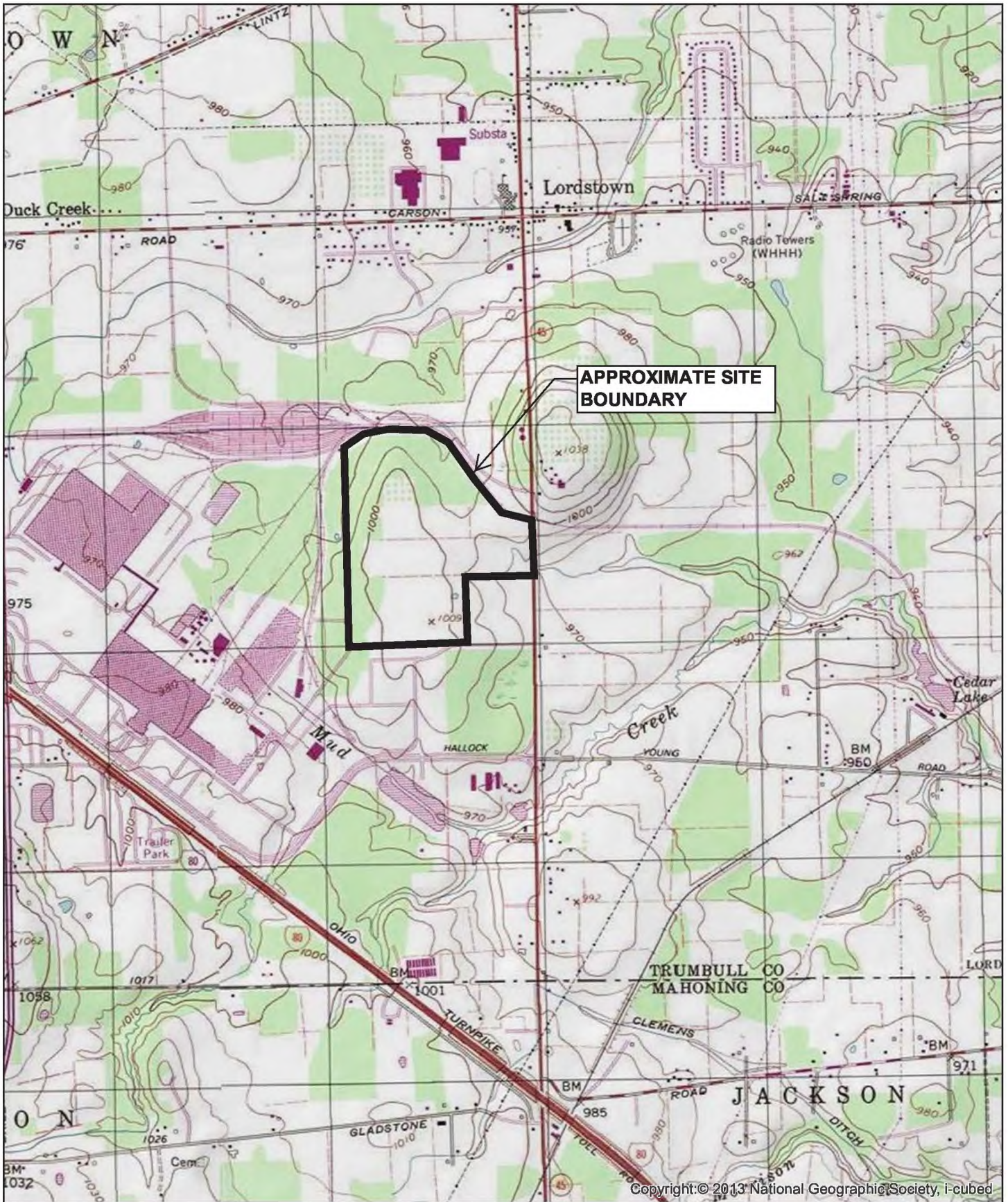
Yours truly,



Scott E. Bush, PWS

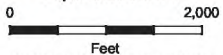
FIGURES

FIGURE 1



Copyright: © 2013 National Geographic Society, i-cubed

Paper Size 8.5 x 11



Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane Ohio North FIPS 3401 Feet



MEGELLAN EAST - PARCEL 4
USGS TOPOGRAPHIC LOCATION MAP

CITY OF LORDSTOWN, TRUMBULL COUNTY, OH
 USGS QUAD: WARREN

Job Number | 11204429
 Revision | A
 Date | Dec 12, 2019

M:\0_Kunka\GHD-Permit\Map_Template_OH.mxd
 © 2019. While every care has been taken to prepare this map, GHD (and DATA CUSTODIAN) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

1240 North Mountain Road Harrisburg, PA 17112 T 717 541 0622 F 717 541 8004 W www.ghd.com

ATTACHMENT 1

USFWS CORRESPONDENCE AND INDIANA BAT SURVEY REPORT

From: susan_zimmermann@fws.gov <susan_zimmermann@fws.gov> **On Behalf Of** Ohio, FW3
Sent: Tuesday, June 26, 2018 2:10 PM
To: cleftwich@copperheadconsulting.com; Milligan, Rob <RMilligan@emht.com>;
twetzel@copperheadconsulting.com
Cc: nathan.reardon@dnr.state.oh.us; kate.parsons@dnr.state.oh.us
Subject: Bat Survey Response for Lordstown Industrial Park Project, Trumbull County

TAILS #03E15000-2018-TA-1201

Dear Mr. Leftwich,

We have received your summer bat survey report for the subject project. The survey was conducted following current U.S. Fish and Wildlife Service (Service) guidelines. No Indiana bats (*Myotis sodalis*) were detected, demonstrating probable absence of Indiana bats in the project area. Currently, the Service has no known hibernacula or maternity roost records for northern long-eared bat (*Myotis septentrionalis*) in the vicinity of the project. Therefore, the 4(d) rule for the northern long-eared bat could be applied (see: <http://www.fws.gov/midwest/endangered/mammals/nleb/index.html>). Tree clearing on the project site at any time of the year is unlikely to result in adverse impacts to Indiana bats and will not result in any unauthorized incidental take of northern long-eared bats. Negative Indiana bat summer surveys are valid for five years. Therefore, **no tree clearing should occur on the site after March 31, 2024** without further coordination with this office.

If there is a federal nexus for the project (e.g., federal funding provided, federal permits required to construct), no tree clearing should occur on any portion of the project area until consultation under section 7 of the Endangered Species Act, between the Service and the federal action agency, is completed. We recommend that the federal action agency submit a determination of effects to this office, relative to the Indiana bat and northern long-eared bat, for our review and concurrence.

Due to the project type, size, and location, we do not anticipate adverse effects to any other federally endangered, threatened, proposed, or candidate species. Should the project design change, or during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, consultation with the Service should be initiated to assess any potential impacts.

This letter provides technical assistance only and does not serve as a completed section 7 consultation document. If project plans change, if portions of the proposed project were not evaluated, or if additional information on listed or proposed species or their critical habitat becomes available, it is our recommendation that you reinitiate coordination with this office. We recommend that the project be coordinated with the Ohio Department of Natural Resources due to the potential for the project to affect state listed species and/or state lands. Contact John Kessler, Environmental Services Administrator, at (614) 265-6621 or at john.kessler@dnr.state.oh.us.

If you have questions, or if we can be of further assistance in this matter, please contact our office at (614) 416-8993 or ohio@fws.gov.

Sincerely,

Scott Pruitt

Acting Field Office Supervisor

cc: Nathan Reardon, ODNR-DOW

Kate Parsons, ODNR-DOW



COPPERHEAD
ENVIRONMENTAL CONSULTING

**Summer 2018 Indiana Bat Presence/Probable Absence Survey
for the Proposed NorthPoint Development, Lordstown
Industrial Park, Trumbull County, OH**

(Survey Reference #18-012)

TAILS# 03E15000-2018-TA-1201

Eric Nagy
Senior Environmental Scientist
EMH&T
5500 New Albany Road
Columbus, OH, 43054

21 June 2018

COPPERHEAD ENVIRONMENTAL CONSULTING, INC.
P.O. BOX 73 ■ 471 MAIN STREET ■ PAINT LICK, KENTUCKY 40461
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Appendices

Appendix A: Mist-Net Photographs

Appendix B: Bat Capture and Habitat Datasheets

INTRODUCTION

Copperhead Environmental Consulting, Inc. (Copperhead) has been contracted by EMH&T to conduct a presence/probable absence (P/A) survey for the federally listed Indiana bat (*Myotis sodalis*) at a 173-acre site containing 30 forested acres south of Salt Springs Rd, west of Highway 45, and northwest of Interstate 80 in the Lordstown Industrial Park, Trumbull Co., OH (Figure 1).

Because the project area is within the Indiana bat’s summer range, removal of forested habitat may potentially impact summer populations of the species. To determine the presence or probable absence of this species, Copperhead completed a mist-net survey within the project area.

METHODS

Site Selection/Mist-Netting

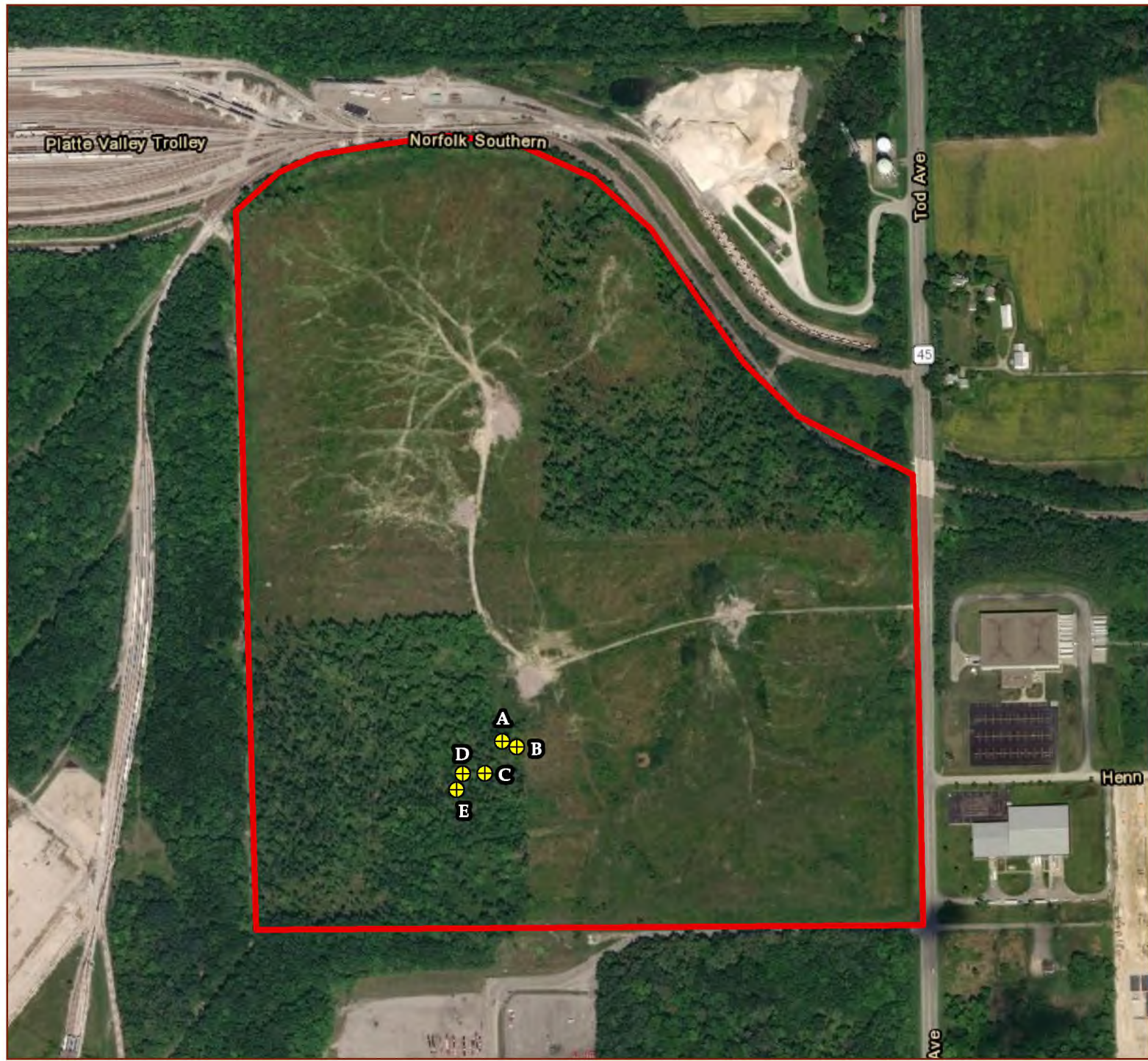
Nine net nights were surveyed within the project area (Table 1; Figure 1) based on estimated forested impacts (30 acres). A study plan was submitted to the U.S. Fish & Wildlife Service (USFWS) Ohio Field Office and Ohio Department of Natural Resources (ODNR) on 15 May 2018 and concurrence was received from USFWS on 16 May 2018. Prior to the survey, Copperhead biologists conducted field reconnaissance of the project area to select mist-net locations (mist-net photographs are provided in Appendix A).

Mist-net surveys were implemented in accordance with guidelines outlined in the *2018 Range-Wide Indiana Bat Survey Guidelines* (USFWS 2018) and the most recent *Ohio Division of Wildlife and USFWS (OH Field Office) Guidance for Bat Permitted Biologist* (ODNR-DOW 2018). Mist-net surveys were conducted under our USFWS Federal Fish and Wildlife Permit #TE94849B-0 and our ODNR Scientific Collecting Permit #20-076.

Table 1. Mist-net locations for the proposed NorthPoint Development of the Lordstown Industrial Park, Trumbull County, Ohio. Summer 2018.

Mist-Net	Dates Surveyed (2018)*	No. of Net Nights	Latitude	Longitude
A	6 June	1	41.15054	-80.86351
B	6-7 June	2	41.15047	-80.86329
C	6-7 June	2	41.15018	-80.86378
D	6-7 June	2	41.15018	-80.86411
E	6-7 June	2	41.15000	-80.86421

* Netting effort was conducted on June 5, but cancelled due to temperatures dropping below 50°C



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Lordstown Industrial Park
Study Area



Trumbull County,
Ohio

- Mist-Net Site
- Study Area

1:7,000
or
1 cm = 70 m



0 120 Meters

Coordinate System:
NAD 1983 StatePlane
Ohio South FIPS 3402
Feet
Projection: Lambert
Conformal Conic
Datum: North American
1983
Sources: USDA, ESRI,
USGS
Date: 6/21/2018

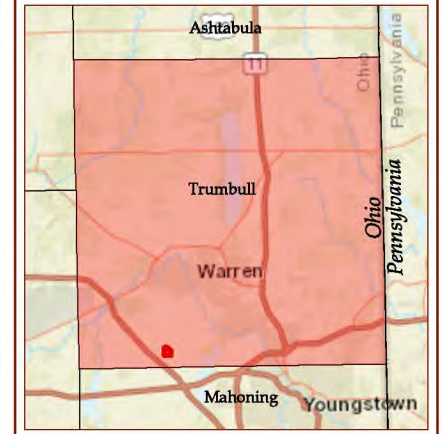


Figure 1. Mist-net locations for the proposed NorthPoint Development of the Lordstown Industrial Park, Trumbull County, Ohio. Summer 2018.

Mist-net locations were recorded using a handheld Global Positioning System (GPS) unit. Mist-nets were set prior to sunset and deployed at dusk. Nets were left open for at least 5 hours after sunset each night and checked every 10 minutes. Disturbance near the nets was kept to a minimum. Weather data, including temperature, relative wind speed, and cloud cover, was recorded on an hourly basis to ensure compliance with mist-netting guidelines (e.g., temperature during survey > 50°F, no rain, etc.).

Low visibility, high-quality nylon nets, 9 to 12 m (~20 – 30 ft) in length (depending upon the width of the corridor) were used for each net set. A two-tier set, at least 6 meters (~20 feet) high, constituted a net set. Netting consisted of 4 mist-net sets erected at one site on the first night and 5 mist-net sets erected at 4 locations on the second night.

Bats were live-caught in mist-nets and released unharmed near the point of capture. Data recorded for each captured individual included time of capture, capture net, capture height, species, sex, age class, reproductive condition, mass, and forearm length. Processing of bats was completed within 30 min from the time the bat was removed from the net.

White-Nose Syndrome Protocol

To minimize the transmission of White-Nose Syndrome (WNS) between captured bats, all netting and field activities followed the most up-to-date USFWS guidelines. All hard, non-porous netting equipment was sanitized with Isopropyl alcohol wipes (70%) prior to arrival at the project site and after each survey night; all other equipment was submersed in hot water (55°C) for a minimum of 20 minutes. Disposable latex gloves were worn over sanitized handling gloves and changed following the handling of each bat. All non-disposable equipment (e.g., PESOLA® scales, rulers, calipers) that came into contact with a bat was sanitized immediately following the handling of each bat. Bats were evaluated for potential WNS infection through wing scoring following the *Wing-Damage Index* (Reichard and Kunz 2009).

RESULTS

Mist-Netting Results

Mist-netting was conducted from 5-7 June, 2018 (Bat Capture and Habitat Datasheets are provided in Appendix B). Survey efforts on 5 June were not counted because the temperature dropped below 50°C during the last hour of the survey. Surveys conducted on 6 and 7 June were completed with no variance from weather guidelines.

In total, 10 bats of 2 species were captured (Table 2). No Indiana bats were captured.

Table 2. Bats captured during the summer 2018 survey for the proposed NorthPoint Development of the Lordstown Industrial Park, Trumbull County, Ohio.

Species	Adult, Male, Non- Reproductive	Adult, Male, Testes Descended	Adult, Female, Pregnant	Unknown*	Total
<i>Eptesicus fuscus</i>	1	2	4	-	7
<i>Lasiurus borealis</i>	1	-	1	1	3
Total	2	2	5	1	10

*Bat escaped before age/sex determination

Habitat

The 30 ac proposed clearing portion of the 173-acre property consists of a small field interspersed with young early successional trees. Dominate tree species include sugar maple (*Acer saccharum*), silver maple (*Acer saccharinum*), red maple (*Acer rubrum*), slippery elm (*Ulmus rubra*), Ohio buckeye (*Aesculus glabra*), and northern red oak (*Quercus rubra*). Trees are present in small clusters or as individuals throughout most of the property. The northern portion of the property includes slightly older trees in larger clusters with interspersed tree falls and forest gaps. No potential roosting habitat was observed. All trees were alive with tight bark. Foraging habitat on the property was of moderate quality. There was an abundance of open space for bats to travel through and forage in but given the surrounding habitat and the quality of the habitat on site it is unlikely that many bats utilize the property for roosting. No water resources were observed on the property.

CONCLUSIONS

Mist-netting efforts provided no evidence that Indiana bats use the project area during summer months. Indiana bat habitat within the project area is of moderate quality. In general, the forest composition and age structure provide unsuitable roosting opportunities for bats. All trees are alive with tight bark; most trees are young. The larger diameter trees of species considered optimal roosting habitat for Indiana bats are absent or few in number and do not exhibit characteristics preferred by Indiana bats based on their lack of exfoliating bark. These findings and the failure to capture listed bats suggest that the target species are not present in the project area during the maternity season or are present in such low densities that current survey techniques failed to detect them.

LITERATURE CITED

Ohio Division of Natural Resources – Division of Wildlife (ODNR-DOW). 2018. Ohio Division of Wildlife and USFWS (OH Field Office) Guidance for Bat Permitted Biologist.

Reichard, J. D. and T. H. Kunz. 2009. White-nose syndrome inflicts lasting injuries to the wings of little brown myotis (*Myotis lucifugus*). *Acta Chiropterologica*, 11(2) 457-464.

United States Fish and Wildlife Service (USFWS). 2018. Range-wide Indiana Bat Survey Guidelines.

APPENDIX A

Mist-Net Photographs



Net A



Net B



Net C



Net D




Net E

APPENDIX B

Bat Capture and Habitat Datasheets

Site No. L1 Project Phase# 711.04 Project Name Lordstown Industrial Park Dates 6/5/2018 + 6/6/18
 Site Location Woodlot off W 8th of CR45 Habitat Type* Bottomland Forest
 County Trumbull State OH Permittee T. Wetzel Technician(s) M. True
 Lat/Lon or UTM (circle one): N/Easting 41.15018 W/Northing 80.86378 UTM Zone — Datum NAD83



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#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Comments	Date	Moon%	Moon rise	Moon set	Sunrise	Sunset
1	6/5	2124	LABO	—	—	—	—	—	D	3.5	ES	CLAPED	—	—	6/5	55	0120	1204	0551	2051
2	6/5	2124	EPPU	A	M	TD	15	48	D	3	1	—	—	—	6/6	50	0151	1303	0551	2052
3	6/5	2128	LABO	A	M	NR	11	41	C	4	1	—	—	—						
4	6/5	2220	EPPU	A	F	P	28.5	52	D	3	0	—	—	—						
1	6/6	2135	LABO	A	F	NR	16	43	D	4	0	—	—	—						
2	6/6	2145	EPPU	A	F	P	26.25	50	D	5.5	OP	—	—	—						
3	6/6	2210	EPPU	A	F	P	24.75	46.5	F	2.0	0	—	—	—						

Date	Time	Temp (°F)	Sky	Wind	Comments
6/5	2100	58	0	1	
6/5	2200	53	0	0	
6/5	2300	51	0	0	
6/5	0000	51	0	0	
6/5	0100	49	0	0	
6/5	0150	48	0	0	
6/6	2100	56	3	0	
6/6	2200	54	1	0	
6/6	2300	53	0	0	
6/6	0000	53	0	0	
6/6	0100	51	0	0	
6/7	0150	51	0	0	

Sky Code

0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or overcast
4	Fog or smoke
5	Drizzle or light rain
6	Heavy rain - thunder storm

Beaufort Wind Scale

0	Calm: <1 mph
1	Light air: 1-3 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

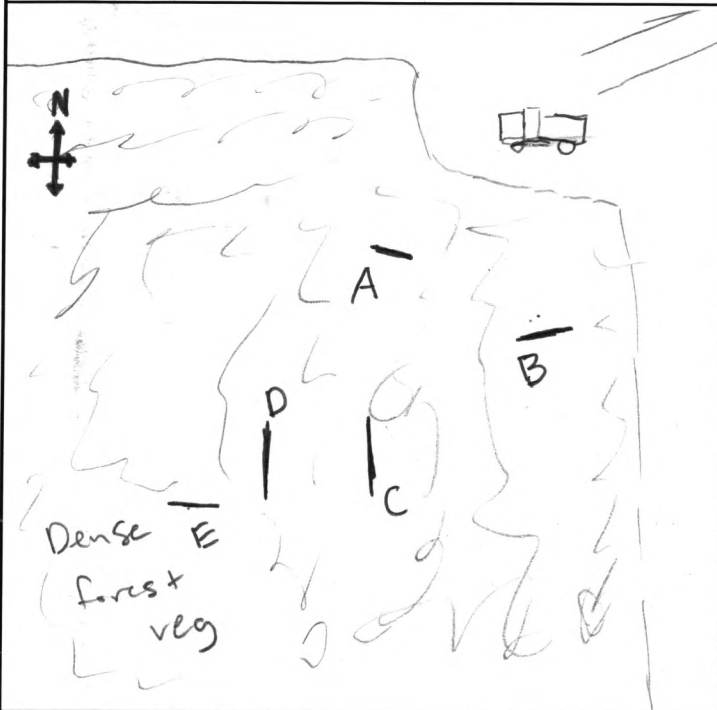
Species Abbreviations: *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPPU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasionycteris noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

***Habitat Type:** Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Site No. 1 Project Phase# 711 Project Name Lordstown Industrial Park Dates 6/5, 6/6

Net Site Diagram



Net height x net length (m)	Dates
A = 5.2 x 9	6/5 ●
B = 5.2 x 9	6/5 + 6/6
C = 5.2 x 12	6/5 + 6/6
D = 5.2 x 12	6/5 + 6/6
E = 5.2 x 9	6/5 + 6/6
F = _____ x _____	

Net Set GPS Location (UTM or Lat/Long)	
A = 41.15054	-80.86351
B = 41.15047	-80.86329
C = 41.15018	-80.86378
D = 41.15018	-80.86411
E = 41.15000	-80.86421
F = _____	

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor	X	X	X	X	X	
Road Rut						
Creek						
River						
Pond						
Forest Gap						
Cave						
Mine						
Tree						
Other: list						

Transmitters	
Band# _____	Band# _____
Freq: _____	Freq: _____
Brand _____	Brand _____
Weight _____	Weight _____
#days _____	#days _____

Date	Time nets up	Time nets down
6/5	2051	0153
6/6	2050	0152

Dominant Vegetation	
1. <u>Acer saccharum</u>	4. <u>Ulmus rubra</u>
2. <u>Acer rubrum</u>	5. <u>Aesculus glabra</u>
3. <u>Acer saccharinum</u>	6. <u>Quercus rubra</u>

Potential listed bat habitat at site:

- 2 **Roost habitat:** **1. Poor:** No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) **2. Moderate:** Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. **3. Optimal:** Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.
- 1 **Water Resources:** **1. Poor:** bat drinking resources not present at the site. **2. Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. **3. Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.
- 3 **Forest Structure:** (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). **1. Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging **2. Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. **3. Optimal:** Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.
- 2 **Land Cover:** **1. Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. **2. Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. **3. Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Site No. _____ Project Phase# _____ Project Name 711 Old Lords town Dates 6/7
 Site Location SEE PG 1 Habitat Type* _____
 County _____ State _____ Permittee _____ Technician(s) _____
 Lat/Lon or UTM (circle one): N/Easting _____ W/Northing _____ UTM Zone _____ Datum _____



COPPERHEAD ENVIRONMENTAL CONSULTING

#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Comments	Date	Moon%	Moon rise	Moon set	Sunrise	Sunset
1	6/7	2140	EPPFA	A	M	TD	12.75	43	D	3.0	0	—	—	—	6/7	37	0219	1403	0551	2053
2	6/7	2245	EPPFA	A	F	P	23.25	47	C	1.0	0	—	—	—						
3	6/7	0115	EPPFA	A	M	NR	14.5	43	D	2.0	2-P	—	—	—						

Date	Time	Temp (°F)	Sky	Wind	Comments
6/7	2100	65	1	0	—
6/7	2200	64	1	0	—
6/7	2300	64	1	0	—
6/7	0000	63	1	0	—
6/7	0100	62	0	0	—
6/7	0150	61	0	0	—

Sky Code	
0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or overcast
4	Fog or smoke
5	Drizzle or light rain
6	Heavy rain - thunder storm

Beaufort Wind Scale	
0	Calm: <1 mph
1	Light air: 1-3 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

Species Abbreviations: *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasionycteris noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

***Habitat Type:** Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Dates _____

Site No. _____

Project Phase# _____

Project Name _____

Net Site Diagram

See pg 1
for other details

Net height x net length (m)	Dates
A = _____ x _____	6/7
B = _____ x _____	6/7
C = _____ x _____	6/7
D = _____ x _____	6/7
E = _____ x _____	6/7
F = _____ x _____	

Net Set GPS Location (UTM or Lat/Long)

A = _____	_____
B = _____	_____
C = _____	_____
D = _____	_____
E = _____	_____
F = _____	_____

Habitat	Net Set by Habitat					
	A	B	C	D	E	F
Corridor						
Road Rut						
Creek						
River						
Pond						
Forest Gap						
Cave						
Mine						
Tree						
Other: list						
Date	Time nets up		Time nets down			
6/7	20:53		01:54			

Transmitters

Band# _____	Band# _____
Freq. _____	Freq. _____
Brand _____	Brand _____
Weight _____	Weight _____
#days _____	#days _____

Dominant Vegetation

1. _____	4. _____
2. _____	5. _____
3. _____	6. _____

Potential listed bat habitat at site:

Roost habitat: **1. Poor:** No or few snags \geq ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) **2. Moderate:** Snags with sloughing bark or other roost features present $>$ ~15 inch DBH within 1000 feet of forested areas. **3. Optimal:** Snags with sloughing bark or other roost features present $>$ ~15 inch DBH within 1000 feet of forested areas.

Water Resources: **1. Poor:** bat drinking resources not present at the site. **2. Moderate:** Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. **3. Optimal:** Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

Forest Structure: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor). **1. Poor:** Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging **2. Moderate:** some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. **3. Optimal:** Mature forest. Diverse age classes of trees present. Trees $>$ 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

Land Cover: **1. Poor:** Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees. **2. Moderate:** Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas. **3. Optimal:** Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

ATTACHMENT 2
SITE PHOTOGRAPHS



Photo 1: Facing N from DP01 towards emergent wetland in Area Z. (Photo taken 10/15/2019)



Photo 2: Facing S from DP06 towards wool grass and pin oak in Area Z. (Photo taken 10/15/2019)



Photo 3: View of emergent wetland in northcentral portion of Area Z. (Photo taken 10/15/2019)



Photo 4: View of large depression in Area Z near flag WLA1026 (Photo taken 10/15/2019)



Photo 5: Facing N from DP14 towards arrow-leaved tearthumb. (Photo taken 10/16/2019)



Photo 6: View of Stream 1 as it leaves the Site. Train tracks in distance. (Photo taken 10/16/2019)



Photo 7: View of incised banks of Stream 1. (Photo taken 10/16/2019)



Photo 8: Facing N from DP17 towards emergent wetland vegetation. (Photo taken 10/17/2019)



Photo 9: Depleted matrix (F3) soil profile at DP17 which is typical for wetland areas throughout the Site. (Photo taken 10/17/2019)



Photo 10: View of Stream 2 in the northwest corner of the Site. (Photo taken 10/17/2019)



Photo 11: Facing S from DP19 towards wool grass on left and Site boundary on right (Photo taken 10/17/2019)



Photo 12: Facing N from border of Area B (on left) and existing gravel access road (on right) (Photo taken 10/17/2019)



Photo 13: View of typical vegetation in Area B. (Photo taken 10/17/2019)



Photo 14: View of Depleted matrix (F3) soil profile in Area B. (Photo taken 10/17/2019)



Photo 15: Facing W towards wool grass in Area X. (Photo taken 10/18/2019)



Photo 16: Facing W towards Area U (on right) and access road (on left). (Photo taken 10/18/2019)



Photo 17: Facing N from border of Area X (on left) and Tod Ave (on right). (Photo taken 10/21/2019)



Photo 18: Facing NE old access road near DP32 in Area R (Photo taken 10/21/2019)



Photo 19: Facing E from DP33 in Area L. (Photo taken 10/21/2019)



Photo 20: Facing W from DP35 towards Area A. (Photo taken 10/22/2019)



Photo 21: Facing S from DP37 towards Area S. (Photo taken 10/22/2019)



Photo 22: Facing E from flag WLG1708 in Area H (on right). (Photo taken 10/23/2019)



Photo 23: Facing E towards upland from edge of Area H and property boundary (on right) (Photo taken 10/23/2019)



Photo 24: Facing E from DP40 in Area H. (Photo taken 10/23/2019)

ATTACHMENT 3
iPAC SPECIS LIST



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Ohio Ecological Services Field Office
4625 Morse Road, Suite 104
Columbus, OH 43230-8355
Phone: (614) 416-8993 Fax: (614) 416-8994

In Reply Refer To:

January 02, 2020

Consultation Code: 03E15000-2019-SLI-1987

Event Code: 03E15000-2020-E-00712

Project Name: Project Magellen East

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

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see <http://www.fws.gov/migratorybirds/RegulationsandPolicies.html>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/BirdHazards.html>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <http://www.fws.gov/migratorybirds/AboutUS.html>.

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

Attachment(s):

- Official Species List
-

Official Species List

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

This species list is provided by:

Ohio Ecological Services Field Office
4625 Morse Road, Suite 104
Columbus, OH 43230-8355
(614) 416-8993

Project Summary

Consultation Code: 03E15000-2019-SLI-1987

Event Code: 03E15000-2020-E-00712

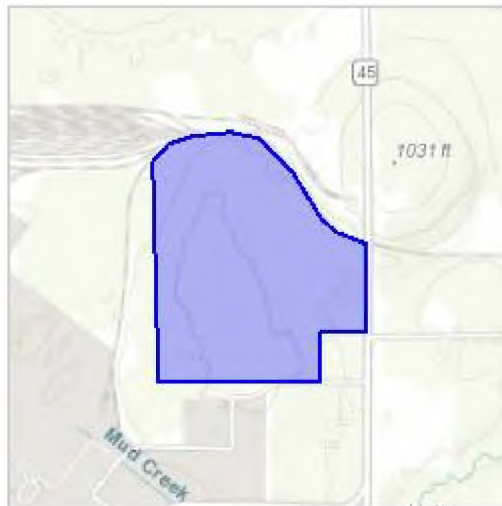
Project Name: Project Magellen East

Project Type: DEVELOPMENT

Project Description: New industrial development on 158.215 Acre parcel. Project planning is being undertaken

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/41.15288572681847N80.86228738786092W>



Counties: Trumbull, OH

Endangered Species Act Species

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

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions.

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

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

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

Mammals

NAME	STATUS
Indiana Bat <i>Myotis sodalis</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: <ul style="list-style-type: none"> ▪ Incidental take of the northern long-eared bat is not prohibited at this location. Federal action agencies may conclude consultation using the streamlined process described at https://www.fws.gov/midwest/endangered/mammals/nleb/s7.html Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Reptiles

NAME	STATUS
Eastern Massasauga (=rattlesnake) <i>Sistrurus catenatus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2202	Threatened

Clams

NAME	STATUS
Clubshell <i>Pleurobema clava</i> Population: Wherever found; Except where listed as Experimental Populations No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3789	Endangered

Critical habitats

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

APPENDIX E4

USFWS Email Correspondence



Tremante, Vinnie

From: Applegate, Jeromy <jeromy_applegate@fws.gov>
Sent: Friday, January 3, 2020 12:59 PM
To: Scott.Bush@ghd.com
Cc: Jim F. Hartnett; Tremante, Vinnie; Gilbert, Matthew C LRP
Subject: Project Magellan East -- Threatened and Endangered Species Review

Scott,

This email is in response to your January 2, 2020 letter requesting a review of the subject project, relative to potential impacts to federally threatened and endangered species. The project Magellan East site is located east of the former GM Lordstown Assembly Plant, on a property known as the North Point site, in reference to the proposed North Point Industrial Development, which never moved forward.

As you state in your letter, this office reviewed the North Point site in 2018, including a mist net survey report for federally listed bats that was completed in June 2018. Because no Indiana bats or northern long-eared bats were captured during the survey, we stated in 2018 that tree clearing at the North Point site could occur at any time of the year, until March 31, 2024, without impacting Indiana bats or northern long-eared bats. This statement is also applicable to the proposed Project Magellan East, because it occurs entirely within the North Point property. In addition, as stated in our 2018 review, we do not anticipate impacts to any other federally listed species.

Please contact me with any questions.

Jeromy

Jeromy Applegate
Fish and Wildlife Biologist
U S Fish and Wildlife Service
Ohio Ecological Services Field Office
4625 Morse Rd., Suite 104
Columbus, OH 43230
Phone: 614-416-8993 ext. 21
FAX: 614-416-8994

APPENDIX F

F1 – State Historic Preservation Office Review Request Letter

F2 – State Historic Preservation Office Review Response Letter

F3 – Weller Cultural Resources Preliminary Review

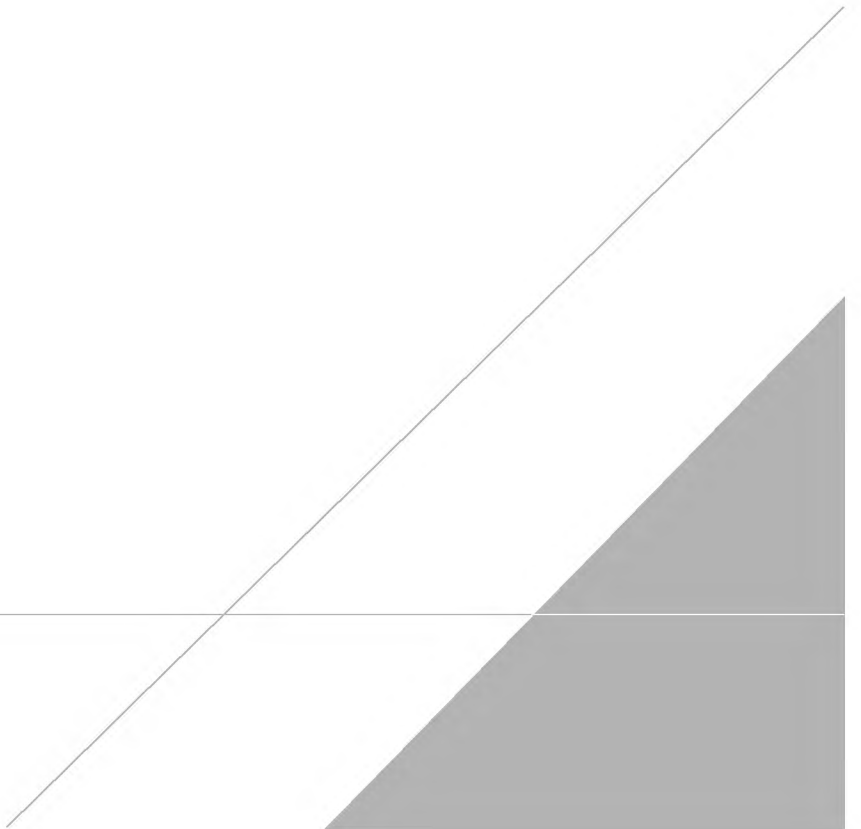
F4 – Weller Phase I Archaeological Investigations

F5 – Weller History/Architecture Investigations



APPENDIX F1

State Historic Preservation Office Review Request Letter





October 14, 2019

Reference No. 11203468

Ms. Diana Welling
State Historic Preservation Office
Resource Protection and Review Department
800 E. 17th Avenue
Columbus, OH 43211-2474

Re: Request for Section 106 Review
Project Magellan – Parcel B
State Route 25 (Tod Ave SW)
Village of Lordstown, Trumbull County, Ohio

Dear Ms. Welling:

GHD Services, Inc. (GHD) has been retained to evaluate a 158.22-acre parcel located on the west side of Tod Ave. in the Village of Lordstown, Trumbull County for potential future industrial development. The location of the Site is shown on the USGS map provided as Figure 1. The use of this Site may require a Department of the Army Section 404 permit and we are requesting your review of the Site under Section 106 consultation. Enclosed please find a completed Project Summary Form with requested maps and attachments.

We look forward to your review and recommendations for Section 106 site clearance. If you have any questions, please feel free to contact me at (610) 646-7486 or scott.bush@GHD.com.

Yours truly,

A handwritten signature in black ink that reads "Scott E. Bush". The signature is fluid and cursive, with the first name "Scott" and last name "Bush" clearly legible.

Scott E. Bush, P.W.S.

Enclosures

106 PROJECT SUMMARY FORM

S106 Data Entry Form

Section 106 Review Project Summary Form**Documentation Table Data Entry Form****Ohio Historic Preservation Office**

1982 Velma Avenue
Columbus, OH 43211-2497
614/298-2000

[Preview Project Summary Form Table](#)

1. Project Number (if applicable):
2. Photo ID:
3. Reference Number:
4. OHI Number (if known)
5. Check box if property is potentially eligible for the National Register of Historic Places

Location

6. Present Name of Property:
7. Address:
8. City or Township:
9. County:

Building Description

14. Present Use:
15. Building Type:
16. Architectural Style:
17. Foundation Material:
18. Wall Construction:
19. Exterior Wall:

Owner Information

24. First Name:
25. Last Name:
26. Mailing Address:
27. City, State and Zip:

UTM Coordinates

10. Zone:
11. Easting: 12. Northing:
13. Quadrangle Name:

Building History

20. Original Date of Construction:
21. Alteration Date:
22. Alteration Type:
23. Condition of Property:

Preparer Information:

28. First Name:
29. Last Name:
30. Organization:
31. Recording Date:

32. Sources:

33. Further Description:



**OHIO HISTORIC PRESERVATION OFFICE:
RESOURCE PROTECTION AND REVIEW**

Section 106 Review - Project Summary Form

For projects requiring a license from the Federal Communications Commission, please use FCC Forms 620 or 621. DO NOT USE THIS FORM.

SECTION 1: GENERAL PROJECT INFORMATION

All contact information provided must include the name, address and phone number of the person listed. Email addresses should also be included, if available. Please refer to the Instructions or contact an OHPO reviewer (mailto:Section106@ohiohistory.org) if you need help completing this Form. Unless otherwise requested, we will contact the person submitting this Form with questions or comments about this project.

Date:10/9/2019
Name/Affiliation of person submitting form: Scott Bush, GHD Services, Inc.
Mailing Address:410 Eagleview Blvd, STE 110. Exton, PA 19341
Phone/Fax/Email:610-646-7486 / 610-321-7462 / scott.bush@ghd.com

A. Project Info:

1. This Form provides information about:

New Project Submittal:

YES

Additional information relating to previously submitted project:

NO

OHPO/RPR Serial Number from previous submission:

N/A

2. Project Name (if applicable):

Project Magellan

3. Internal tracking or reference number used by Federal Agency, consultant, and/or applicant to identify this project (if applicable):

11203468

B. Project Address or vicinity:

7685-7665 Tod Ave SW

Warren, OH 44481

- C. City/Township:
Lordstown
- D. County:
Trumbull
- E. Federal Agency and Agency Contact. *If you do not know the federal agency involved in your project, please contact the party asking you to apply for Section 106 Review, not OHPO, for this information. HUD Entitlement Communities acting under delegated environmental review authority should list their own contact information.*
U.S. Army Corps of Engineers, Pittsburgh District
- F. Type of Federal Assistance. *List all known federal sources of federal funding, approvals, and permits to avoid repeated reviews.*
Department of the Army Section 404 Permit
- G. State Agency and Contact Person (if applicable):
Ohio EPA
- H. Type of State Assistance:
401 Water Quality Certification and / or Isolated Wetland Permit
- I. Is this project being submitted at the direction of a state agency **solely** under Ohio Revised Code 149.53 or at the direction of a State Agency? *Answering yes to this question means that you are sure that no federal funding, permits or approvals will be used for any part of your project, and that you are seeking comments only under ORC 149.53.*

NO
- J. Public Involvement- Describe how the public has been/will be informed about this project and its potential to affect historic properties. Please summarize how they will have an opportunity to provide comments about any effects to historic properties. (This step is required for all projects under 36 CFR § 800.2):

The DA / OEPA will require public notice and comment. There are no known historic or archeological resources on or adjoining the property
- K. Please list other consulting parties that you have contacted/will contact about this project, such as Indian Tribes, Certified Local Governments, local officials, property owners, or preservation groups. (See 36 CFR § 800.2 for more information about involving other consulting parties). Please summarize how they will have an opportunity to provide comments:

L.

