

# **ADDITIONAL HYDRAULIC IMPROVEMENTS PROJECT**

Wetland and Waterbody Delineation  
Report



Prepared for:

Mr. Steve Wilson, PE, PS  
Maumee Watershed Conservancy District

Prepared by:

Stantec Consulting Services Inc.  
4540 Heatherdowns Blvd, Suite A  
Toledo, OH 43614-3100 US


September 28, 2020



## ADDITIONAL HYDRAULIC IMPROVEMENTS PROJECT

This document entitled Additional Hydraulic Improvements Project was prepared by Stantec Consulting Services Inc. ("Stantec") for the account of Maumee Watershed Conservancy District (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by   
(signature)

**Aaron Kwolek**  
Reviewed by   
(signature)

**Nathan Noland**  
Reviewed by   
(signature)

**Jayme Huston**



**Table of Contents**

**EXECUTIVE SUMMARY ..... I**

**1.0 INTRODUCTION..... 1**

**2.0 METHODS ..... 2**

    2.1.1 Wetland Delineation .....2

    2.1.2 Stream Delineation.....3

**3.0 FINDINGS ..... 4**

3.1 SITE SOILS..... 4

3.2 NATIONAL WETLANDS INVENTORY ..... 4

3.3 VEGETATION COMMUNITIES ..... 4

3.4 HYDROLOGY ..... 5

3.5 WETLANDS ..... 6

3.6 STREAMS AND OTHER WATERS ..... 6

**4.0 REGULATORY CONSIDERATIONS ..... 7**

4.1 MEETINGS WITH REGULATORY AGENCIES ..... 7

4.2 REGULATORY PERMITTING ..... 7

**5.0 CONCLUSION ..... 8**

**6.0 LEVEL OF CARE..... 9**

**7.0 REFERENCES.....10**

**LIST OF TABLES**

Table 1. NRCS Soil Data..... 4

Table 2. Watershed Information ..... 5

Table 3. Stream Findings ..... 6

**LIST OF APPENDICES**

**APPENDIX A FIGURES ..... A.1**

Figure 1. Project Location Map ..... A.1

Figure 2. NRCS Soil Survey Map ..... A.2

Figure 3. National Wetlands Inventory Map..... A.3

Figure 4. Wetland and Waterbody Delineation Map ..... A.4

**APPENDIX B DATA FORMS ..... B.1**

B.1 Wetland Determination Data Forms ..... B.1

B.2 QHEI Data Form ..... B.2

**APPENDIX C PHOTOGRAPHS ..... C.1**



## EXECUTIVE SUMMARY

Stantec Consulting Services Inc. (Stantec) has been assisting Hancock County and the Maumee Watershed Conservancy District (MWCD) with the Hancock County Flood Risk Reduction Program (HCFRRP) since 2016. Stantec previously completed conceptual design and analysis of potential additional hydraulic improvements to the Blanchard River corridor within the City of Findlay and Hancock County. The Additional Hydraulic Improvements Project (the “Project”) is intended to increase the flood carrying capacity of the Blanchard River and reduce the water surface elevations (WSEs) upstream of the proposed Project areas. Recommendations for additional benching upstream of the existing Phase I and Phase II Hydraulic Improvements projects were made such that the WSE reduction benefits of the Project would be complimentary to Phase I and Phase II of the Norfolk Southern railroad bridge expansion. In addition to the additional benching upstream of the Phase I and Phase II Hydraulic Improvements projects, MWCD requested Stantec to construct two additional riffle structures to add to the aesthetics of the Project.

The Project area is located between North Cory Street and Central Parkway in the City of Findlay, Hancock County, Ohio (Figure 1, Appendix A).

Stantec was retained by MWCD to perform a wetland and waterbody delineation study within the proposed Project area (Figure 1, Appendix A). Stantec biologists performed pedestrian field surveys for wetlands and waterbodies within the Project area on July 22, 2020. In addition to wetlands and waterbodies, Stantec documented the locations of upland vegetation communities and land uses within the Project area. The dominant land uses within the Project area consisted of maintained lawn, mixed early successional/second growth riparian forest, and industrial habitats. During the wetland and waterbody delineation field surveys, one stream (Stream 1, Blanchard River) was identified within the Project area. Additionally, no wetlands or other waterbodies were identified within the Project area.

Features identified within the Project area were mapped by Stantec using handheld sub-meter accuracy Global Positioning System (GPS) unit and mapped with Geographic Information System (GIS) software and are shown on Figure 4.