Consulting Parties Contacted	How Comments Will be Provided
U.S. Fish and Wildlife Service Ohio Ecological Field Office Columbus, OH	IPAC request for review submitted on 10-4-19
U.S Army Corps of Engineers Pittsburgh District Pittsburg, PA	Department of Army Permit Application to be submitted
Ohio Environmental Protection Agency Division of Surface Water Columbus, OH	Isolated Wetland Permit Preconstruction Notification and Section 401 Water Quality. To be submitted
Ohio Department of Natural Resources Office of Real Estate & Land Man.	Request for Environmental Review to be submitted
Local governmental approvals will be required.	Local meetings with officials

SECTION 2: PROJECT DESCRIPTION AND AREA OF POTENTIAL EFFECTS (APE)

Provide a description of your project, its site, and geographical information. You will also describe your project’s Area of Potential Effects (APE). Please refer to the Instructions or contact an OHPO reviewer if you need help with developing the APE or completing this form.

The approximate center of the Site is 41.154145, -80.863821 WGS84. A USGS map showing the location of the Site is provided as Figure 1. The site is 158.22 acres, shown as Parcel B on the attached ALTA property survey plan (Figure 2). The site is contemplated for industrial development. Over 80 to 90 percent of the parcel will be required for the development. The APE is the entire site. The site is surrounded by other industrial uses including the GM Lordstown Assembly Plant to the west, railroad sidings to the north, Magna Seating Systems to the east, and Cassens Transport Company parking areas to the south.

For challenging projects, provide as much information as possible in all sections, and then check the box in Section 5.A. to ask OHPO to offer preliminary comments or make recommendations about how to proceed with your project consultation. This is recommended if your project involves effects to significant historic properties or if there may be challenging procedural issues related to your project. Please note that providing information to complete all Sections will still be required and that asking OHPO for preliminary comments may tend to delay completion of the review process for some projects.

A. Does this project involve any Ground-Disturbing activity: **YES**

(If **Yes**, you must complete all of Section 2.A. If No, proceed directly to Section 2. B.)

1. General description of width, length and depth of proposed ground disturbing activity:

Almost the entire site (approximately 3,100 feet north-south by 2,500 feet east-west) will be disturbed by construction of a new industrial manufacturing facility.

2. Narrative description of previous land use and past ground disturbances, if known:

From at least 1903, the site was historically used for agriculture but contained some small wooded areas. Agriculture appears to have ceased in the 1980s. The site was developed for natural gas in the mid 1990s. Currently, the only structures onsite are a natural gas well, gas collection lines, a gas meter, and a small oil collection tank. The entire site was logged in 2015. Much of the site was clear cut and smaller portions were selectively logged. The logging resulted in significant rutting and disturbance of the site. A series of historical aerial photographs is provided as Figure 3.

3. Narrative description of current land use and conditions:

The site is currently vacant except for a gas well, gas collection system, and oil collection tank.

4. Does the landowner know of any archaeological resources found on the property?
NO If yes, please describe:

There are no known or suspected archeological resources on the property

B. Submit the exact project site location on a USGS 7.5-minute topographic quadrangle map for all projects. Map sections, photocopies of map sections, and online versions of USGS maps are acceptable as long as the location is clearly marked. Show the project's Area of Potential Effects (APE). It should be clearly distinguished from other features shown on the map:

1. USGS Quad Map Name:

Warren, OH

2. Township/City/Village Name:

Lordstown Township, Village of Lordstown, Trumbull County, Ohio

C. Provide a street-level map indicating the location of the project site; road names must be identified and legible. Your map must show the exact location of the boundaries for the project site. Show the project's Area of Potential Effects (APE). It should be clearly distinguished from other features shown on the map:

See Figure 4

D. Provide a verbal description of the APE, including a discussion of how the APE will include areas with the potential for direct and indirect effects from the project. Explain the steps

taken to identify the project's APE, and your justification for the specific boundaries chosen:

The APE consists of the Site boundaries. The lands surrounding the Site are industrial in nature and are developed. The adjoining lands are not historic.

- E. Provide a detailed description of the project. This is a critical part of your submission. Your description should be prepared for a cold reader who may not be an expert in this type of project. The information provided must help support your analysis of effects to historic properties, not other types of project impacts. Do not simply include copies of environmental documents or other types of specialized project reports. If there are multiple project alternatives, you should include information about all alternatives that are still under active consideration:

The project will consist of a large industrial manufacturing facility that will encompass most of the Site. The exact footprint of the facility has not been determined but the scale of the facility will require disturbance to 80 to 90 percent of the site.

SECTION 3: IDENTIFICATION OF HISTORIC PROPERTIES

Describe whether there are historic properties located within your project APE. To make that determination, use information generated from your own Background Research and Field Survey. Then choose one of the following options to report your findings. Please refer to the Instructions and/or contact an OHPO reviewer if you are unsure about how to identify historic properties for your project.

There are no historical properties in the APE.

If you read the Instructions and you're still confused as to which reporting option best fits your project, or you are not sure if your project needs a survey, you may choose to skip this section, but provide as much supporting documentation as possible in all other Sections, then check the box in Section 5.A. to request preliminary comments from OHPO. After reviewing the information provided, OHPO will then offer comments as to which reporting option is best suited to document historic properties for your project. Please note that providing information to complete this Section will still be required and that asking OHPO for preliminary comments may tend to delay completion of the review process for some projects.

Recording the Results of Background Research and Field Survey:

- A. Summary of discussions and/or consultation with OHPO** about this project that demonstrates how the Agency Official and OHPO have agreed that no Field Survey was necessary for this project (typically due to extreme ground disturbance or other special circumstances). Please **attach copies** of emails/correspondence that document this agreement. You must explain how the project's potential to affect both archaeological and historic resources were considered.

No consultation has been completed with OHPO.

- B. A table that includes the minimum information** listed in the OHPO Section 106 Documentation Table (which is generally equivalent to the information found on an inventory form). This information must be printed and mailed with the Project Summary Form. To provide sufficient information to complete this Section, you must also include summary observations from your field survey, background research and eligibility determinations for each property that was evaluated in the project APE.

A preliminary site investigation was completed on September 24, 2019 by GHD. The entire site was inspected. No standing structures or ruins were present. A gas well, gas collection system, gas meter, and oil collection tank are present. The site was

logged circa 2015 which resulted in rutting and disturbance to the land. No consultation has been completed with OHPO.

- C. OHI (Ohio Historic Inventory) or OAI (Ohio Archaeological Inventory) forms-** New or updated inventory forms may be prepared using the OHI pdf form with data population capabilities, the Internet IForm, or typed on archival quality inventory forms. To provide sufficient information to complete this Section, you must include summary observations from your field survey and background research. You must also include eligibility determinations for each property that was evaluated in the project APE

No consultation has been completed with OHPO and a formal historical/archeological survey of the property has not been completed.

- D. A historic or archaeological survey report** prepared by a qualified consultant that meets professional standards. The survey report should meet the Secretary of the Interior's Standards and Guidelines for Identification and OHPO Archaeological Guidelines. You may also include new inventory forms with your survey, or update previous inventory forms. To complete this section, your survey report must include summary observations from your field survey, background research and eligibility determinations for each property that was evaluated within the APE.

No consultation has been completed with OHPO and a formal historical/archeological survey of the property has not been completed.

- E. Project Findings.** Based on the conclusions you reached in completing Section 3, please choose one finding for your project. There are (mark one):

Historic Properties Present in the APE:

No historic properties are known from the APE

SECTION 4: SUPPORTING DOCUMENTATION

This information must be provided for all projects.

- A.** Photographs must be keyed to a street-level map, and should be included as attachments to this application. Please label all forms, tables and CDs with the date of your submission and project name, as identified in Section 1. You must present enough documentation to clearly show existing conditions at your project site and convey details about the buildings, structures or sites that are described in your submission. Faxed or photocopied photographs are not acceptable. See Instructions for more info about photo submissions or 36 CFR § 800.11 for federal documentation standards.
1. Provide photos of the entire project site and take photos to/from historic properties from/towards your project site to support your determination of effect in Section 5.
 2. Provide current photos of all buildings/structures/sites described.
- B.** Project plan, specifications, site drawings and any other media presentation that conveys detailed information about your project and its potential to affect historic properties.
- C.** Copies or summaries of any comments provided by consulting parties or the public. None

SECTION 5: DETERMINATION OF EFFECT

A. **Request Preliminary Comments.** For challenging projects, provide as much information as possible in previous sections and ask OHPO to offer preliminary comments or make recommendations about how to proceed with your project consultation. This is recommended if your project involves effects to significant historic properties, if the public has concerns about your project's potential to affect historic properties, or if there may be challenging procedural issues related to your project. Please be aware that providing information in all Sections will still be required and that asking OHPO for preliminary comments may tend to delay completion of the review process for some projects.

1. We request preliminary comments from OHPO about this project:
YES

2. Please specify as clearly as possible the particular issues that you would like OHPO to examine for your project (for example- help with developing an APE, addressing the concerns of consulting parties, survey methodology, etc.):

We are requesting your preliminary review of the Site for historic and archeologic concerns to determine if any additional studies are warranted.

B. **Determination of Effect.** If you believe that you have gathered enough information to conclude the Section 106 process, you may be ready to make a determination of effect and ask OHPO for concurrence, while considering public comments. Please select and mark one of the following determinations, then explain the basis for your decision on an attached sheet of paper:

No historic properties will be affected based on 36 CFR § 800.4(d) (1).
Please explain how you made this determination:
To be determined

No Adverse Effect [36 CFR § 800.5(b)] on historic properties. This finding cannot be used if there are no historic properties present in your project APE. Please explain why the Criteria of Adverse Effect, [36 CFR Part 800.5(a) (1)], were found not to be applicable for your project:
To be determined

Adverse Effect [36 CFR § 800.5(d) (2)] on historic properties. Please explain why the criteria of adverse effect, [36 CFR Part 800.5(a) (1)], were found to be applicable to your project. You may also include an explanation of how these adverse effects might be avoided, reduced or mitigated:
To be determined

Please print and mail completed form and supporting documentation to:

*State Historic Preservation Office
Resource Protection and Review Department
800 E. 17th Avenue
Columbus, OH 43211-2474*

S106 Data Entry Form

Section 106 Review Project Summary Form**Documentation Table Data Entry Form****Ohio Historic Preservation Office**

1982 Velma Avenue
Columbus, OH 43211-2497
614/298-2000

[Preview Project Summary Form Table](#)

1. Project Number (if applicable):
2. Photo ID:
3. Reference Number:
4. OHI Number (if known)
5. Check box if property is potentially eligible for the National Register of Historic Places

Location

6. Present Name of Property:
7. Address:
8. City or Township: ▼
9. County: ▼

Building Description

14. Present Use: ▼
15. Building Type: ▼
16. Architectural Style: ▼
17. Foundation Material: ▼
18. Wall Construction: ▼
19. Exterior Wall: ▼

Owner Information

24. First Name:
25. Last Name:
26. Mailing Address:
27. City, State and Zip:

UTM Coordinates

10. Zone:
11. Easting: 12. Northing:
13. Quadrangle Name: ▼

Building History

20. Original Date of Construction:
21. Alteration Date:
22. Alteration Type: ▼
23. Condition of Property: ▼

Preparer Information:

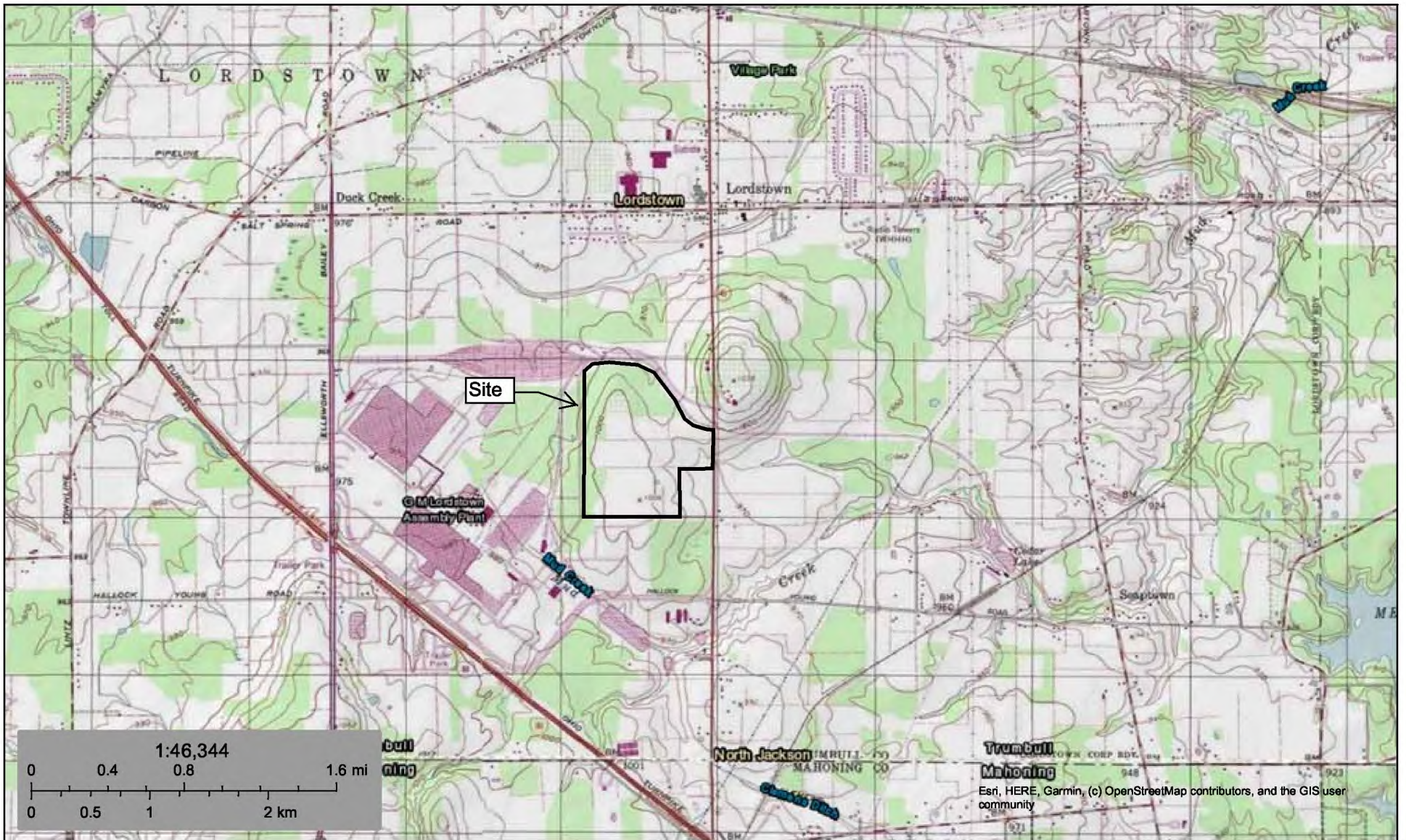
28. First Name:
29. Last Name:
30. Organization:
31. Recording Date:

32. Sources:

33. Further Description:

FIGURES

Project Magellan
Lordstown, Ohio



October 8, 2019

Figure 1
USGS Map

BOUNDARY SURVEY

Situated In the Village of Lordstown, County of Trumbull and State of Ohio, being part of Original Lordstown Township Lot Numbers 64 and 65, and part of Lot No. 1 of the Great Salt Springs Tract

NOTES:

- The monuments referenced herein (found or set) are in good condition and undisturbed (unless otherwise noted) at or near existing grade. All set pins are 5/8" wide x 30" long with an identification cap bearing the number "DEWITT S-8625".
- The surveyor was not provided any documentation, was not made aware, and did not observe, any ground markings on the surveyed property with regards to wetlands. No environmental assessment or audit was performed on the subject parcel by NV5.
- There are no wetlands on or adjacent to the subject parcel per the National Wetlands Inventory map. This statement should not be used as a substitute for an actual field delineation of wetlands.
- Basis of Bearings is Grid North, Ohio State Plane Coordinate System, North Zone (3401), NAD 83 (Conus).
- Pertinent documents include: Surveys on file at the County Engineer's Office; Deeds and Plats as shown hereon; County Tax Maps

ZONING INFORMATION

The subject property is zoned "I-1" - Industrial District of the Village of Lordstown

Front Setback: 100'
Side Setback: 50'
Rear Setback: 75'

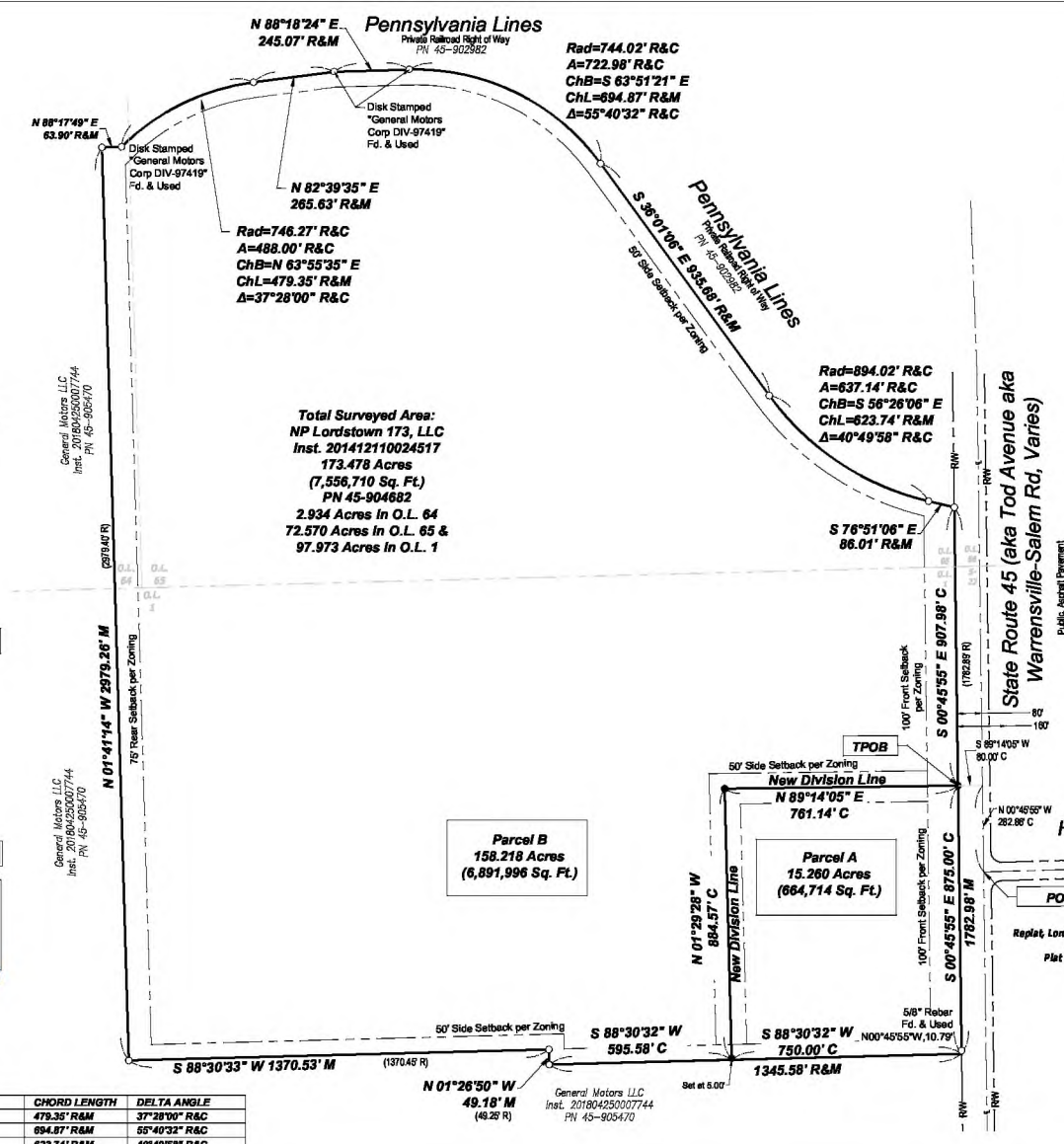
Minimum Lot Area: 150,000 Sq. Ft.
Maximum Building Height: 100'
Minimum Lot Width: 300'
Minimum Lot Depth: 500'
Minimum Parking: One for each 500 sq. ft. of gross floor area

The zoning information shown above was provided by NV5 Zip Report, Project No. 7201901152, having a date of effect of May 9, 2019, pursuant to Item 6b of Table A.

FIGURE 2

SYMBOL LEGEND

- RW - Right of Way
 - C - Centerline
 - Rad - Radius
 - A - Arc Length
 - Δ - Delta Angle
 - ChL - Chord Length
 - ChB - Chord Bearing
 - C - Calculated
 - M - Measured
 - R - Record
- Surveyed (Record)**
- - Iron Pin Fd. "DIVERSIFIED ENGINEERING" Unless Noted
 - - 5/8" Rebar w/Cap Set "DEWITT S-8625"
 - - Fence



Total Surveyed Area:
NP Lordstown 173, LLC
Inst. 201412110024517
173.478 Acres
(7,556,710 Sq. Ft.)
PN 45-904682
2.934 Acres in O.L. 64
72.570 Acres in O.L. 65 &
97.973 Acres in O.L. 1

Parcel B
158.218 Acres
(6,891,996 Sq. Ft.)

Parcel A
15.260 Acres
(664,714 Sq. Ft.)

Lot 3
Lordstown Industrial Park
Plat No. 2
Plat Vol. 53, Pg. 22

Henn Parkway (60')

Lot 1-8
Replat, Lordstown Industrial Park
Plat No. 1
Plat Vol. 37, Pg. 138

Certification:

I certify that the parcel shown hereon has been surveyed by me or under my direct supervision in accordance with the Minimum Standards For Boundary Surveys, Ohio Administrative Code, Chapter 4733.37.

By: Aleine J. DeWitt, P.S.
License No. S-8625
Field Dates: May-June 2019
File No. 19064

Survey Prepared By:

Cardinal Precision Surveying, LLC
2715 Virginia Ridge Road
Philo, OH 43771
(330) 603-0264
www.cardinalprecisionsurveying.com
adewitt@cardinalprecisionsurveying.com

Survey Prepared For:

PREPARED FOR:
OD Lordstown
DATE OF FIELDWORK: MAY 09, 2019
NETWORK PROJECT NUMBER: 201901152
1-(800)-SURVEYS (737-5397)
TRANSACTION SERVICES

NV5
SURVEY • ZONING • ENVIRONMENTAL • ASSESSMENT

Curve Table

CURVE	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH	DELTA ANGLE
C1	746.27' R&C	488.00' R&C	N 63°55'35" E	479.35' R&M	37°28'00" R&C
C2	744.02' R&C	722.98' R&C	S 63°51'21" E	694.87' R&M	65°40'32" R&C
C3	894.02' R&C	637.14' R&C	S 56°26'06" E	623.74' R&M	40°49'58" R&C



SITE

Figure 3A

INQUIRY #: 2614661.5

YEAR: 1965

| = 500'





Figure 3B

INQUIRY #: 2614661.5

YEAR: 1970

| = 500'





SITE

Figure 3C

INQUIRY #: 2614661.5

YEAR: 1977

| = 1000'





Figure 3D

INQUIRY #: 2614661.5

YEAR: 1982

| = 1000'





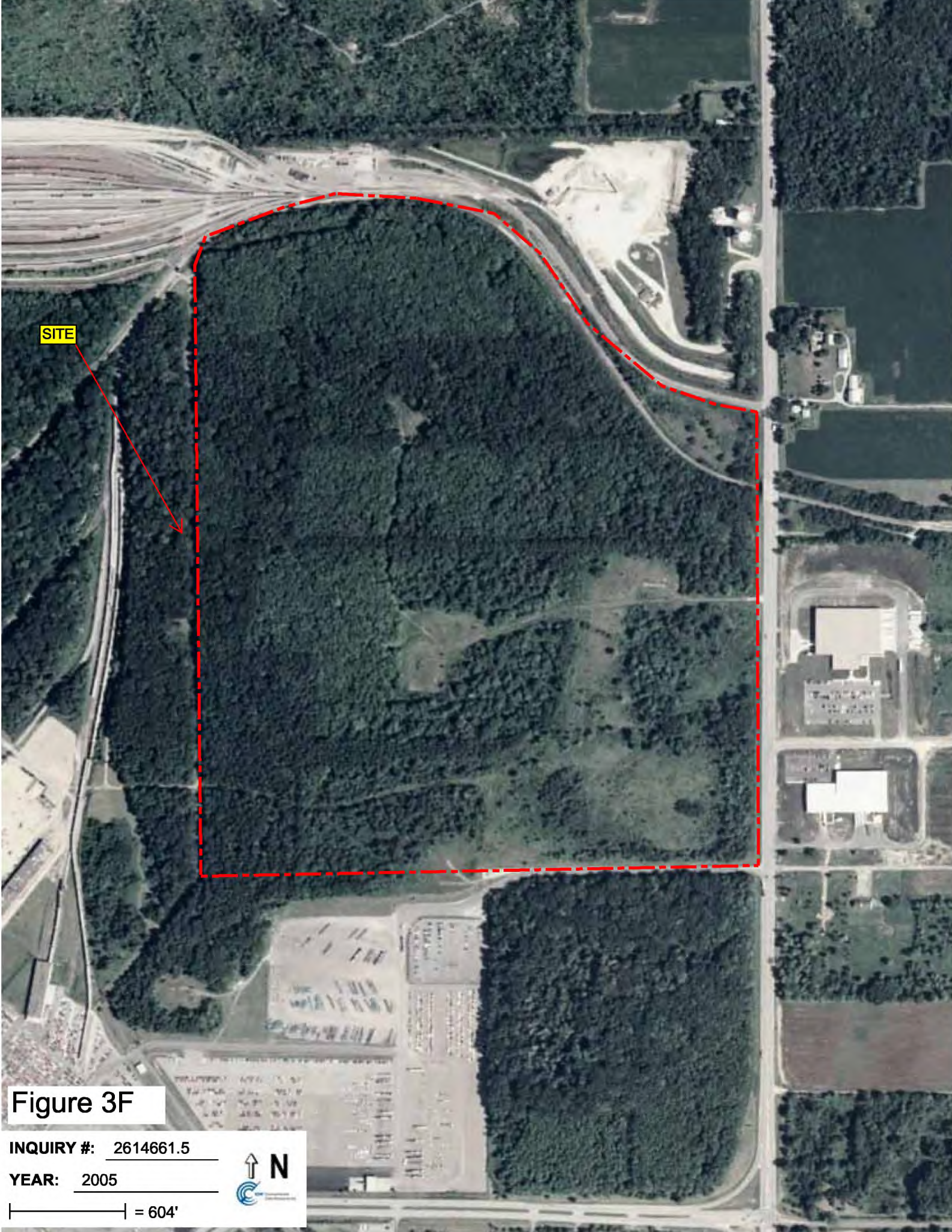
Figure 3E

INQUIRY #: 2614661.5

YEAR: 1994

| = 750'





SITE

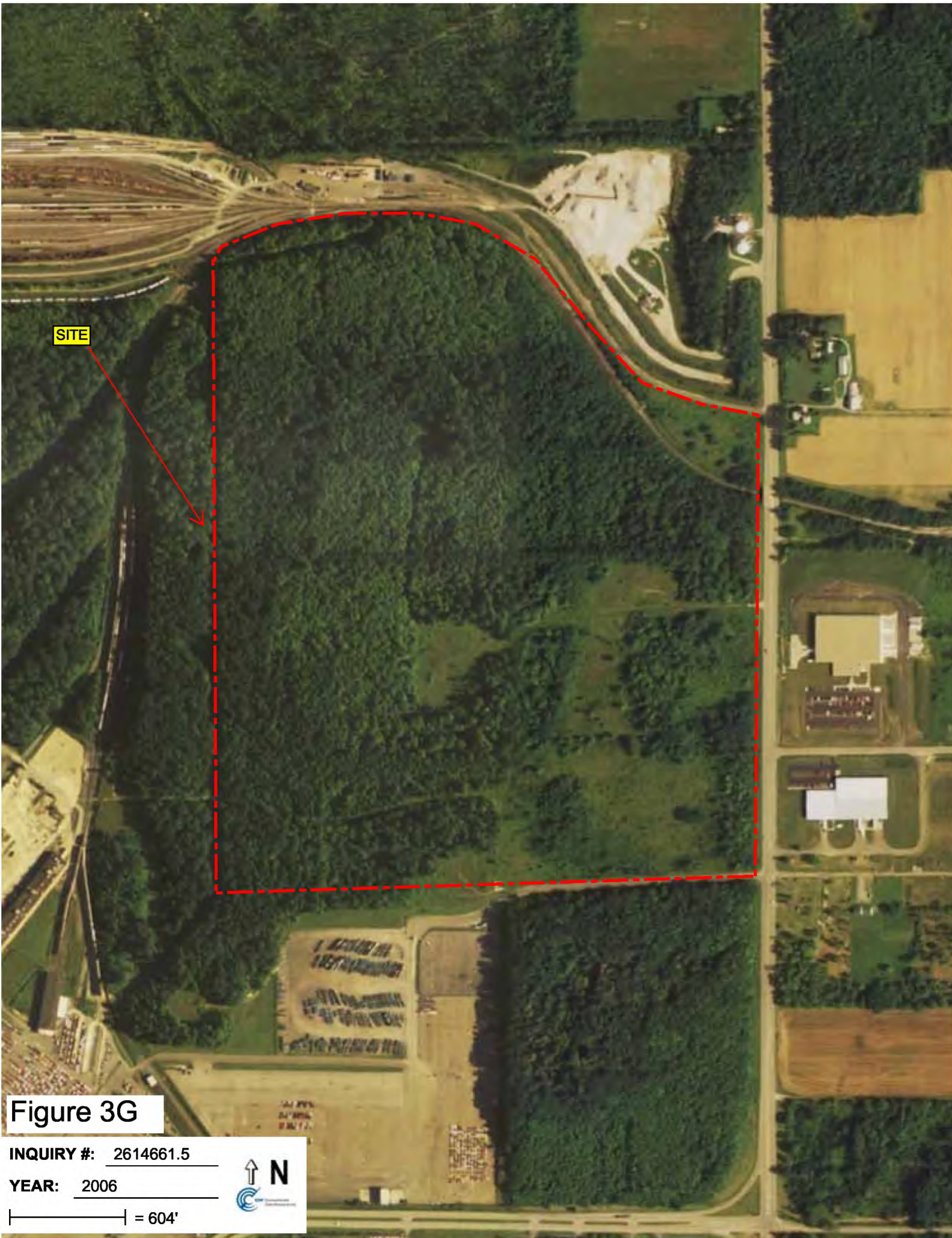
Figure 3F

INQUIRY #: 2614661.5

YEAR: 2005

| = 604'





SITE

Figure 3G

INQUIRY #: 2614661.5

YEAR: 2006

| = 604'



Project Magellan

2014

SITE



1000 AVE SW

45

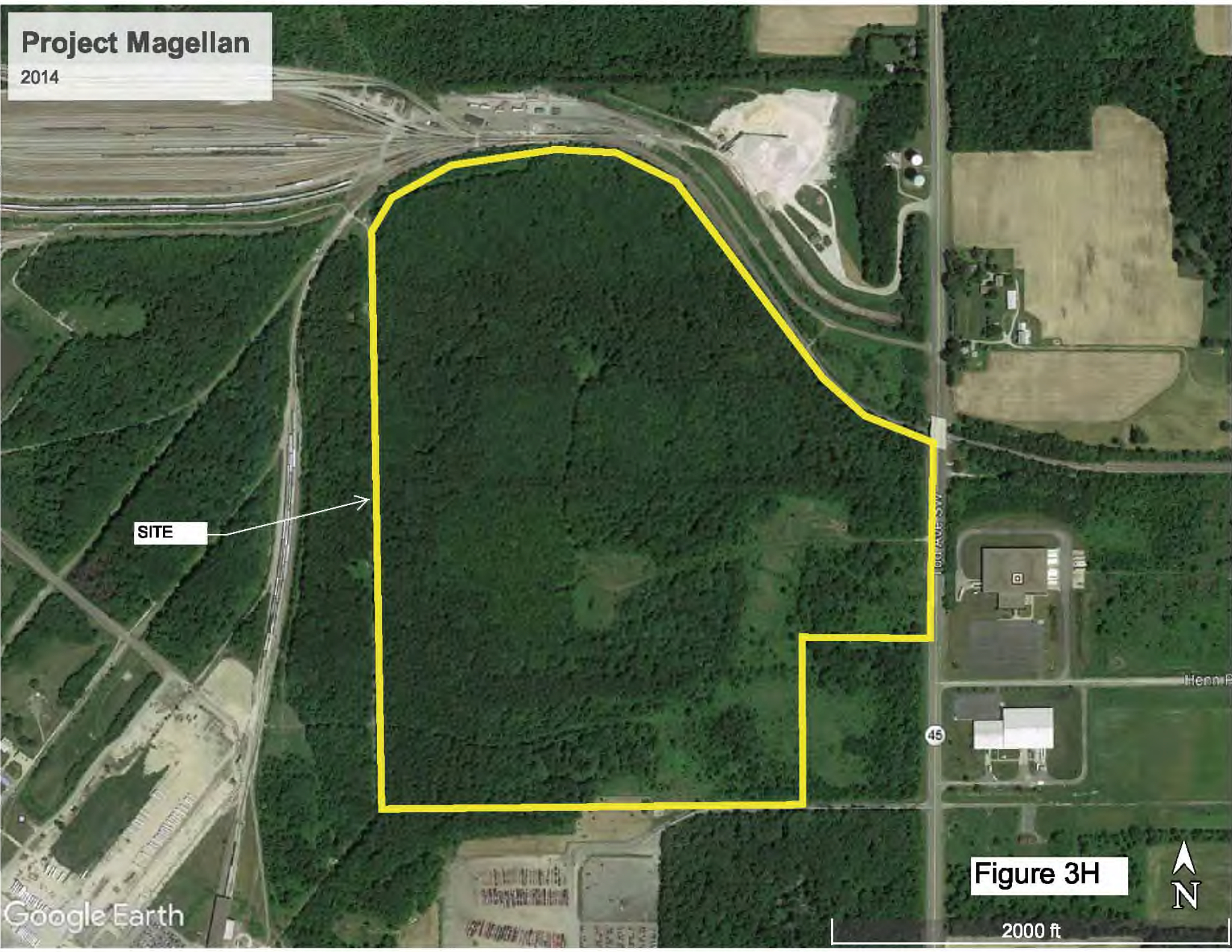
Hennepin

Figure 3H



2000 ft

Google Earth



Project Magellan

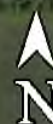
2015

SITE

Todd Ave SW

45

Figure 3I



2000 ft

Google Earth



Project Magellan

2016

SITE

Figure 3J



2000 ft

Google Earth

© 2018 Google



ATTACHMENT 1
SITE PHOTOGRAPHS AND KEY MAP

Project Magellan

Photo Key Map



SITE

TOD AVE SW

45

Google Earth

© 2018 Google

1000 ft





Photo 1: Looking north at oil collection tank in eastern portion of the Site.



Photo 2: Gas meter in eastern portion of the Site.



Photo 3: Selectively logged area in the eastern portion of the Site.



Photo 4: Clear cut area in the north eastern portion of the Site.



Photo 5: Recently logged area in the north eastern portion of the Site.



Photo 6: Clear cut area in the eastern portion of the Site.



Photo 7: Clear cut area in the center of the Site.



Photo 8: Looking west towards western property line in the northern part of the Site.



Photo 9: Small drainage feature along chain link fence on the western property boundary.



Photo 10: Clear cut area along western property boundary.



Photo 11: Looking south across the center of the Site.



Photo 12: Looking south at gravel logging/access road in southern portion of the Site.



Photo 13: Looking east at recently cut logging access / drainage ditch in southern portion of the Site.



Photo 14: Looking west at logging road and selectively cut woods in the southwestern portion of the Site.



Photo 15: Looking east at south eastern portion of the Site.



Photo 16: Looking south at access road in the southern portion of the Site.

APPENDIX F2

State Historic Preservation Office Review Response Letter





In reply refer to:
2019-TRU-46596

October 28, 2019

Scott E. Bush, P.W.S.
GHD Services Inc.
410 Eagleview Boulevard, Suite 110
Exton, Pennsylvania 19341
Email: scott.bush@GHD.com

RE: Section 106 Review-158.22-acre Project Magellan (Parcel B) Industrial Development-
Lordstown, Trumbull County, Ohio (GHD Ref. #11203468)

Dear Mr. Bush:

This letter is in response to correspondence, received October 16, 2019, regarding the proposed 158.22-acre Project Magellan (Parcel B) industrial development project in Lordstown, Trumbull County, Ohio. We appreciate the opportunity to comment on this project. The comments of the State Historic Preservation Office (SHPO) are made in accordance with the provisions of Section 106 of the National Historic Preservation Act of 1966, as amended, and the associated regulations at 36 CFR Part 800.

The proposed project involves the development of a 158.22-acre parcel for future industrial development and related infrastructure. According to our records, the area has never been investigated for cultural resources and though you note some disturbances, large portions appear to be undisturbed and/or minimally impacted by past activities.

In order to determine if the current project will affect historic properties, the SHPO recommends an archaeological survey, as well as, a history/architecture survey for the entire Area of Potential Effects (direct and indirect). Additionally, any buildings that appear to be over 50 years old in the indirect APE should be documented and evaluated for National Register of Historic Places (NRHP) eligibility.

Please be advised that this is a Section 106 decision. This review decision may not extend to other SHPO programs. If you have any questions concerning this review, please contact me at 614-298-2000 or by email at sbiehl@ohiohistory.org. Thank you for your cooperation.

Sincerely,

A handwritten signature in blue ink that reads "Stephen M. Biehl".

Stephen M. Biehl, Project Reviews Coordinator
Resource Protection and Review
State Historic Preservation Office

RPR Serial No. 1081142

APPENDIX F3

Weller Cultural Resources Preliminary Review





**A Cultural Resource Management Preliminary Review for the
66.4 ha (164 ac) Magellan East Parcel 4 Project in
Lordstown Township, Trumbull County, Ohio**

Ryan J. Weller

December 3, 2019

1395 West Fifth Ave.
Columbus, OH 43212
Phone: 614.485.9435
Fax: 614.485.9439
Website: www.wellercrm.com

**A Cultural Resource Management Preliminary Review for the
66.4 ha (164 ac) Magellan East Parcel 4 Project in
Lordstown Township, Trumbull County, Ohio**

By

Ryan J. Weller

Submitted By:

**Ryan J. Weller, P.I.
Weller & Associates, Inc.
1395 West Fifth Ave.
Columbus, OH 43212
Phone: 614.485.9435 Fax: 614.485.9439
Website: www.wellercrm.com**

Prepared for:

**GHD
210 Eagleview Boulevard, Suite 110
Exton, PA 19341**

Lead Agency:

US Army Corps of Engineers, Pittsburgh



Ryan J. Weller, P.I.

December 3, 2019

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W-2721e

Introduction

In December 2019, GHD contracted Weller & Associates, Inc. (Weller) to conduct a Cultural Resource Management Preliminary review for the 66.4 ha (164 ac) Magellan East Parcel 4 Project in Lordstown Township, Trumbull County, Ohio (Figures 1-4). The lead agency for this project is the US Army Corps of Engineers, Pittsburgh. This literature review is intended to identify any previously identified resources or surveys that involve the current area of investigation. The work focused on the available and standard resources that are utilized for projects in Ohio. This report summarizes the results of the literature review.

Ryan J. Weller served as the Principal Investigator and as the Senior Project Manager. He was responsible for the textual aspects of the report and Chad Porter completed the figures.

Project Description

The generic project plans are for a possible expansion of the existing Lordstown Plant complex. The type of development is unknown to Weller at this time. The project area is located in an upland setting that is to the northeast of the plant facilities proper. It is to the west of Tod Avenue SW and is opposite Henn Parkway and its related developments. Further, this area is north of Hallock Young Road and to the south and east of railroad lines. The relief in the area is gently rolling to nearly level areas. The current conditions include fallow former farm fields and deciduous forestation.

Basic Environment

The project area is in an upland, glaciated till plain setting where the topographic relief is gentle to nearly flat; this creates areas that are imperfectly drained. There are five soil types indicated for this project area including the Lordstown loam (6-12% slope), Rittman silt loam (2-6% slope), Udorthents, and Wadsworth silt loam (0-2, 2-6% slope). Udorthents is a disturbed soil type and accounts for about 11-12 percent of the overall project area. The remaining soil types are indicative of generic and homogenous upland conditions. There are no deep floodplain/alluvial soils indicated in this area [United States Department of Agriculture, Soils Conservation Service (USDA, SCS) 2019)]. The project area is drained by Mud Creek and its tributaries and it is within the Mahoning River watershed.

Literature Review

The literature review was conducted for a 1.6 km (1.0 mi) study area. This allows for an understanding as to the amount of previously recorded resources near the project. In conducting the literature review, the following resources were consulted at SHPO and the State Library of Ohio:

- 1) *An Archeological Atlas of Ohio* (Mills 1914);
- 2) SHPO United States Geological Survey (USGS) 7.5' series topographic maps;

- 3) Ohio Archaeological Inventory (OAI) files;
- 4) Ohio Historic Inventory (OHI) files;
- 5) National Register of Historic Places (NRHP) files;
- 6) Determinations of Eligibility (DOE) files;
- 7) SHPO CRM/contract archaeology files; and
- 8) Trumbull County atlases, histories, historic USGS 15' series topographic map(s), and current USGS 7.5' series topographic map(s);
- 9) Online Genealogical and Cemetery Records.

The *Archeological Atlas of Ohio* (Mills 1914) did not indicate any prehistoric sites in the vicinity of the project.

Inspection of the Ohio Archaeological Inventory (OAI) files indicated that there are 14 archaeological sites in the study area (Figure 2; Table 1). Few of these sites have a known temporal component. There are 10 prehistoric and 4 historic period sites indicated in the study area. There is one prehistoric period site that is indicated as dating from the Middle Woodland period (33TR0252). Most of these sites were identified during professional surveys that were conducted to the east of Tod Avenue SW and were not considered to be significant. None of these previously recorded sites were identified within the project area.

Site #	General Affiliation	Temporal Period	Site Type	Site Size
TR0096	Prehistoric	Unassigned	Artifact scatter	
TR0207	Prehistoric	Unassigned	Isolated find	1
TR0208	Prehistoric	Unassigned	Isolated find	1
TR0272	Prehistoric	Unassigned	Isolated find	1
TR0273	Historic	Non-aboriginal	Artifact scatter	1520
TR0232	Prehistoric	Unassigned	Isolated find	1
TR0233	Prehistoric	Unassigned	Isolated find	1
TR0234	Prehistoric	Unassigned	Isolated find	1
TR0235	Prehistoric	Unassigned	Isolated find	1
TR0251	Historic	Non-aboriginal	Artifact scatter	2400
TR0252	Prehistoric	Middle Woodland	Artifact scatter	10
TR0257	Historic	Non-aboriginal	Artifact scatter	38
TR0258	Historic	Non-aboriginal	Isolated find	1
TR0259	Prehistoric	Unassigned	Isolated find	1

The Ohio Historic Inventory (OHI) files did not indicate any resources within or immediately adjacent to the project; however, there are 27 located in the study area (Table 2; Figure 2). These were mostly identified and evaluated during professional surveys that have been conducted in the study area.

OHI #	Present Name	Address	ArchStyle1	HistUse1	Activity	Date
TRU0283622	House, 3490 Goldner Lane	3490 Goldner Ln	Modern Movements	Single Dwelling	Original/Most significant construction	1945
TRU0283922	House, 3502	3502 Goldner Ln	No	STORAGE	Original/Most	1943

Table 2. OHI resources located in the study area.						
OHI #	Present Name	Address	ArchStyle1	HistUse1	Activity	Date
	Goldner Lane		academic style - Vernacular		significant construction	
TRU0284222	House, 3530 Goldner Lane	3530 Goldner Ln	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1910
TRU0284322	House, 3521 Goldner Lane	3521 Goldner Ln	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1941
TRU0285322	House, 3555 Goldner Lane	3555 Goldner Ln	Modern Movements	Single Dwelling	Original/Most significant construction	1956
TRU0285422	House, 2382 Pike Drive	2382 Pike Dr	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1890
TRU0285822	House, 1267 Hallock Young Road	1267 Hallock Young Rd	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1910
TRU0286022	Barns, Hallock Young Road	N side Hallock Young Rd	No academic style - Vernacular	Barn	Original/Most significant construction	1901
TRU0286122	House, 8290 State Route 45	8292 SR 45	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1907
TRU0286222	House, 8392 State Route 45	8392 SR 45	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1940
TRU0286322	House, 8447 State Route 45	8447 SR 45	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1845
TRU0286422	House, 8555 State Route 45	8555 SR 45	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1955
TRU0286522	House, 8655 State Route 45	8655 SR 45	Modern Movements	Single Dwelling	Original/Most significant construction	1956
TRU0286622	Barn, State Route 45	W side SR 45	No academic style - Vernacular	Barn	Original/Most significant construction	1958
TRU0286722	House, 8831 State Route 45	8831 SR 45	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1894

Table 2. OHI resources located in the study area.							
OHI #	Present Name	Address	ArchStyle1		HistUse1	Activity	Date
TRU0102122		Carson-Salt Springs Rd	Vernacular		Single Dwelling	Original Construction	1880
TRU0102822	House, 8933 State Route 45	8933 SR 45	Queen Anne		Single Dwelling	Original/Most significant construction	1915
MAH017500 2	House, 1935 Pritchard Ohltown Rd	1935 Pritchard Ohltown Rd	No academic style - Vernacular		Single Dwelling	Original/Most significant construction	1855
TRU0103622		1628 Carson-Salt Springs Rd	Greek Revival		Single Dwelling	Original Construction	1850
TRU0103722	Lordstown Christian Church	6370 SR 45	Greek Revival		Church/Religious Structure	Original Construction	1830
TRU0103822	BE Moore House	6631 SR 45	Greek Revival		Single Dwelling	Original Construction	1840
TRU0103922	Charles Woodward House	6830 SR 45	Italianate		Single Dwelling	Original Construction	1870
TRU0104022	James Wilson House	7321 SR 45	Queen Anne		Single Dwelling	Original Construction	1888
TRU0104122	Amanda Woodward Wilson House	SR 45	Greek Revival		Single Dwelling	Original Construction	1840
TRU0104222	House, 8213 State Route 45	8213 SR 45	No academic style - Vernacular		Single Dwelling	Original/Most significant construction	1840
TRU0104822		8292 S Todd Ave	Vernacular		Single Dwelling	Original Construction	1864
TRU0294222	Integra House	3530 Goldner Ln	No academic style - Vernacular		Single Dwelling	Original/Most significant construction	1935

There were no NRHP properties or DOE resources located in the project or within the study radius.

A review of the OHPO online contract files did not indicate that the project area had been the subject of any previous investigations; however, there has been six Phase I surveys that are known from within the study area (Weller 2017; Chidester and Bauschard 2016; Soldo 2002; Bush et al. 1981; Zink 2010; Nelson 2015) (Figure 2). All of these surveys were conducted for developed and proposed development areas that are on the east side of Tod Avenue SW; due east of the current project. These surveys were conducted in similar settings to that of the project.

Cartographic/atlas resources were reviewed for the project area. The *Atlas of Trumbull County, Ohio* (Everts 1874) indicates that this area was once owned by J. T.

Woodward, Mrs. John Bowman, and Rich Williamson. The residence indicated on the Bowman property may be in the eastern part of the project area. The USGS *1908 Warren, Ohio Quadrangle 15 Minute Series (Topographic)* map did not indicate any buildings or structures within the project (Figure 4). The modern USGS *1985 Warren, Ohio 7.5 Minute Series (Topographic)* map does not indicate any buildings in the project area. There are relatively newer railroad lines along the northern side as well as a driveway along the western boundary (Figure 2). There is one cemetery known and recorded in the study area. The Center Cemetery is located to the north and in the vicinity of Lordstown. None are indicated within or near the project.

Summary

In December 2019, Weller & Associates, Inc. conducted a Cultural Resource Management Preliminary review for the 66.4 ha (164 ac) Magellan East Parcel 4 Project in Lordstown Township, Trumbull County, Ohio. The project area has not been the subject of any previous investigations and there are no sites (archaeological or architectural) recorded within it. There are no recorded National Register or significant cultural resources located within or near the project area. The project area remains undeveloped with open previously farmed areas and patches of woods and scrub or rangeland. Based on Weller's experience in this region and in the immediate vicinity, it is unlikely that any significant cultural resources would be present within the area.

References Cited

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1998 *Physiographic Regions of Ohio*. Ohio Department of Natural Resources, Division of Geological Survey, Columbus, Ohio.

Bush, D. R., L. J. Grand, and L. A. Bush

1981 *The Archaeological Resources of the Ohio Turnpike - Phase II Investigations at Existing and Proposed Interchanges*. Case Western University. Copy available for review from Ohio History Connection.

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2016 *A Phase I Archaeological Survey of Proposed Water and Sanitary Sewer Lines Serving the Lordstown Energy Center, Village of Lordstown, Lordstown Township (T3N R4W), Trumbull County, Ohio*. Mannik & Smith. Copy available for review from Ohio History Connection.

Everts, L. H.

1874 *Combination Atlas Map of Trumbull County, Ohio*. Chicago, Illinois.

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1914 *Archeological Atlas of Ohio*. Ohio State Archaeological and Historical Society, Columbus.

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2015 *Phase I Archaeological Investigations for the Approximately 12.6 ha (31.15 ac) Lordstown Energy Center in the Village of Lordstown, Trumbull County, Ohio*. Weller & Associates, Inc. Copy available for review from Ohio History Connection.

Soldo, D.

2002 *A Phase I Inventory and Archaeological Survey for the Country Basket Collections Site: A 10.3 Acre Tract in Lordstown Township, Trumbull County, Ohio*. American Archaeological Services LTD. Copy available for review from Ohio History Connection.

United States Department of Agriculture, Soil Conservation Service

2019 *Soil Survey of Trumbull County, Ohio*. Soil Conservation Service, U. S. Department of Agriculture, Washington, D. C. in cooperation with the Ohio Department of Natural Resources, Division of Lands and Soils, and the Ohio Agricultural Research and Development Center, Columbus.

Weller, R. J.

2017 *Phase I Archaeological Investigations for the Approximately 55.9 ha (138 ac) Trumbull Energy Facility in Lordstown Township, Trumbull County, Ohio*. Weller & Associates, Inc. Copy available for review from Ohio History Connection.

Zink, J.

2010 *Phase I Cultural Resources Management Survey for the 17.8 ha (44 ac) Henn Industrial Park Development in Lordstown Township, Trumbull County, Ohio*. Weller & Associates, Inc. Copy available for review from Ohio History Connection.

Figures



Figure 1. Political map of Ohio showing the approximate location of the project.

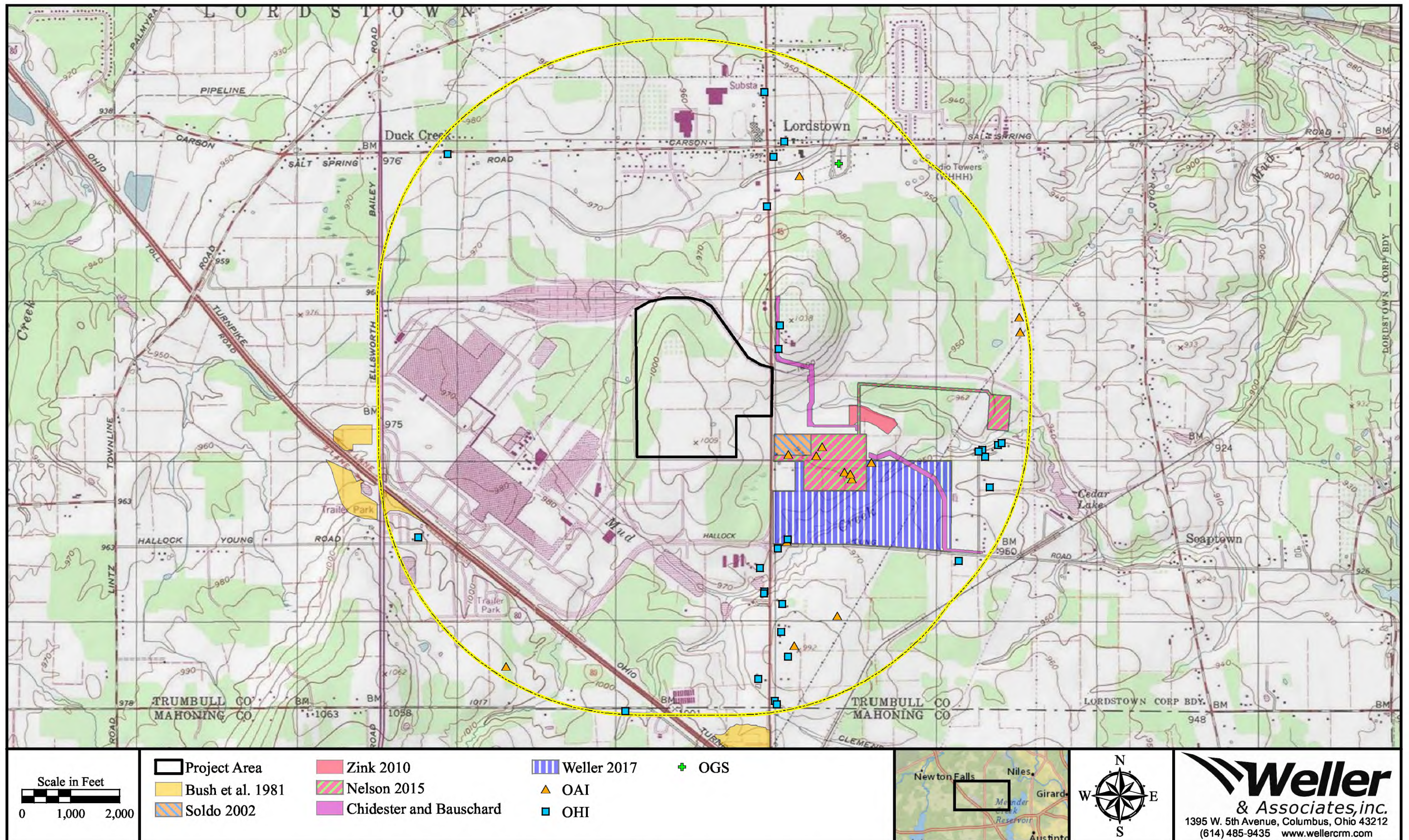


Figure 2. Portion of the USGS 1985 Warren, Ohio 7.5 Minute Series (Topographic) map indicating the location of the project and previously recorded resources in the study area.

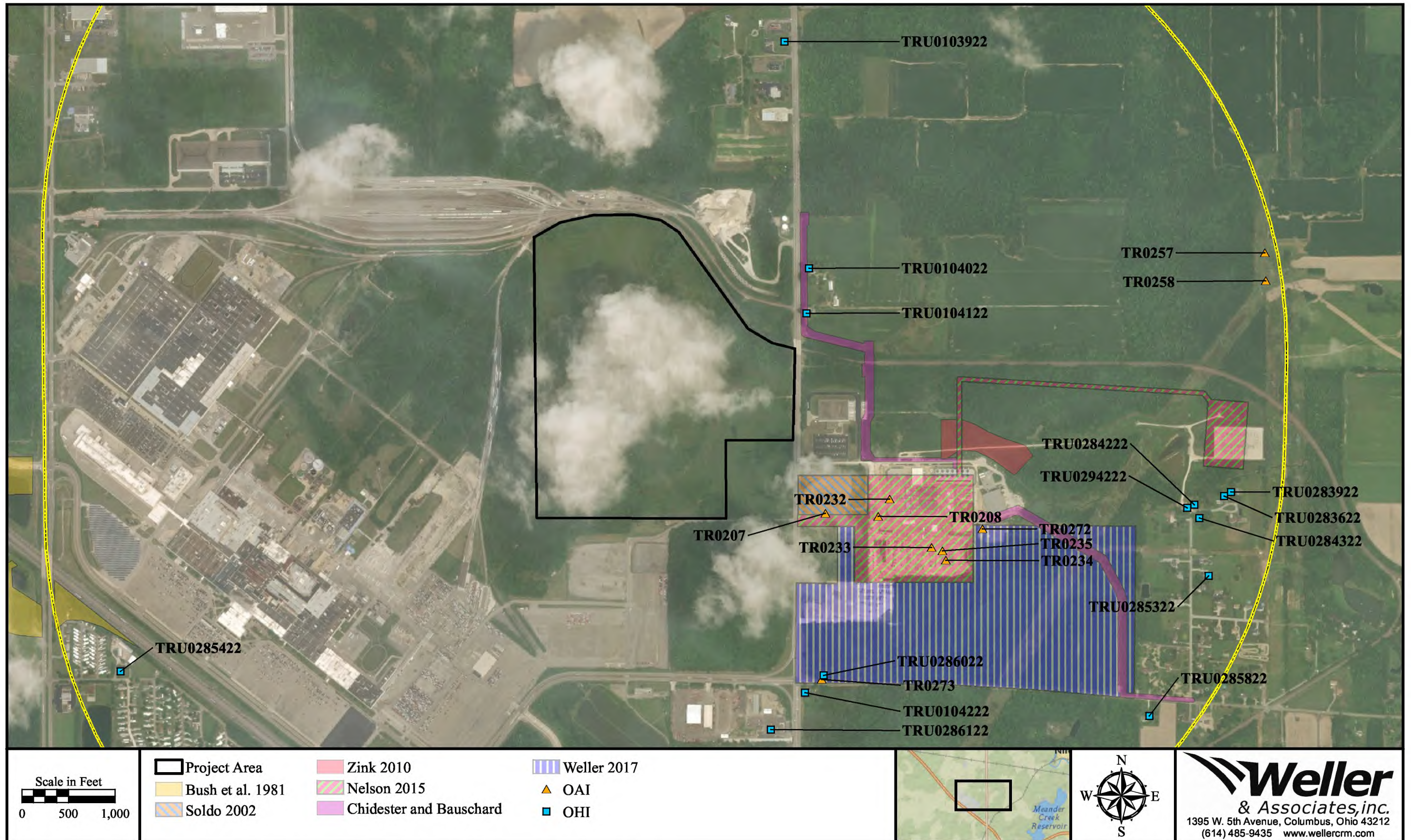


Figure 3. Aerial map indicating the location of the project area and recorded resources within the study area.

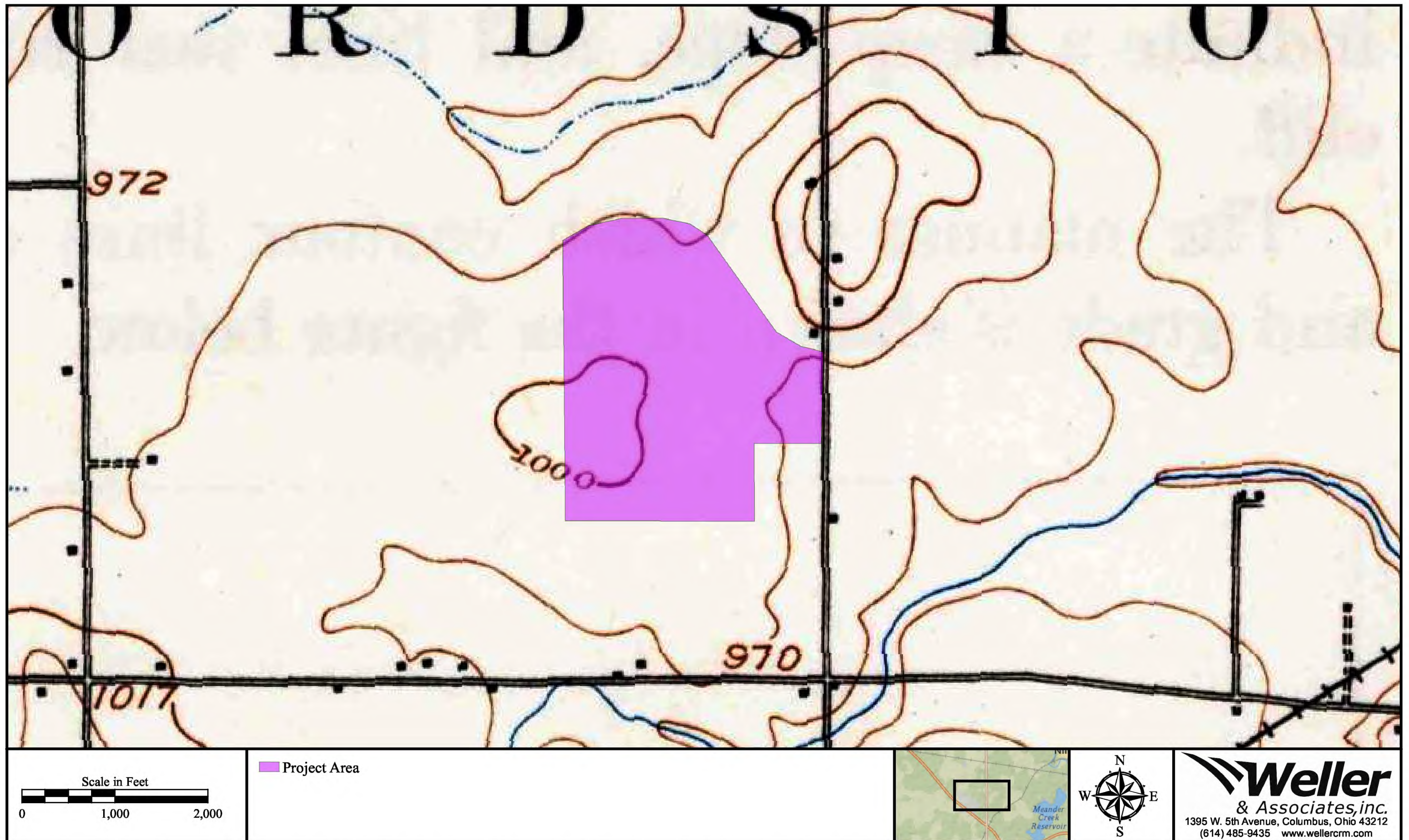


Figure 4. Portion of the USGS 1908 Warren, Ohio 15 Minute Series (Topographic) map indicating the approximate location of the project.

APPENDIX F4

Weller Phase I Archaeological Investigations





**Phase I Archaeological Investigations for the
64 ha (158.22 ac) Magellan East Project
in Lordstown Township, Trumbull County, Ohio**

Ryan J. Weller

January 6, 2020

1395 West Fifth Ave.
Columbus, OH 43212
Phone: 614.485.9435
Fax: 614.485.9439
www.wellercrm.com

**Phase I Archaeological Investigations for the
64 ha (158.22 ac) Magellan East Project
in Lordstown Township, Trumbull County, Ohio**

By

Ryan J. Weller

Submitted By:

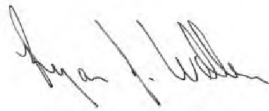
**Ryan J. Weller, P.I.
Weller & Associates, Inc.
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Columbus, OH 43212
Phone: 614.485.9435 Fax: 614.485.9439**

Prepared For:

**GHD Services, Inc.
410 Eagleview Blvd, Suite 110
Exton, PA 19341**

Lead Agency:

U.S. Army Corps of Engineers, Pittsburgh



Ryan J. Weller, P.I.

January 6, 2020

Abstract

In December 2019, Weller & Associates, Inc. (Weller) was retained by GHD Services, Inc. to conduct a Phase I Archaeological Survey for the 64 ha (158.22 ac) Magellan East Project in Lordstown Township, Trumbull County, Ohio. The work was conducted for submittal to the U.S. Army Corps of Engineers, Pittsburgh, the lead federal agency. These investigations were conducted to identify any sites or properties and to evaluate them in a manner that is reflective of Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 [36 CFR 800]). This report summarizes the results of the archaeological fieldwork and an intensive literature review; the architectural report is contained in a separate and stand-alone document. There were no archaeological deposits identified during these investigations.

The project plans are to construct a new automotive electric battery cell manufacturing facility near the existing Lordstown Motors Automotive Assembly Plant. The project area is located in an upland setting that is to the northeast of the plant facilities proper. It is to the west of Tod Avenue SW and is opposite Henn Parkway and its related developments. Further, this area is north of Hallock Young Road and to the south and east of railroad lines. The relief in the area is gently rolling to nearly level areas. The current conditions include fallow former farm fields and deciduous forestation. The conditions of the project area at the time of survey include fallow areas with patches of dense scrub and immature forestation; there are large wetland documented in the area.

The literature review conducted for this project indicated that it had not been the subject of any previous investigations and there are no sites recorded within it. There have been professional surveys completed in the nearby and similar terrain including areas to the east of Tod Avenue SW. There have not been any significant cultural resources identified in the project or its study area.

Much of this project area was found to be disturbed, altered, or contains sizeable wetland areas. These archaeological investigations did not result in the identification of any cultural materials. The fieldwork involved subsurface testing and visual inspection but was limited by inundation and poor conditions (i.e., disturbances). This Undertaking will not affect any significant archaeological resources (36 CFR 800.5). No further archaeological work is deemed necessary.

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3. OHI Resources Recorded Within the Study Area.

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3. Aerial map indicating the location of the project area and recorded resources within the study area.
4. Portion of the USGS *1908 Warren, Ohio 15 Minute Series (Topographic)* map indicating the approximate location of the project.
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17. Profile of a typical shovel test unit excavated within the project.

Introduction

In December 2019, Weller & Associates, Inc. (Weller) was retained by GHD Services, Inc. (GHD) to conduct a Phase I Archaeological Survey for the 64 ha (158.22 ac) Magellan East Project in Lordstown Township, Trumbull County, Ohio (Figures 1-3). The work was conducted for submittal to the U.S. Army Corps of Engineers, Pittsburgh (ACOE). These investigations were conducted to identify any sites or properties and to evaluate them in a manner that is consistent with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 [36 CFR 800]). This report summarizes the results of the archaeological fieldwork and reconnaissance work and an intensive literature review. The report format and design are similar to that established in *Archaeology Guidelines* (Ohio Historic Preservation Office [OHPO] 1994). The work includes archaeological literature review, field investigations, and consideration of the archaeological area of potential effect.

Chad Porter conducted the literature review on November 19, 2019. Austin White was responsible for the history/architectural component of this project, which was completed as a separate and stand-alone document. Ryan J. Weller served as the archaeological Principal Investigator and Senior Project Manager; Austin White served as the history/architectural Principal Investigator. The Phase I field investigations were completed from December 3-5, 2019. The archaeological field crew included Cullen Dunajski, Nicky DeWitt, Rich Peterson, Seth Cooper, Chris Goodrich, Josh Engle, and Justin Fryer.

Project Description

The proposed project is to construct a new automotive electric battery manufacturing facility near the Lordstown Automotive Manufacturing Facility. The project area is located in an upland setting that is to the northeast of the plant facilities proper. It is to the west of Tod Avenue SW and is opposite Henn Parkway and its related developments. Further, this area is north of Hallock Young Road and to the south and east of railroad lines. The relief in the area is gently rolling to nearly level areas. The current conditions include fallow former farm fields and deciduous forestation.

Environmental Setting

Climate

Trumbull County, like all of Ohio, has a continental climate, with hot and humid summers and cold winters. About 94 cm (37 in) of precipitation fall annually on the county with the average monthly precipitation about 7.9 cm (3.1 in). February is the driest month, while July tends to be the wettest month for Trumbull County [United States Department of Agriculture, Soil Conservation Service (USDA, SCS) 1992].

Physiography, Relief, and Drainage

Trumbull County is located within the Glaciated Allegheny Plateaus physiographic region of Ohio and, more specifically, the project is located on the Killbuck-Glaciated Pittsburgh Plateau. This region is characterized by “ridges and flat uplands generally above 1,200 ft, covered with thin drift and dissected by steep valleys, valley segments alternate between broad drift-filled and narrow rock-walled reaches, elevation 600-1,505 ft” (Brockman 1998). The northern part of the project area is drained by Duck Creek and the southern part is drained by Mud Creek; these are both part of the Mahoning River watershed.

Geology

The county is underlain by shale and sandstone associated with the Devonian and Mississippian age bedrocks (Brockman 1998). The Devonian-aged bedrock is predominately in the northern and western aspects of the county. Mississippian-age bedrock occurs in sleeves that are in the central and eastern part (Brockman 1998; USDA, SCS 1992). The project area is near the interface of the Pennsylvanian, Mississippian, and Devonian bedrocks.

Soils

The project is located in the Wadsworth-Rittman association. This association is characterized by “nearly level to sloping, somewhat poorly drained and moderately well drained soils formed in medium textured and moderately fine textured glacial till” (USDA, SCS 1992). There are five specific soils located in the project (Table 1). The soils are consistent with what would be expected from upland glacial till plain conditions in this region; these soils account for most of the project area. However, severely disturbed soils (i.e., Udorthents) account for 11.4 percent of the project and are consistent with made land/disturbance.

Soil Name	Slope %	% in Project	Location
Lordstown loam	6-12	.2	Uplands, rises
Rittman silt loam	2-6	12.7	Uplands, slight rises
Udorthents	n/a	11.4	Disturbed lands
Wadsworth silt loam	0-2	39.2	Uplands, slight rises
Wadsworth silt loam	0-2	36.4	Uplands, slight rises

Flora

There is, or at least was, great floral diversity in Ohio. This diversity is relative to the soils and the terrain that generally includes the till plain, lake plain, terminal glacial margins, and unglaciated plateau (Forsyth 1970). Three major glacial advances, including the Kansan, Illinoisan, and Wisconsinan, have affected the landscape of Ohio. The effects of the Wisconsin glaciation are most pronounced and have affected more than half of the state (Pavey et al. 1999).

The least diverse part of Ohio extends in a belt from the northeast below the lake-affected areas through most of western Ohio (Gordon 1966). These areas are part of the late Wisconsin ground moraine and lateral end moraines. The project area is positioned between the in a broad expansive Till Plains area. This area included broad forested areas of beech maple forests interspersed with mixed oak forests in elevated terrain or where relief is greater (Forsyth 1970; Gordon 1966). Prairie environments such as those in Wyandot and Marion County areas would contain islands of forests, but were mostly expansive open terrain dominated by grasses.

Generally, beech forests are the most common variety through Ohio and could be found in all regions. Oak and hickory forests dominated the southeastern Ohio terrain and were found with patchy frequency across most of northern Ohio. Areas that were formerly open prairies and grasslands are in glacial areas, but are still patchy; these are in the west central part of the state. Oak and sugar maple forests occur predominantly along the glacial terminal moraine. Elm-ash swamp forests are prevalent in glaciated areas including the northern and western parts of Ohio (Gordon 1966; Pavey et al. 1999). Southwestern Trumbull County, including the project area, is generally within what is considered to be a mixed oak and mixed mesophytic forest area (Gordon 1966).

Fauna

The upland forest zone offered a diversity of mammals to the prehistoric diet. This food source consisted of white-tailed deer, black bear, Eastern cottontail rabbit, opossum, a variety of squirrels, as well as other less economically important mammals. Several avian species were a part of the upland prehistoric diet as well (i.e., wild turkey, quail, ruffed grouse, passenger pigeon, etc.). The lowland zone offered significant species as well; raccoon, beaver, and muskrat were a few of the mammals, while wood duck and wild goose were the economically important birds. Fishes and shellfish were also an integral part of the prehistoric diet. Ohio muskellunge, yellow perch, white crappie, long nose gar, channel catfish, pike, and sturgeon were several of the fish, whereas, the Ohio naiad mollusc, butterfly's shell, long solid, common bullhead, knob rockshell, and cod shell were the major varieties of shellfish. Reptiles and amphibians, such as several varieties of snakes, frogs, and turtles, were also part of the prehistoric diet (Trautman 1981; Lafferty 1979; Mahr 1949).

Cultural Setting

The first inhabitants of Ohio were probably unable to enter this land until the ice sheets of the Wisconsin glacier melted around 16,000 B.P. Paleoindian sites are considered rare due to the age of the sites and the effects of land altering activities such as erosion. Such sites were mostly used temporarily and thus lack the accumulation of human occupational deposits that would have been created by frequent visitation. Paleoindian artifact assemblages are characteristic of transient hunter-gatherer foraging activity and subsistence patterns. In Ohio, major Paleoindian sites have been documented along large river systems and near flint outcrops in the Unglaciated Plateau (Cunningham

1973). Otherwise, Paleoindian sites in the glaciated portions of Ohio are encountered infrequently and are usually represented by isolated finds or open-air scatters.

The Paleoindian period is characterized by tool kits and gear utilized in hunting Late Pleistocene megafauna and other herding animals including but not limited to short-faced bear, barren ground caribou, flat-headed peccary, bison, mastodon, and giant beaver (Bamforth 1988; Brose 1994a; McDonald 1994). Groups have been depicted as being mobile and nomadic (Tankersley 1989); artifacts include projectile points, multi-purpose unifacial tools, burins, graters, and spokeshaves (Tankersley 1994). The most diagnostic artifacts associated with this period are fluted points that exhibit a groove or channel positioned at the base to facilitate hafting. The projectiles dating from the late Paleoindian period generally lack this trait; however, the lance form of the blade is retained and is often distinctive from the following Early Archaic period (Justice 1987).

Certain artifacts indicate Paleoindian activity. These artifact assemblages are characteristic of transient hunter-gatherer foraging activity and subsistence patterns. The most common artifacts from the Paleoindian period are lanceolate-shaped projectile points. These may be fluted (flake removed from the base to facilitate hafting) and have some evidence of grinding on the hafting element (base and lower portion of the biface). Other artifacts that may be part of a Paleoindian assemblage include pitted stones, burins, bipolar flakes, backed knives, and unifacial endscrapers with graver spurs. Paleoindian sites in the glaciated portions of Ohio are encountered infrequently and are usually represented by isolated finds.

There are several sites that pertain to this period from northeastern Ohio, including Nobles Pond, Paleo Crossing, and Krill Cave. The Nobles Pond site in Stark County is situated in a nearly level area that had been glaciated. Based on a fairly large Paleoindian artifact assemblage recovered from this site, it has been interpreted as a semi-circular base camp occupation. The site was systematically collected for a period of 12 years by Gramly and Summers (1986). There have been over 3,000 tools recovered from this site, including Gainey style projectile points. This site appears to have been occupied from 10,000 to 11,000 years ago over a short time span (Seeman et al. 1994).

The Paleo Crossing site was occupied around 11,000 years ago. This site contained a large number of Clovis and Clovis-like points recovered from plow zone deposits. There was a lack of Upper Mercer flint contained within the Paleoindian portion of this assemblage. The majority of the flint from this site was acquired from southern and southeastern Indiana. Brose (1994a) has suggested that this site represents one of the earliest known structural remains associated with this period. A post mold from the site has been dated to $12,250 \pm 100$ B.P.

Krill Cave (33SU18) is situated within Summit County. This is a stratified site that has been dated from the Paleoindian to Early Archaic periods. Little information is readily available concerning this site. It is located along an intermittent drainage with sandstone outcrops and overlooks a poorly drained marsh that is fed by springs (Pruffer et al. 1989: 3).

The Archaic period has been broken down into three sub-categories, including the Early, Middle, and Late Archaic. During the Early Archaic period (ca. 10,000-8000 B.P.), the environment was becoming increasingly arid as indicated by the canopy (Shane 1987). This period of dryness allowed for the exploitation of areas that were previously inaccessible or undesirable. The Early Archaic period does not diverge greatly from the Paleoindian regarding the type of settlement. Societies still appear to be largely mobile with reliance on herding animals (Fitting 1963). For these reasons, Early Archaic artifacts can be encountered in nearly all settings throughout Ohio. Tool diversity increased at this time including hafted knives that are often re-sharpened by the process of beveling the utilized blade edge and intense basal grinding (Justice 1987). There is a basic transition from lance-shaped points to those with blades that are triangular. Notching becomes a common hafting trait. Another characteristic trait occurring almost exclusively in the Early and Middle Archaic periods is basal bifurcation and large blade serrations. Tool forms begin to vary more and may be a reflection of differential resource exploitation. Finished tools from this period can include bifacial knives, points, drills/perforators, utilized flakes, and scrapers.

The Middle Archaic period (8000-6000 B.P.) is poorly known or understood in archaeological contexts within Ohio. Some (e.g., Justice 1987) regard small bifurcate points as being indicative of this period. Ground stone artifacts become more prevalent at this time. Other hafted bifaces exhibit large side notches with squared bases, but this same trait can extend back to the Paleoindian period. The climate at this time is much like that of the modern era. Middle Archaic period subsistence tended to be associated with small patch foraging that involved a consistent need for mobility with a shift towards stream valleys (Stafford 1994). Sites encountered from this time period throughout most of Ohio tend to be lithic scatters or isolated finds. The initial appearance of regional traits may be apparent at this time.

The Late Archaic period in Ohio (ca 6000-3000 B.P.) diverges from the previous periods in many ways. Preferred locations within a regional setting appear to have been repeatedly occupied. The more intensive and repeated occupations often resulted in the creation of greater social and material culture complexity. The environment at this time is warmer and drier. Most elevated landforms in northeastern Ohio have yielded Archaic artifacts (Prufer and Long 1986: 7), and the same can be stated for the remainder of Ohio.

Various artifacts are diagnostic of the Late Archaic period. Often, burial goods provide evidence that there was some long-distance movement of materials, while lithic materials used in utilitarian assemblages are often from a local chert outcrop. There is increased variation in projectile point styles that may reflect regionalism. Slate was often used in the production of ornamental artifacts. Ground and polished stone artifacts reached a high level of development. This is evident in such artifacts as grooved axes, celts, bannerstones, and other slate artifacts.

It is during the Terminal Archaic period (ca 3500-2500 B.P.), part of the Late Archaic, that extensive and deep burials are encountered. Cultural regionalism within Ohio is evident in the presence of Crab Orchard (southwest), Glacial Kame (northern),

and Meadowood (central to Northeastern). Along the Ohio River, intensive occupations have been placed within the Riverton phase. Pottery makes its first appearance during the Terminal Late Archaic.

There are two Terminal Late Archaic cultures known from northeastern Ohio. Situated to the north and west of an imaginary line drawn from Cincinnati to Cleveland, the Glacial Kame culture (4,950 to 4,450 B.P.) is best interpreted as part of a burial cult that developed in the Late Archaic period. Glacial Kame can be considered the earliest of two Late Archaic cultural expressions in Ohio. The most diagnostic artifact of the Glacial Kame culture is the three-hole sandal-sole gorget (Converse 1979). The Meadowood culture (3,100 to 2,300 B.P.) is considered similar to Glacial Kame. Meadowood cultural traits are found mainly in the northeastern portions of Ohio; however, sporadic isolated finds of diagnostic artifacts are found throughout Ohio (Ritchie 1965).

The Early Woodland period (ca 3000-2100 B.P.) in Ohio is often associated with the Adena culture and the early mound builders (Dragoo 1976). Early and comparably simple geometric earthworks first appear with mounds more spread across the landscape. Pottery at this time is thick and tempered with grit, grog, or limestone; however, it becomes noticeably thinner towards the end of the period. There is increased emphasis on gathered plant resources, including maygrass, chenopodium, sunflower, and squash. Habitation sites have been documented that include structural evidence. Houses that were constructed during this period were circular, having a diameter of up to 18.3 m (Webb and Baby 1963) and often with paired posts (Cramer 1989). Artifacts dating from this period include leaf-shaped blades with parallel to lobate hafting elements, drilled slate pieces, ground stone, thick pottery, and increased use of copper. Early Woodland artifacts can be recovered from every region of Ohio.

The Early Woodland of northern Ohio is somewhat different from that of the remainder of the State. There are fewer mounds and the artifact assemblage is more attributable to the Leimbach Phase. Adena-like bifaces and tools are commonly found in river and stream valleys that drain into Lake Erie as well as in the uplands. It is assumed that Early Woodland inhabitants used these areas for little more than a transient hunting-collecting subsistence with occasional 'hot spots' of activity. One of the best-known Early Woodland sites is the Leimbach site. This site is located where the Huron River empties into Lake Erie (Shane 1975). Early Woodland ceramics and lugged vessels have been recovered from this site. An Early Woodland component of the Krill Cave site (33SU18) has been dated to about 2,145 B.P. Evidence of activity during this period, such as the ceramics, has been encountered infrequently at locations across north central and northwestern Ohio.

The Middle Woodland period (ca 2200-1600 B.P.) is often considered to be equivalent with the Hopewell culture. The largest earthworks in Ohio date from this time period. There is dramatic increase in the appearance of exotic materials that appear most often in association with earthworks and burials. Artifacts representative of this period include thinner, grit-tempered pottery, dart-sized projectile points (Lowe Flared, Steuben,

Snyders, and Chesser) [Justice 1987], exotic materials (mica, obsidian, and marine shell, etc.). The points are often thin, bifacially beveled, and have flat cross sections. There seems to have been a marked increase in the population, as well as increased levels of social organization. Middle Woodland sites seem to reflect a seasonal exploitation of the environment. There is a notable increase in the amount of Eastern Agricultural Complex plant cultigens, including chenopodium, knotweed, sumpweed, and little barley. This seasonal exploitation may have followed a scheduled resource extraction year in which the populations moved camp several times per year, stopping at known resource extraction loci. Middle Woodland land use appears to center on the regions surrounding earthworks (Dancey 1992; Pacheco 1996); however, there is evidence of repeated occupation away from earthworks (Weller 2005). Household structures at this time vary, with many of them being squares with rounded corners (Weller 2005). Exotic goods are often attributed to funerary activities associated with mounds and earthworks. Utilitarian items are more frequently encountered outside of funerary/ritual contexts. The artifact most diagnostic of this period is the bladelet, a prismatic and thin razor-like tool, and bladelet cores. Middle Woodland remains are more commonly recovered from central Ohio south and lacking from most areas in the northern and southeastern part of the state. The few northeastern Ohio Middle Woodland sites that have been identified include the Cole Mound in Tuscarawas County and mounds near Phippen Lake, Portage County. Other than an occasional mound and projectile point, Middle Woodland sites are rare in northeastern Ohio (Zakucia 1964). However, excavations at the Szalay Site in Summit County encountered a series of postmolds that yielded dates and artifacts that were attributable to the Middle Woodland period. This site is located on at the confluence of Furnace Run and the Cuyahoga River. Bladelets, pottery, postmolds, and radiocarbon dates obtained from the site confirm its Hopewellian affiliation (Richner and Volf 2000).

The Late Woodland period (ca 1600-1100 B.P.) is distinct from the previous period in several ways. There appears to be a population increase and a more noticeable aggregation of groups into formative villages. The villages are often positioned along large streams, on terraces, and were likely seasonally occupied (Cowan 1987). This increased sedentism was due in part to a greater reliance on horticultural garden plots, much more so than in the preceding Middle Woodland period. The early Late Woodland groups were growing a wide variety of crop plants that are collectively referred to as the Eastern Agricultural Complex. These crops included maygrass, sunflower, and domesticated forms of goosefoot and sumpweed. This starch and protein diet was supplemented with wild plants and animals. Circa 1200 to 1000 B.P., populations adopted maize agriculture, and around this same time, shell-tempered ceramics appear. Other technological innovations and changes during this time period included the bow and arrow and changes in ceramic vessel forms.

Evidence suggests that the Late Woodland occupations in northern Ohio developed from the Western Basin Middle Woodland tradition. The Late Woodland period in northern Ohio is best defined by ceramic traditions. Western Basin Late Woodland sites have been identified in most of the river valleys in northwestern Ohio such as the Maumee, Auglaize, and the Sandusky Rivers. Radiocarbon dating establishes this Late Woodland occupation at the first century to about 1,500 B.P. (Pratt and Bush

1981:88). The Western Basin tradition consists of three primary phases, which include the Riviere au Vase, the Younge (Fitting 1965), and the Springwells phase.

The Late Prehistoric period (ca 1000-450 B.P.) is distinctive from former periods. It has been suggested that this cultural manifestation developed out of the local Middle Woodland cultures and may have lasted to be contemporaneous with the Late Prehistoric period (Barkes 1982; Baby and Potter 1965; Potter 1966).

The Late Prehistoric period in northern Ohio is often associated with an intensification of the use of plant resources, the presence of large villages, and a steady population increase. Permanent villages were associated with a heavy dependence on farming. These villages were often located on the meander belt zones of river valleys (Stothers et al. 1984:6). Subsistence of these farming communities relied upon maize, beans, and squash as the major cultigens. Villages were often strategically located on bluff tops. There is a change in social structure to a chiefdom-based society.

The Whittlesey cultural groups (1100 to 350 B.P.) inhabited most of northern Ohio in an area described as being south of Lake Erie from the Pennsylvania boundary to the western end of Lake Erie, as well as on some of the islands. Similar sites have been identified in northern Indiana and southern Michigan. These groups inhabited villages that encompassed an area of approximately 1.6 ha. These villages were often situated on top of high bluffs on stream bends, or high inaccessible areas of land located at stream junctions. These villages were usually fortified with wooden stockades or earthen embankments with ditches on the outer side (Brose 1994b).

The Fort Meigs and Indian Hills phases occur late in the Late Prehistoric period. The Fort Meigs phase may be related to the Wolf phase in that the pottery is similar. Fort Meigs phase occupations are identified by specific rim and neck motifs that are applied to their pottery. The Indian Hills phase is associated with shell-tempered pottery. Some villages show evidence of defensive features such as stockade lines, ditches, or earthen walls (Pratt and Bush 1981:155). There is little evidence to support inter-village relationships, such as trade; this lack may have been due to competition for localized resources.

Protohistoric to Settlement

By the mid-1600s, French explorers traveled through the Ohio country as trappers, traders, and missionaries. They kept journals about their encounters and details of their travels. These journals are often the only resource historians have regarding the early occupants of seventeenth century Ohio. The earliest village encountered by the explorers in 1652 was a Tionontati village located along the banks of Lake Erie and the Maumee River. Around 1670, it is known that three Shawnee villages were located along the confluence of the Ohio River and the Little Miami River. Because of the Iroquois Wars, which continued from 1641-1701, explorers did not spend much time in the Ohio region, and little else is known about the natives of Ohio during the 1600s. Although the

Native American tribes of Ohio may have been affected by the outcome of the Iroquois Wars, no battles occurred in Ohio (Tanner 1987).

French explorers traveled extensively through the Ohio region from 1720-1761. During these expeditions, the locations of many Native American villages were documented. In 1751, a Delaware village known as Maguck existed near present-day Chillicothe. In 1758, a Shawnee town known as 'Lower Shawnee 2' existed at the same location. The French also documented the locations of trading posts and forts, which were typically established along the banks of Lake Erie or the Ohio River (Tanner 1987).