Wetlands and waterbodies that are considered Waters of the United States (WOTUS) are subject to regulation under Sections 404 and 401 of the Clean Water Act (CWA) and placement of fill and/or dredging activities within WOTUS are regulated in Ohio by the U. S. Army Corps of Engineers (USACE) and Ohio Environmental Protection Agency (OEPA), respectively. With the new Navigable Waters Protection Rule that went into effect on June 22, 2020, the OEPA also regulates impacts to ephemeral streams and wetlands that are considered isolated and not WOTUS in the state of Ohio. Hancock County and the City of Findlay may also have local regulatory authority over certain types of wetlands and waterbodies. MWCD is the Project proponent and would need to obtain all required permits and approvals prior to initiation of the Project should impacts to WOTUS or State waters occur.

Due to the proposed addition of two riffle structures within the Blanchard River as part of the Project, MWCD would be required to receive authorization from the USACE and OEPA under Sections 404 and 401 of the



## ADDITIONAL HYDRAULIC IMPROVEMENTS PROJECT

CWA prior to initiation of any construction activities. The proposed Project components should be able to receive authorization through the USACE Nationwide Permit (NWP) application process under NWP 27 (Aquatic Habitat Restoration, Enhancement and Establishment Activities) Pre-Construction Notification (PCN). Additionally, MWCD would be required to comply with Section 7 of the Endangered Species Act (ESA) and Section 106 of the National Historic Preservation Act (NHPA) as part of the Section 404 and Section 401 CWA permitting process.



# ADDITIONAL HYDRAULIC IMPROVEMENTS PROJECT

Introduction  
September 28, 2020

## 1.0 INTRODUCTION

The Project is intended to increase the flood carrying capacity of the Blanchard River and reduce the WSEs upstream of the proposed Project areas. Recommendations for additional benching upstream of the existing Phase I and Phase II Hydraulic Improvements projects were made such that the WSE reduction benefits of the Project would be complimentary to Phase I and Phase II of the NS Railroad Bridge Expansion. In addition to the additional benching upstream of the Phase I and Phase II Hydraulic Improvements projects, MWCD requested Stantec to construct two additional riffle structures to add to the aesthetics of the Project.

The Project area is located between North Cory Street and Central Parkway in the City of Findlay, Hancock County, Ohio (Figure 1, Appendix A).

Stantec was retained by MWCD to perform a wetland and waterbody delineation study within the proposed Project area (Figure 1, Appendix A). Stantec biologists performed pedestrian field surveys for wetlands and waterbodies within the Project area on July 22, 2020. In addition to wetlands and waterbodies, Stantec also documented the locations of upland vegetation communities and land uses within the Project area. The dominant land uses within the Project area consisted of maintained lawn, mixed early successional/second growth riparian forest, and industrial habitats. During the wetland and waterbody delineation field surveys, one stream (Stream 1, Blanchard River) was identified within the Project area. Additionally, no wetlands or other waterbodies were identified within the Project area.

General flow of surface water in the surrounding area is south to the Blanchard River and eventually west into the Auglaize River in Putnam County, Ohio. Surface water within the Project area flows south via surface flow to the Blanchard River, which is located on the southern border of the Project area (Figure 4, Appendix A).

This report presents the findings of a wetland and waterbody delineation study conducted by Stantec within the Project area. Features identified within the Project area were mapped by Stantec using handheld sub-meter accuracy GPS unit and mapped with GIS software and are shown on Figure 4.



## ADDITIONAL HYDRAULIC IMPROVEMENTS PROJECT

Methods  
September 28, 2020

## 2.0 METHODS

### 2.1.1 Wetland Delineation

The wetland delineation was based on Stantec's professional judgment and interpretation of the technical criteria presented in the 1987 *Corps of Engineers Wetlands Delineation Manual* (USACE Manual; USACE 1987) and the USACE *Regional Supplement to the Corps of Engineers Wetland Delineation Manual Northcentral and Northeast Region Version 2.0* (The Northcentral and Northeast Regional Supplement; USACE 2012). The wetland boundaries, where present, were delineated using the routine onsite determination method described in the USACE Manual and Northcentral and Northeast Regional Supplement, supplemented by *The National Wetland Plant List: 2014 Wetland Ratings* (Lichvar 2014), *The National Wetland Plant List: 2016 Update of Wetland Ratings* (Lichvar et al. 2016), and *Field Indicators of Hydric Soils of the United States, Version 8.2* (USDA 2018). Wetland categories were classified using the Ohio Rapid Assessment Method (ORAM) for Wetlands Version 5.0 (Mack 2001). Stantec completed the following scope of services to identify and delineate wetland boundaries within the Project area:

1. Office Data Review: Stantec personnel reviewed the U.S. Geological Survey (USGS) topographic map with coverage of the Project area (Figure 1), U.S. Department of Agriculture (USDA) Soil Survey of Hancock County, Ohio (USDA 2020) (Figure 2), U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps (Figure 3), and the corresponding Hancock County hydric soils list. These resources were used to identify potential wetland areas and potential streams prior to completing field surveys.
2. Site Reconnaissance: Stantec performed the field survey portion of the wetland and waterbody delineation study on July 22, 2020, using the routine onsite determination method. First, the dominant plant species within each community were identified and a determination was made on whether the plant community was dominated by hydrophytic (wetland) plants. Next, a representative wetland determination sample point was located within plant communities that appeared to potentially be dominated by hydrophytic vegetation and soils were observed using a spade shovel to determine if hydric soil indicators were present. Lastly, the sample point location was observed to determine if indicators of wetland hydrology (inundation, soil saturation, etc.) were present. When a sample point location was determined to be within a wetland, further testing was to be performed to locate the wetland/upland boundary and a second sample point location was established outside of the wetland boundary to document conditions in the upland area. Wetland boundaries and the wetland determination sample points were located using a handheld sub-meter accuracy GPS unit and mapped with GIS software.
3. Data Collection: Northcentral and Northeast Regional Supplement wetland determination data forms for the routine onsite determination method were completed for two representative locations within the Project area (see Figure 4 for the wetland determination sample point locations and Appendix B for Northcentral and Northeast Regional Supplement wetland determination data



## ADDITIONAL HYDRAULIC IMPROVEMENTS PROJECT

Methods

September 28, 2020

forms). The data forms provide a record of the vegetation, soils, and hydrology observations used in making the wetland determinations

Stantec photographed the wetland determination sample point locations and vegetation communities located within the Project area. Representative photographs of the vegetation communities and wetland determination sample point locations are provided in Appendix C.

### 2.1.2 Stream Delineation

Streams that demonstrated a continuously defined channel (bed and bank), ordinary high water mark (OHWM), and the disturbance of terrestrial vegetation were delineated within the Project area, per the protocols outlined in the USACE's Guidance on Ordinary High Water Mark Identification (Regulatory Guidance Letter No. 05-05; USACE 2005). Delineated streams were classified as ephemeral, intermittent, or perennial per definitions in the Federal Register/Vol. 67, No. 10 (USACE 2002 ) and determined as potential Waters of the U.S. (WOTUS) per "The Navigable Waters Protection Rule" published in the Federal Register/Vol. 85, No. 77 (USACE 2020). Functional assessment of streams identified within the Project area was based on completion of the OEPA's Headwater Habitat Evaluation Index (HHEI; OEPA 2012) and/or Qualitative Habitat Evaluation Index (QHEI; OEPA 2006). The centerline or OHWM of each waterway was identified and surveyed using a handheld sub-meter accuracy GPS unit and mapped with GIS software. Additionally, the locations of upland drainage features (which lacked a continuously defined bed and bank/OHWM) were identified within the Project area and recorded with a sub-meter accuracy GPS unit during the field surveys.





## ADDITIONAL HYDRAULIC IMPROVEMENTS PROJECT

Findings  
September 28, 2020

### 3.0 FINDINGS

#### 3.1 SITE SOILS

The Web Soil Survey of Hancock County, Ohio (USDA 2020a) identifies two soil types within the Project area (Table 1, Figure 2). According to the Natural Resources Conservation Service (NRCS) Soil Data Access - Hydric Soils List for Hancock County, Ohio (USDA 2020b), one of the soil types within the Project area is considered to be partially hydric soil.

The Project area is made up of well-drained and somewhat poorly drained soils. The soils within the Project area have been previously disturbed. Therefore, some of the soils within the Project area may no longer reflect the characteristics of the soil mapping units in the NRCS database and web soil survey.

**Table 1. NRCS Soil Data**

Map Unit Symbol	Description	Drainage Class	Hydric Soil Rating
Ur	Urban	Well drained	Not Hydric
LcA	Lamberjack-Urban land complex, 0 to 2 percent slopes	Somewhat Poorly drained	Partially Hydric

#### 3.2 NATIONAL WETLANDS INVENTORY

NWI maps have been prepared by the USFWS (2018) based on high altitude infrared aerial photography and limited ground truthing. Wetlands and deep-water habitats are identified on these maps and classified according to the system developed by Cowardin and others. The aerial photographs reflect conditions during the specific year and season the data were acquired and all wetlands may not be indicated.