While the French were establishing a claim to the Ohio region, many Native Americans were also entering new claims to the region. The Shawnee were being forced out of Pennsylvania because of English settlement along the eastern coast. The Shawnee created a new headquarters at Shawnee Town, which was located at the mouth of the Scioto River. This headquarters served as a way to pull together many of the tribes which had been dispersed because of the Iroquois Wars (Tanner 1987).

Warfare was bound to break out as the British also began to stake claims in the Ohio region by the mid-1700s. The French and Indian War (1754-1760) affected many Ohio Native Americans; however, no battles were recorded in Ohio (Tanner 1987). Although the French and Indian War ended in 1760, the Native Americans continued to fight against the British explorers. In 1764, Colonel Henry Bouquet led a British troop from Fort Pitt, Pennsylvania to near Zanesville, Ohio.

In 1763, the Seven Years' War, which was being fought between France and Britain, had finally ended. The Treaty of Paris in 1763, granted the entire Ohio region to the British. In 1783, the second Treaty of Paris ending the American Revolution granted the entire Ohio region to the Americans; however, Ohio was specifically described as Native American territory. Native Americans were not to move south of the Ohio River (Tanner 1987).

By 1783, Native Americans had established fairly distinct boundaries throughout Ohio. The Shawnee tribes generally occupied southwest Ohio, while the Delaware tribes stayed in the eastern half of the state. Wyandot tribes were located in north-central Ohio, and Ottawa tribes were restricted to northeast Ohio. There was also a small band of Mingo tribes in eastern Ohio along the Ohio River, and there was a band of Mississauga tribes in northeastern Ohio along Lake Erie. The Shawnee people had several villages within Ross County along the Scioto River (Tanner 1987). Although warfare between tribes continued, it was not as intense as it had been in previous years. Conflicts were contained because boundaries and provisions had been created by earlier treaties.

In 1795, the Treaty of Greenville was signed as a result of the American forces defeat of the Native American forces at the Battle of Fallen Timbers. This allocated the northern portion of Ohio to the Native Americans, while the southern portion was opened for Euro-American settlement. Although most of the battles which led up to this treaty did not occur in Ohio, the outcome resulted in dramatic fluctuations in the Ohio region.

The Greenville Treaty line was established, confining all Ohio Native Americans to northern Ohio, west of the Tuscarawas River (Tanner 1987).

Ohio Native Americans were again involved with the Americans and the British in the War of 1812. Unlike the previous wars, many battles were fought in the Ohio region during the War of 1812. By 1815, peace treaties began to be established between the Americans, British, and Native Americans. The Native Americans lost more and more of their territory in Ohio. By 1830, the Shawnee, Ottawa, Wyandot, and Seneca were the only tribes remaining in Ohio. These tribes were contained on reservations in northwest Ohio. By the middle 1800s, the last of the Ohio Native Americans signed treaties and were removed from the Ohio region.

Trumbull County History

Trumbull County was established on July 10, 1800, becoming the seventh county in the Northwest Territory. The original boundaries for Trumbull County included all of the Western Reserve, north to Lake Erie, east to Pennsylvania, and surrounded to the west by Seneca and Sandusky counties. At the early onset of the county, there were few settlements found within its borders. Over time, the size of Trumbull County was greatly reduced. Ten other counties were formed from what was formerly Trumbull County land, the first being Granger County on March 1, 1806. In 1845, the reduction of Trumbull County was complete, thus delineating its present borders (Everts 1874; Galbreath 1925; Williams 1882).

Salt miners had explored the area in the years surrounding 1755, but the cost of extraction, transportation, and risk of Indian obstruction precluded any sizable business in the area. The Connecticut Land Company had the area surveyed in portions a number of times, but, occupation was generally stayed by one early national conflict or another (Howe 1888; Upton 1909).

General Samuel H. Parsons was the first man to purchase Western Reserve lands in Trumbull County. James Kingsbury is generally accepted as the first Trumbull County immigrant; though there were certainly squatters here before he came in the late 1700's. The early settlers of Trumbull County were farmers who used barter as their major economic system. The orchards of the county were plentiful and fruit was abundant. Apples and peaches were used frequently to make Apple-jack as well as other alcoholic beverages. Brockway's and Hawn's were the Reserve's two earliest mills; each in Orangeville. Henry Lane, Jr. and Charles Dailey built the first gristmill in the present confines of the county at Warren, along the Mahoning River, in June of 1802 (Everts 1874; Galbreath 1925; Howe 1888; Williams 1882).

John Fitch was a famous resident of Trumbull County. He is credited with the actual invention of the steamboat, although he didn't have the means to fund the manufacture his invention. He was from the town of Hartford, located in Trumbull County. Another famous entrepreneur in Trumbull County was Samuel Cone. In 1846, Cone started a cheese factory in Hartford Township. This was the first cheese factory in

Ohio and perhaps in the country. The first merchant of Trumbull County was James E. Caldwell in 1801 (Everts 1874; Galbreath 1925).

In 1827, plans were formulated for connecting Lake Erie with the Ohio River by railroad but never solidified. Eleven years later a company known as Ashtabula, Warren & East Liverpool R. R. Company was formed for the same purpose. However, the financial crisis known as the panic of 1836 and 1837 put an end to the plan and instead, the Ohio Canal was built (Upton 1909). The first railroad built running through Trumbull County was the Cleveland & Mahoning. Work began in 1853 and the first train ran on this line on July 1, 1856. Other local railroads include the Franklin & Warren Railroad Company, organized 1851; The Ashtabula & New Lisbon Railroad; the Liberty & Vienna, which was built in 1868 and extended to Youngstown in 1870; later the Ashtabula, Youngstown, and Pittsburg; the Painesville & Youngstown Railroad; the Pittsburg, Youngstown & Chicago; and the Pittsburg, Cleveland & Toledo which became the Pittsburg & Western Railroad Company later bought by the B. & O. Company (Everts 1874; Howe 1888; Upton 1909; Williams 1882).

The great availability of transportation in the region supported the manufacturing economy of this region once the county had turned from a purely agrarian area. This allowed cities to grow, along with more business in a profitable cycle (Galbreath 1925; Upton 1909; Williams 1882).

Warren is the county seat, as it was even before its streets were laid out and organized. Gov. St. Clair deemed Warren to be seat of justice for the newly proclaimed Trumbull County at the time of its inception. It was at least another five months, however, before Ephraim Quinby platted the town. Incorporation came 25 years later. As with most county seat designations, there was quite a fuss concerning the selection of Warren over the more populated center of Youngstown. Warren was chosen because of its more central location, and also because it was home to more influential men. Youngstown would not be set back long though; it was granted the same honor at the establishment of Mahoning County (Everts 1874; Galbreath 1925; Howe 1888; Upton 1909; Williams 1882).

Niles is another city in Trumbull. James Heaton and his son laid it out in 1834 and it gained incorporation in 1865. This is the birthplace of President William McKinley. McKinley's father was involved in the expanding manufacturing interests of the town in that day. Its furnaces, mills, and factories were greatly benefited by the connection to the larger cities in Northeastern Ohio by several new rail lines (Galbreath 1925; Howe 1888; Upton 1909).

Hieronimus Eckman originally settled where there would one day be the city of Girard in 1802. A post office arose here in 1836 and David Tod laid the town out and named it the following year. The Pennsylvania and Ohio Canal reached the town one year before it was finished and aided the city's growth immensely. Cortland, Newton Falls, and Hubbard are newer cities in Trumbull along with several towns and villages in the more rural, still very agrarian, areas (Galbreath 1925; Howe 1888; Upton 1909).

Lordstown Township History

The Village of Lordstown is contained within the “Fire Lands” of the Connecticut Western Reserve. Samuel P. Lord was the claimant of this portion and the township, which derives its title from the Lord family name. Lord, for whatever reason, did not sell any of his holdings until the 1820s and thus the township was one of the latest settled in the region. However, when he did begin to sell, nearly all the property was bought within a few years, and by settlers rather than speculators (Duncan 1876; Williams & Bro. 1882).

Henry Thorne allegedly built the first cabin in 1829, but others were already in the area before the 1820s, occupying land that they would purchase upon availability. The majority of the population of the township has ancestry that is derived from Germany. The township consists of low-lying till plain that includes broad swamps and periodic isolated elevations. It is drained by Little Duck Creek and one of its tributaries referred to as Meander. It contained little mineral wealth for the early settlers, but was a fruitful farm country (Everts 1874; Williams & Bro. 1882).

The focus of the early settlement was around Centre Roads or the Centre (Upton 1909; Williams & Bro. 1882). This is an intersection that is the near center of the township and has historically been referred to as Lordstown Center, P.O. The early industry and businesses in the area revolved around agriculture and general trade. John and Robert Tait, some of the first settlers, were blacksmiths. John Carrolton built the first sawmill north of the Centre. Shiveley’s Mill was constructed to the southeast of the Centre on Little Duck Creek (circa 1850) and followed by Simons Mill about ten years later. The development of the Centre was in the 1830s when the first post office, store, and hotel were established (Upton 1909; Williams & Bro. 1882).

The first schoolhouse was established in 1830 on the Moses Haskell farm within the first district (Upton 1909; Williams & Bro. 1882). The first schoolhouse to be built at the Centre was also of log construction, followed by a frame building in 1840 (Upton 1909). The religious activity of the township was initiated with the Methodists in the mid-1830s and later the United Brethren in the mid-1850s. In the early 1830s the German Lutherans and German Reformed built a church near Bailey’s Corner (Upton 1909).

The township organized in 1827 to perform its first elections of local government (Upton 1909; Williams & Bro. 1882). Today however, the township is organized, not as a township, but as a village municipality. It is a suburb of the larger city, Warren, which lies on its northern border. The township wholly incorporated itself as the Village of Lordstown in 1975 in order to have more control over land usage, concerning the potential for urban sprawl from the nearby cities of Warren and Youngstown. Industrial development and businesses are the focus of the economy in the modern Village of Lordstown. This is not surprising, as it is in the industrial part of Northeast Ohio and within an area that has more recently been coined “The Rust Belt”. There is a General

Motors plant in Lordstown that is responsible for a great deal of the manufacturing jobs in the region. Of course, many residents find employment in the larger markets of the neighboring cities, extending as far as Akron, Cleveland, and Pittsburgh. Farming is still an important part of the economy, but modern efforts are pointed towards industrial development (Village of Lordstown 2010).

Research Design

The purpose of a Phase I archaeological survey is to locate and identify cultural resources that will be affected by the planned project constructions. These investigations are being conducted in manner that is consistent with the OHC guidelines for survey as they have been implemented (OHS 1994) as guidance for such testing. The archaeological aspect of this project was considerate of the footprint of the parcel and relative to where constructions are planned. This report and research methodology are relative to archaeological survey for the project. Once these resources were identified, they were evaluated for their eligibility or potential eligibility to the NRHP. These investigations were directed to answer or address the following questions:

- 1) Did the literature review reveal anything that suggests the project area had been previously surveyed, and what is the relationship of previously recorded properties to the project area?
- 2) Are cultural resources likely to be identified in the project area?

Archaeological Field Methods

The survey conducted for this project used three methods of sampling/testing to identify and evaluate cultural resources. These included shovel probing, surface collection, shovel testing, and visual inspection.

Shovel test unit excavation. Shovel test units were placed at 15-m intervals. Shovel test units measure 50 cm on a side and were excavated to 5 cm below the topsoil/subsoil interface. Individual shovel test units were documented regarding their depth, content and color (Munsell™). Wherever sites were encountered, Munsell color readings were taken per shovel test unit. All of the undisturbed soil matrices from shovel test units were screened using 0.6 cm hardware mesh. When sites are encountered, additional shovel test units were excavated at 7.5 m intervals extending on grid and in the two cardinal directions within the corridor from the positive locations.

Shovel probe excavation. Shovel probes were excavated during these investigations to document the extent of the disturbance associated with modern construction activities. These probes were excavated similarly to shovel test units. They had the same dimensions of 50 cm on a side, but were not screened. They were excavated at 15-m and/or 30 m intervals and to a depth of 15-20 cm or deep enough to establish lack of soil integrity.

Visual inspection. This method was conducted to document the nature of the project area and its setting. This method was used to verify the absence or likelihood of any cultural resources within and around the project area to assist in defining the APE.

The application of the resulting field survey methods was documented in field notes, field maps, and project plan maps.

Curation

There were no cultural materials collected or identified from this project. Notes and maps affiliated with this project will be maintained at Weller's files.

Literature Review

Concerning archaeological resources, the study radius was for the literature review is considered to be the standard 1.6 km (1.0 mile) radius as it is acceptable to the OHC. In conducting the literature review, the following resources were consulted at OHPO and the State Library of Ohio:

- 1) *An Archeological Atlas of Ohio* (Mills 1914);
- 2) OHPO United States Geological Survey (USGS) 7.5' series topographic maps;
- 3) Ohio Archaeological Inventory (OAI) files;
- 4) Ohio Historic Inventory (OHI) files;
- 5) National Register of Historic Places (NRHP) files;
- 6) OHPO consensus Determinations of Eligibility (DOE) files;
- 7) OHPO CRM/contract archaeology files; and
- 8) Trumbull County atlases, histories, historic USGS 15' series topographic map(s), and current USGS 7.5' series topographic map(s);
- 9) Online Cemetery and Genealogical records.

The *Archeological Atlas of Ohio* (Mills 1914) did not indicate any prehistoric sites in the vicinity of the project.

Inspection of the Ohio Archaeological Inventory (OAI) files indicated that there are 14 archaeological sites in the study area (Figure 2; Table 2). Few of these sites have a known temporal component. There are 10 prehistoric and 4 historic period sites indicated in the study area. There is one prehistoric period site that is indicated as dating from the Middle Woodland period (33TR0252). Most of these sites were identified during professional surveys that were conducted to the east of Tod Avenue SW and were not considered to be significant. None of these previously recorded sites were identified within the project area.

Site #	General Affiliation	Temporal Period	Site Type	Site Size
TR0096	Prehistoric	Unassigned	Artifact scatter	
TR0207	Prehistoric	Unassigned	Isolated find	1
TR0208	Prehistoric	Unassigned	Isolated find	1
TR0272	Prehistoric	Unassigned	Isolated find	1
TR0273	Historic	Non-aboriginal	Artifact scatter	1520
TR0232	Prehistoric	Unassigned	Isolated find	1
TR0233	Prehistoric	Unassigned	Isolated find	1
TR0234	Prehistoric	Unassigned	Isolated find	1
TR0235	Prehistoric	Unassigned	Isolated find	1
TR0251	Historic	Non-aboriginal	Artifact scatter	2400
TR0252	Prehistoric	Middle Woodland	Artifact scatter	10
TR0257	Historic	Non-aboriginal	Artifact scatter	38
TR0258	Historic	Non-aboriginal	Isolated find	1
TR0259	Prehistoric	Unassigned	Isolated find	1

The Ohio Historic Inventory (OHI) files did not indicate any resources within or immediately adjacent to the project; however, there are 27 located in the study area (Table 3; Figure 2). These were mostly identified and evaluated during professional surveys that have been conducted in the study area.

OHI #	Present Name	Address	ArchStyle1	HistUse1	Activity	Date
TRU0283622	House, 3490 Goldner Lane	3490 Goldner Ln	Modern Movements	Single Dwelling	Original/Most significant construction	1945
TRU0283922	House, 3502 Goldner Lane	3502 Goldner Ln	No academic style - Vernacular	STORAGE	Original/Most significant construction	1943
TRU0284222	House, 3530 Goldner Lane	3530 Goldner Ln	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1910
TRU0284322	House, 3521 Goldner Lane	3521 Goldner Ln	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1941
TRU0285322	House, 3555 Goldner Lane	3555 Goldner Ln	Modern Movements	Single Dwelling	Original/Most significant construction	1956
TRU0285422	House, 2382 Pike Drive	2382 Pike Dr	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1890
TRU0285822	House, 1267 Hallock Young Road	1267 Hallock Young Rd	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1910
TRU0286022	Barns, Hallock Young Road	N side Hallock Young Rd	No academic style -	Barn	Original/Most significant	1901

			Vernacular		construction	
TRU0286122	House, 8290 State Route 45	8292 SR 45	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1907
TRU0286222	House, 8392 State Route 45	8392 SR 45	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1940
TRU0286322	House, 8447 State Route 45	8447 SR 45	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1845
TRU0286422	House, 8555 State Route 45	8555 SR 45	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1955
TRU0286522	House, 8655 State Route 45	8655 SR 45	Modern Movements	Single Dwelling	Original/Most significant construction	1956
TRU0286622	Barn, State Route 45	W side SR 45	No academic style - Vernacular	Barn	Original/Most significant construction	1958
TRU0286722	House, 8831 State Route 45	8831 SR 45	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1894
TRU0102122		Carson-Salt Springs Rd	Vernacular	Single Dwelling	Original Construction	1880
TRU0102822	House, 8933 State Route 45	8933 SR 45	Queen Anne	Single Dwelling	Original/Most significant construction	1915
MAH017500 2	House, 1935 Pritchard Ohltown Rd	1935 Pritchard Ohltown Rd	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1855
TRU0103622		1628 Carson- Salt Springs Rd	Greek Revival	Single Dwelling	Original Construction	1850
TRU0103722	Lordstown Christian Church	6370 SR 45	Greek Revival	Church/Rel igious Structure	Original Construction	1830
TRU0103822	BE Moore House	6631 SR 45	Greek Revival	Single Dwelling	Original Construction	1840
TRU0103922	Charles Woodward House	6830 SR 45	Italianate	Single Dwelling	Original Construction	1870
TRU0104022	James Wilson House	7321 SR 45	Queen Anne	Single Dwelling	Original Construction	1888
TRU0104122	Amanda Woodward Wilson House	SR 45	Greek Revival	Single Dwelling	Original Construction	1840
TRU0104222	House, 8213 State Route 45	8213 SR 45	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1840
TRU0104822		8292 S Todd Ave	Vernacular	Single Dwelling	Original Construction	1864
TRU0294222	Integra House	3530 Goldner Ln	No academic style - Vernacular	Single Dwelling	Original/Most significant construction	1935

There were no NRHP properties or DOE resources located in the project or within the study radius.

A review of the OHPO online contract files did not indicate that the project area had been the subject of any previous investigations; however, there has been six Phase I surveys that are known from within the study area (Weller 2017; Chidester and Bauschard 2016; Soldo 2002; Bush et al. 1981; Zink 2010; Nelson 2015) (Figure 2). All of these surveys were conducted for developed and proposed development areas that are on the east side of Tod Avenue SW; due east of the current project. These surveys were conducted in similar settings to that of the project.

Cartographic/atlas resources were reviewed for the project area. The *Atlas of Trumbull County, Ohio* (Everts 1874) indicates that this area was once owned by J. T. Woodward, Mrs. John Bowman, and Rich Williamson. The residence indicated on the Bowman property may be in the eastern part of the project area. The USGS 1908 *Warren, Ohio Quadrangle 15 Minute Series (Topographic)* map did not indicate any buildings or structures within the project (Figure 4). The modern USGS 1985 *Warren, Ohio 7.5 Minute Series (Topographic)* map does not indicate any buildings in the project area. There are relatively newer railroad lines along the northern side as well as a driveway along the western boundary (Figure 2). There is one cemetery known and recorded in the study area. The Center Cemetery is located to the north and in the vicinity of Lordstown. None are indicated within or near the project.

Evaluation of Research Questions 1 and 2

There were two questions presented in the research design that will be addressed at this point. These are:

- 1) Did the literature review reveal anything that suggests the project area had been previously surveyed?
- 2) Are cultural resources likely to be identified in the project area?

The literature review for this project did not identify any recorded sites or any previous surveys that had been completed within the subject area. Weller has completed investigations for projects that are in a similar setting and terrain to that of the current project area. One survey was completed for a large tract that is to the southwest and opposite the turnpike. This survey did not identify any archaeological sites and there were no significant resources identified (Weller and Engle 2018). Surveys completed by Weller that are to the east and immediately opposite Tod Avenue SW were conducted (Weller 2017; Zink 2010). These surveys encountered nearly identical conditions to that of the current project area and failed to identify any significant archaeological resources. The archaeological sites that were identified were generally indicative of short-termed/transient prehistoric period activity or light scatters of historic period material near residences. Historic period materials would not be anticipated from the project area as it does not appear that there were any buildings that were definitively located within it. Prehistoric period materials are possible, but without a defined and prominent landform

or any position near a drainage, it is considered unlikely that any such deposits will be encountered during these investigations.

Archaeological Fieldwork Results

The field investigations for this project were conducted from December 26-30, 2019 (Figures 5-17). The weather conditions at the time of survey were warmer than usual and normal for this area with temperatures ranging from 35-55 degrees Fahrenheit. There were intermittent bouts of rainfall during the weekend that increased the areas that were prone to inundation along the edges of the area. The field investigations for this project involved visual inspection, and shovel testing; both shovel probes and shovel test units were excavated. Much of the project area was found to be poorly suited for archaeological testing and was occasionally impenetrable due to dense foliage. Still, the testing was sufficient to allow for the determination of any significant archaeological resources in the area. These investigations did not result in the identification of any archaeological sites.

Wet and Inundated Conditions

Much of the project area was found to be ill-suited for archaeological investigation due to wetlands, inundated conditions, and severe disturbance (Figures 6-16). Coincidentally, these are areas that were least likely to be locations and landforms to contain significant, intact, or any archaeological deposits. These are low-lying areas relative to the elevation that is central to the overall project area. The project area is nearly surrounded by constructions such as railway lines, Tod Avenue SW, and modern drives/roads. These have assisted in creating situations where the natural runoff/drainage capabilities of the already subtle topography have created impounded water situations. Surveys conducted by Weller to the immediate east of this project demonstrated that the low relief, clayey soils, and graded construction types have greatly affected the drainages in this area. Low-lying situations are increasingly prone to inundation and wetland conditions.

A large part of this overall project is contained in situations that have been designated as wetlands (Figure 5). These locations were determined just prior to the initiation of the archaeological fieldwork and were demarcated/flagged in the field. It is estimated that about 26.7 ha (65.99 ac) of the 158 acre site was designated as a wetland. These naturally low-lying areas are generally located in the remaining wooded areas and along the edge of the project's boundaries in every direction. Runoff in the area is in all directions as it relates to the relative elevation that is central to the area. Still, additionally inundated conditions that extended beyond that of the designated wetlands were identified and further reduced the testability of the project area. Visual inspection was used to verify the inundated conditions.

Disturbed Conditions

Severely disturbed conditions were identified through a sizeable aspect of the project (Figure 5). Some of these conditions are apparent in the soils survey data where 'udorthents' are indicated (northern and southeastern parts of the project). Disturbed conditions were anticipated prior to the beginning of the fieldwork. Inspection of aerial images of the area dating from the middle 1990s indicates that it was once wooded and there were oil/gas drilling operations located within it. By 2004, the drilling operations had been removed from the central part of the area but the scars of what had been there from the relative grading remained. The majority of the project area was covered with dense and immature foliage as of 2004. This persisted until 2014-2015 where the northern, central, and southeastern aspects of the project were deforested, and the terrain being apparently scarred from the activity. The modern and experienced conditions of the area were from this landscape being left fallow since 2016. There were intense and deep rutting, severely mottled soils, grading, bulldozer push-piles, and general non-descript disturbances identified in all of the areas where this clearing activity occurred. Wooded and often wet conditions remained in the southwestern and northeastern parts of the project.

According to the soils survey data, about 11.4 percent of the area was contained in conditions that are severely disturbed or what is termed 'made-land'. These are locations where grading and fill have eliminated any natural soils from the area and the conditions are consistent with preparation for development or for extant developments. These soils, udorthents, are located in the northern and southeastern parts of the project area. The nature and severity of the disturbances in these areas was verified visually and through shovel probe excavations, if necessary (Figures 6 and 16). The udorthents are located where a railway had been graded, oil/gas drilling operations, and highway construction/grading.

According to atlas/cartographic mapping, there was a possible residence located in the eastern part of the project and near the Tod Avenue SW right-of-way (Everts 1874). Testing and inspection of this area did not identify any aspects of this resource and there were no indications from surface inspection that any such occupation was in this area. Accordingly, this residence is very near the northeastern corner of the project but is apparently just outside of the survey area (Figure 4). The possible Mrs. Bowman residence was not identified; this area where it was possible had been severely disturbed. Shovel probes were excavated in this area to verify conditions.

The dense foliage presented somewhat of a challenge to the archaeological field crew. There were some areas where the immature growth was so dense and filled briars and Hawthorne trees that it was impenetrable. These conditions were created when the taller and more mature trees had been cleared and the area left fallow for several years. It was necessary to circumnavigate these areas and account for them as best as possible. Coincidentally, these locations were often relative to disturbed and/or inundated conditions.

Subsurface Testing Results

The physical archaeological testing component for this project involved shovel test unit and shovel probe excavation. The datum for these investigations was established in the southeastern corner of the testing 'block' or grid and provenienced with a GPS unit. Shovel test units were excavated in the aspects of the project where intact and comparably drier conditions were identified. This was limited to a large patch in the north central part of the project area (Figure 5). The testing identified plowzone-depth topsoil that was free of any gravels or rocks. The topsoil was dark brown (10YR3/3) silt loam and the interface with the subsoil was clear, slightly wavy, and abrupt. It was clear the area had been plowed in the past as the only inclusions into the subsoil were from roots and insect burrows. The subsoil was dark yellowish brown (10YR4/6) silt loam and also free of any rock/gravels (Figure 17). There was no fragipan identified, a common attribute of soils in the uplands in this region. This was likely obliterated by farming and relatively shallow topsoil deposits. There were 163 shovel test units excavated over the course of these investigations (Figure 5); however, there were no archaeological deposits identified.

Shovel probes were excavated in the aspects of the project area where disturbances were not apparent on the surface and where standing water was not encountered. These were used to demonstrate the nature and extent of the identified disturbances, otherwise, if the area was intact it was shovel tested. There were 219 shovel probes excavated in the project area at 30 m intervals. The shovel probed areas encountered a range of unnatural and deleterious soil manipulation. The soils were often found to contain noticeably higher amounts of gravels and clay. The soils were highly mottled and clearly disturbed from what would be expected from upland, formerly plowed conditions (Figures 5 and 16). The shovel probing was conducted mostly in the southern and eastern aspects of the project area.

APE Definition and NRHP Determination

The APE is a term that must be applied on an individual project basis. The nature of the project or undertaking is considered in determining the APE. This may include areas that are off the property or outside of the actual project's boundaries to account for possible visual impacts. When construction is limited to underground activity, the APE may be contained within the footprint of the project area. The APE for the archaeological aspect of this project is considered to be the footprint of construction and the limits the investigated parcel. The project plans are for the construction of a new automotive battery cell manufacturing facility near the Lordstown Automotive Manufacturing Facility.

The literature review that was conducted for this project did not indicate that it had been subject of any previous investigations and there were no previously recorded resources identified within it.

These investigations did not result in the identification of any archaeological sites; much of the surveyed area was wet or disturbed. Considering the footprint of the project area and what is regarded as the archaeological APE, a finding of no historic properties affected is deemed appropriate for this project.

Recommendations

In December 2019, GHD contracted Weller & Associates, Inc. (Weller) to conduct a Phase I archaeological survey for the 64 ha (158.22 ac) Magellan East Project in Lordstown Township, Trumbull County, Ohio. These field investigations involved subsurface methods of sampling and visual inspection. The field reconnaissance did not result in the identification of any archaeological deposits. Much of the project area was found to be severely disturbed from previous activities or contained in designated wetlands. These conditions were anticipated prior to the initiation of the fieldwork. There were no archaeological sites identified during this survey. Weller considers a finding of no historic properties affected (36 CFR 800.5) appropriate and no further archaeological work is considered to be necessary for this Undertaking.

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Figures



Figure 1. Political map of Ohio showing the approximate location of the project.

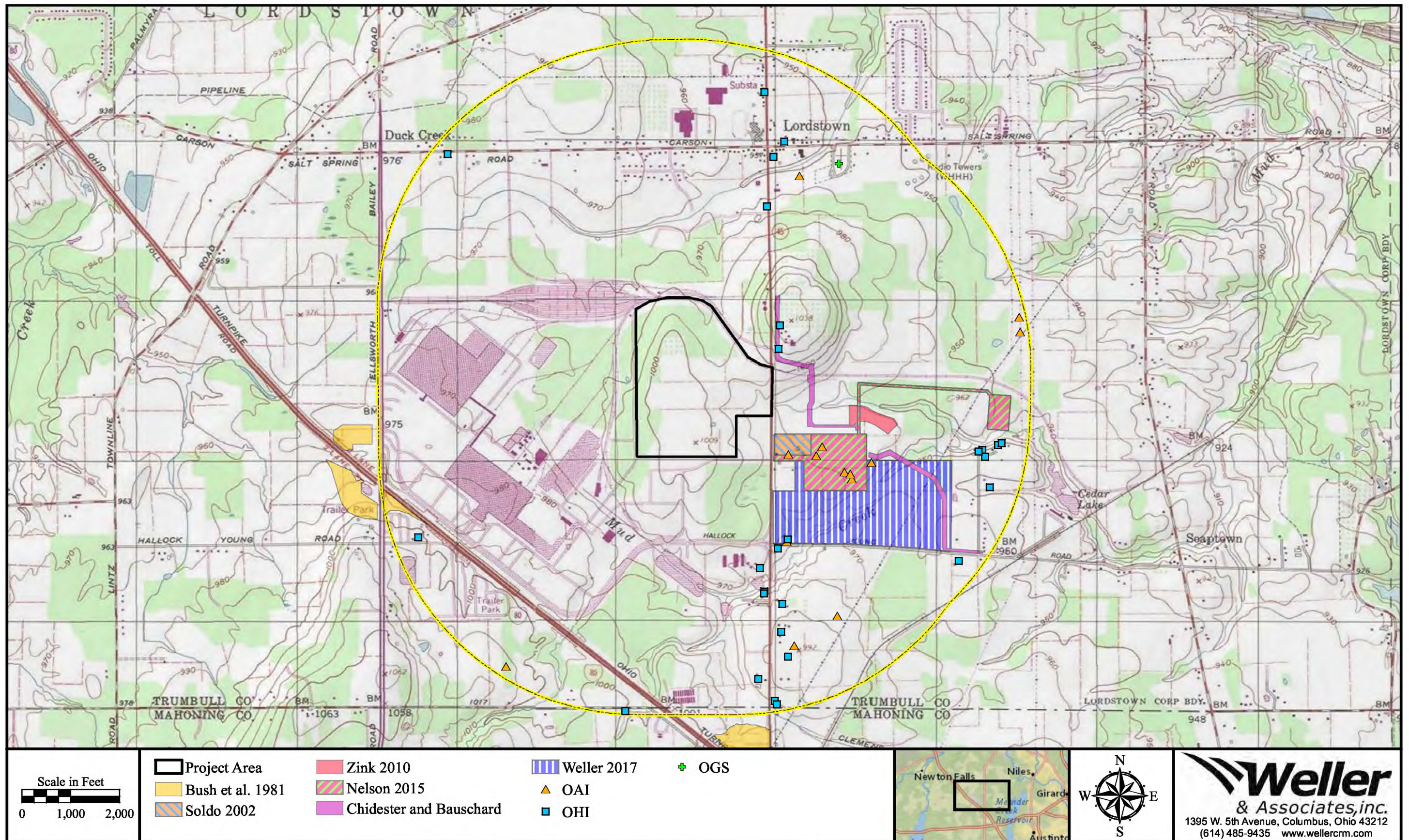


Figure 2. Portion of the USGS 1985 Warren, Ohio 7.5 Minute Series (Topographic) map indicating the location of the project and previously recorded resources in the study area.

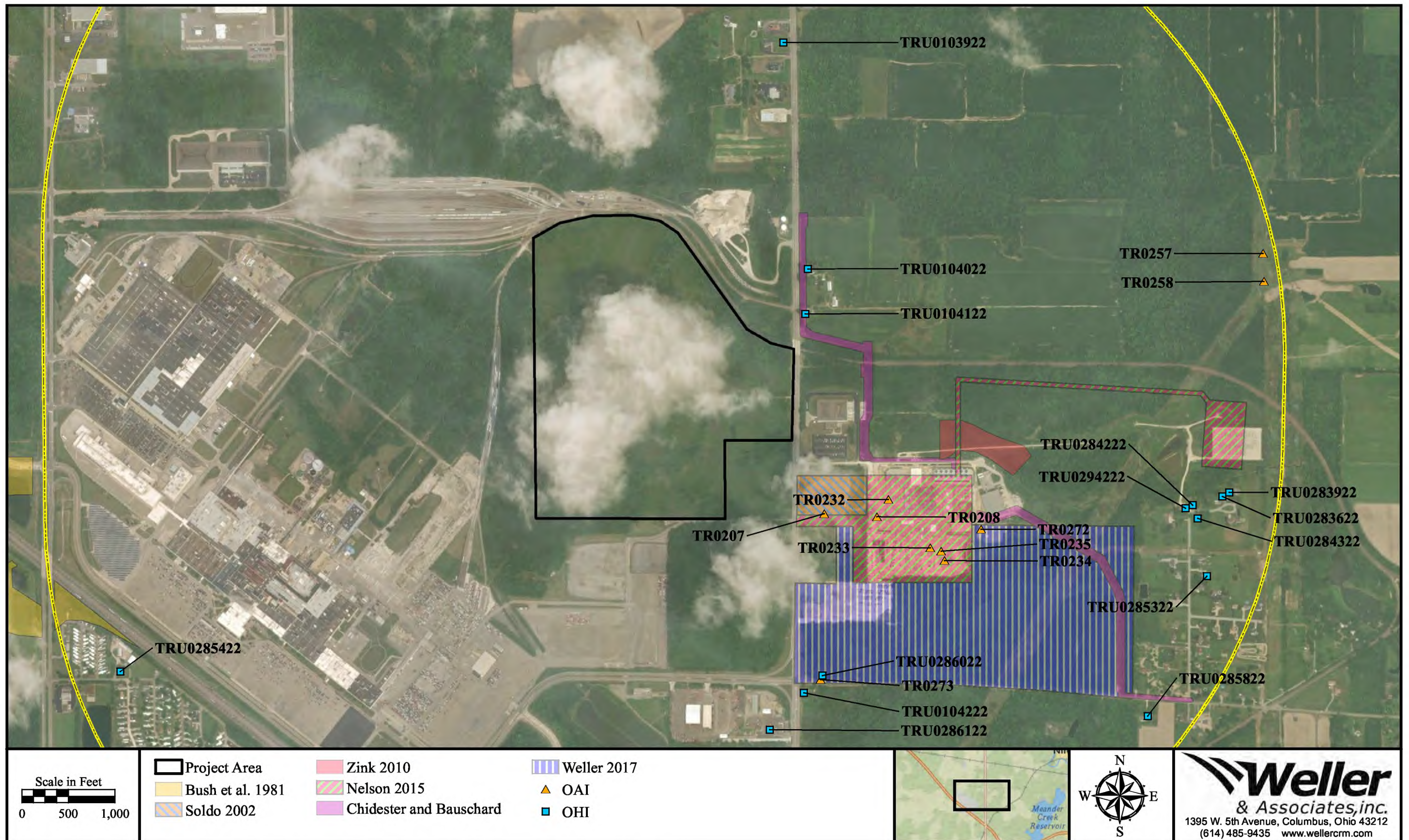


Figure 3. Aerial map indicating the location of the project area and recorded resources within the study area.

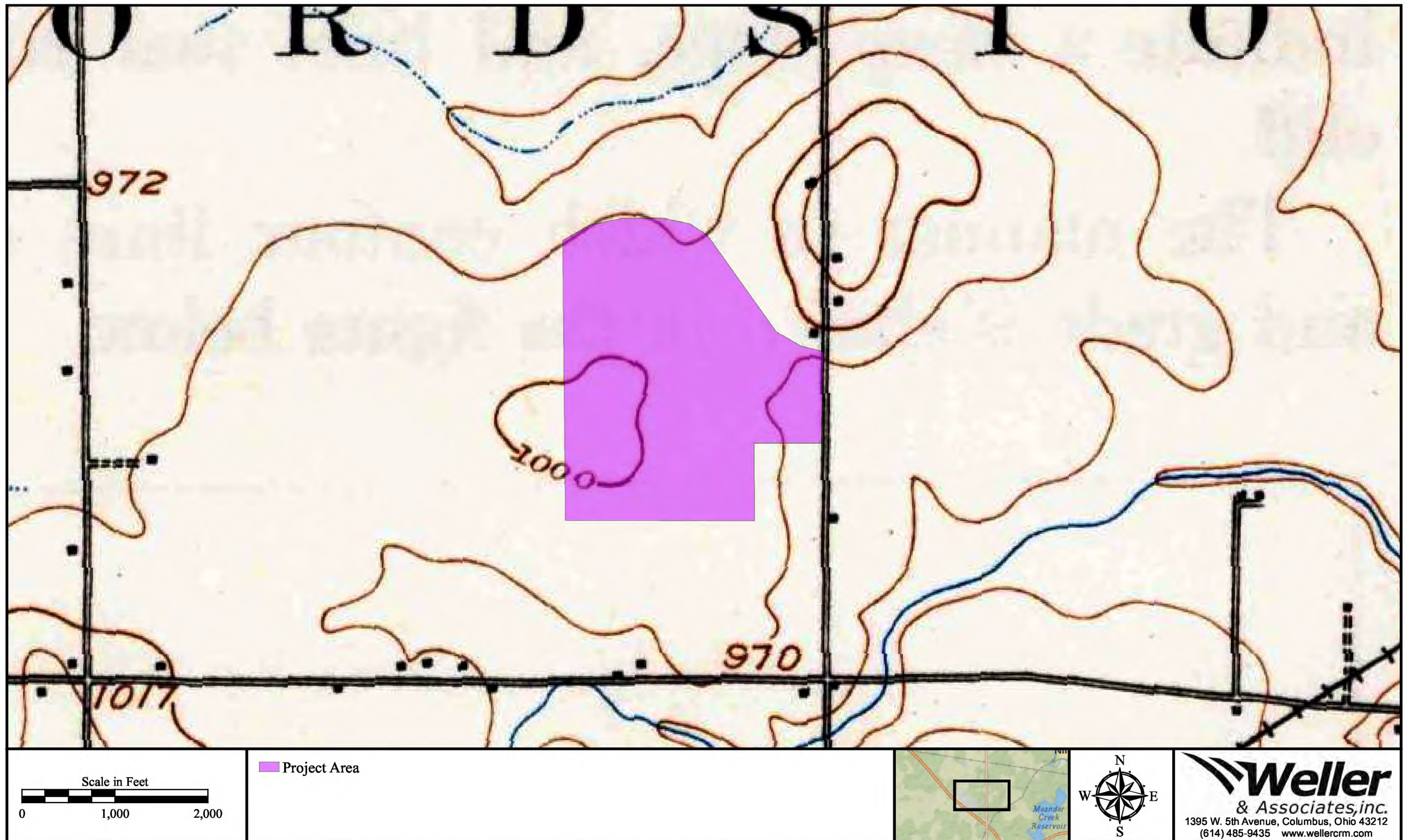
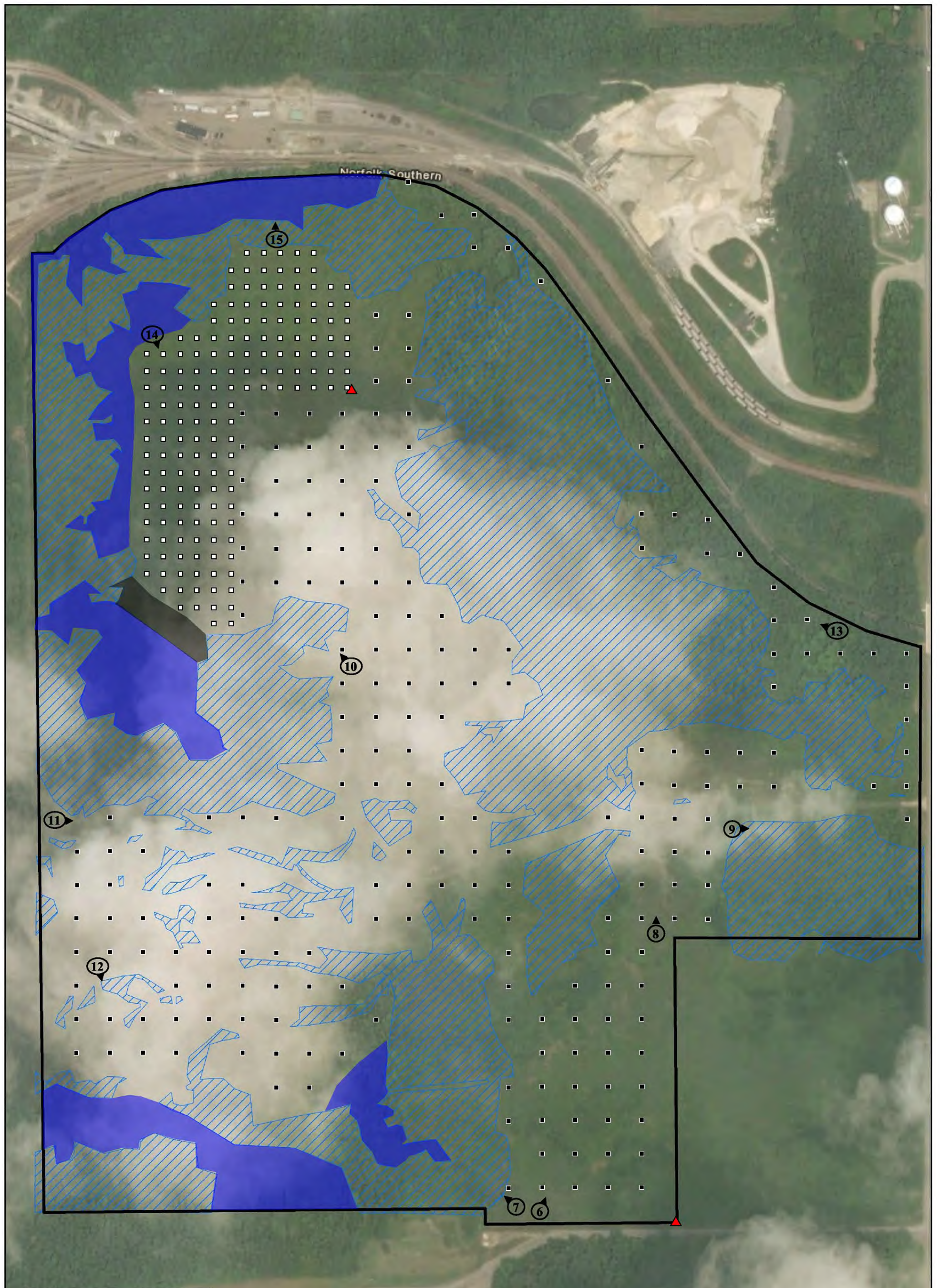


Figure 4. Portion of the USGS 1908 Warren, Ohio 15 Minute Series (Topographic) map indicating the approximate location of the project.



Legend

- Project
- Designated Wetland

Figure 5. Aerial fieldwork map of the project indicating the results of testing and photo orientations.

<p>Scale in Feet</p> <p>0 100 200</p>	<ul style="list-style-type: none"> Wet Area Disturbed Area 	<ul style="list-style-type: none"> Datum Locations Disturbed Shovel Probe Negative Shovel Test Unit Photo Orientations 		<p>Weller & Associates, Inc. 1395 W. 5th Avenue, Columbus, Ohio 43212 (614) 485-9435 www.wellercrm.com</p>
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Figure 6. View of the disturbed shovel probed southeastern portion of the project.



Figure 7. View of the designated wetland within the southern portion of the project.



Figure 8. Typical conditions within the eastern portion of the project.



Figure 9. Some of the conditions within the designated wetlands.



Figure 10. View of the central portion of the project.



Figure 11. Conditions within the western portion of the project.



Figure 12. Some of the conditions within the southern portion of the project.



Figure 13. Some of the conditions within the eastern portion of the project.



Figure 14. View of the shovel tested northern portion of the project.



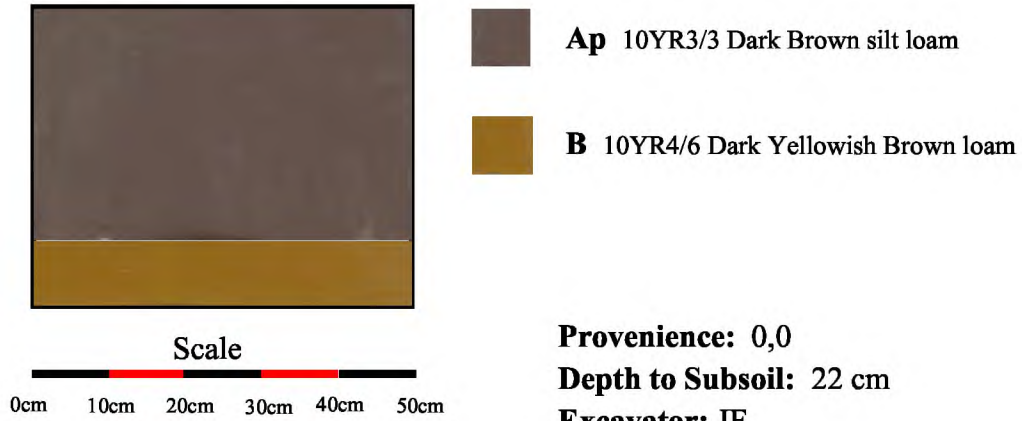
Figure 15. Conditions within the northern portion of the project.



Figure 16. A disturbed shovel probe from within the project.

Schematic of a Test Unit Profile

Rittman Silt Loam (RsB)



Provenience: 0,0

Depth to Subsoil: 22 cm

Excavator: JF



Figure 17. Profile of a typical shovel test unit excavated within the project.

APPENDIX F5

Weller History/Architecture Investigations





**History/Architecture Investigations for the 64 ha (158.22 ac)
Magellan East Project in Lordstown Township, Trumbull
County, Ohio**

Austin White

January 6, 2020

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**History/Architecture Investigations for the 64 ha (158.22 ac)
Magellan East Project in Lordstown Township, Trumbull
County, Ohio**

By

Austin White

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Lead Agency:

U.S. Army Corps of Engineers, Pittsburgh



Austin White, P.I.

January 6, 2020

Abstract

In December 2019, Weller & Associates, Inc. conducted History/Architecture Investigations for the 64 ha (158.22 ac) Magellan East Project in Lordstown Township, Trumbull County, Ohio. The work was conducted under contract with GHD Services, Inc. (GHD). The lead agency for the project is the U.S. Army Corps of Engineers, Pittsburgh and is therefore considered to be an Undertaking. A survey was deemed necessary to identify any sites or properties and to evaluate them for the National Register of Historic Places (NRHP) pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended (54 U.S.C. 306108 [36 CFR 800]).

The proposed project will consist of the construction of a new automotive electric battery manufacturing facility next to the Lordstown Automotive Manufacturing Facility. The literature review utilized a one-mile study area, identifying 27 Ohio Historic Inventory resources, and one previously conducted history/architecture survey within one-mile of the proposed project. No extant buildings or structures were identified in the project area. The TRU0104022 and TRU0104122 resources were found to be located in the Area of Potential Effects and situated to the east of the project area.

The field survey found no buildings or structures in the project area and identified two resources 50 years of age or older. The two resources (TRU0104022 and TRU0104122) are located directly east of the project area. Both resources were evaluated in the late 1970's/early 1980's and 2015 and were recommended as ineligible for inclusion in the National Register of Historic Places under Criteria A, B, or C due to a lack of associative significance, a loss of integrity, and an absence of character defining features, and are partially obscured by arboreal shields. Weller concurred with the previous evaluations and recommends of finding of 'no historic properties affected'.

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18. Northeast view of an English barn associated with TRU0104022 from Tod Avenue SW (SR 45).
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Introduction

In December 2019, Weller & Associates, Inc. conducted History/Architecture Investigations for the 64 ha (158.22 ac) Magellan East Project in Lordstown Township, Trumbull County, Ohio (Figures 1-3). The work was conducted under contract with GHD Services, Inc. (GHD). The lead agency for the project is the U.S. Army Corps of Engineers, Pittsburgh and is therefore considered to be an Undertaking. A survey was deemed necessary to identify any sites or properties and to evaluate them for the National Register of Historic Places (NRHP) pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended (54 U.S.C. 306108 [36 CFR 800]).

The investigations were conducted in two parts: a history/architecture survey and archaeological investigation. This report covers the results of the history/architecture survey of the entire area that may be affected by the proposed development of the project.

Austin White served as Principal Investigator for this project. Mapping and figures for this project were generated by Chad Porter, Alex Thomas and Austin White. The archival research was conducted on December 19th, 2019 and the field survey was conducted December 20th, 2019.

Project Description

The proposed project will consist of the construction of an industrial facility adjacent to the Lordstown Automotive Manufacturing Facility. The project area is located to the northeast of the existing plant facilities, to the west of Tod Avenue SW (SR 45), and to the west and opposite of Henn Parkway and its related developments. The project area is north of Hallock Young Road and to the south and east of railroad lines that service the surrounding industrial parks.

Description of the Area of Potential Effect

The type of Undertaking and its location are considered to determine the Area of Potential Effects (APE) prior to the field survey. As the project consists of the proposed construction of an extension of an industrial facility, viewshed effects were considered in addition to direct effects. The northern boundary of the project area is lined by railroad tracks and arboreal shields terminating the visual APE. As the project area extends to Tod Ave SW/Route 45, the TRU0104022 and TRU0104122 resources are considered to have a viewshed of the project area that is partially obscured by arboreal shields. From the eastern boundary of the project area, the Visual APE extends across SR 45 and encompasses several modern industrial facilities and woods directly to the east, which terminate the viewshed (Figure 5). From the southern boundary of the project area, the Visual APE includes a parking lot associated with a modern industrial facility located to the west and southwest of the project area, as well as wood areas adjacent to the east and west of the parking lot. From the western boundary of the project area, the APE is limited by wooded areas bordering the western boundary of the project area.

Research Design

The purpose of the history/architecture portion of the project was to identify any historic properties in the area that may be affected by the proposed development of the project. These effects may be direct or indirect. Direct effects occur within the boundaries of the project, while indirect effects can occur for areas outside the direct boundaries and can include visual, audible, and atmospheric effects that are associated with the development of the project. Based on the nature of the project, the history/architecture investigations consisted of a survey of potentially significant resources 50 years of age or older, that are situated within the project area or within the project viewshed.

Methods

This survey was conducted following the guidelines established in Archeology and Preservation: Secretary of the Interior's Standards and Guidelines (National Park Service 1983) and Guidelines for Local Surveys: A Basis for Preservation Planning. National Register Bulletin No. 24 (National Park Service 1997), and *Guidelines for Conducting History/Architecture Surveys in Ohio* (Ohio SHPO, 2014). When properties are identified, they are subjected to the guidelines outlined in National Register Bulletin 15, How to Apply the National Register Criteria for Evaluation (National Park Service 1996).

There are four criteria for eligibility to be listed in the National Register of Historic Places (NRHP). Only one of these criteria must be met to be considered eligible for listing; however, oftentimes more than one of the criteria is met. The criteria for significance include:

- A. Association with historic events or patterns of events;
- B. Association with persons important to our past;
- C. Exceptional or important architectural characteristics; and/or
- D. Data potential.

Architectural properties typically qualify under Criteria A, B, or C. Criterion D is typically reserved for archaeological sites.

In addition to meeting at least one of the established criteria, the appropriate integrity must also be retained by the resource. There must be integrity of location, design, workmanship, setting, materials, feeling, and association.

Prior to commencing fieldwork, a literature review was conducted to determine if any previously inventoried or recorded architectural resources were present within the project area or study area. Historic maps were also reviewed to aid in guiding the fieldwork and detecting the possible presence of resources 50 years of age or older within the project and study area. Background research was also conducted in order to establish a historic context of the region. The context was compiled by utilizing materials from the Ohio State Historic Preservation Office (SHPO), archival materials at the respective county courthouses, local libraries, and several online resources. The establishment of the historic context helped to guide the interpretation of the field survey results.

The field survey included a systematic approach to identifying all properties that have potential significance for inclusion within the NRHP within the survey area, 1 mile from the center of the proposed project. Some areas will be obscured from having a direct line-of-sight to the proposed project by topography and forested areas. The areas that did not have a direct line-of-sight to the project were visually verified in the field and the survey did not include all of these areas. Each potentially significant resource identified within the survey area that will have a direct line-of-sight was photographed and annotated on appropriate mapping and included in the report. The approach was to identify those properties with NRHP potential, followed by a more intensive documentation and evaluation of those potentially eligible aboveground resources. The survey involved recording of each resource with potential historic significance to a baseline level of documentation.

Weller focused on the ground plan, the height, and the roof configuration of each structure, noting all visible materials, appendages, extensions, or other alterations. Housing types and structural details within the report and utilized on Ohio Historic Inventory (OHI) forms follow the terminology used by geographers Jakle, Bastian, and Meyer (1988), architectural historians McAlester and McAlester (2013), and Gordon (1992). Weller then supplemented the field survey data with an examination of available tax records, aerial photographs, and cartographic sources.

Definitions

Within this report, an *architectural resource* is defined as aboveground buildings or structures that are 50 years of age or older. A *historic property* is defined as a building, structure, object, or site that is listed in, or considered eligible for listing in, the NRHP. An *effect* is defined as an activity associated with the project that alters a characteristic of a historic property that qualified it for inclusion in the NRHP.

Historic Context

Trumbull County History

Trumbull County was established on July 10, 1800, becoming the seventh county in the Northwest Territory. The original boundaries for Trumbull County included all of the Western Reserve, north to Lake Erie, east to Pennsylvania, and surrounded to the west by Seneca and Sandusky counties. At the early onset of the county, there were few settlements found within its borders. Over time, the size of Trumbull County was greatly reduced. Ten other counties were formed from what was formerly Trumbull County land, the first being Granger County on March 1, 1806. In 1845, the reduction of Trumbull County was complete, thus delineating its present borders (Everts 1874; Galbreath 1925; Williams 1882).

Salt miners had explored the area in the years surrounding 1755, but the cost of extraction, transportation, and risk of Indian obstruction precluded any sizable business in the area. The Connecticut Land Company had the area surveyed in portions a number of times, but

occupation was generally stayed by one early national conflict or another (Howe 1888; Upton 1909).

General Samuel H. Parsons was the first man to purchase Western Reserve lands in Trumbull County. James Kingsbury is generally accepted as the first Trumbull County immigrant; though there were certainly squatters here before he came in the late 1700's. The early settlers of Trumbull County were farmers who used barter as their major economic system. The orchards of the county were plentiful, and fruit was abundant. Apples and peaches were used frequently to make Apple-jack as well as other alcoholic beverages. Brockway's and Hawn's were the Reserve's two earliest mills; each in Orangeville. Henry Lane, Jr. and Charles Dailey built the first gristmill in the present confines of the county at Warren, along the Mahoning River, in June of 1802 (Everts 1874; Galbreath 1925; Howe 1888; Williams 1882).

John Fitch was a famous resident of Trumbull County. He is credited with the actual invention of the steamboat, although he didn't have the means to fund the manufacture his invention. He was from the town of Hartford, located in Trumbull County. Another famous entrepreneur in Trumbull County was Samuel Cone. In 1846, Cone started a cheese factory in Hartford Township. This was the first cheese factory in Ohio and perhaps in the country. The first merchant of Trumbull County was James E. Caldwell in 1801 (Everts 1874; Galbreath 1925).

In 1827, plans were formulated for connecting Lake Erie with the Ohio River by railroad but never solidified. Eleven years later a company known as Ashtabula, Warren & East Liverpool R. R. Company was formed for the same purpose. However, the financial crisis known as the panic of 1836 and 1837 put an end to the plan and instead, the Ohio Canal was built (Upton 1909). The first railroad built running through Trumbull County was the Cleveland & Mahoning. Work began in 1853 and the first train ran on this line on July 1, 1856. Other local railroads include the Franklin & Warren Railroad Company, organized 1851; The Ashtabula & New Lisbon Railroad; the Liberty & Vienna, which was built in 1868 and extended to Youngstown in 1870; later the Ashtabula, Youngstown, and Pittsburg; the Painesville & Youngstown Railroad; the Pittsburg, Youngstown & Chicago; and the Pittsburg, Cleveland & Toledo which became the Pittsburg & Western Railroad Company later bought by the B. & O. Company (Everts 1874; Howe 1888; Upton 1909; Williams 1882).

The great availability of transportation in the region supported the manufacturing economy of this region once the county had turned from a purely agrarian area. This allowed cities to grow, along with more business in a profitable cycle (Galbreath 1925; Upton 1909; Williams 1882).

Warren is the county seat, as it was even before its streets were laid out and organized. Gov. St. Clair deemed Warren to be seat of justice for the newly proclaimed Trumbull County at the time of its inception. It was at least another five months, however, before Ephraim Quinby platted the town. Incorporation came 25 years later. As with most county seat designations, there was quite a fuss concerning the selection of Warren over the more populated center of Youngstown. Warren was chosen because of its more central location, and also because it was home to more influential men. Youngstown would not be set back long though; it was granted

the same honor at the establishment of Mahoning County (Everts 1874; Galbreath 1925; Howe 1888; Upton 1909; Williams 1882).

Niles is another city in Trumbull. James Heaton and his son laid it out in 1834 and it gained incorporation in 1865. This is the birthplace of President William McKinley. McKinley's father was involved in the expanding manufacturing interests of the town in that day. Its furnaces, mills, and factories were greatly benefited by the connection to the larger cities in Northeastern Ohio by several new rail lines (Galbreath 1925; Howe 1888; Upton 1909).

Hieronimus Eckman originally settled where there would one day be the city of Girard in 1802. A post office arose here in 1836 and David Tod laid the town out and named it the following year. The Pennsylvania and Ohio Canal reached the town one year before it was finished and aided the city's growth immensely. Cortland, Newton Falls, and Hubbard are newer cities in Trumbull along with several towns and villages in the more rural, still very agrarian, areas (Galbreath 1925; Howe 1888; Upton 1909).

Lordstown Township History

The Village of Lordstown is contained within the "Fire Lands" of the Connecticut Western Reserve. Samuel P. Lord was the claimant of this portion and the township, which derives its title from the Lord family name. Lord, for whatever reason, did not sell any of his holdings until the 1820s and thus the township was one of the latest settled in the region. However, when he did begin to sell, nearly all the property was bought within a few years, and by settlers rather than speculators (Duncan 1876; Williams & Bro. 1882).

Henry Thorne allegedly built the first cabin in 1829, but others were already in the area before the 1820s, occupying land that they would purchase upon availability. The majority of the population of the township has ancestry that is derived from Germany. The township consists of low-lying till plain that includes broad swamps and periodic isolated elevations. It is drained by Little Duck Creek and one of its tributaries referred to as Meander. It contained little mineral wealth for the early settlers but was a fruitful farm country (Everts 1874; Williams & Bro. 1882).

The focus of the early settlement was around Centre Roads or the Centre (Upton 1909; Williams & Bro. 1882). This is an intersection that is the near center of the township and has historically been referred to as Lordstown Center, P.O. The early industry and businesses in the area revolved around agriculture and general trade. John and Robert Tait, some of the first settlers, were blacksmiths. John Carrolton built the first sawmill north of the Centre. Shiveley's Mill was constructed to the southeast of the Centre on Little Duck Creek (circa 1850) and followed by Simons Mill about ten years later. The development of the Centre was in the 1830s when the first post office, store, and hotel were established (Upton 1909; Williams & Bro. 1882).

The first schoolhouse was established in 1830 on the Moses Haskell farm within the first district (Upton 1909; Williams & Bro. 1882). The first schoolhouse to be built at the Centre was also of log construction, followed by a frame building in 1840 (Upton 1909). The religious activity of the township was initiated with the Methodists in the mid-1830s and later the United

Brethren in the mid-1850s. In the early 1830s the German Lutherans and German Reformed built a church near Bailey's Corner (Upton 1909).

The township organized in 1827 to perform its first elections of local government (Upton 1909; Williams & Bro. 1882). Today however, the township is organized, not as a township, but as a village municipality. It is a suburb of the larger city, Warren, which lies on its northern border. The township wholly incorporated itself as the Village of Lordstown in 1975 in order to have more control over land usage, concerning the potential for urban sprawl from the nearby cities of Warren and Youngstown. Industrial development and businesses are the focus of the economy in the modern Village of Lordstown. This is not surprising, as it is in the industrial part of Northeast Ohio and within an area that has more recently been coined "The Rust Belt". There is a General Motors plant in Lordstown that is responsible for a great deal of the manufacturing jobs in the region. Of course, many residents find employment in the larger markets of the neighboring cities, extending as far as Akron, Cleveland, and Pittsburgh. Farming is still an important part of the economy, but modern efforts are pointed towards industrial development (Village of Lordstown 2010).

Literature Review

The literature review for this project utilized a 1 mi (1.6 km) study area to ensure the identification of all historic resources that may be in the APE (Figures 2 and 3). SHPO files (Historic Property Inventory, National Register of Historic Places, Determinations of Eligibility, Ohio Genealogical Society), historic atlases, topographic maps, and previously conducted history/architecture surveys were utilized to identify the presence of historic properties and resources located within the study area/APE.

A review of SHPO records identified 27 OHI resources, and one previously conducted history/architecture survey in the one-mile study area/APE (Figures 2 and 3; Table 1). Two of the OHI resources (TRU0104022 and TRU0104122) are located in the vicinity of the project area, situated to the east along Tod Avenue Southwest/Route 45, and are considered to be in the APE (Figures 17-20). The TRU0104022 and TRU0104122 resources were not recommended as eligible during a survey from an unknown date; based on the form format, these resources were recorded sometime in the late 1970's/early 1980's. The resources were again evaluated by Weller in 2015, who concurred with the original recommendations (Figures 2 and 3; Nelson 2015). An inspection of historic and modern aerial images indicate that five OHI's have been demolished due to deferred maintenance and development: TRU0102122, Ca.1994-2004; TRU0103622, Ca.1970-1994; TRU0103822, Ca.1970-1994; TRU0103922, Ca.1994-2004; and TRU0286122, Ca.2016-2018 (NETROnline; Google Earth).

The USGS 1908 Warren, Ohio Quadrangle 15 Minute Series (*Topographic*) map does not indicate any buildings or structures within the project area (Figure 4). The modern USGS 1985 Warren, Ohio 7.5 Minute Series (*Topographic*) map similarly does not indicate any buildings in the project area, but does show newer railroad lines present to the immediate north of the project area as well as a ca 1980s driveway along the western boundary of the project area (Figure 2). A review of modern aerial images indicates that the project area consists of fallow

agricultural fields and woods with a road leading into the central portion, surrounded by industrial facilities and railroad tracks (Figure 3).

Table 1. Previously Recorded Resources Identified in the Study Area/APE.

Resource #	Present Name	Location	Place Name	Style	Date	NRHP Status
MAH0175002	House, 1935 Pritchard Ohltown Road	1935 Pritchard Ohltown Road	Jackson (Township of)	Vernacular	Ca.1855	Not Listed
TRU0102122	-	Carson-Salt Springs Road, Section 58	Lordstown	Vernacular	Ca.1880's-1890's	Demolished
TRU0102822	-	8933 Tod Avenue SW (SR 45), Tract XV, Section 4	Lordstown	Queen Anne	Ca.1880's-1890's	Not Listed
TRU0103622	-	1628 Carson-Salt Springs Road, Section 46	Lordstown	Greek Revival	Ca.1840's-1850's	Demolished
TRU0103722	Lordstown Christian Church	6370 Tod Avenue SW (SR 45), Section 45	Lordstown	Transitional Greek/Gothic Revival	Ca.1830	Not Listed
TRU0103822	Moore, Mrs. B. E., Residence	6631 Tod Avenue SW (SR 45), Section 55	Lordstown	Greek Revival	Ca.1830's-1840's	Demolished
TRU0103922	Woodward, Charles, Residence	6830 Tod Avenue SW (SR 45)	Lordstown	Italianate	Ca.1875	Demolished
TRU0104022	Wilson, James, Residence	7321 Tod Avenue SW (SR 45), Section 66	Lordstown	Queen Anne	Ca.1890	Not Listed
TRU0104122	Wilson, Amanda Woodward, Residence	7321 Tod Avenue SW (SR 45)	Lordstown	Greek Revival	Ca.1830's-1840's	Not Listed
TRU0104222	Fenstermaker, Eleanor, Residence	8211 Tod Avenue SW (SR 45), Tract XVI, Section 11	Lordstown	Greek Revival	Ca.1830's-1840's	Not Listed
TRU0104822	-	8292 Tod Avenue SW (SR 45), Section 79	Lordstown	Vernacular with Italianate Elements	1864-1867	Not Listed

TRU0283622	House, 3490 Goldner Lane	3490 Goldner Lane	Lordstown	Modern Movements	1945	Not Listed
TRU0283922	House, 3502 Goldner Lane	3502 Goldner Lane	Lordstown	Vernacular	1943	Not Listed
TRU0284222	House, 3530 Goldner Lane	3530 Goldner Lane	Lordstown	Vernacular	Ca.1910	Not Listed
TRU0284322	House, 3521 Goldner Lane	3521 Goldner Lane	Lordstown	Vernacular with Craftsman Elements	1941	Not Listed
TRU0285322	House, 3555 Goldner Lane	3555 Goldner Lane	Lordstown	Modern Movements	1956	Not Listed
TRU0285422	House, 2382 Pike Drive	2382 Pike Drive	Lordstown	Vernacular	1956	Not Listed
TRU0285822	House, 1267 Hallock Young Road	1267 Hallock Young Road	Lordstown	Vernacular	Ca.1910	Not Listed
TRU0286022	Barns, Hallock Young Road	N Side of Hallock Young Road, 90m E of Tod Avenue SW	Lordstown	Vernacular	Ca.1901	Not Listed
TRU0286122	House, 8290 State Route 45	8290 State Route 45	Lordstown	Vernacular with Queen Anne Elements	1907	Demolished
TRU0286222	House, 8392 State Route 45	8392 State Route 45	Lordstown	Vernacular with Colonial Revival Elements	1940	Not Listed
TRU0286322	House, 8447 State Route 45	8392 State Route 45	Lordstown	Vernacular	1845	Not Listed
TRU0286422	House, 8555 State Route 45	8555 State Route 45	Lordstown	Vernacular	1955	Not Listed
TRU0286522	House, 8655 State Route 45	8655 State Route 45	Lordstown	Vernacular	1956	Not Listed

TRU0286622	Barn, State Route 45	W side of State Route 45, 170m N of County Line Road	Lordstown	Vernacular	1958	Not Listed
TRU0286722	House, 8831 State Route 45	8831 State Route 45	Lordstown	Vernacular	1894	Not Listed
TRU0294222	Integra House	3530 Goldner Lane	Lordstown	Vernacular	Ca.1935	Not Listed

Architectural Survey Results

The field survey confirmed that project area is contained in fallow agricultural fields and woods west of Tod Avenue SW (SR 45) opposite Henn Parkway, bounded by railroad lines on the north and west, and on the south by Hallock Young Road (Figures 5-16). There are no buildings present within the project area. The surrounding area is primarily industrial and contains only two residences, both of which were the only resources 50 years of age or older identified in the visual APE (Figures 5, 6, 11, 17-20; Table 2; Appendix A). The two resources (TRU0104022 and TRU0104122) are located directly east of the project area; the remaining 25 OHIs are not located in the immediate facility, and no buildings or structures were identified in the project area. The extensively altered TRU0104022 and TRU0104122 resources were evaluated by Weller in 2015 and were found to be ineligible for inclusion in the NRHP under Criteria A, B, or C due to a lack of associative significance, a loss of integrity, and an absence of character defining features, and are partially obscured by arboreal shields (Nelson 2015); Weller concurs with this recommendation.

The northern boundary of the project area is lined by railroad tracks and arboreal shields which terminate the Visual APE. From the eastern boundary of the project area, the Visual APE extends across Tod Road SW (SR 45) encompasses the TRU0104022 and TRU0104122 resources, both of which are partially obscured by arboreal shields. From the eastern boundary of the project area, the Viewshed APE extends across Tod Road SW (SR 45) and encompasses several modern industrial facilities and woods directly to the east, which terminate the viewshed. From the southern boundary of the project area, the Visual APE includes a parking lot associated with a modern industrial facility located to the west and southwest of the project area, which terminates at the wooded areas adjacent to the east and west of the parking lot. From the western boundary of the project area, the Visual APE is limited by a large, north-south wooded tract adjacent to railroad tracks on the west and north.

Table 2. Field Survey Results.

Field #	County	Figure	Location	Date	Stylistic Influence	Type	Alterations	Integrity	NRHP Status
TRU0104022/ Wilson, James, Residence	Trumbull	5, 7, 18-20	7321 Tod Avenue SW (SR 45), Section 66, Lordstown	Ca.1890	Queen Anne	Irregular	Windows, Siding, Doors, Rear Additions	Location, Design, Materials, Workmanship	Not Eligible
TRU0104122/ Wilson, Amanda Woodward, Residence	Trumbull	5, 7, 12 and 21	7321 Tod Avenue SW (SR 45)	Ca.1850	Greek Revival	New England One and a Half	Windows, Siding, Doors, Front Porch, Rear Additions	Location, Design	Not Eligible

Conclusions

In December 2019, Weller & Associates, Inc. conducted History/Architecture Investigations for the 64 ha (158.22 ac) Magellan East Project in Lordstown Township, Trumbull County, Ohio. The work was conducted under contract with GHD Services, Inc. (GHD). The lead agency for the project is the U.S. Army Corps of Engineers, Pittsburgh and is therefore considered to be an Undertaking.

The literature review and field investigations identified two individual resources (TRU0104022 and TRU0104122) 50 years of age or older within the Visual APE. Both resources were found to be ineligible for inclusion in the NRHP under Criteria A, B, or C due to a lack of associative significance, a loss of integrity, and an absence of character defining features. Weller recommends a finding of ‘no historic properties affected’ for this project.

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<http://www.lordstown.com/history.asp>. Accessed: January 29, 2010. Village of Lordstown. Lordstown, Ohio.

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1882 *History of Trumbull and Mahoning Counties; with Illustrations and Biographical Sketches, Vol. I*. H. Z. Williams & Bro., Cleveland.

Figures



Figure 1. Political map of Ohio showing the approximate location of the project.

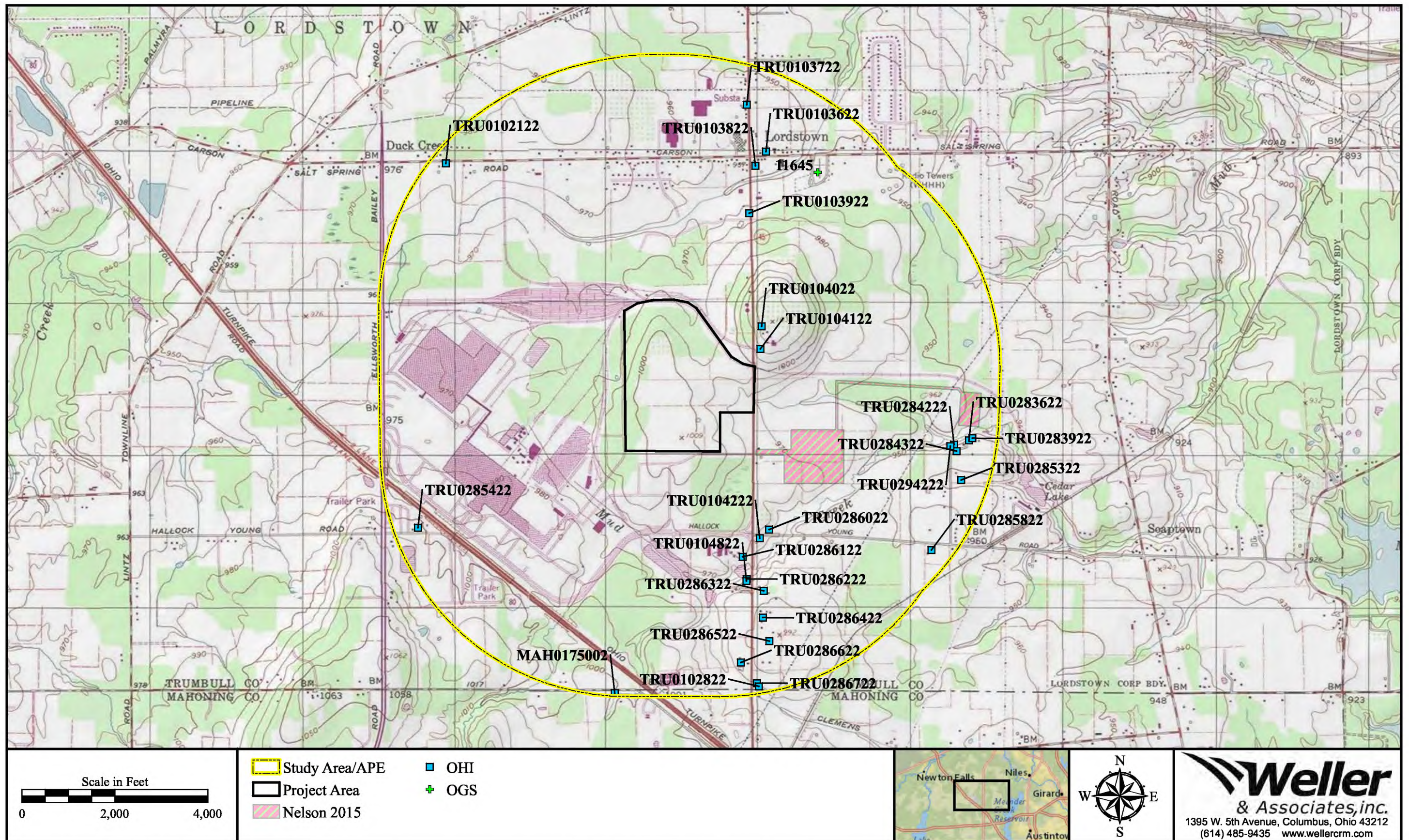


Figure 2. Portion of the USGS 1985 Warren, Ohio 7.5 Minute Series (Topographic) map indicating the location of the project and previously recorded resources in the study area/APE.



Figure 3. Aerial map indicating the location of the project area and recorded resources within the study area/APE.

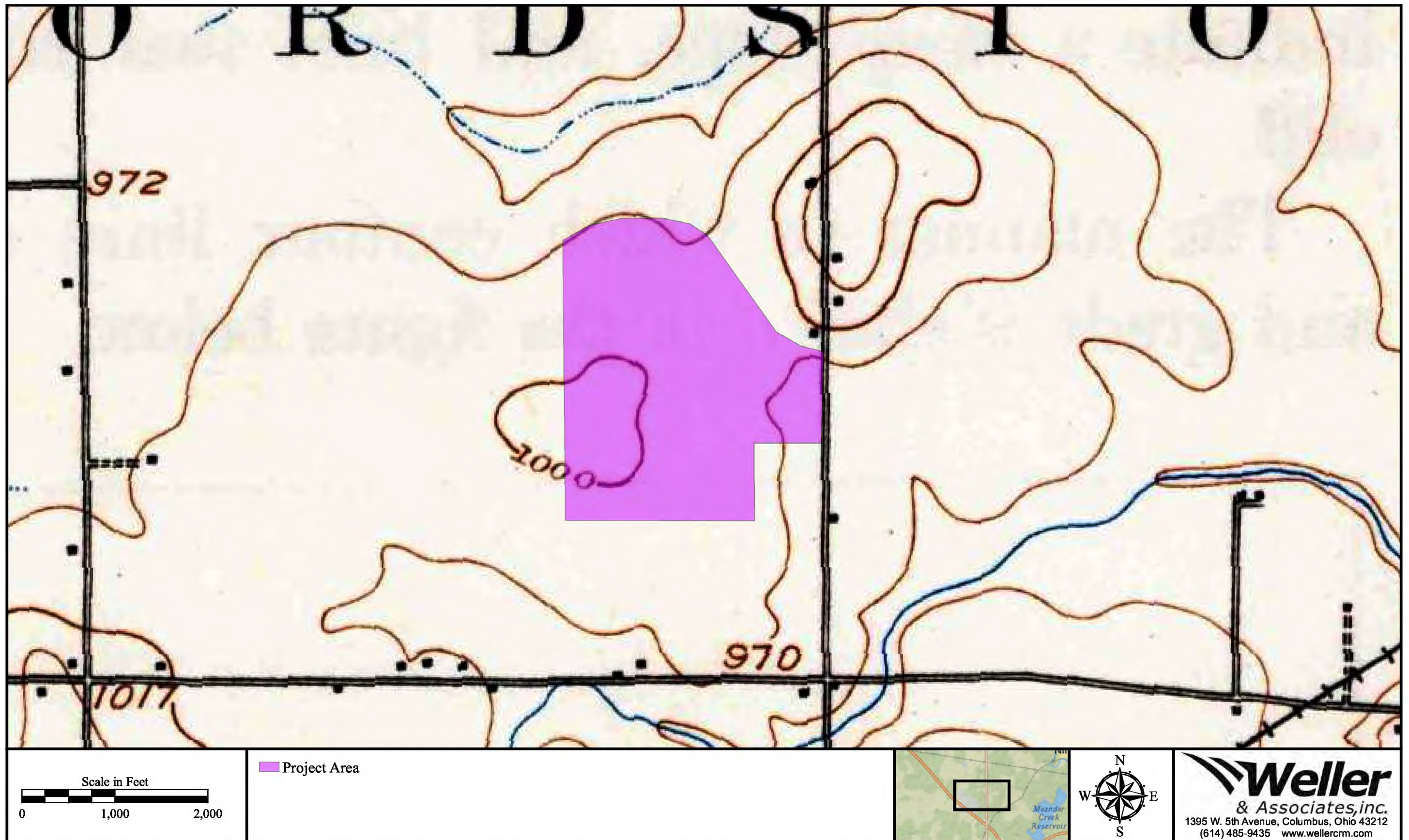


Figure 4. Portion of the USGS 1908 Warren, Ohio 15 Minute Series (Topographic) map indicating the approximate location of the project.

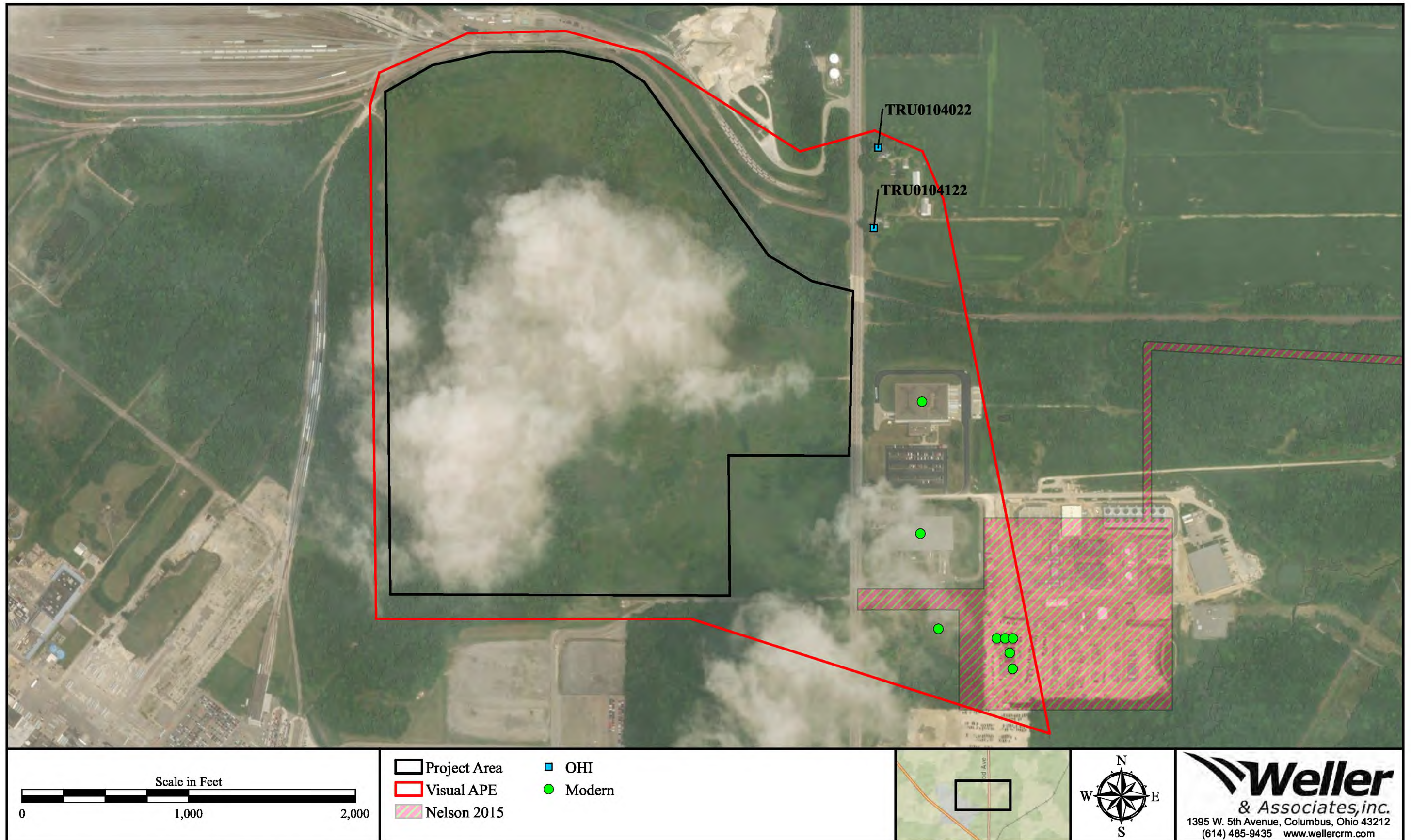


Figure 5. Aerial map indicating the extent of the APE.



Figure 6. Fieldwork results and photo orientation map.



Figure 7. View of the general conditions of the project area facing north.



Figure 8. East view of a modern industrial building from the eastern boundary of the project area along Tod Avenue SW (SR 45).



Figure 9. West view of the project area from Tod Avenue SW (SR 45).



Figure 10. View facing southeast from the eastern edge of project area along Tod Avenue SW (SR 45).



Figure 11. View facing northeast from the eastern edge of project area along Tod Avenue SW (SR 45), towards outbuildings associated with TRU0104122.



Figure 12. North view from the northern edge of project area.



Figure 13. South view from the southern edge of project area.



Figure 14. West view from the western edge of project area.



Figure 15. Streetscape view of Tod Avenue SW (SR 45), facing south.



Figure 16. Streetscape view of Tod Avenue SW (SR 45), facing north.



Figure 17. View facing east towards TRU0104022 from Tod Avenue SW (SR 45).



Figure 18. Northeast view of an English barn associated with TRU0104022 from Tod Avenue SW (SR 45).



Figure 19. East view of a pole barn associated with TRU0104022 from Tod Avenue SW (SR 45).



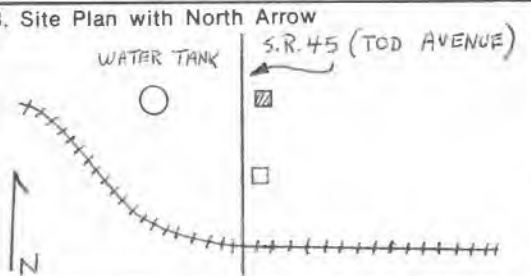

Figure 20. Northeast view TRU0104122 and its associated English barn from Tod Avenue SW (SR 45).