The NWI map (Figure 3) identifies one wetland community within the Project area. This NWI-mapped community consists of one riverine, lower perennial, unconsolidated bottom, permanently flooded (R2UBH) system within the Project area. As shown on Figure 4, Stantec identified this area as the Blanchard River.

#### 3.3 VEGETATION COMMUNITIES

The vegetation communities present within the Project area predominantly consist of maintained lawn, mixed early successional/second growth riparian forest, and industrial habitats. Dominant plant species comprising these vegetation communities were identified and the USFWS wetland plant indicator status was determined according to Lichvar (2014) and Lichvar et al. (2016). The USFWS has defined five wetland plant indicator categories, which include:

- Obligate wetland (OBL – has >99% probability of occurring in wetlands);



## ADDITIONAL HYDRAULIC IMPROVEMENTS PROJECT

### Findings

September 28, 2020

- Facultative wetland (FACW – has 66% to 99% chance of occurring in wetlands);
- Facultative (FAC – has 33% to 66% chance of occurring in wetlands);
- Facultative upland (FACU – has 1 to 33% chance of occurring in wetlands); and
- Upland (UPL – has <1% chance of occurring in wetlands).

Plants classified as OBL, FACW or FAC are, considered to be, wetland plants (hydrophytes) by the USFWS and USACE.

#### Maintained Lawn

Dominant plant species found within the maintained lawn habitats consisted of: Kentucky bluegrass (*Poa pratensis*), tall fescue (*Schedonorus arundinaceus*), Timothy grass (*Phleum pratense*), dandelion (*Taraxacum officinalis*), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), alsike clover (*Trifolium hybridum*), and broadleaf plantain (*Plantago major*).

#### Mixed Early Successional/Second Growth Riparian Forest

Dominant plant species found within the mixed early successional/second growth riparian forest habitats consisted of: Amur honeysuckle, green ash (*Fraxinus pennsylvanica*), Osage orange (*Maclura pomifera*), black walnut (*Juglans nigra*), eastern cottonwood, poison ivy (*Toxicodendron radicans*), American sycamore, riverbank wildrye (*Elymus riparius*), honeylocust (*Gleditsia triacanthos*), Virginia wildrye (*Elymus virginicus*), common hackberry (*Celtis occidentalis*), American elm (*Ulmus americana*), silver maple (*Acer saccharinum*), boxelder (*Acer negundo*), switchgrass, poison hemlock (*Conium maculatum*), American pokeweed (*Phytolacca americana*) and wingstem (*Verbesina alternifolia*).

#### Industrial

Industrial habitats within the Project area were dominated by disturbance-tolerant species such as Amur honeysuckle, lesser trefoil (*Trifolium dubium*), bird's-foot trefoil (*Lotus corniculatus*), alsike clover, hairy crabgrass (*Digitaria sanguinalis*), and common wormwood (*Artemisia vulgaris*).

### 3.4 HYDROLOGY

The Project is located within the Howard Run – Blanchard River watershed (12-Digit Hydrologic Unit Code [HUC] 041000080304) (Table 2). General flow of surface water in the surrounding area is south to the Blanchard River and eventually west into the Auglaize River in Putnam County, Ohio. One stream (Stream 1, Blanchard River) was identified within the Project area (Figure 4, Appendix A).

**Table 2. Watershed Information**

Watershed Name	12-Digit Hydrologic Unit Code (HUC)
Howard Run – Blanchard River	041000080304



## ADDITIONAL HYDRAULIC IMPROVEMENTS PROJECT

Findings  
September 28, 2020

### 3.5 WETLANDS

No wetlands were identified within the Project area. However, two wetland determination sample points (SP01 and SP02) were assessed in areas that displayed hydrophytic vegetation. Northcentral and Northeast Regional Supplement wetland determination data forms for SP01 and SP02 are provided in Appendix B and photographs of the wetland determination sample point locations are provided in Appendix C. The locations of the wetland determination sample points were recorded by Stantec using a sub-meter accuracy GPS unit (Figure 4, Appendix A).

### 3.6 STREAMS AND OTHER WATERS

One stream was identified within the Project area. Stream 1 (Blanchard River) is a USGS named stream. The QHEI data form is provided in Appendix B and photographs of the stream are provided in Appendix C. The location of the stream was recorded by Stantec using a sub-meter accuracy GPS unit (Figure 4, Appendix A). Additional information for Stream 1 can be seen in Table 3 below.