Appendix A: Previously Recorded OHI Forms

OHIO HISTORIC INVENTORY

Ohio Historic Preservation Office
Ohio Historical Center
Columbus, Ohio 43211

CODED

<p>1. No. TRU-1040-TWP22</p> <p>2. County TRUMBULL</p> <p>3. Location of Negatives Trumbull County Planning Commission</p>	<p>4. Present Name(s) Wilson, James, Residence</p> <p>5. Other Name(s) Wilson, James, Jr., Residence</p>	1. No. TRU-1040-22																
<p>6. Specific Location 7321 State Route 45 (Tod Avenue) Section 66</p>	<p>16. Thematic Category C</p> <p>17. Date(s) or Period 1888</p>	<p>28. No. of Stories 2½</p> <p>29. Basement? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>30. Foundation Material</p>	2. County TRUMBULL															
<p>7. City or Town If Rural, Township & Vicinity Lordstown</p>	<p>18. Style or Design Queen Anne</p> <p>19. Architect or Engineer</p>	<p>31. Wall Construction Frame</p> <p>32. Roof Type & Material Hip with gable/slate</p>	4. Present Name(s) Wilson, James															
<p>8. Site Plan with North Arrow</p> 	<p>20. Contractor or Builder James Wilson, Jr.</p> <p>21. Original Use, if apparent Residence</p> <p>22. Present Use Residence</p>	<p>33. No. of Bays Front Side</p> <p>34. Wall Treatment Clapboard</p> <p>35. Plan Shape irregular</p>	1. No. TRU-1040-22															
<p>9. Coordinates Warren U.S.G.S. Map</p> <p>Lat. _____ Long. _____</p> <p>U.T.M. Reference</p> <table border="1" style="width:100%; text-align: center;"> <tr> <td>1</td><td>7</td><td>5</td><td>1</td><td>2</td><td>0</td><td>2</td><td>0</td><td>4</td><td>5</td><td>5</td><td>5</td><td>8</td><td>4</td><td>0</td> </tr> </table> <p>Zone Easting Northing</p>	1	7	5	1	2	0	2	0	4	5	5	5	8	4	0	<p>23. Ownership Public <input type="checkbox"/> Private <input checked="" type="checkbox"/></p> <p>24. Owner's Name & Address, if known James Wilson 7321 Tod Avenue</p>	<p>36. Changes (Explain in #42) Addition <input checked="" type="checkbox"/> Altered <input type="checkbox"/> Moved <input type="checkbox"/></p> <p>37. Condition Interior Good Exterior Good</p>	1. No. TRU-1040-22
1	7	5	1	2	0	2	0	4	5	5	5	8	4	0				
<p>10. Site Building <input checked="" type="checkbox"/> Structure Object <input type="checkbox"/></p> <p>11. On National Register? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p> <p>12. Is It Eligible? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p> <p>13. Part of Estab. Hist. Dist.? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p> <p>14. District Potent'l? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p> <p>15. Name of Established District</p>	<p>25. Open to Public? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p> <p>26. Local Contact Person or Organization Lordstown Historical Society</p> <p>27. Other Surveys in Which Included</p>	<p>38. Preservation Underway? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>39. Endangered? By What? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p> <p>40. Visible from Public Road? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>41. Distance from and Frontage on Road 30 yards</p>	1. No. TRU-1040-22															
<p>42. Further Description of Important Features Gables have shingle treatment and rafter ends are carved. A shed roof porch has a center gable and wraps around west and south facades. Porch columns and balustrade are turned. Windows are 1/1 and frames are plain.</p>		5. Other Name(s) Wilson, James, Jr.																
<p>43. History and Significance James Wilson, Jr. was born in Lordstown Township in 1842 and lived his entire life in the township except for three years in a Youngstown drugstore and four years in the coal business in Carroll County. He married in 1869 to Amanda Woodward, daughter of Leonard Woodward. After his first wife died, Wilson married another daughter of Woodward, Almira. Wilson was a farmer. See Vol. II, page 547, 1882 History.</p>																		
<p>44. Description of Environment and Outbuildings House is at top of a large hill in Lordstown. Orchard is on the property as well as a large barn and a garage.</p>																		
<p>45. Sources of Information 1874 Trumbull County Atlas, L. H. Everts Atlas of Trumbull County, 1899, American Atlas Co. History of Trumbull and Mahoning Counties, Ohio, H.Z. Williams & Bro. Mrs. James Wilson</p>	<p>46. Prepared by Gregory A. Griffith</p> <p>47. Organization Trumbull County Planning Comm.</p> <p>48. Date</p> <p>49. Revision Date(s)</p>																	

CODED

OHIO HISTORIC INVENTORY

1. No. TRU-1041-TWP 22

2. County TRUMBULL

3. Location of Negatives Trumbull
County Planning Commission

4. Present Name(s)

5. Other Name(s)
Wilson, Amanda Woodward, Residence

1. No. TRU-1041-22

2. County TRUMBULL

4. Present Name(s)

6. Specific Location
State Route 45 (Tod Avenue)
Section 66

16. Thematic Category
C

17. Date(s) or Period
1830's - 1840's

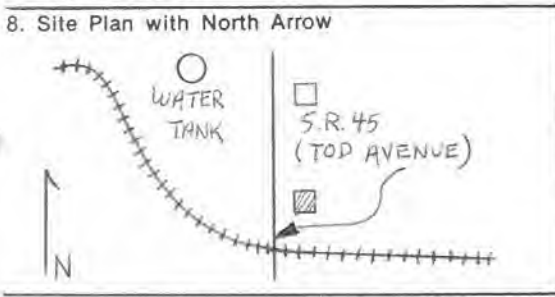
28. No. of Stories 1½

29. Basement? Yes
No

7. City or Town If Rural, Township & Vicinity
Lordstown

18. Style or Design
Greek Revival

30. Foundation Material
Stone



19. Architect or Engineer

31. Wall Construction
Frame

20. Contractor or Builder

32. Roof Type & Material
Gable/asbestos

21. Original Use, If apparent
Residence

33. No. of Bays
Front 3 Side 2

22. Present Use
Residence

34. Wall Treatment
Clapboard

23. Ownership Public
Private

35. Plan Shape rectangle

24. Owner's Name & Address, If known
James Wilson
7321 Tod Avenue

36. Changes Addition
(Explain in #42) Altered
Moved

9. Coordinates Warren U.S.G.S. Map
Lat. _____ Long. _____
U.T.M. Reference

1	7	5	1	2	0	0	0	4	5	5	5	7	0	0
Zone				Easting				Northing						

25. Open to Public? Yes
No

38. Preservation Underway? Yes
No

10. Site Building
Structure Object

26. Local Contact Person or Organization
Lordstown Historical Society

39. Endangered? By What? Yes
No

11. On National Register? Yes
No

12. Is It Eligible? Yes
No

27. Other Surveys in Which Included

40. Visible from Public Road? Yes
No

13. Part of Estab. Hist. Dist.? Yes
No

14. District Potent'l? Yes
No

41. Distance from and Frontage on Road
20 yards

15. Name of Established District

42. Further Description of Important Features

Home retains return cornice and entablature with three frieze windows in front. Windows are 6/6 and an enclosed shed roof front porch has been added to the front elevation plus an addition has been built on the rear. Front door has sidelights and flanking pilasters.



5. Other Name(s)
Wilson, Amanda Woodward

43. History and Significance

Both the 1874 and 1899 Atlas' indicate the property was owned by Amanda Wilson, wife of James Wilson. Although Amanda had died in 1875. This home certainly dates before the larger Wilson home just to the north.

44. Description of Environment and Outbuildings

Apple orchard is to the north and pastureland to the east and south. Railroad tracks to GMAD is also to the south. Large white English barn is to the east.

45. Sources of Information
1874 Trumbull County Atlas, L. H. Everts
Atlas of Trumbull County, 1899, American Atlas Co.
Atlas of Trumbull and Mahoning Counties, Ohio, H.Z. Williams & Bro.
Mr. James Wilson

46. Prepared by
Gregory A. Griffith

47. Organization Trumbull
County Planning Comm.

48. Date _____ 49. Revision Date(s) _____

APPENDIX G

G – Property Overview and Site Analysis for Large Sites

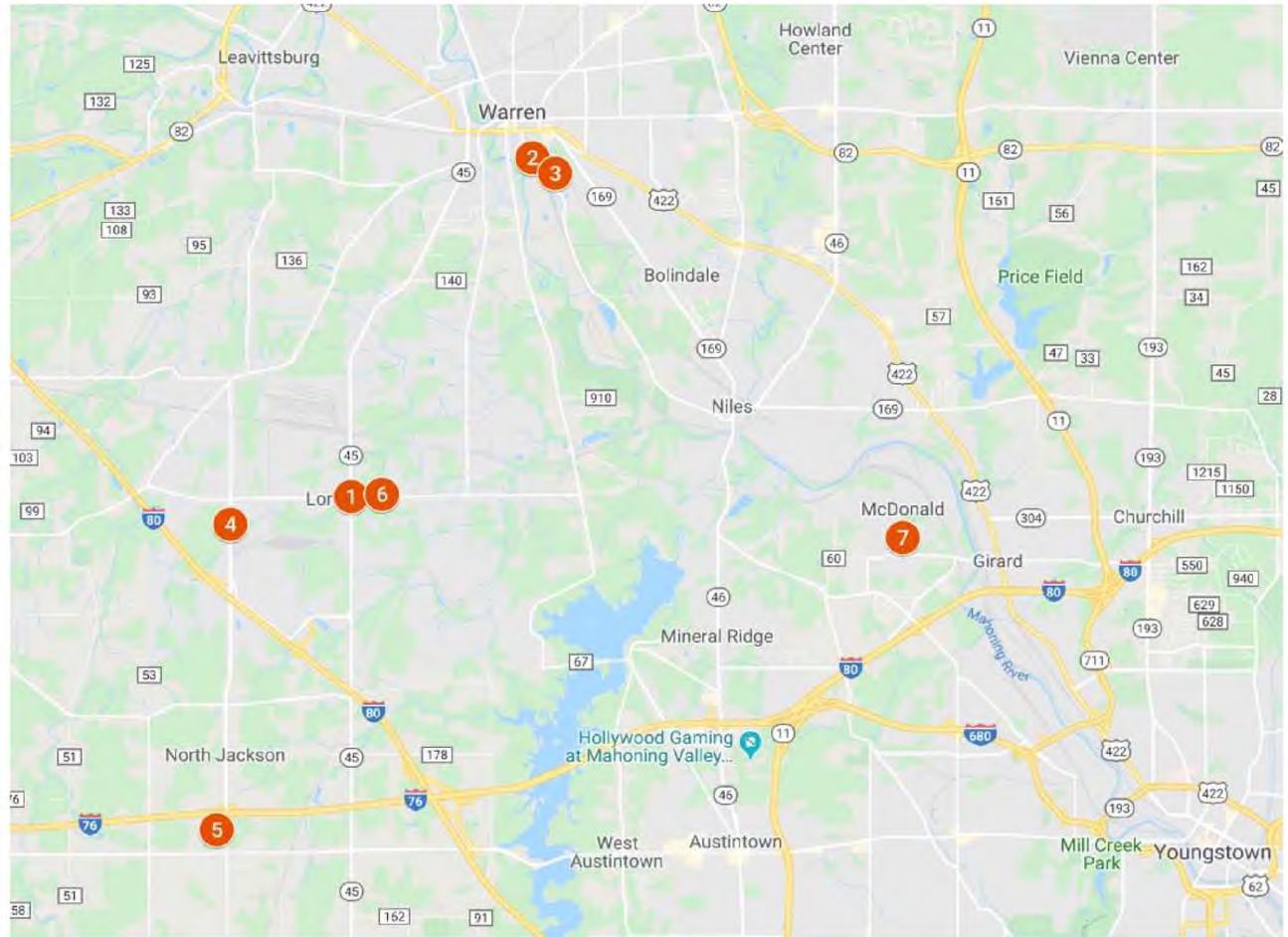


LARGE LAND SITES

PROPERTY OVERVIEW MAP

LARGE LAND SITES

- 1 Tod Avenue
- 2 999 Pine Ave SE
- 3 999 Pine Ave SE
- 4 Ellsworth Bailey Road
- 5 Leonard Parkway
- 6 Tod Ave
- 7 McDonald-USS/Lafarge



1. LORDSTOWN – NORTHPOINT

TOD AVENUE | TRUMBULL COUNTY | LORDSTOWN, OH 44481

PROPERTY OVERVIEW

TAX PARCEL ID	45904682
OWNERSHIP	NP LORDSTOWN 173 LLC
PROPERTY TYPE	Land
LAND SIZE	5 – 163 AC
LAND SHAPE FACTOR	Rectangular with 1 rounded area
PROPERTY DESCRIPTION	This property is 50% cleared and 50% wooded and is located near the GM complex in Lordstown. The site is adjacent to a NS rail yard and is situated off SR-45.



ZONING

ZONING / LAND USE	Industrial / 300 – Industrial – Vacant Land
SETBACKS	Front / Road: 60' Side: 30' Rear: 50'
ZONING ORDINANCE	https://www.lordstown.com/forms/planzon12-8.pdf

TRANSPORTATION

	PRIMARY	SECONDARY
HIGHWAYS	SR-45 (0 miles)	SR-422 (4 miles)
INTERSTATES	I-80 (2.5 miles)	I-76 (3.5 miles)
AIRPORT	Youngstown-Warren Regional (14.6 miles)	Cleveland Hopkins International (47.9 miles)
PORT	Ashtabula Harbor (57.7 miles)	N/A
RAIL	Norfolk Southern	N/A

1. LORDSTOWN – NORTHPOINT

TOD AVENUE | TRUMBULL COUNTY | LORDSTOWN, OH 44481

PROPERTY CONDITION	
TOPOGRAPHY	Gently sloping (30'); high at center of property
ENVIRONMENTAL	Existing environmental concerns
WETLANDS	Small amount of wetlands on northern part of property
FLOODPLAINS	Area of minimal flood hazard

AVAILABLE DOCUMENTS & INCENTIVES	
SITE SURVEY	No / Unknown
ENVIRONMENTAL	Yes
WETLAND SURVEY	Yes
TOPO	Yes
GEOTECH	Yes

INCENTIVES	
Enterprise Zone; Community Reinvestment Area; eligible for USDA rural development funding programs; qualifies as a Foreign Trade Zone (if desired)	

UTILITIES	
SEWER	
PROVIDER	Village of Lordstown
MAIN SIZE	10"
LOCATION	Eastern border

WATER	
PROVIDER	Village of Lordstown
MAIN SIZE	16"
LOCATION	Eastern border

GAS	
PROVIDER	Dominion East Ohio Gas
MAIN SIZE	4"
PRESSURE	30 – 50 psi
LOCATION	Tod Avenue

ELECTRIC	
PROVIDER	First Energy - Ohio Edison
CAPACITY	12.5kva
LOCATION	Eastern border

TELECOM	
PROVIDER	AT&T
LOCATION	N/A

Topographic Map



<http://historicalmaps.arcgis.com/usgs/>

Flood Map



<https://hazards-fema.maps.arcgis.com/apps/webappviewer/>

Wetlands Map



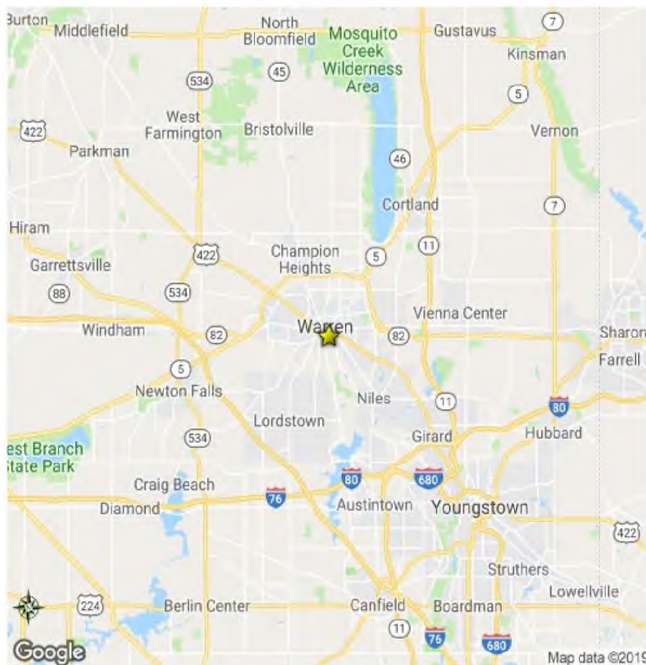
<https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>

2. WARREN BDM – BROWNFIELD

999 PINE AVE SE | TRUMBULL COUNTY | WARREN, OH 44483

PROPERTY OVERVIEW

TAX PARCEL ID	28901340
OWNERSHIP	BDM Warren Steel Holdings LLC
PROPERTY TYPE	Land
LAND SIZE	5 – 250 AC
LAND SHAPE FACTOR	Rectangular
PROPERTY DESCRIPTION	Former steel mill with access to adequate water supply and able to meet most of client's requirements. Property has 2 months of remaining work to meet Phase II remediation recommendations.



ZONING

ZONING / LAND USE	Industrial / 300 – Industrial – Vacant Land
SETBACKS	Front / Road: 30' Side: 20' Rear: 20'
ZONING ORDINANCE	http://www.howlandtownship.org/images/stories/pdf/zoning/Zoning_Resolution_updated_20170721.pdf

TRANSPORTATION

	PRIMARY	SECONDARY
HIGHWAYS	SR-422 (1 mile)	SR-11 (3 miles)
INTERSTATES	I-80 (5 miles)	I-76 (10 miles)
AIRPORT	Youngstown-Warren Regional (9.1 miles)	Cleveland Hopkins International (60.5 miles)
PORT	Ashtabula Harbor (51.6 Miles)	N/A
RAIL	Norfolk Southern	N/A

2. WARREN BDM – BROWNFIELD

999 PINE AVE SE | TRUMBULL COUNTY | WARREN, OH 44483

PROPERTY CONDITION

TOPOGRAPHY	Very flat, little to no grade change
ENVIRONMENTAL	Remediation in progress
WETLANDS	Property has Wetlands
FLOODPLAINS	Northern portion has 0.2% - 1% chance of flooding (low risk)

AVAILABLE DOCUMENTS & INCENTIVES

SITE SURVEY	Yes
ENVIRONMENTAL	Yes
WETLAND SURVEY	No
TOPO	Yes
GEOTECH	Yes

INCENTIVES

Opportunity Zone

UTILITIES

SEWER

PROVIDER	City of Warren
MAIN SIZE	36"
LOCATION	Eastern & Western border

WATER

PROVIDER	City of Warren
MAIN SIZE	8"
LOCATION	Eastern & Western border

GAS

PROVIDER	Dominion
MAIN SIZE	12"
PRESSURE	97 psi
LOCATION	Northern portion of property

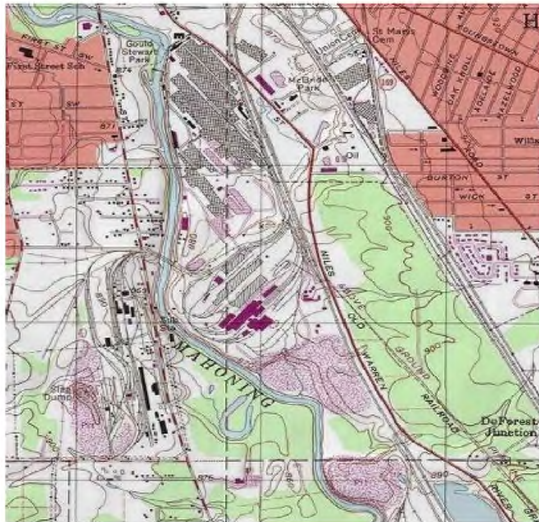
ELECTRIC

PROVIDER	First Energy
LOCATION	Boundary

TELECOM

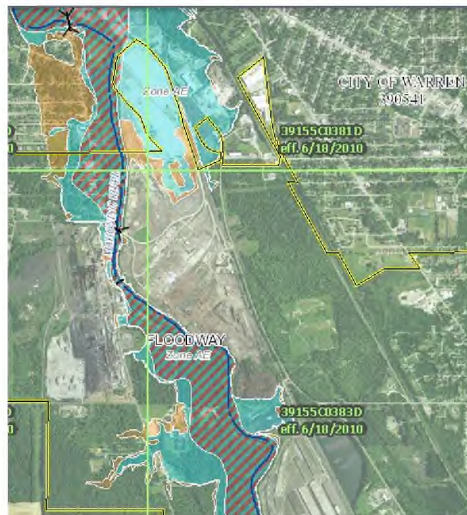
PROVIDER	Century Link
LOCATION	Along Pine Ave

Topographic Map



<http://historicalmaps.arcgis.com/usqs/>

Flood Map



<https://hazards-fema.maps.arcgis.com/apps/webappviewer/>

Wetlands Map



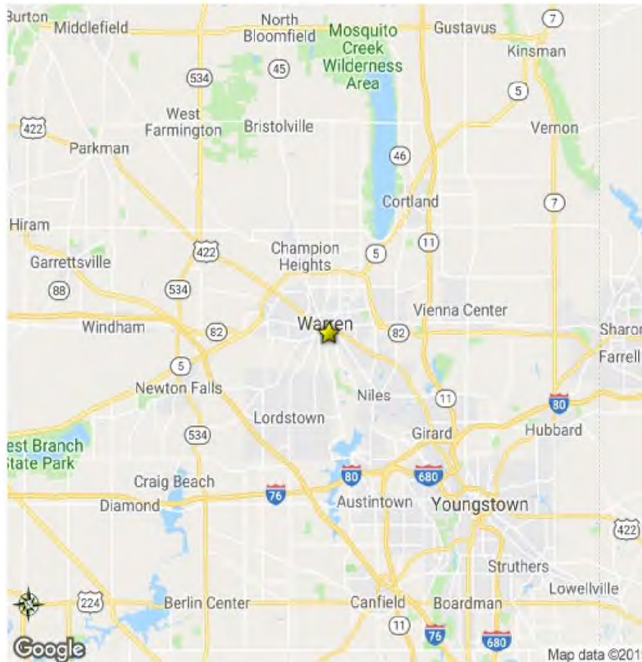
<https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>

3. WARREN BDM – BROWNFIELD

999 PINE AVE SE | TRUMBULL COUNTY | WARREN, OH 44483

PROPERTY OVERVIEW

TAX PARCEL ID	28901340
OWNERSHIP	BDM Warren Steel Holdings LLC
PROPERTY TYPE	Land
LAND SIZE	100 – 267 AC
LAND SHAPE FACTOR	Rectangular
PROPERTY DESCRIPTION	Owner can provide BTS option. Site is near former steel mill, has access to adequate water supply, and can meet heavy industrial power requirements. Phase I revealed no evidence of REC's in connection with property.



ZONING

ZONING / LAND USE	Industrial / 300 – Industrial – Vacant Land
SETBACKS	Front / Road: 30' Side: 20' Rear: 20'
ZONING ORDINANCE	http://www.howlandtownship.org/images/stories/pdf/zoning/Zoning_Resolution_updated_20170721.pdf

TRANSPORTATION

	PRIMARY	SECONDARY
HIGHWAYS	SR-422 (1 mile)	SR-11 (3 miles)
INTERSTATES	I-80 (5 miles)	I-76 (10 miles)
AIRPORT	Youngstown-Warren Regional (9.1 miles)	Cleveland Hopkins International (60.5 miles)
PORT	Ashtabula Harbor (51.6 Miles)	N/A
RAIL	CSX Rail	N/A

3. WARREN BDM – BROWNFIELD

999 PINE AVE SE | TRUMBULL COUNTY | WARREN, OH 44483

PROPERTY CONDITION	
TOPOGRAPHY	Very flat, little to no grade change
ENVIRONMENTAL	No known environmental issues
WETLANDS	Has wetlands
FLOODPLAINS	Area of minimal flood hazard

AVAILABLE DOCUMENTS & INCENTIVES	
SITE SURVEY	Yes
ENVIRONMENTAL	Yes
WETLAND SURVEY	No
TOPO	Yes
GEOTECH	Yes

INCENTIVES	
Opportunity Zone; Enterprise Zone	

UTILITIES	
-----------	--

SEWER	
PROVIDER	City of Warren
MAIN SIZE	36"
LOCATION	Eastern & Western border

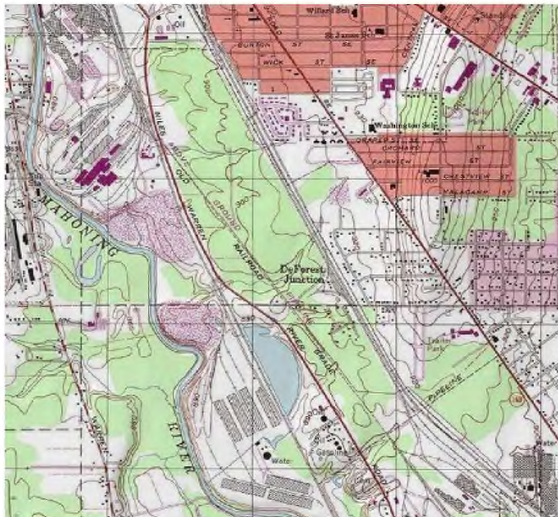
WATER	
PROVIDER	City of Warren
MAIN SIZE	8"
LOCATION	Eastern & Western border

GAS	
PROVIDER	Dominion
MAIN SIZE	12"
PRESSURE	97 psi
LOCATION	Northern portion of property

ELECTRIC	
PROVIDER	First Energy
LOCATION	Boundary

TELECOM	
PROVIDER	Century Link
LOCATION	Along Pine Ave

Topographic Map



<http://historicalmaps.arcgis.com/usgs/>

Flood Map



<https://hazards-fema.maps.arcgis.com/apps/webappviewer/>

Wetlands Map



<https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>

4. LORDSTOWN – NORFOLK SOUTHERN / ARMIL INDUSTRIAL SITE

ELLSWORTH BAILEY ROAD | TRUMBULL COUNTY | LORDSTOWN, OH 44481

PROPERTY OVERVIEW

TAX PARCEL ID	45902995
OWNERSHIP	Pennsylvania Lines LLC
PROPERTY TYPE	Land
LAND SIZE	5 – 161 AC
LAND SHAPE FACTOR	Triangular
PROPERTY DESCRIPTION	Triangular property owned by a Class 1 rail line. The property is not cleared and would need utilities extended beyond road.



ZONING

ZONING / LAND USE	Industrial / 850 – Railroad Real Not Used in Oper
SETBACKS	Front / Road: 60' Side: 30' Rear: 50'
ZONING ORDINANCE	https://www.lordstown.com/forms/planzon12-8.pdf

TRANSPORTATION

	PRIMARY	SECONDARY
HIGHWAYS	SR-45 (6 miles)	SR-11 (2 miles)
INTERSTATES	I-80 (2 miles)	I-76 (0.25 miles)
AIRPORT	Youngstown-Warren Regional (16 miles)	Cleveland Hopkins International (66.4 miles)
PORT	Ashtabula Harbor (58.3 miles)	N/A
RAIL	N/A	N/A

4. LORDSTOWN – NORFOLK SOUTHERN / ARMIL INDUSTRIAL SITE

ELLSWORTH BAILEY ROAD | TRUMBULL COUNTY | LORDSTOWN, OH 44481

PROPERTY CONDITION

TOPOGRAPHY	Flat
ENVIRONMENTAL	Environmental condition unknown
WETLANDS	Minimal wetlands located on south central portion of site
FLOODPLAINS	Area of minimal flood hazard

AVAILABLE DOCUMENTS & INCENTIVES

SITE SURVEY	No / Unknown
ENVIRONMENTAL	No / Unknown
WETLAND SURVEY	Yes
TOPO	Yes
GEOTECH	Yes

INCENTIVES

Enterprise Zone

UTILITIES

SEWER

PROVIDER	Municipal Sewage System
MAIN SIZE	21"
LOCATION	At road

WATER

PROVIDER	Village of Lordstown
MAIN SIZE	14"
LOCATION	At road

GAS

PROVIDER	Dominion East Ohio Gas
MAIN SIZE	4"
PRESSURE	60 psi
LOCATION	At road

ELECTRIC

PROVIDER	Ohio Edison
CAPACITY	12470V/7200A/3PH
LOCATION	At road

TELECOM

PROVIDER	Century Link
LOCATION	At road

Topographic Map



<http://historicalmaps.arcgis.com/usgs/>

Flood Map



<https://hazards-fema.maps.arcgis.com/apps/webappviewer/>

Wetlands Map



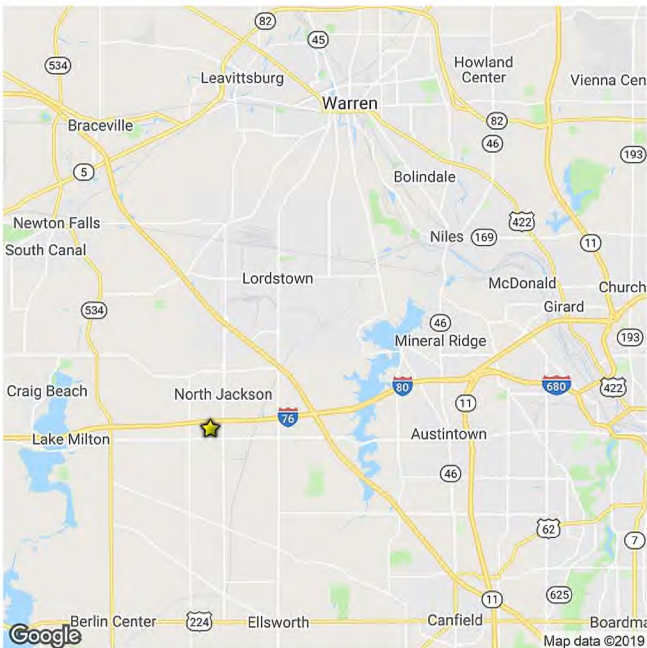
<https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>

5. NORTH JACKSON – LEONARD 1

LEONARD PKWY | MAHONING COUNTY | NORTH JACKSON, OH 44451

PROPERTY OVERVIEW

TAX PARCEL ID	500060024.020
OWNERSHIP	LEONARD ENTERPRISES LTD
PROPERTY TYPE	Land
LAND SIZE	5 – 152 AC
LAND SHAPE FACTOR	T-Shaped
PROPERTY DESCRIPTION	Partially cleared property, bordered by an access road (Leonard Parkway). Great visibility from N Bailey road and excellent access to Interstate 76. This location neighbors industrial and high traffic operations.



ZONING

ZONING / LAND USE	Agricultural / 400 - Commercial – Vacant Land
SETBACKS	Front / Road: 60'
ZONING ORDINANCE	http://www.jacksonwp.net/PDF/Zoning%20Resolutions.pdf

TRANSPORTATION

	PRIMARY	SECONDARY
HIGHWAYS	SR-45 (0 miles)	SR-422 (4 miles)
INTERSTATES	I-80 (2 miles)	I-76 (2 miles)
AIRPORT	Youngstown-Warren Regional (23 miles)	Cleveland Hopkins International (63.4 miles)
PORT	Ashtabula Harbor (65.1 miles)	N/A
RAIL	N/A	N/A

5. NORTH JACKSON – LEONARD 1

LEONARD PKWY | MAHONING COUNTY | NORTH JACKSON, OH 44451

PROPERTY CONDITION	
TOPOGRAPHY	Flat
ENVIRONMENTAL	Environmental condition unknown
WETLANDS	No wetlands
FLOODPLAINS	Area of minimal flood hazard

AVAILABLE DOCUMENTS & INCENTIVES	
SITE SURVEY	No / Unknown
ENVIRONMENTAL	No / Unknown
WETLAND SURVEY	Yes
TOPO	Yes
GEOTECH	No

INCENTIVES	
	N/A

UTILITIES	
-----------	--

SEWER	
PROVIDER	Mahoning County
MAIN SIZE	10"
LOCATION	Eastern border

WATER	
PROVIDER	Mahoning County
MAIN SIZE	8"
LOCATION	At road

GAS	
PROVIDER	Dominion East Ohio Gas
MAIN SIZE	6"
PRESSURE	60 psi
LOCATION	At road

ELECTRIC	
PROVIDER	First Energy
CAPACITY	132V/132A/3PH
LOCATION	Eastern border

TELECOM	
PROVIDER	AT&T
LOCATION	Near site

Topographic Map



<http://historicalmaps.ercgis.com/usgs/>

Flood Map



<https://hazards-fema.maps.ercgis.com/apps/webappviewer/>

Wetlands Map



<https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>

6. LORDSTOWN – LORDSTOWN COMMERCE PARK WEST

TOD AVENUE | TRUMBULL COUNTY | LORDSTOWN, OH 44481

PROPERTY OVERVIEW

TAX PARCEL ID 45189203; 50031000.4001

OWNERSHIP BHGH PROPERTIES LLC

PROPERTY TYPE Land

LAND SIZE 10 – 138 AC

LAND SHAPE FACTOR Triangular

PROPERTY DESCRIPTION This Property is owned by Gerald Henn, a private developer. Industrial grade utilities to the site but will need to be extended to the final parcel.



ZONING

ZONING / LAND USE Agricultural / 101 – Cash – Grain or General Farm

SETBACKS Front / Road: 60' | Side: 30' | Rear: 50'

ZONING ORDINANCE <https://www.lordstown.com/forms/planzon12-8.pdf>

TRANSPORTATION

	PRIMARY	SECONDARY
HIGHWAYS	SR-45 (7 miles)	SR-11 (0 miles)
INTERSTATES	I-80 (2.5 miles)	I-76 (2.5 miles)
AIRPORT	Youngstown-Warren Regional (15 miles)	Cleveland Hopkins International (65.4 miles)
PORT	Ashtabula Harbor (57.4 miles)	N/A
RAIL	N/A	N/A

6. LORDSTOWN – LORDSTOWN COMMERCE PARK WEST

TOD AVENUE | TRUMBULL COUNTY | LORDSTOWN, OH 44481

PROPERTY CONDITION	
TOPOGRAPHY	Flat
ENVIRONMENTAL	Environmental condition unknown
WETLANDS	Some wetlands located on property
FLOODPLAINS	Area of minimal flood hazard

AVAILABLE DOCUMENTS & INCENTIVES	
SITE SURVEY	No / Unknown
ENVIRONMENTAL	No / Unknown
WETLAND SURVEY	Yes
TOPO	Yes
GEOTECH	No

INCENTIVES	
Enterprise Zone; qualifies as Foreign Trade Zone (if desired)	

UTILITIES	
-----------	--

SEWER	
PROVIDER	Trum Co
MAIN SIZE	12"
LOCATION	At road

WATER	
PROVIDER	Village of Lordstown
MAIN SIZE	16"
LOCATION	At road

GAS	
PROVIDER	Dominion East Ohio Gas
MAIN SIZE	4"
PRESSURE	60 psi
LOCATION	At road

ELECTRIC	
PROVIDER	First Energy
CAPACITY	138kva
LOCATION	Eastern portion

TELECOM	
PROVIDER	Century Link
LOCATION	At road

Topographic Map



<http://historicalmaps.arcgis.com/usgs/>

Flood Map



<https://hazards-fema.maps.arcgis.com/apps/webappviewer/>

Wetlands Map



<https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>

7. MCDONALD – USS / LAFARGE

OHIO AVENUE | TRUMBULL COUNTY | MCDONALD, OH 44437

PROPERTY OVERVIEW

TAX PARCEL ID 26183300 / 26190860

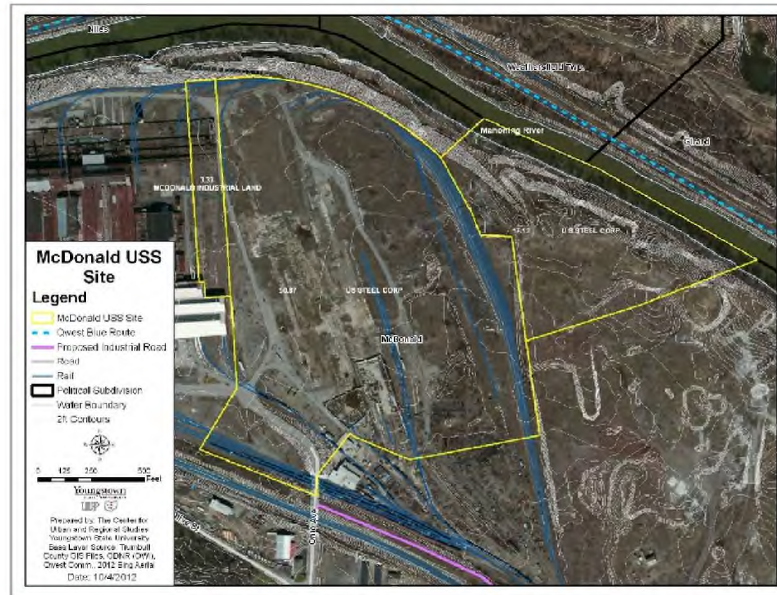
OWNERSHIP STEEL ALLOY CORP / SPIRONGO SLAG LLC

PROPERTY TYPE Land

LAND SIZE 100 – 204 AC

LAND SHAPE FACTOR Uniquely shaped

PROPERTY DESCRIPTION Former steel and slag company. Heavy industrial, flat, cleared site with access to Mohoning River raw water supply and three rail lines (CSX, NS, and Ohio Central). There is a pump house on the property.



ZONING

ZONING / LAND USE Industrial / 320 - Foundries & Heavy Manufacturing

SETBACKS Front / Road: 30' | Side: 10' | Rear: 50'

ZONING ORDINANCE <https://cbre.box.com/s/zt03gh14ioo0uw3toolf8coxrx6idrn5>

TRANSPORTATION

	PRIMARY	SECONDARY
HIGHWAYS	SR-422 (1.5 miles)	SR-11 (1 mile)
INTERSTATES	I-80 (1.5 miles)	I-76 (1.5 miles)
AIRPORT	Youngstown-Warren Regional (10 miles)	Pittsburgh International (70 miles)
PORT	Ashtabula Harbor (54.5 miles)	N/A
RAIL	CSX	Norfolk Southern

7. MCDONALD – USS / LAFARGE

OHIO AVENUE | TRUMBULL COUNTY | MCDONALD, OH 44437

PROPERTY CONDITION

TOPOGRAPHY	Flat, less than 20' grade change
ENVIRONMENTAL	Environmental condition unknown
WETLANDS	Property has wetlands
FLOODPLAINS	Regulatory Floodway along Eastern and Northern boundary

AVAILABLE DOCUMENTS & INCENTIVES

SITE SURVEY	No / Unknown
ENVIRONMENTAL	No / Unknown
WETLAND SURVEY	Yes
TOPO	Yes
GEOTECH	Yes

INCENTIVES

Enterprise Zone

UTILITIES

SEWER

PROVIDER	McDonald
MAIN SIZE	10"
LOCATION	Onsite

WATER

PROVIDER	McDonald
MAIN SIZE	10"
LOCATION	Onsite

GAS

PROVIDER	Dominion East Ohio Gas
MAIN SIZE	4"
PRESSURE	198 psi
LOCATION	Onsite

ELECTRIC

PROVIDER	Ohio Edison
CAPACITY	138V/138A/4PH (can support 30MW)
LOCATION	Onsite

TELECOM

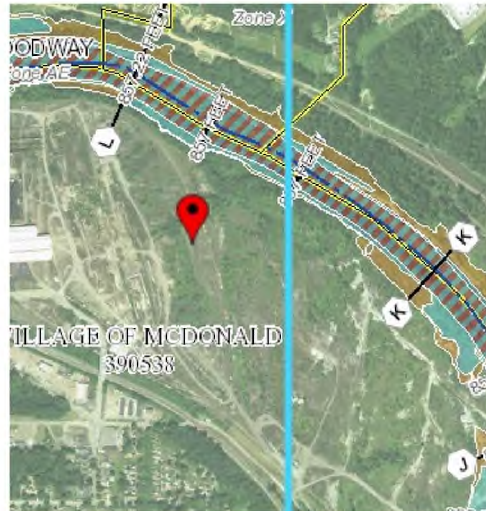
PROVIDER	Century Link
LOCATION	Onsite

Topographic Map



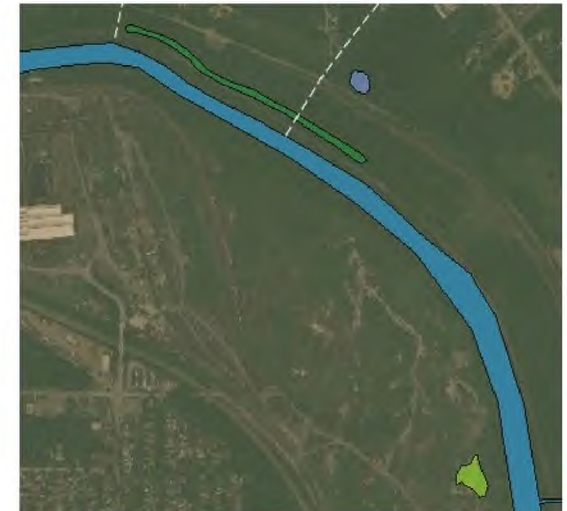
<http://historicalmaps.arcgis.com/usgs/>

Flood Map



<https://hazards-fema.maps.arcgis.com/apps/webappviewer/>

Wetlands Map



<https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>

APPENDIX H

H – Alternatives Analysis Site Practicability Table



Practicability Category	Factor	Site 1 - NP Site Lordstown	Site 2 - Brownfield Warren BDM	Site 3 - Greenfield Steel Warren BDM	Site 4 - Multi Property NS/Armil Lordstown	Site 5 - Tshape/Gas Line North Jackson	Site 6 - Agricultural Com Prk West Lordstown
Availability	Ease of Acquisition	Available	Brownfield issues need t/b considered	Available	NS – Available Armil – 5 parcel owners city road & cell tower	Available	Available
Logistics	Sufficient Parcel Size - Acreage	YES 158	YES 250	YES 267	YES 304	YES 152	YES 138
	Potential for Future Expansion: On-Site or Adjacent	Undetermined at this time	YES	YES	YES	NO	YES
	Cost per Acre - Listed	\$35,000	\$50,000	\$30,000	\$37,000-\$50,000	\$35,000	\$7,150
Logistics	Existing Zoning Appropriate	YES Industrial	YES Industrial	YES Industrial	YES Industrial	NO Ag/Comm - 3 City Council votes & referendum req'd	NO Ag - Requires rezoning
Logistics	Availability of Utilities	YES	YES	YES	YES	YES	YES/NO
	Electric	Very nearby	Very nearby	Nearby	Moderate	Nearby	TBD
	Gas	Nearby	Available	Available	Available	Nearby	TBD
	Storm	Detention required	River adjacent	TBD -none visible	TBD along freeway	TBD	TBD
	Sanitary	Nearby	Nearby	Nearby	Nearby	Nearby	TBD
	Communications	Nearby	Nearby	Nearby	Nearby	Nearby	TBD
Logistics	Accessibility	YES	NO	NO	YES	NO	NO
	Distance to nearest expressway	Less than 1 Mile	5-10 Miles	5-10 Miles	Less than 1 Mile	Less than 1 mlle	10-15 mi
	Site Transportation	Good	Poor	Poor	Good	Good	Poor
	Rail Potential	Good	Good	Poor	Moderate Extend across street	Poor	Poor
Existing Features	Site Conditions Feasible for Construction	YES	YES	YES	YES	NO	YES
	Flexibility of building arrangement	Moderate	Good	Good	Good	Poor - gas mains traverse site minimizing options.	Good
	Clearing Issues	Moderate	None	Moderate	Heavy lumber/Hardwoods	Moderate	Minimal
	NWI Wetlands	Small amount of wetlands on northern portion of site	Has wetlands	Has wetlands	Minimal wetlands on south central portion of site	No wetlands	Some wetlands
	Floodplains	Minimal flood hazard	Northern portion has 0.2%-1% change of flooding	Minimal flood hazard	Minimal flood hazard	Minimal flood hazard	Minimal flood hazard
Practicable?		Selected for further investigation 10/3/2019	NO	NO	Selected for further investigation 10/3/2019	NO	NO

Notes:

Black Text - Acceptable Criteria

Red Text - Disqualifying Criteria

Poor: Access to a utility/feature is beyond project needs-criteria, or access issues to a utility/feature appear significant and/or unable to be overcome

Moderate: Access to a utility/feature is not ideal but a workable solution seems possible

Good: No significant issues to accessing the utility/feature are apparent

APPENDIX I

I – Mitigation Plan





Wetland Mitigation and Monitoring Plan Electric Vehicle Battery Cell Manufacturing Facility Lordstown, Ohio

Mosquito Creek Wildlife Area Wetland Mitigation Site Mecca Township, Trumbull County, Ohio

January 2020

Prepared for:

GigaPower LLC
c/o General Motors LLC
300 Renaissance Center
Detroit, MI 48243

Prepared by:

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123 South Broad Street, Suite 238
Lancaster, Ohio 43130
740-654-4016

With Assistance from:

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A Division of The Davey Tree Expert Company
1500 North Mantua Street
Kent, Ohio 44240
800-828-8312

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- A. Location Maps
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 - A2. Location of Project on Highway Map
 - A3. Location of Project on USGS 7.5-Minute Topographic Map (Bristolville, OH Quadrangle)
 - A4. Location of Project on National Wetlands Inventory Map (Bristolville, OH Quadrangle)
 - A5. Location of Project on Trumbull County Soil Survey Map
- B. Mosquito Creek Wildlife Area Wetland Mitigation Site Plan
- C. Draft Conservation Easement
- D. Definition of Wetlands Vegetation Indicator Status (from Lichvar et al. 2016)
- E. Planting and Seed Mix Lists
- F. References

Introduction

GigaPower LLC, a joint venture between General Motors and LG Chem, is proposing to construct a new manufacturing facility for the purpose of producing battery cells for electric vehicles. The new manufacturing facility will be located on a 158.2-acre parcel that is located west of Tod Avenue SW, north of Hallock Young Road, and south of the Norfolk Southern Goodman Yard in the Village of Lordstown, Trumbull County, Ohio (the “Development Site”). GigaPower LLC is seeking a Section 401 Water Quality Certification from Ohio Environmental Protection Agency (EPA) (ID No. _____) and a Section 404 Individual Permit from U.S. Army Corps of Engineers (USACE) (No.LRP_____).

To address unavoidable impacts to 49.21 acres of non-forested wetlands and 16.78 acres of forested wetlands located within the Development Site, GigaPower LLC has retained Stream + Wetlands Foundation (S+W) to complete the development of this off-site, permittee-responsible wetland mitigation project and associated mitigation and monitoring plan. S+W proposes to complete the required compensatory mitigation at the Mosquito Creek Wildlife Area Wetland Mitigation Site (the “Mitigation Site”), a site owned by the Ohio Department of Natural Resources (ODNR). The Mosquito Creek Site is located entirely within the Mosquito Creek Wildlife Area and is located immediately north of Mahan-Denham Road and approximately one-half mile east of Townline Road, in Mecca Township, Trumbull County, Ohio (Appendix A). The Mitigation Site is located within the Mahoning River Hydrologic Unit (HUC 05030103) and therefore, the impacts related to the construction of the project will be mitigated within the same watershed as the proposed impacts (Mahoning River HUC), ensuring that wetland functions and values will not be lost from the watershed. Construction of the mitigation site will be completed within the first full construction season after the permits have been issued.

This *Wetland Mitigation and Monitoring Plan* was prepared for GigaPower LLC by S+W, with assistance from Davey Resource Group, a division of The Davey Tree Expert Company, using the USACE rule for compensatory mitigation for losses of aquatic resources. Specifically, this document complies with 33 CFR 332.4 and includes the components listed in paragraphs (c)(2) through (c)(14) of this section of the USACE rule. Additionally, this document also complies with the requirements of Ohio Revised Code 6111 and Ohio Administrative Code 3754-1-54. Table 1 provides a summary of the wetland impacts proposed for the project and the corresponding amount of compensatory mitigation required for each wetland.

In addition to impacts to wetlands, 81 linear feet of ephemeral stream will be impacted at the Development Site. Compensatory mitigation for the proposed impacts to streams will be completed through the purchase of stream mitigation credits from the S+W in-lieu fee program.

Table 1. Wetland Impacts Mitigated at the Mosquito Creek Wildlife Area Wetland Mitigation Site

Area	Total Size (ac)	Classification	Impacts at Development Site (ac)		ORAM		Required Off-Site Mitigation Ratio	Required Off-Site Mitigation Provided at Mitigation Site (ac.)
					Score	Category		
A	9.37	Non-forested	9.07	28	1	1.5:1	13.61	
		Forested	0.30					0.45
B	8.82	Non-forested	8.82	26.5	1	1.5:1	13.23	
C	0.03	Forested	0.03	33*	2	2.5:1	0.08	
D	0.11	Forested	0.11	33*	2	2.5:1	0.28	
E	0.03	Forested	0.03	33*	2	2.5:1	0.08	
F	0.05	Forested	0.05	33*	2	2.5:1	0.13	
H	2.86	Non-forested	1.17	40.5	2	2.0:1	2.34	
		Forested	1.69			2.5:1	4.23	
I	0.01	Forested	0.01	33*	2	2.5:1	0.03	
J	0.15	Forested	0.15	33*	2	2.5:1	0.38	
K	0.01	Forested	0.01	33*	2	2.5:1	0.03	
L	0.16	Forested	0.16	33*	2	2.5:1	0.40	
M	0.03	Forested	0.03	33*	2	2.5:1	0.08	
N	0.07	Forested	0.07	33*	2	2.5:1	0.18	
O	0.18	Non-forested	0.18	33*	2	2.0:1	0.36	
P	0.01	Forested	0.01	33*	2	2.5:1	0.03	
Q	0.01	Non-forested	0.01	33*	2	2.0:1	0.02	
R	0.64	Non-forested	0.64	33*	2	2.0:1	1.28	
S	9.44	Non-forested	5.74	36	2	2.0:1	11.48	
		Forested	3.70			2.5:1	9.25	
T	0.03	Non-forested	0.03	33*	2	2.0:1	0.06	
U	2.00	Non-forested	2.00	25	1	1.5:1	3.00	
V	0.31	Non-forested	0.31	33*	2	2.0:1	0.62	
W	0.01	Non-forested	0.01	14	1	1.5:1	0.02	
X	4.86	Non-forested	4.86	31	2	2.0:1	9.72	
Y	0.01	Non-forested	0.01	18.5	1	1.5:1	0.02	
Z	26.79	Non-forested	16.36	35	2	2.0:1	32.72	
		Forested	10.43			2.5:1	26.08	
TOTALS	65.99	-	65.99	-	-	-	130.19	

*Notes areas C-F, I-R, T, and V scored together

Objectives

The primary objective of the Mitigation Project is to produce a minimum of 130.19 acres of wetland mitigation to fulfill the Development Site’s compensatory mitigation needs within the Mahoning River watershed. Mitigation on the site will be generated through wetland re-establishment, establishment of upland forest, and rehabilitation of existing low-quality wetlands. Specifically, the Mitigation Site will be designed, constructed and managed to attain the following basic goals. The actual amount of rehabilitation and restoration will be based on a “baseline” delineation to be completed (and approved by the Corps) prior to initiation of restoration efforts and a “final” delineation that will be completed at the conclusion of monitoring. The acreages provided in the goals below are estimates.

- **Re-establish 130.19 acres of wetlands.** Compensatory mitigation requirements for the project require the re-establishment of 41.71 acres of forested wetlands and 88.48 acres of non-forested wetlands. Re-establishment of high-quality wetlands will take place across the majority of the mitigation site's active restoration area. To accomplish this goal, hydrology restoration, microtopography restoration, and installation of native trees, shrubs, and seed mixes will take place. Forested and non-forested (e.g. marsh, scrub/shrub) plant communities are anticipated to develop on the site across a spectrum of existing topography and anticipated hydrology. The site will be designed, constructed, and planted with the aim of re-establishing the maximum amount of forested wetlands practicable. It is anticipated that forested wetlands will develop in excess of compensatory mitigation needs; this excess will be used to fulfill non-forested wetland compensatory mitigation needs. The restoration activities, more fully described in the *Mitigation Work Plan* section of this document, will re-establish a diverse wetland system to an area that undoubtedly supported forested wetlands prior to the conversion of the land to agricultural use. In accordance with 33 CFR 332.2, re-establishment of wetlands in these areas will result in *rebuilding a former aquatic resource and will result in a gain of aquatic resource area and functions.*
- **Re-establish approximately 21.5 acres of forested upland and forested upland-wetland mosaic.** Portions of the site's active restoration area in the existing agricultural field may not convert to wetland and these areas will become restored upland forest. These areas will be interspersed within and around the wetlands and provide valuable habitat adjacent for wildlife. The restored upland forests will be planted and seeded with native species at similar densities to the re-established wetlands; however, species planted in these areas will be better suited for mosaic habitat conditions.
- **Rehabilitate 2.9 acres of existing wetlands.** Small areas of degraded farmed wetlands are located in the existing agricultural field. All of the farm field at the Mitigation Site was identified as prior converted cropland by Natural Resources Conservation Service (NRCS) and has been regularly disturbed by normal farming activities; it has not been abandoned. The degraded farmed wetlands within the agricultural field will be rehabilitated through hydrology restoration, microtopography restoration, and installation of native trees, shrubs, and seed mixes. Non-native invasive vegetation growing in this area will be controlled through appropriate physical or chemical means (e.g. mowing, herbicide applications). In accordance with 33 CFR 332.2, rehabilitation of these areas will result in *a gain in aquatic resource function but will not result in a gain of aquatic resource area.*

The report section entitled *Performance Standards* contains details on how the success of the wetland mitigation site will be measured. A copy of the project's site plan is provided in Appendix B.

Site Selection

Watershed and Site Information

The Mitigation Site is located along the northern end of Mosquito Creek Lake in Mecca Township, Trumbull County, Ohio. The lake was originally constructed in 1944 as a flood control project by the U.S. Army Corps of Engineers (USACE) Pittsburgh District. Today, almost all the USACE land at the northern end of the lake (north of the Route 88 causeway) is leased to ODNR Division of Wildlife for fish and wildlife management purposes. These lands are comprised of an interspersed of second-growth forests, open fields, ponds, and wetlands around Mosquito Creek Lake. The 9,021-acre management area provides critical wildlife habitat for the region. In particular, the interspersed of habitat connecting unique ecological resources has provided refuges to a variety of migrating waterfowl and raptors; nesting bald eagles (*Haliaeetus leucocephalus*) and osprey (*Pandion haliaetus*) also occupy the area. The eastern massasauga rattlesnake (*Sistrurus catenatus*), listed as a threatened species by the U.S. Fish and Wildlife Service, is also known to occur in the secluded marshes around the area.

Staff at S+W have worked extensively with ODNR on previous mitigation projects conducted on ODNR property, most notably the Big Island Wildlife Area, Pickerel Creek Wildlife Area, and Dorsett Wildlife Area. The Mitigation Site was identified as well suited for wetland mitigation due to the physical characteristics of the site, its proximity to the Development Site, and the presence of a mosaic of high-quality, mature forested wetlands located in woodlots that abut the mitigation area to the north and south. At maturity, the Mitigation Site will expand the extent of forested wetlands at the Mosquito Creek Wildlife Area and provide improved connectivity to previously fragmented forested areas. Renewed connectivity will improve landscape level functions and increase habitat for regionally scarce native species.



Figure 1. The Mosquito Creek Mitigation Site is located in the Mahoning River watershed (05030103).

The Mitigation Site is located within the Mahoning River 8-digit hydrologic unit code (HUC) watershed (05030103) and is located approximately 18.5 miles northeast of the Development Site (Figure 1). As part of the total maximum daily load (TMDL) assessment process, Ohio EPA separates the Mahoning River watershed into western (upper) and eastern (lower) halves. The Mitigation Site and Development

Site are located within the eastern (lower) portion of the Mahoning River watershed. Land use in the central portion of this watershed is predominately comprised of urban development as Youngstown, Warren, and Lordstown are the major municipalities in the watershed; forest and agricultural land uses are more predominant in the outlying sub-watersheds. According to the Biological and Water Quality Study of the Lower Mahoning River Watershed, a history of industrial and municipal source pollution has degraded water quality throughout the watershed. Since the 1994 Ohio EPA biological and water quality study of the watershed, warmwater habitat communities have re-established throughout many of the sampling sites (Figure 2). Significant improvement to the fish and macroinvertebrate communities over that time are attributed to the elimination of pollution point sources and improved wastewater treatment. Despite the recovery efforts to date, use impairment persists throughout the watershed.

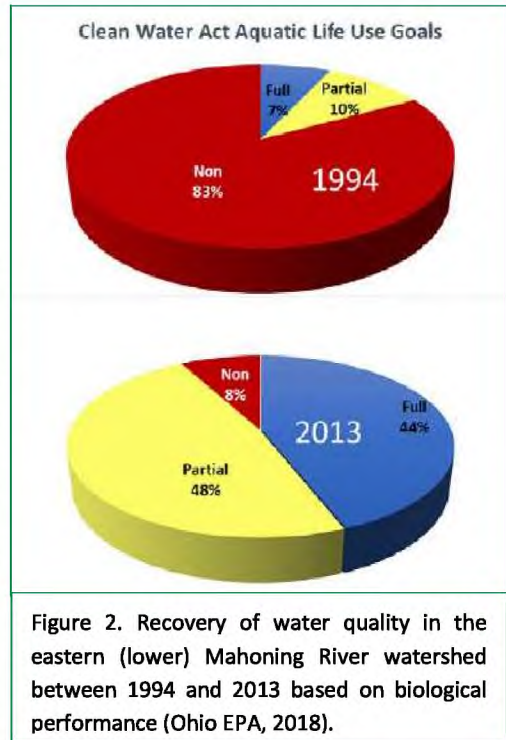


Figure 2. Recovery of water quality in the eastern (lower) Mahoning River watershed between 1994 and 2013 based on biological performance (Ohio EPA, 2018).

According to Ohio EPA's 2013 *Integrated Water Quality Monitoring and Assessment Report* (Ohio EPA 2013), the Middle Mosquito Creek watershed assessment unit where the mitigation site is located is listed as fully attaining. Restoration of high-quality wetlands within this 12-digit HUC sub-watershed will continue to aid in preventing future impairment in this assessment unit, while thoroughly mitigating for unavoidable impacts at the Development Site.

Environmentally Preferable Mitigation

The U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, Ohio EPA, and USACE Pittsburgh participated in a pre-application meeting with the permit applicant and their consultants on 6 December 2019. During that meeting, the different compensatory mitigation options were discussed for the project. As there are no mitigation banks established with a service area that includes the Development Site and there are insufficient in-lieu fee mitigation credits available within the Mahoning River watershed, the participating agencies determined that permittee-responsible mitigation was the most desirable option to provide compensatory mitigation for unavoidable impacts to wetlands resulting from the construction of the project within the Mahoning River watershed.

The Mitigation Site was identified as the environmentally preferable permittee-responsible mitigation option. The likelihood for ecological success and sustainability and the location of the compensation site relative to the mitigation site and their significance within the watershed was as evaluated. The ecological sustainability of the Mitigation Site is greatly enhanced due to the location of the site being entirely within the Mosquito Creek Wildlife Area. Additionally, the Mitigation Site is adjacent to an existing block of forest that likely contain significant amounts of high quality, Category 3 forested wetlands. The existing forested wetland adjacent to the

site will help bolster development of the plant community within the Mitigation Site through the recruitment of native woody and herbaceous species. The expanding native plant community will provide functional lift to available niche habitat as constraints on the distribution for sensitive species are alleviated compared to the intensively managed agricultural field. In addition to its proximity to these high-quality wetlands, the physical characteristics of the site, including mapped soil types, lend themselves towards successful and sustainable wetland restoration. The site will require little, if any, human intervention after wetland hydrology and a native hydrophytic plant community have been re-established and matured in the mitigation area.

Site Protection Instrument

The Mitigation Site will be protected in perpetuity by an environmental covenant. The environmental covenant will be held by ODNR. Ohio EPA will be a non-holder agency and signatory to the covenant. Included within the terms of the covenant will be methods by which unauthorized activities will be remedied by the grantor. Please see Appendix C for draft environmental covenant language. A boundary survey will be conducted to determine the final acreage of the protected area.

Baseline Information

Mitigation Site

The majority of the approximately 172-acre Mitigation Site is an agricultural field that has been utilized for intensive farming to provide food and cover for wildlife (Photograph 1). Evaluation of recent aerial photographs suggests that the site has been extensively drained via subsurface tile and surface drainage swales and furrows. Intensive drainage and manipulation of the property has facilitated the successful establishment of row crops on the site. S+W and the ODNR are seeking a certified determination from the Natural Resources Conservation Service (NRCS) that the site is Prior Converted Cropland (PCC); regardless, the site meets the definition of prior converted cropland per 7 CFR 12.2 (the site was converted to agriculture prior to December 23, 1985, an agricultural commodity had been produced at least once before December 23, 1985, and as of December 23, 1985 the site did not support woody vegetation).



Photograph 1 (12-26-19). *Wetland re-establishment is proposed in the agricultural fields located across the site.*

A delineation of jurisdictional waters located within the Mosquito Creek site will be completed and verified by USACE prior to initiation of implementation of the mitigation plan.

Annual planting of row crops has been in practice within the mitigation area for many decades. Cultivated crops, such as corn, are grown in alternating strips with sod-forming crops that are generally planted as either hay, wheat, or forages. The upland areas are intensively managed on an annual basis to provide food and cover for wildlife.

The Mitigation Site is shown on the Bristolville, OH Quadrangle of the United States Geological Survey (USGS) map (Appendix A). The gently sloping topography of the site ranges in elevation from 910 feet to 930 feet. The Bristolville, OH Quadrangle of the National Wetland Inventory (NWI) map is provided in Appendix A. A small area of palustrine, emergent, persistent, semi-permanently flooded, diked/impounded wetlands (code PEM1Fh) is mapped along the southern boundary of the mitigation area. A small area of palustrine, emergent, persistent, seasonally flooded wetlands (code PEM1C) is mapped within the proposed wetland re-establishment area. Additional NWI wetlands are mapped offsite, immediately to the north and south of the mitigation site.

As shown on the Trumbull County Soil Survey Map (Appendix A), the entire mitigation area is underlain by soils that are poorly drained to somewhat poorly drained. Mahoning silt loam, 0 to 2 percent slopes (MgA) underlays the majority of the mitigation area. Mahoning soils are nearly level to gently sloping soils that formed in moderately fine textured glacial till. Wetness is a severe hazard and limits this soil for farming and for most nonfarm uses; Mahoning soils have a perched water table during wet periods (Ernst and Musgrave 1976). See Table 2 for soil types mapped for the site.

Table 2. Soil Types Mapped for the Mosquito Creek Wildlife Area Wetland Mitigation Site

Map Unit	Soil Description	Hydric Determination ¹
Ct	Condit silt loam	non-hydric with hydric inclusions
DrA	Darien silt loam, 0 to 2 percent slopes	non-hydric with hydric inclusions
MgA	Mahoning silt loam, 0 to 2 percent slopes	non-hydric with hydric inclusions
MgB	Mahoning silt loam, 2 to 6 percent slopes	non-hydric with hydric inclusions

¹ As determined by *The Hydric Soils of the United States* 1991

Drainage from the site is generally to the east. After leaving the mitigation area, water continues to flow east where it eventually drains into Mosquito Creek Lake. The lake drains south into Mosquito Creek. Mosquito Creek is a direct tributary to the Mahoning River. According to OAC 3745-1-25, Mosquito Creek is a warmwater habitat perennial stream and serves as a public water supply for the City of Warren.

Development/Impact Site

Forested and non-forested wetlands that will be impacted by the project are dominated by common species. Tree species identified within these wetlands include *Acer rubrum* (red maple, FACW), *Ulmus americana* (American elm, FACW), *Fraxinus pennsylvanica* (green ash, FACW), *Salix nigra* (black willow, OBL), *Populus deltoides* (eastern cottonwood, FAC), *Quercus palustris* (pin oak, FACW), *A. saccharinum* (silver maple, FACW), and *A. negundo* (box elder, FAC). Shrubs and herbaceous plants found within the forested wetlands include *Lindera benzoin* (spicebush, FACW), *Rose multiflora* (rambler rose, FACU), *Cornus alba* (red osier, FACW), *Symplocarpus foetidus* (skunk cabbage, OBL), *Glyceria striata* (fowl mannagrass, OBL), *Cinna arundinacea* (wood

reed, FACW), *Onoclea sensibilis* (sensitive fern, FACW), *Toxicodendron radicans* (poison ivy, FAC), *Impatiens capensis* (spotted-touch-me-not, FACW), and *Carex* spp. (sedges).

Wetlands to impacted by the project are either ORAM Category 1 or Category 2. No impacts to Category 3 wetlands will occur during construction of the project.

Determination of Mitigation Provided

Based upon the wetland impact data provided in Table 1, the Mitigation Site will be designed and constructed to generate 130.19 acres of wetland mitigation through wetland re-establishment, wetland rehabilitation, and upland forest re-establishment in order to compensate for unavoidable impacts arising from the project. Based on project impacts, at least 41.71 acres of re-established forested wetland mitigation will need to be generated. It is anticipated that the site design will generate forested wetland mitigation in excess of this compensatory mitigation need; this excess re-established forested wetland will be used to fulfill non-forested wetland requirements. A summary of the mitigation anticipated to be generated by the project is provided in Table 3. Periodic wetland delineations conducted over the course of ecological monitoring will determine the acreage of wetlands that have developed on the site; based on the conceptual plan, the anticipated habitat to develop onsite will meet the required amounts of compensatory mitigation (41.71 acres of forested wetland and 88.48 acres of non-forested wetland). If the mitigation project generates more wetland mitigation than required for the Development Site, and if the excess mitigation meets all performance requirements, the applicant may be authorized to use the excess mitigation for future compensatory mitigation needs in the Mahoning River watershed with approval from the Corps and Ohio EPA on a case by case basis.

Table 3. Estimated Wetland Mitigation to be Generated at the Wetland Mitigation Site

	Mitigation Type	Resource Type	Size (acres)	Credit Ratio (percentage)	Mitigation	
Wetlands	Re-establishment	Forested wetland	107.5	1:1 (100%)	107.5	
	Re-establishment	Non-forested wetland	35.3	1:1 (100%)	35.3	
	Re-establishment	Forested wetlands/uplands mosaic 75% wetland conversion	Total= 4.5	WL = 3.4	1:1 (100%)	3.4
				UPL = 1.1	1:4 (25%)	0.3
	Re-establishment	Forested upland <100-ft. from wetlands	21.1	1:4 (25%)	5.3	
	Rehabilitation	Forested wetland	3.0	1:2 (50%)	1.5	
Total Anticipated Forested Wetland Mitigation					118.0	
Total Anticipated Non-Forested Wetland Mitigation					35.3	
Total Anticipated Wetland Mitigation					153.3	

Mitigation Work Plan

A variety of mitigation construction activities will take place across the existing agricultural field to facilitate successful wetland re-establishment, wetland rehabilitation, and upland forest re-establishment on the property. Activities will focus on restoring site hydrology, recreating natural site topography, and re-establishing a native plant community. Construction of the mitigation site will be completed within the first full construction season after the permits are issued. Specific construction and planting activities anticipated to be completed on the site are discussed in detail below.

Invasive Vegetation Control

Prior to commencing earthwork on the site, populations of non-native invasive vegetation on the Mitigation Site will be controlled. Sporadic areas within the agricultural field presently support concentrations of *Phalaris arundinacea* (reed canarygrass, FACW), a species that is capable of forming large monocultures in wetlands. This and other invasives listed in Table 4 that are found within the restoration area will be treated with an herbicide listed for use in aquatic environments prior to the plants flowering and producing seed. Completing treatment prior to earthwork activities will help to limit the spread of seed or vegetative propagules (e.g. rhizomes) of this species into the re-established wetland area. Additional herbicide treatments will be conducted, as needed, per the methods outlined in the *Maintenance Plan* section of this document.

Hydrology Restoration

Drainage Swales. A series of drainage swales were constructed within the agricultural fields to facilitate the movement of water across the site. To disable the drainage system, a series of ditch plugs will be designed and loaded to restore hydrology to the agricultural fields. The constructed plugs will help retain hydrology on the Mitigation Site.

Tile Search. Prior to initiating earth work, a search for drainage tiles will be made throughout the proposed re-establishment area to ensure the restoration of historical site hydrology. To disrupt and disable the functioning subsurface drainage system, a track hoe or similar piece of construction equipment will be used to excavate a trench to a depth of at least 4 feet in order to disrupt deeper drainage tiles within the agricultural field. When tiles are found, they will be excavated inward approximately 15 to 20 feet and crushed. The trenches will then be filled with excavated soil and compacted in order to prevent the movement of water through the disabled lines. This method will primarily be utilized near the perimeter of the site and periodically throughout the restoration area.

Berm Construction. A series of low earth embankments (typical maximum height of 3-feet) will be constructed in various locations across the site. The purpose of these berms will be to pool water and to increase the residence time of surface water on the property. The high clay content of the soils on the site make them well suited for the construction of these small features. The development of shallow water areas within the restored wetland will provide a water source for wildlife and be a particular benefit to sensitive waterfowl and amphibian species in the area. These low berms will also be sited around the periphery of the property, as needed, to ensure that neighboring land is not adversely affected by increased hydrology on the mitigation site.

The above activities will be sufficient for establishing and maintaining appropriate hydrology for the re-established and rehabilitated forested and non-forested wetland areas within the Mitigation Site. Hydrology for the wetlands at the Mosquito Creek site will meet the criteria established in the *Corps of Engineers Wetlands Delineation Manual*.

Micro-Topography Restoration

Micro-topographic features and small pools will be restored throughout the mitigation area. Minor contouring of small areas, consisting of limited excavation and mounding, will be created to mimic the hummock-hollow topography associated with windthrown trees that occurs in natural wetlands in this region of Ohio (including the reference Category 3 forested wetland that abuts the project site to the north). Micro-topography restoration will be accomplished with the use of low ground pressure construction equipment.

Planting Plan

To facilitate the successful return of diverse vegetation communities to the restored wetlands, the active restoration area will be planted with native woody trees and shrubs and seeded with native seed mixes. In order to attain stem density goals, a minimum of 600 bare root stems per acre will be planted the first spring after construction is completed. The density of shrubs and trees will ultimately be dependent on post construction hydrology and projected habitats.

In the restored forested wetlands and uplands, planting will include 400 trees and 200 shrubs of varying species. Seed mixes will be custom blended based on habitat type to include a diversity of native perennial plants with a variety of hydrologic preferences, and will incorporate sedges, grasses, forbs and woody species (e.g. buttonbush, dogwoods).

The species under consideration for installation and seeding are provided in Appendix E. At a minimum, eight species of trees, representing four genera, and six species of shrubs, representing three genera will be planted to ensure species diversity on the site. The species planted will be native to the region as described in Braun, 1967; Furlow, unpublished; Cooperider, 1995; and Fisher, 1988. In addition to plant material obtained from commercial nurseries, on-site harvesting and installation of seed, vegetative propagules, or live-stake material may also be conducted to ensure re-establishment of a diverse native wetland plant community within the mitigation area.

Planting Methods

Planting will generally be performed by hand in early spring when soil conditions are conducive to this work. Bare root stock will be planted in the spring to minimize frost heave. Where possible, planting will occur while plants are still dormant and prior to bud break. No soil amendments will be used or added during planting.

Areas disturbed during construction and not immediately planted will be seeded. A diverse native seed mix of grasses, sedges, forbs, and woody species will be sown to stabilize soils, minimize compaction, and improve overall plant community diversity within restored wetlands. A list of potential species to be included in the seed mixes is provided in Appendix E. These seed mixes will also be applied in portions of the mitigation area to supplement and improve the diversity of the interim plant communities that will develop prior to development of mature forests across the majority of the site. Upland disturbed areas will be sown with a seed mix consisting of native

grasses and forbs (Appendix E).

Because the goal is to recreate a natural ecosystem, planting will be done randomly to create a more natural distribution that is similar to what is found in the existing woodlots located in the area. To the extent practicable, efforts will be made to install plant materials according to that species' habitat preferences (e.g. hydrological tolerance). For example, *Acer rubrum* (red maple) is a facultative species of depressional forested wetlands that will tolerate a wide variety of conditions, so this species can be planted in both wetlands and upland areas. *Cephalanthus occidentalis* (common buttonbush) and *Salix nigra* (black willow) will be planted in the lowest, wettest locations. Upland species, such as *Acer saccharum* (sugar maple) and *Fagus grandifolia* (American beech), will be planted on uplands or slightly higher areas of micro-topography within the wetlands.

Maintenance Plan

Vegetation Control

Invasive plant treatments will occur annually, as needed, to meet the stated performance standards. Invasive plant species are listed in Table 4. When identified within and around the restoration area, these species will be treated with an herbicide listed for use in aquatic environments before they are able to set seed. Foliar application rates will be in accordance with label specifications.

Tree planting areas will be monitored for excessive grass and herbaceous plant growth. During their initial establishment, these types of plants compete with installed trees and shrubs for nutrients, light, and water, and can slow growth. Pre-emergent and post-emergent herbicides

Table 4. Invasive Vegetation

Species	Common Name
<i>Acer platanoides</i>	Norway maple
<i>Ailanthus altissima</i>	tree-of-heaven
<i>Alliaria petiolata</i>	garlic mustard
<i>Alnus glutinosa</i>	European alder
<i>Berberis thunbergii</i>	Japanese barberry
<i>Butomus umbellatus</i>	flowering rush
<i>Catalpa speciosa</i>	northern catalpa
<i>Celastrus orbiculatus</i>	Asian bittersweet
<i>Cirsium arvense</i>	Canada thistle
<i>Conium maculatum</i>	poison hemlock
<i>Coronilla varia</i>	crown vetch
<i>Dipsacus fullonum</i>	common teasel
<i>Dipsacus laciniatus</i>	cut-leaved teasel
<i>Elaeagnus angustifolia</i>	Russian olive
<i>Elaeagnus umbellata</i>	autumn olive
<i>Epilobium hirsutum</i>	hairy willow-herb
<i>Epilobium parviflorum</i>	small-flowered willow-herb
<i>Euonymus alatus</i>	winged euonymus
<i>Euonymus fortunei</i>	wintercreeper
<i>Frangula alnus</i>	glossy buckthorn
<i>Hydrocharis morsus-ranae</i>	common frog-bit
<i>Iris pseudacorus</i>	yellow flag
<i>Ligustrum vulgare</i>	common privet
<i>Lonicera japonica</i>	Japanese honeysuckle
<i>Lonicera maackii</i>	Amur honeysuckle
<i>Lonicera morrowii</i>	Morrow honeysuckle
<i>Lonicera tatarica</i>	Tartarian honeysuckle
<i>Lythrum salicaria</i>	purple loosestrife
<i>Maclura pomifera</i>	osage orange
<i>Microstegium vimineum</i>	Japanese stilt grass
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil
<i>Najas minor</i>	lesser naiad
<i>Nasturtium officinale</i>	watercress
<i>Phalaris arundinacea</i>	reed canary grass
<i>Phragmites australis</i>	common reed
<i>Polygonum cuspidatum</i>	Japanese knotweed
<i>Potamogeton crispus</i>	curly pondweed
<i>Pyrus calleryana</i>	bradford pear
<i>Ranunculus ficaria</i>	lesser celandine
<i>Rhamnus cathartica</i>	common buckthorn
<i>Rosa multiflora</i>	multiflora rose
<i>Schoenoplectus mucronatus</i>	bog bulrush
<i>Sorghum halepense</i>	johnson grass
<i>Typha x glauca</i>	hybrid cattail
<i>Typha angustifolia</i>	narrow-leaved cattail
<i>Viburnum opulus var. opulus</i>	European cranberry-bush
<i>Vinca minor</i>	periwinkle

will be applied as, needed. It is anticipated that neither supplemental watering nor supplemental fertilization will be needed after planting. Insect and disease problems will be assessed and dealt with appropriately, if necessary.

Hydrology

Post-construction maintenance may include corrective earthwork upon discovery of any additional swales or operational subsurface tiles found to be negatively affecting the hydrology of the restoration area. Any earthwork required to address such issues will be conducted during dry periods to minimize disturbance to restored areas to the maximum extent practicable.

Performance Standards

The long-term objective of Mitigation Site is to ensure that high-quality forested and non-forested wetlands and forested uplands develop across the active restoration area. Given the long-term nature of forest succession (multi-decadal), it is understood that a high-quality forested plant community will not be fully developed by the end of the monitoring period. Performance standards for the site are provided below.

1. Re-established and rehabilitated forested and scrub/shrub wetlands and marshes (i.e. restored depressional wetlands, including swamp forest, marsh, and shrub swamp) shall meet minimum **VIBI score of 61** (Category 2, EOLP region). All other re-established depressional wetlands (i.e. wet meadows, including prairies and sedge grass communities not on slopes) will meet a minimum **VIBI score of 60** (Category 2, EOLP region). Additionally, mitigation wetlands shall meet an **FQAI score equivalent to a mid-level Category 2 wetland**. If it is determined that FQAI scores are in line with VIBI data, S+W in consultation with USACE and Ohio EPA, may reduce the frequency or stop collecting VIBI data in the future.
2. The re-established and rehabilitated wetlands shall have **less than 10 percent of its total area as unvegetated open water** provided that open water areas are less than 1.0 acre or where the average width does not exceed 100-feet (along the short axis). Unvegetated open water is defined as any open water area that has a mean annual water depth >6.6 ft., lacks soil, and/or is either unvegetated or supports only floating or submersed macrophytes. Areas with water depths (<6.6 ft.) which support rooted vegetation will be considered wetland habitat and receive full credit provided the rooted vegetation meets Corps of Engineers Wetlands Delineation Manual and applicable regional supplements' hydrophytic vegetation indicators. Unvegetated open water does not include inundated areas where there is expected to be a closed canopy of living trees or shrubs over the area of inundation. Areas of open water will be mapped during each delineation, with a final classification based on normal circumstances associated with seasonality and preceding precipitation trends. Any areas of unvegetated open water areas will receive mitigation at a ratio of 1:4.
3. The goal is to **re-establish at least 41.71 acres of forested wetland and to generate a total of 130.19 acres of mitigation**. Based on the conceptual site plan, it is anticipated that forested wetlands will develop in excess of compensatory mitigation needs; the excess forested wetlands will be used to fulfill non-forested compensatory mitigation requirements. Wetland delineations will be completed per the 1987 *Corps of Engineers Wetlands Delineation Manual*

and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region*. It is anticipated that delineations will be performed in Years 3, 5, 7, and 10 after construction and planting. Variance from this schedule may be made by S+W in consultation with the agencies.

4. For wetlands anticipated to become dominated by a forested plant community, at least 41.71 acres, and for forested uplands the goal will be **400 vigorously free growing and healthy woody plants per acre, of which 200 must be tree species**. Vigorous and healthy woody plants within the reforested areas should exhibit twig elongation and foliage typical for its species. Free growing is defined as those woody plants that have breached the existing herbaceous layer and are no longer being negatively influenced by this vegetation stratum. Stem density will be recorded based upon stem counts completed in the established VIBI plot.
5. In wetland mitigation areas, there will be less than **5% relative cover of all non-Typha invasive plant species** listed within Table 4 of this document. Due to the difficulty of distinguishing the three species of cattails (*Typha latifolia*, *T. angustifolia*, *T. x glauca*), as well as the likelihood that at least one of these will be present within the mitigation wetlands, **the total relative cover of all invasive species, including Typha spp., shall be less than 10%**. These species will be managed through active methods of invasive plant control, as necessary.

If it appears at the end of the monitoring period that the project is not meeting this goal due to the predominance of native cattail, the Ohio EPA and USACE can modify this performance requirement if it can be demonstrated that the cattail is interspersed with other desirable native wetland plant species, particularly woody plant species that have breached the herbaceous layer; this determination will be acceptable only if the following conditions are met:

- wetland areas exceed the VIBI goal; and
- wetland areas exceed the native perennial hydrophyte goal; and
- the amount of restored forested wetlands habitat goal is exceeded.

Due to the abundance of sensitive waterfowl in the area and the functional nesting and foraging habitat that native cattail provides, aggressive treatment of native cattail may negatively impact the functional quality of the wetland; avoiding active management of vegetation in these areas will be the most ecologically preferred outcome. Furthermore, the control of native cattail could result in providing opportunistic invasive plant species a location to become established.

6. There will be **at least 75 percent relative cover of native perennial hydrophytes (i.e. wetland indicator status of FAC, FACW, and OBL)** within the re-established and rehabilitated wetlands. If it appears during the monitoring period that the project is not on a strong trajectory to meet this goal, appropriate planting measures will be implemented.
7. During typical years, as determined by preceding precipitation or climatic trends, monitoring wells or automatic data recorders will show re-established and rehabilitated wetland areas as inundated {flooded or ponded} or show evidence that the water table is ≤ 12

inches below the soil surface for at least 14 consecutive days during the growing season at a minimum frequency of 5 years in 10 ($\geq 50\%$ probability). Any combination of inundation or shallow water table is acceptable in meeting the 14-day minimum requirement. Short-term monitoring data may be used to address the frequency requirement if the normality of rainfall occurring prior to and during the monitoring period each year is considered.

Monitoring Requirements

Monitoring will occur over 10 years and monitoring data will be collected in at least five of the growing seasons over the 10-year monitoring period. Monitoring years may be adjusted by S+W based on the rate of progress towards meeting performance goals. It is anticipated that monitoring will occur 1, 3, 5, 7, and 10 years after construction and planting. Adjustments to the monitoring schedule may be made by S+W, in consultation with the regulatory agencies. Site meetings will be scheduled at the site with the agencies throughout the monitoring period as needed to evaluate development of the site or to determine if remedial measures are necessary.

Upon concurrence by USACE and Ohio EPA that the performance standards have been met or that there is a high degree of confidence that they will be met within a reasonable amount of time, monitoring will cease. If performance standards have not been met or not met within a reasonable period of time post monitoring, USACE and Ohio EPA, in consultation with GigaPower LLC and S+W, may elect to extend the monitoring period.

Wetland Vegetation Monitoring Methodology

Vegetation data will be collected at sampling plots distributed across the mitigation site. These data will be used to evaluate attainment of vegetation performance standards. Each plot will consist of a 5-m radius circle (78.5 m² sampled area), with the center of the plot marked with a numbered stake or post and mapped using GPS equipment. Plots will be installed at a density of one plot per 5 to 10 acres of forested wetland areas, non-forested wetland areas, or forested upland areas. Sample plots will be randomly stratified across plant communities on the site (e.g. marsh, wet meadow, uplands), such that each area is sampled at a level relative to the acreage of the plant community anticipated to develop in the mitigation project.

Plant cover data from each vegetation stratum at the monitoring points will be collected; sapling/shrubs and herbaceous plants will be identified to species and areal cover estimated within the 5-m radius circle centered on the fixed monitoring stake. Cover data for each species identified at a plot will be recorded using cover classes as presented in Table 1 of Mack and Gara (2015). In addition to collecting cover data, a stem count of woody species growing within each plot will also be completed. Diameter, height, and health will be collected for each tree or shrub identified during the stem count. Data from the stem counts will be compiled to determine standard forestry metrics (frequency, density, and dominance) for the site. Finally, photo documentation of site conditions will be collected at these locations during each monitoring event and will include the stake and stake number. Subsequent photographs will be taken in the same area and with the same direction of view to allow for an accurate portrayal of site development over the course of the project's monitoring period.

In addition to quantitative vegetation cover and stem density data collected at the sampling plots, observations of any new plant species noted throughout the site but not identified at the monitoring points will be recorded. Cover of these additional species will be estimated across the entire mitigation area and will be recorded using the methods described above.

Floristic Quality Assessment Index (FQAI) and Vegetation Index of Biotic Integrity (VIBI). The overall ecological quality of the plant community within the project's active restoration area will be evaluated using the Floristic Quality Assessment Index (FQAI). The FQAI, originally developed by Swink and Wilhelm (1979), was designed to create an objective standard of plant community quality by evaluating the weighted averaging of species richness (through application of each species' assigned Coefficient of Conservatism value – C of C); the FQAI allows for relative comparisons of the condition of vegetation communities of different sites or varying portions of the same wetland. The FQAI methodology and C of C values for Ohio are presented in Andreas et al. (2004).

FQAI has been shown to correlate well with indices of human disturbance, including results from the Ohio Rapid Assessment Method for Wetlands v. 5.0 (Andreas et al. 2004, see Fennessy 1998) and the Vegetation Index of Biotic Integrity (VIBI), the Level 3 assessment method that has been utilized as a means to evaluate mitigation project performance for more than ten years within Ohio (Gara 2013). Due to the statistically significant correlations between FQAI and ORAM, and FQAI and VIBI, FQAI can be used to interpret a wetland's Category relative to Ohio's wetland antidegradation rule (OAC 3745-1-54), as scoring break points for each wetland Category (i.e. 1, 2, and 3) have been established for these other assessments. As use of FQAI monitoring represents a fresh approach to mitigation wetland quality categorization in Ohio, S+W will collaborate closely with Ohio EPA to evaluate the vegetation data collected at the mitigation site to establish an appropriate FQAI scoring goal equivalent to a mid-level Category 2 wetland.

Using vegetation data collected at the fixed monitoring plots and from observations made across the site, a comprehensive plant species list will be prepared for each habitat type. A composite FQAI value for each habitat type will be calculated per Equation 7 from Andreas et al. (2004):

$$I = \sum (CC_i) / V(N_{\text{allspecies}})$$

where I = the FQAI score, CC_i = the coefficient of conservatism of plant species i , and $N_{\text{allspecies}}$ = the total number of species occurring in the community being evaluated.

Until Ohio EPA and USACE can confirm that use of the FQAI method is producing anticipated results based upon vegetation community development, a composite VIBI score will also be calculated during each monitoring event using FQAI plot data to allow for comparisons of FQAI to VIBI to assist Ohio EPA and the USACE with evaluation of the FQAI monitoring method relative to historically used assessment tools. VIBI monitoring protocols will follow the *Integrated Wetlands Assessment Program: Part 9: Field Manual for the Vegetation Index of Biotic Integrity for Wetlands v. 1.5* (Mack, 2015). The VIBI score will be determined using plant cover data collected at the monitoring plots and from observations across the site. Midpoint values from the plant cover class numbers assigned to each species will be used to calculate relative cover of each species in the mitigation area.

Starting in Year 5, VIBI focus plots (e.g. 20m x 50m, or an acceptable modified plot layout) will be established and sampled within the mitigation wetlands. One focus plot per 20± acres of forested

wetlands and one focus plot per 20± acres of non-forested wetlands will be established to sample the developing wetland community. The total number of focus plots are commensurate to the variation within typical habitats restored on the project site. Scores from the focus plots will be used as controls to confirm that FQAI values and composite VIBI scores generated from the site are providing expected results based upon overall vegetation community development. If Year 5 VIBI focus plots meet VIBI performance standards, VIBI focus plot monitoring will occur again in Year 10; however, if Year 5 VIBI focus plots fail to meet VIBI performance standards, VIBI focus plot monitoring will occur again in Years 7 and 10.

If S+W in consultation with Ohio EPA and USACE, is able to determine the results of proposed FQAI/VIBI random plot monitoring methodology are yielding reliable results, then the duplicative VIBI focus plot sampling may be ceased. Likewise, if the proposed FQAI monitoring methodology does not yield desired results, then the FQAI based monitoring can be ceased.

Hydrology Monitoring Methodology

Hydrology monitoring at the site will include a variety of tasks and associated data collection to document hydrologic conditions within wetland areas. These activities will include:

- During monitoring years (i.e. Years 1, 3, 5, 7, and 10 after construction and planting), monitoring of site hydrology will include observations of primary and secondary hydrology indicators during the spring wetland delineation, observations of primary and secondary hydrology indicators at monitoring plots during summer vegetation monitoring, annual collection of data from a groundwater monitoring well's automatic data recorder to be installed within the mitigation wetlands, and observations at a staff gauge to be installed within the non-forested portion of the site. All of these data, and a summary of preceding precipitation and climatic trends, will be presented in the monitoring reports in Years 1, 3, 5, 7, and 10.

Reporting Plan

A baseline as-built report will be submitted in a letter format within 90 days of completing construction and planting. It is anticipated that construction will occur between June and October and planting will begin the subsequent spring. The baseline letter report shall include the following information:

- A drawing showing the as-built conditions of the mitigation area. This drawing will include water levels, as applicable. An 11- by 17-inch drawing will be provided.
- Color photographs and a photograph location map.
- A list of all seed mixes applied and a map showing locations and densities of installed trees, shrubs, and/or forbs will be provided. Wetlands Vegetation Indicator Status (Lichvar et al. 2016) and strata (e.g. herb, shrub, tree) will also be included for the installed plant material.

Monitoring reports will be prepared and submitted 1, 3, 5, 7, and 10 years from construction or until mitigation goals are met. The reports will be submitted to USACE and Ohio EPA by December 31 of each monitoring year and will include the following information based upon data collected during an annual site visit conducted within the growing season:

- A copy of the as-built map.
- Color photographs and a photograph location map.
- A comprehensive plant species list.
- Water depths and hydrological indicators
- Soil chromas and hydric soil indicators
- A discussion regarding whether or not the objectives of the mitigation project are being met and a plan with an implementation timetable to correct any deficiencies.
- Comprehensive wetland delineations will be conducted in Years 3, 5, 7, and 10 using the protocols in the 1987 Corps Manual and applicable Regional Supplement, including the use of field forms.
- A discussion regarding whether or not the objectives of the mitigation project are being met and a plan with an implementation timetable to correct any deficiencies.

Monitoring results, including information on FQAI and VIBI scores, percent relative cover of native hydrophytes, percent unvegetated open water, and percent relative cover of invasive species will be included in the monitoring reports. A discussion and graphical representation of how data corresponds to the performance standards will be included in each monitoring report for each goal. At a minimum, these reports will include graphs of the above parameters charted against time. Each graph will provide a threshold line representing the performance standard for that parameter. Table 5 presents information on the anticipated monitoring and reporting schedule for the site.

Table 5. Anticipated Monitoring and Reporting Schedule

Monitoring Activity	Years Post-Construction ¹										
	0	1	2	3	4	5	6	7	8	9	10
Wetland Delineation	–	–	–	X	–	X	–	X	–	–	X
Hydrologic Monitoring	–	X	–	X	–	X	–	X	–	–	X
FQAI Sampling/ VIBI Plot Sampling	–	X	–	X	–	X	–	X	–	–	X
VIBI Focus Plot Sampling	–	–	–	–	–	X	–	X ²	–	–	X
Vegetation Community Mapping	–	X	–	X	–	X	–	X	–	–	X
As-Built Report	X	–	–	–	–	–	–	–	–	–	–
Monitoring Report	–	X	–	X	–	X	–	X	–	–	X

¹ Variation from this schedule may be made by S+W in consultation with USACE and the IRT.

²Only necessary if Year 5 VIBI focus plot data fail to meet VIBI performance goal.

Long-Term Management Plan

Annual monitoring of the easement area on the Mitigation Site will be conducted by the environmental covenant holder (ODNR Division of Wildlife is planned) and will include documentation of any unauthorized activities occurring within the protected area that negatively impacts the re-established aquatic resources. Included within the terms of the conservation easement will be methods by which unauthorized activities will be remedied by the grantor. Annual monitoring conducted by the environmental covenant holder will be documented in reports in accordance with the practices of the entity selected to hold the covenant.

Adaptive Management Plan

If the mitigation site is not adequately vegetated by the end of the third year, a planting plan will be developed. Native plant or seed material will be obtained from commercial plant nurseries or, if possible, from nearby wetlands.

If USACE or Ohio EPA, determine that the site (or any portion thereof) is failing to establish or that it is not making satisfactory progress towards meeting the performance goals within the monitoring period, S+W will develop a remedial action plan to correct the deficiencies. The remedial action plan will be submitted to USACE and Ohio EPA within 90 days of receipt of written notification of deficiencies from USACE or Ohio EPA. Within 60 days of receipt of the remedial action plan, USACE and Ohio EPA will provide written acceptance of the submitted plan or a modified plan acceptable to the agencies and S+W. The remedial action plan (as submitted by S+W or as mutually modified by the Corps and Ohio EPA in consultation with S+W) will then be implemented within six months or as otherwise provided in the remedial action plan.

Financial Assurances

The applicant (GigaPower LLC) will provide funding to S+W for the completion of the mitigation project within 30 days of the permit issuance date. Confirmation of the payment of funds will be provided in writing by S+W to USACE and Ohio EPA prior to initiation of construction at the Development Site. In addition, S+W will secure a construction and 1-year post construction performance bond in the value of \$2,700,000 for the estimated cost of construction and planting of the Mitigation Site. The performance bond will conform with USACE requirements and will be obtained prior to the start of construction of the mitigation project. This financial assurance will provide a high level of confidence that wetlands will be successfully restored by this project.

Appendix A

Location Maps

Appendix A.1

Location of Project on Ohio County Map

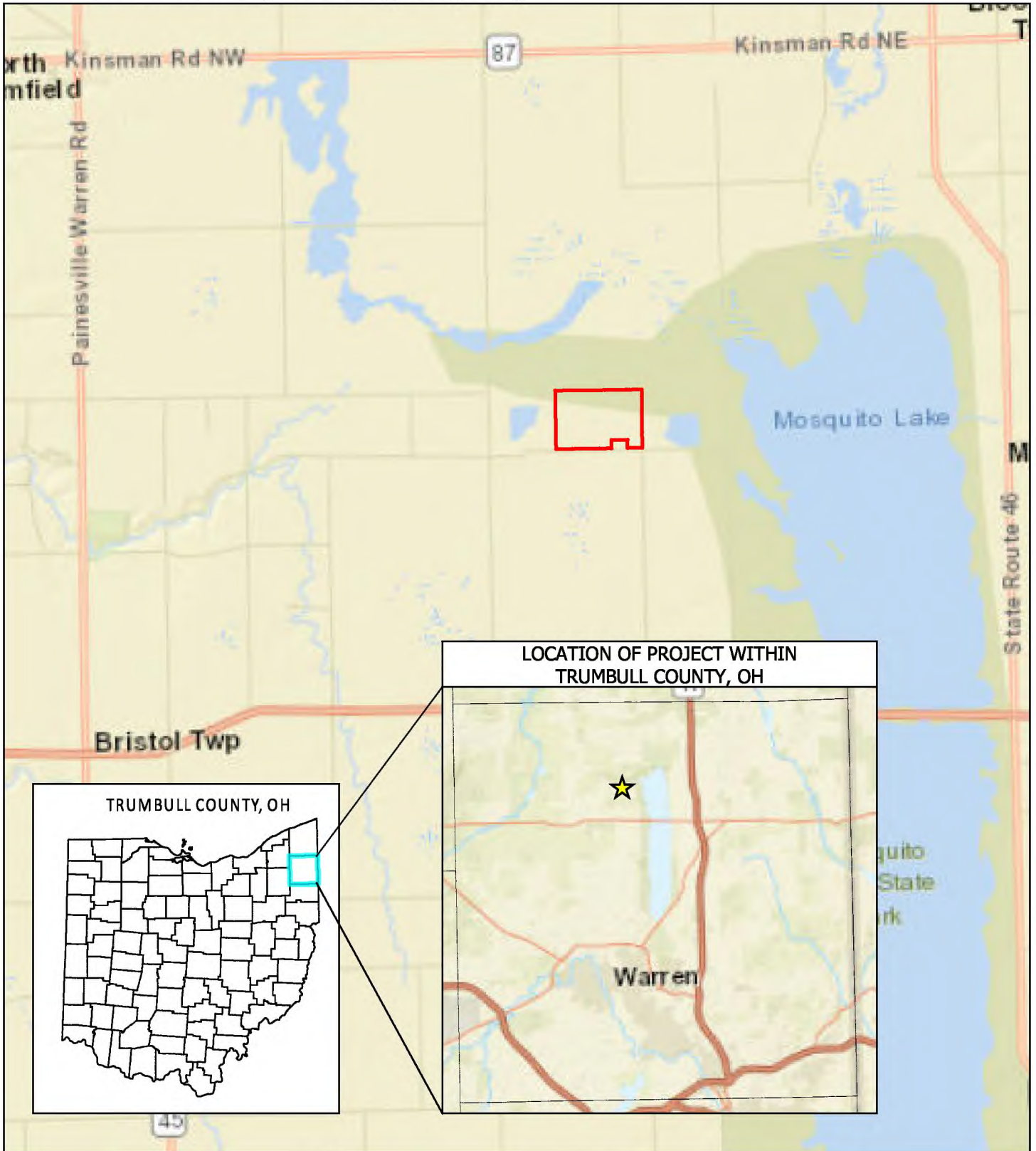


MECCA TOWNSHIP, TRUMBULL COUNTY, OHIO

**MOSQUITO CREEK WILDLIFE AREA
WETLAND MITIGATION SITE**

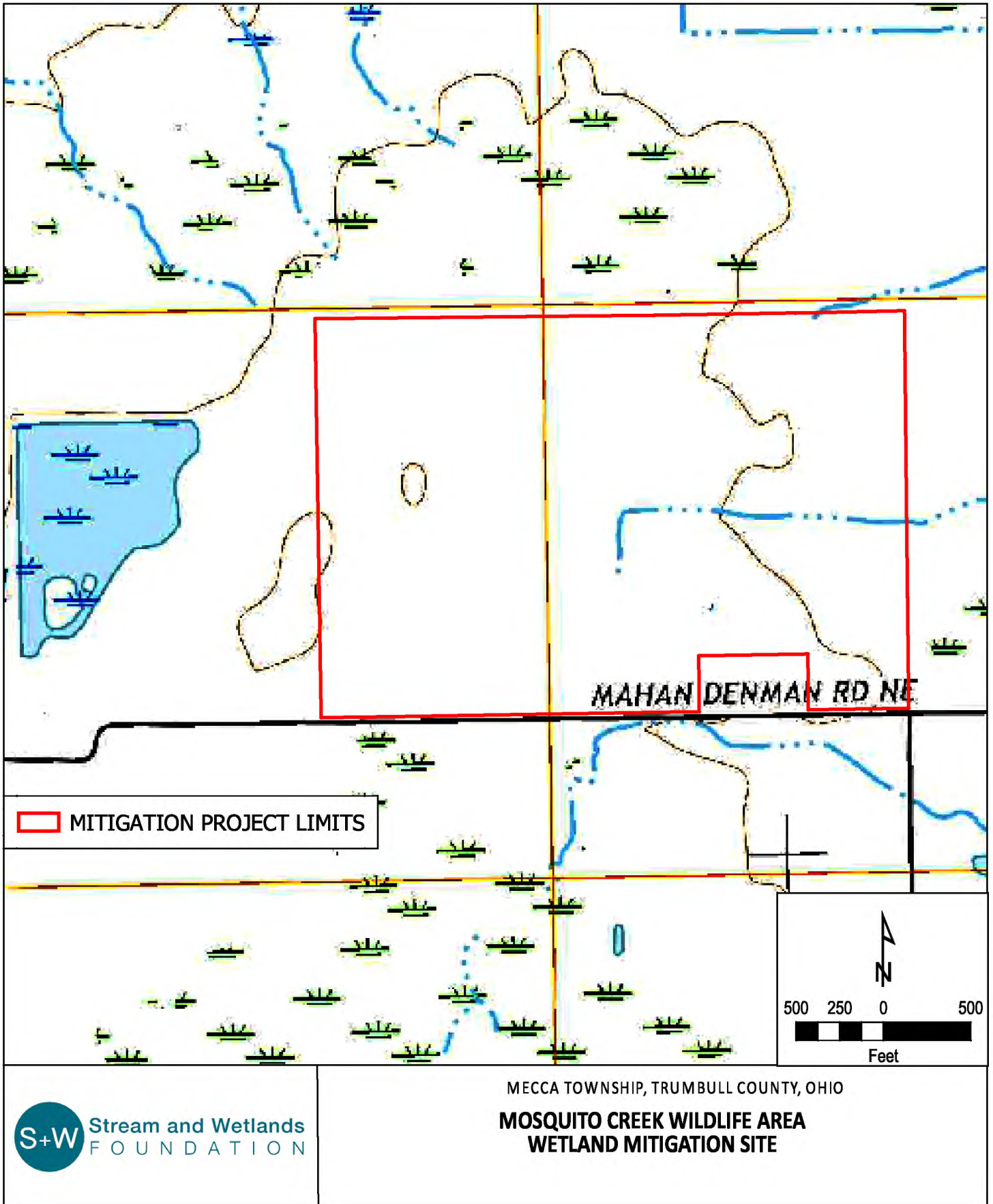


Appendix A.2 Location of Project on Highway Map

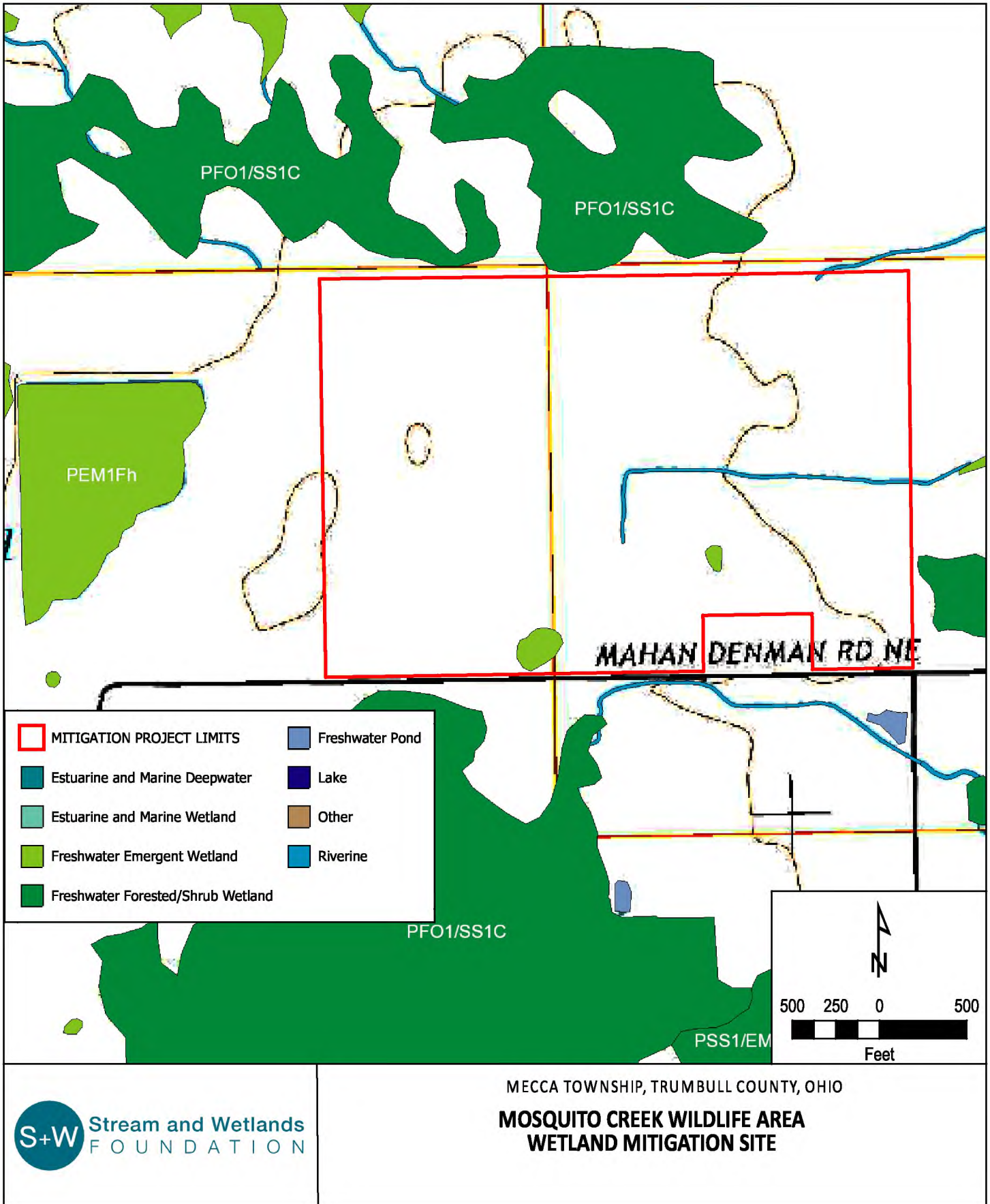


Appendix A.3

Location of Project on USGS 7.5 Minute Topographic Map (Bristolville, OH Quadrangle)

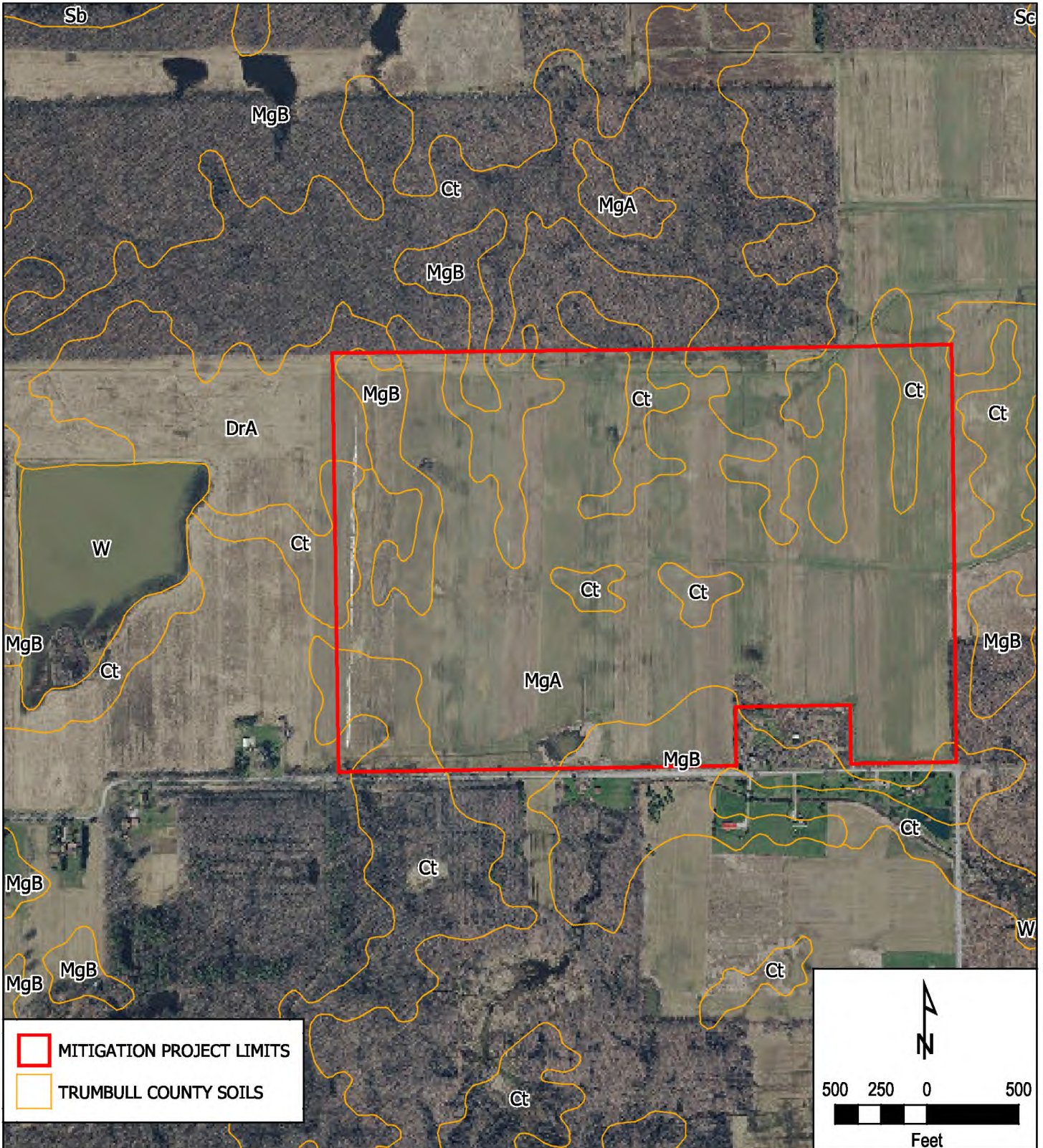


Appendix A.4 Location of Project on National Wetlands Inventory Map (Bristolville, OH Quadrangle)



Appendix A.5

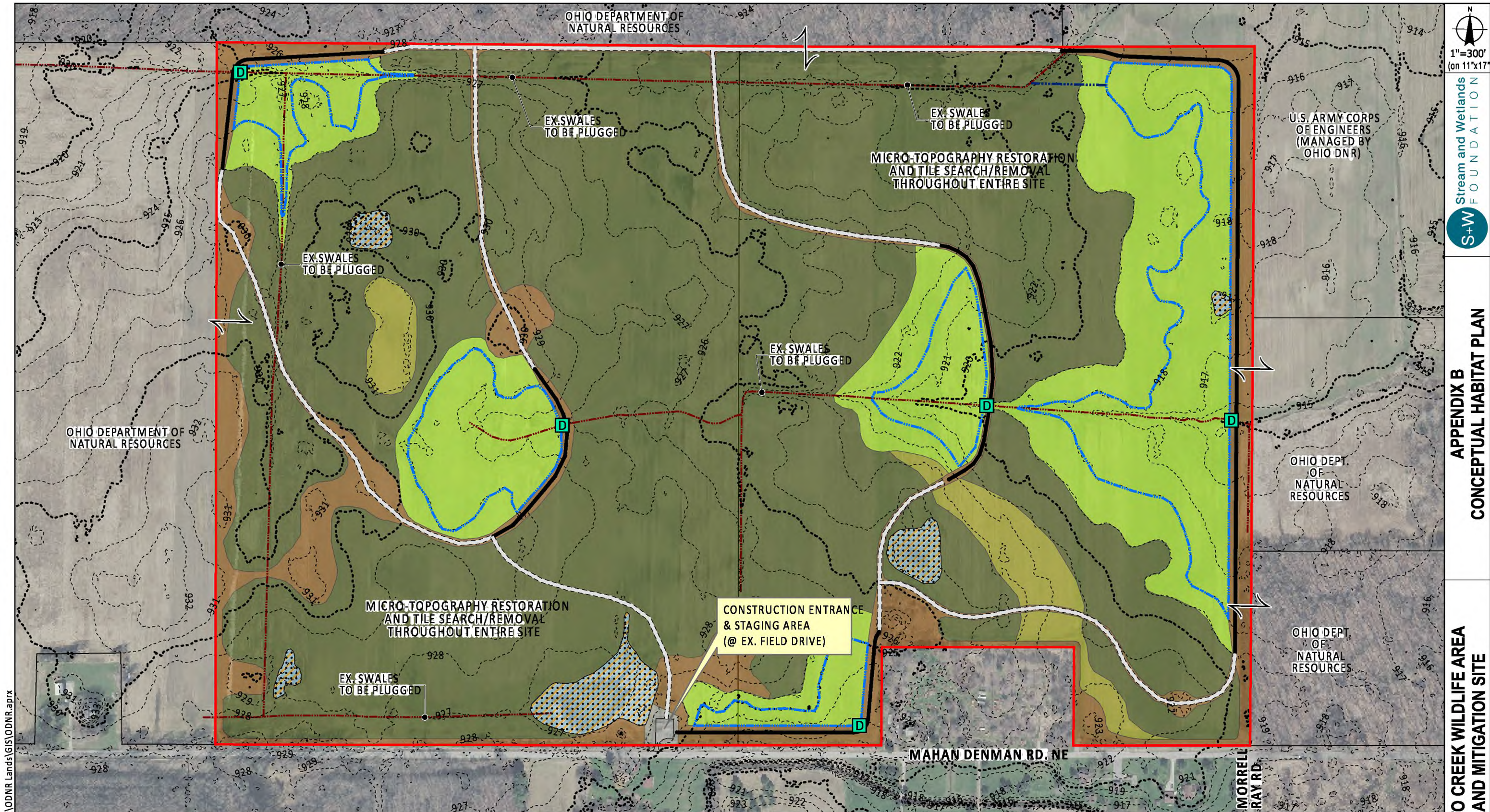
Location of Project on Trumbull County Soil Survey Map



MECCA TOWNSHIP, TRUMBULL COUNTY, OHIO

**MOSQUITO CREEK WILDLIFE AREA
WETLAND MITIGATION SITE**

Appendix B
Mosquito Creek Mitigation Site Mitigation Plan



1/8/2020 P:\Prospects\OH\Wahoning\ODNR Lands\GIS\ODNR.aprx

	PROJECT LIMITS (171.6 AC.)		OUTLET STRUCTURE		RE-ESTABLISHED NON-FORESTED WETLANDS		REHABILITATED EXISTING WETLANDS
	EXISTING WETLANDS (ESTIMATED)		PROPOSED BERM		RE-ESTABLISHED FORESTED WETLANDS		APPROX. MAX. POOL
	EXISTING SWALE/DRAINAGEWAY		PROPOSED SWALE		RE-ESTABLISHED FORESTED WETLANDS UPLANDS MOSAIC		CONSTRUCTION ENTRANCE & STAGING AREA
	PROPOSED MAINTENANCE/ACCESS TRAIL		RE-ESTABLISHED FORESTED UPLANDS				

Appendix C

Draft Environmental Covenant Text

To be recorded with Deed

Records – O.R.C. § 317.08

ENVIRONMENTAL COVENANT

This Environmental Covenant is entered into pursuant to Ohio Revised Code (“O.R.C.”) §§ 5301.80 to 5301.92 by the State of Ohio (the “Owner”), acting by and through the Department of Administrative Services, General Services Division, Office of Real Estate Planning, having an address of 4200 Surface Road, Columbus, Ohio 43228, for and on behalf of the Ohio Department of Natural Resources (the “Agency”), and Ohio Environmental Protection Agency (“Ohio EPA”), as a non-holder agency, for the purpose of subjecting certain property (the “Covenant Area”) to the activity and use limitations set forth herein.

WHEREAS, the Owner is the owner in fee of certain real property comprising approximately _____ acres and situated the Township of Mecca, Trumbull County, Ohio, in the Mahoning River watershed; and;

WHEREAS, GigaPower LLC (the “Applicant”) has proposed to construct the GigaPower LLC Project on certain other real property (the “Project Site”), a portion of which is also located in Trumbull County, Ohio (“the Project”), which Project impacts certain surface water features located on the Project Site and the approvals for which the Project required that Applicant obtain a 401 water quality certification (401 WQC) pursuant to Section 401 of the Clean Water Act, 33 U.S.C. § 1341 from the Ohio EPA and 404 permit coverage from the United States Army Corps of Engineers (“the Army Corps”);

WHEREAS, the Applicant has approached the Agency to request the Department of Natural Resources assist it with its environmental requirements for the Project by subjecting a certain area or portion of the Property, the Covenant Area, as shown on the map in Exhibit A and more specifically described in Exhibit B attached hereto and by this reference incorporated herein, to certain restrictions to protect environmental resources as may be required or found desirable by the Clean Water Act (33 U.S.C. 125, et seq.) or like or similar federal and state laws;

WHEREAS, in exchange for Ohio EPA and Army Corps issuing such a certificate and permit for the Project, respectively, the Owner has agreed to forever preserve and maintain the Covenant Area in its natural state following implementation of the Mosquito Creek Wildlife Area Wetland Mitigation and Monitoring Plan, dated January 2020 (the “Mitigation Plan”). The permit numbers are _____.

WHEREAS, the Covenant Area located on the Owner’s property possesses substantial value in conserving and protecting the physical, biological and chemical integrity of the Black River and is important in the protection of the existing or designated use of the waters of the state pursuant to § 303 of the Clean Water Act, 33 U.S.C. § 1313 and § 6111.041 of the Ohio Water Pollution Control Act. The specific conservation values (hereinafter “Conservation Values”) of the Covenant Area on the Owner’s Property have been documented in the Mitigation and Monitoring Plan; and

WHEREAS, the Applicant proposes to fulfill its obligation to ensure the Covenant Area and the Covenant Area’s Conservation Values are protected in perpetuity by this Environmental Covenant.

Now therefore, the Owner and Ohio EPA agree to the following:

1. Environmental Covenant. This instrument is an environmental covenant developed and executed pursuant to O.R.C. §§ 5301.80 to 5301.92.

2. Property. This Environmental Covenant concerns approximately _____ acres of real property located in the Township of Mecca, Trumbull County, Ohio, and more particularly described in Exhibit A attached hereto and hereby incorporated by reference herein (the “Covenant Area”).

3. The Owner is the fee simple owner of the Covenant Area.

4. The Owner is the holder of this Environmental Covenant.

5. Activity and Use Limitations. Given the conservation values of the Covenant Area, the Owner hereby imposes and agrees to comply with the following activity and use limitations:

a. Division: Any division or subdivision of the Covenant Area is prohibited.

b. Commercial Activities: Commercial development or industrial activity on the Covenant Area is prohibited.

c. Construction: Any features, including trails, fencing, driveways, and utilities, that exist prior to the establishment of this Environmental Covenant (as shown in the Mitigation and Monitoring Plan) may be maintained as necessary to ensure their function and safe access by the Owner. Additionally, the placement or construction of any additional man-made modifications such as buildings, structures, fences, billboards, roads, utilities, and parking lots on the Covenant Area is prohibited. If maintenance activities required to ensure safe function of existing facilities identified within the Covenant Area are necessary, and impacts to wetlands or streams associated with this maintenance are unavoidable, the impacts must follow all local, state and federal permitting laws and regulations applicable at the time of construction.

d. Cutting Vegetation: Any cutting of trees, ground cover or vegetation, or destroying by means of herbicides or pesticides on the Covenant Area is prohibited except for the control of invasive plants species as defined in the Mitigation and Monitoring Plan; native plant species that are necessary to control in order to achieve the performance goals established in the Mitigation and Monitoring Plan; and vegetation near or adjacent to existing trails, fencing, driveways and other allowable facilities so as to maintain those facilities in a functional and/or safe working condition.

e. Dumping: Waste, garbage and unsightly or offensive materials are not permitted and may not be accumulated on the Covenant Area.

f. Water Courses: Natural water courses and streams and adjacent riparian buffers may not be dredged, straightened, filled, channelized, impeded, diverted or otherwise altered on the Covenant Area.

6. Running with the Land. This Environmental Covenant shall be binding upon the Owner and all assigns and successors in interest, including any Transferee, and shall run with the land, pursuant to O.R.C. § 5301.85, subject to amendment or termination as set forth herein. The term “Transferee” as used in this Environmental Covenant, shall mean any future owner of any interest in

the Covenant Area or any portion thereof, including, but not limited to, owners of an interest in fee simple, mortgagees, easement holders, and/or lessees.

7. Compliance Enforcement. Compliance with this Environmental Covenant may be enforced pursuant to O.R.C. § 5301.91 or other applicable law. Failure to timely enforce compliance with this Environmental Covenant or the use limitations contained herein by any party shall not bar subsequent enforcement by such party and shall not be deemed a waiver of the party's right to take action to enforce any provision of this Covenant. Nothing in this Environmental Covenant shall restrict the Director of the Ohio EPA from exercising any authority under applicable law in order to protect public health or safety or the environment.

8. Rights of Access. The Owner hereby grants to the Ohio EPA, its agents, contractors, and employees and the Holder or its agents the right of access to the Covenant Area on the Covenant Area in connection with the implementation or Enforcement of this Environmental Covenant.

9. Notice upon Conveyance. Each instrument hereafter conveying any interest in the Covenant Area or any portion of the Covenant Area shall contain a notice of the activity and use limitations set forth in this Environmental Covenant and provide the recorded location of this Environmental Covenant. The notice shall be substantially in the following form:

THE INTEREST CONVEYED HEREBY IS SUBJECT TO AN ENVIRONMENTAL COVENANT, DATED _____, 20____, RECORDED IN THE DEED OR OFFICIAL RECORDS OF THE TRUMBULL COUNTY RECORDER ON _____, 20____, IN [DOCUMENT _____, *or* BOOK____, PAGE _____]. THE ENVIRONMENTAL COVENANT CONTAINS THE FOLLOWING ACTIVITY AND USE LIMITATIONS [LIST ACTIVITY AND USE LIMITATIONS FROM THE RECORDED COVENANT]:

10. Representations and Warranties. The Owner hereby represents and warrants to the other signatories hereto:

- a. that the Owner is the sole owner of the Covenant Area;
- b. that the Owner holds fee simple title to the Covenant Area, which is free, clear and unencumbered except for the existing lease of oil and gas production rights;
- c. that the Owner has the power and authority to enter into this Environmental Covenant, to grant the rights and interests herein provided and to carry out all obligations hereunder; and
- d. that this Environmental Covenant will not materially violate or contravene or constitute a material default under any other agreement, document or instrument to which the Owner is a party of by which the Owner may be bound or affected.

11. Amendment or Termination. This Environmental Covenant may be amended or terminated only by consent of all of the following: the Owner or a Transferee and the Ohio EPA, pursuant to O.R.C. § 5301.90 and other applicable law. "Amendment" means any changes to the Environmental Covenant, including the activity and use limitations set forth herein, or the elimination of one or more activity and use limitations when there is at least one limitation remaining. "Termination" means the elimination of all activity and use limitations set forth herein and all other obligations under this Environmental Covenant.

This Environmental Covenant may be amended or terminated only by a written instrument duly executed by the Director of the Ohio EPA and the Owner[s] or Transferee[s] of the Covenant Area or portion thereof, as applicable. Within thirty (30) days of signature by all requisite parties on any amendment or termination of this Environmental Covenant, the Owner[s] or Transferee[s] shall file such instrument for recording with the Trumbull County Recorder's Office, and shall provide a true copy of the recorded instrument to the Ohio EPA.

12. Severability. If any provision of this Environmental Covenant is found to be unenforceable in any respect, the validity, legality, and enforceability of the remaining provisions shall not in any way be affected or impaired.

13. Governing Law. This Environmental Covenant shall be governed by and interpreted in accordance with the laws of the State of Ohio.

14. Recordation. Within *thirty (30)* days after the date of the final required signature upon this Environmental Covenant, the Owner shall file this Environmental Covenant for recording, in the same manner as a deed to the property, with the Trumbull County Recorder's Office.

15. Effective Date. The effective date of this Environmental Covenant shall be the date upon which the fully executed Environmental Covenant has been recorded as a deed record for the Covenant Area with the Trumbull County Recorder.

16. Distribution of Environmental Covenant. The Owner[s] shall distribute a file- and date-stamped copy of the recorded Environmental Covenant to: the Ohio EPA; and the United States Army Corps of Engineers, Pittsburgh District Office.

17. Notice. Unless otherwise notified in writing by or on behalf of the current owner of Ohio EPA, any document or communication required by this Environmental Covenant shall be submitted to:

Ohio EPA
Division of Surface Water
Mitigation Compliance
P.O. Box 1049
Columbus, Ohio 43216-1049

18. Counterparts. This Covenant may be executed in several counterparts, each of which may be deemed an original, and all of such counterparts together shall constitute one and the same Covenant.

The undersigned [representatives of] the Owner[s] and Ohio EPA represent and certify that they are authorized to execute this Environmental Covenant.

IT IS SO AGREED:

OHIO DEPARTMENT OF NATURAL RESOURCES (OWNER):

Date: _____

State of _____)
) ss:
 County of _____)

Before me, a notary public, in and for said county and state, personally appeared _____, a duly authorized representative of Ohio Department of Natural Resources, who acknowledged to me that [he/she] did execute the foregoing instrument on behalf of _____.

IN TESTIMONY WHEREOF, I have subscribed my name and affixed my official seal this ___ day of _____, 20____.

 Notary Public

OHIO ENVIRONMENTAL PROTECTION AGENCY

 By: The Current OEPA Director

Date: _____

State of Ohio)
) ss:
 County of Franklin)

Before me, a notary public, in and for said county and state, personally appeared _____, the Director of the Ohio EPA, who acknowledged to me that he did execute the foregoing instrument on behalf of Ohio EPA.

IN TESTIMONY WHEREOF, I have subscribed my name and affixed my official seal this ___ day of _____, 20____.

 Notary Public

Appendix D

Definition of Wetlands Vegetation Indicator Status (from Lichvar et al. 2016)

Obligate Wetlands (OBL). Almost always is a hydrophyte, rarely in uplands.

Facultative Wetlands (FACW). Usually is a hydrophyte but occasionally found in uplands.

Facultative (FAC). Commonly occurs as either a hydrophyte or non-hydrophyte.

Facultative Upland (FACU). Occasionally is a hydrophyte but usually occurs in uplands.

Obligate Upland (UPL). Rarely is a hydrophyte, almost always in uplands.

Species for which little or no information was available to base an indicator status were assigned a no indicator (NI) status. An asterisk (*) after the indicator status indicates that the indicator status was based on limited ecological information.

The wetlands indicator categories should not be equated to degrees of wetness. Many obligate wetlands species occur in permanently or semi-permanently flooded wetlands, but a number of obligates also occur, and some are restricted to wetlands that are only temporarily or seasonally flooded. The facultative upland species include a diverse collection of plants that range from weedy species adapted to exist in a number of environmentally stressful or disturbed sites (including wetlands), to species in which a portion of the gene pool (an ecotype) always occurs in wetlands. Both the weedy and ecotype representatives of the facultative upland category occur in seasonally and semi-permanently flooded wetlands.

Davey Resource Group has added two additional indicators for situations when plants can only be identified to genus. A Wetlands Indicator Species (WIS) is a plant that is most likely obligate wetlands, facultative wetlands, or facultative. An Upland Indicator Species (UIS) is a plant that is most likely indicative of upland or facultative upland conditions. These additional indicators are used when species identification is not possible. A variety of factors are part of the UIS and WIS assignments. Indicator statuses of all locally occurring members of the genus in question are considered, as are the health and size of the population and the indicator status of nearby plants.

Appendix E

Planting and Seed Mix Lists

Tree and Shrub Species List

Scientific Name	Common Name	Habit	Indicator Status ¹	C of C ²
<i>Acer rubrum</i>	red maple	tree	FAC	2
<i>Acer saccharinum</i>	silver maple	tree	FACW	3
<i>Acer saccharum</i>	sugar maple	tree	FACU	5
<i>Amelanchier laevis</i>	smooth serviceberry	tree	FAC	5
<i>Aronia melanocarpa</i>	black chokeberry	shrub	FAC	5
<i>Betula populifolia</i>	gray birch	tree	FAC	5
<i>Cephalanthus occidentalis</i>	common buttonbush	shrub	OBL	6
<i>Cornus alba</i>	red osier	shrub	FACW	3
<i>Cornus amomum</i>	silky dogwood	shrub	FACW	2
<i>Hamamelis virginiana</i>	American witch-hazel	shrub	FACU	5
<i>Ilex verticillata</i>	common winterberry	shrub	FACW	6
<i>Larix laricina</i>	Eastern larch	tree	FACW	9
<i>Lindera benzoin</i>	northern spicebush	shrub	FACW	5
<i>Liriodendron tulipifera</i>	tuliptree	tree	FACU	6
<i>Morella pensylvanica</i>	northern bayberry	shrub	FAC	10
<i>Nyssa sylvatica</i>	black tupelo	tree	FACW	7
<i>Platanus occidentalis</i>	American sycamore	tree	FACW	7
<i>Populus heterophylla</i>	swamp cottonwood	tree	OBL	9
<i>Quercus alba</i>	northern white oak	tree	FACU	6
<i>Quercus bicolor</i>	swamp white oak	tree	FACW	7
<i>Quercus macrocarpa</i>	burr oak	tree	FACU	6
<i>Quercus palustris</i>	pin oak	tree	FACW	5
<i>Quercus rubra</i>	northern red oak	tree	FACU	6
<i>Salix bebbiana</i>	gray willow	shrub	FACW	5
<i>Salix nigra</i>	black willow	tree	OBL	2
<i>Salix sericea</i>	silky willow	shrub	OBL	4
<i>Sambucus nigra</i>	black elder	shrub	FACW	3
<i>Spiraea tomentosa</i>	steeplebush	shrub	FACW	4
<i>Vaccinium corymbosum</i>	highbush blueberry	shrub	FACW	6
<i>Viburnum lentago</i>	nannyberry	shrub	FAC	5

*Dependent on availability. On-site harvesting and installation of seed, vegetative propagules, or live-stake material from species not specifically listed here may also be conducted to ensure re-establishment of a diverse native wetland plant community within the mitigation area

¹ From Lichvar et al. 2016

² From Andreas et al. 2004

Seed Mix Species List

Scientific Name	Common Name	Indicator Status ¹	C of C ²
<i>Agrimonia parviflora</i>	harvestlice	FAC	2
<i>Andropogon gerardii</i>	big bluestem	FACU	5
<i>Asclepias incarnata</i>	swamp milkweed	OBL	4
<i>Bidens cernua</i>	nodding burr-marigold	OBL	3
<i>Carex crinita</i>	fringed sedge	OBL	3
<i>Carex frankii</i>	Frank's sedge	OBL	2
<i>Carex lupulina</i>	hop sedge	OBL	3
<i>Carex lurida</i>	shallow sedge	OBL	3
<i>Carex stricta</i>	uptight sedge	OBL	5
<i>Carex vulpinoidea</i>	common fox sedge	OBL	1
<i>Clematis virginiana</i>	devil's-darning-needles	FAC	3
<i>Cornus amomum</i>	silky dogwood	FACW	2
<i>Cornus racemosa</i>	gray dogwood	FAC	1
<i>Elymus virginicus</i>	Virginia wild rye	FACW	3
<i>Eupatorium perfoliatum</i>	common boneset	FACW	3
<i>Euthamia graminifolia</i>	flat-top goldentop	FAC	2
<i>Glyceria septentrionalis</i>	floating manna grass	OBL	6
<i>Ilex verticillata</i>	common winterberry	FACW	6
<i>Juncus effusus</i>	lamp rush	OBL	1
<i>Leersia oryzoides</i>	rice cut grass	OBL	1
<i>Lindera benzoin</i>	northern spicebush	FACW	5
<i>Lobelia siphilitica</i>	great blue lobelia	FACW	3
<i>Mimulus ringens</i>	Allegheny monkey-flower	OBL	4
<i>Onoclea sensibilis</i>	sensitive fern	FACW	2
<i>Panicum virgatum</i>	wand panic grass	FAC	4
<i>Penstemon digitalis</i>	foxglove beardtongue	FAC	2
<i>Penthorum sedoides</i>	ditch-stonecrop	OBL	2
<i>Pontederia cordata</i>	pickerelweed	OBL	6
<i>Ratibida pinnata</i>	grey-headed coneflower	UPL	5
<i>Sambucus nigra</i>	black elder	FACW	3
<i>Schoenoplectus acutus</i>	hard-stem club-rush	OBL	7
<i>Schoenoplectus tabernaemontani</i>	soft-stem club-rush	OBL	2
<i>Scirpus atrovirens</i>	dark-green bulrush	OBL	1
<i>Scirpus cyperinus</i>	cottongrass bulrush	OBL	1
<i>Solidago patula</i>	round-leaf goldenrod	OBL	6
<i>Sparganium americanum</i>	American burr-reed	OBL	6
<i>Sparganium eurycarpum</i>	broad-fruit burr-reed	OBL	4
<i>Symphyotrichum novae-angliae</i>	New England American-aster	FACW	2
<i>Symphyotrichum puniceum</i>	purple-stem American-aster	OBL	7
<i>Symplocarpus foetidus</i>	skunk cabbage	OBL	7
<i>Verbena hastata</i>	sinpler's-joy	FACW	4
<i>Vernonia gigantea</i>	giant ironweed	FAC	2

*Dependent on availability. On-site harvesting and installation of seed, vegetative propagules, or live-stake material from species not specifically listed here may also be conducted to ensure re-establishment of a diverse native wetland plant community within the mitigation area

¹ From Lichvar et al. 2016

² From Andreas et al. 2004

Appendix F References

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