**Table 3. Stream Findings**

Wetland Name	Interpreted Stream Flow Regime	QHEI Score/ Narrative Rating	Approximate Bank to Bank Width (Feet)	Approximate OHWM Width (Feet)	Approximate Stream Length within Project Area (Feet)	Substrates
Stream 1 (Blanchard River)	Perennial	53/Fair	130	145	2,291.5	Boulder, cobble, gravel, sand, bedrock, detritus, muck, silt
<b>Total</b>					<b>2,291.5</b>	-



## **ADDITIONAL HYDRAULIC IMPROVEMENTS PROJECT**

Regulatory Considerations  
September 28, 2020

### **4.0 REGULATORY CONSIDERATIONS**

#### **4.1 MEETINGS WITH REGULATORY AGENCIES**

No meetings between regulatory agencies and Stantec have taken place at the time this report was prepared. The wetland and waterbody delineation findings presented in this document were developed based upon Stantec's professional training and experience and the results of the July 22, 2020, site visit.

#### **4.2 REGULATORY PERMITTING**

Impacts to jurisdictional waters (e.g., streams, wetlands, etc.) are regulated in the State of Ohio by the USACE and OEPA. Discharges of dredged or fill material into waters of the United States (WOTUS), including streams and wetlands, require permit approval from the USACE under the provisions of Section 404 of the Clean Water Act (CWA). In addition, filling in streams and wetlands also requires Water Quality Certification (WQC) from the OEPA under the provisions of Section 401 of the CWA. Regulatory authority over impacts to these waters lies with the USACE and OEPA in Ohio. Under the new "Navigable Waters Protection Rule" (effective June 22, 2020) ephemeral streams and wetlands that have no surface water connection to a traditional navigable water (TNW) (isolated wetlands) are not considered WOTUS, and therefore are not regulated by the USACE. In Ohio, ephemeral streams and isolated wetlands are considered waters of the State and are therefore regulated by the OEPA. Per new regulatory guidance, impacts to ephemeral streams and level 1 isolated wetlands in Ohio will now require issuance of a general permit from the OEPA. Additionally, any impacts to isolated wetlands categorized above a level 1 (level 2 or level 3) will require an Isolated Wetland Permit from the OEPA. Hancock County and the City of Findlay may also have local regulatory authority over certain types of wetlands and waterbodies.



## ADDITIONAL HYDRAULIC IMPROVEMENTS PROJECT

Conclusion  
September 28, 2020

### 5.0 CONCLUSION

On July 22, 2020, Stantec performed wetland and waterbody delineation field surveys within the Project area. The objective of the wetland and waterbody delineation study was to identify the extent and spatial arrangement of wetlands and waterbodies within the Project area that may be affected by Project construction activities.

One perennial stream (Stream 1, Blanchard River) totaling roughly 2,291.5 feet was identified within the Project area. Stream 1 achieved a QHEI score of 53 and a narrative rating of “fair” per the QHEI scoring methods (OEPA 2006). No wetlands or other waterbodies were identified within the Project area. However, due to the proposed addition of two riffle structures within the Blanchard River as part of the Project, MWCD would be required to receive authorization from the USACE and OEPA under Sections 404 and 401 of the CWA prior to initiation of any construction activities. The proposed Project components should be able to receive authorization through the USACE Nationwide Permit (NWP) application process under NWP 27 (Aquatic Habitat Restoration, Enhancement and Establishment Activities) Pre-Construction Notification (PCN). Additionally, MWCD would be required to demonstrate compliance with Section 7 of the Endangered Species Act (ESA) and Section 106 of the National Historic Preservation Act (NHPA) as part of the Section 404 and Section 401 CWA permitting process.



## ADDITIONAL HYDRAULIC IMPROVEMENTS PROJECT

Level of Care  
September 28, 2020

### 6.0 LEVEL OF CARE

The wetland and waterbody delineation services performed by Stantec were conducted in a manner consistent with the criteria contained in the USACE Manual and Northcentral and Northeast Regional Supplement and with the level of care and skill ordinarily exercised by members of the environmental consulting profession practicing contemporaneously under similar conditions in the locality of the Project. It must be recognized that the wetland and waterbody delineation was based on field observations and Stantec's professional interpretation of the criteria in the USACE Manual and Northcentral and Northeast Regional Supplement at the time of our field surveys. The ultimate determination regarding wetland boundaries rests with the USACE. As a result, there may be adjustments to wetland boundaries based upon review by a regulatory agency. An agency determination can vary from time to time depending on various factors including, but not limited to, the agency representative completing the review, the timeliness of the agency's review, recent precipitation patterns, and season of the year. In addition, the physical characteristics of the site can change over time, depending on the weather, vegetation patterns, drainage, activities on adjacent parcels, or other events. Any of these factors can change the nature and extent of wetlands on the site.



## ADDITIONAL HYDRAULIC IMPROVEMENTS PROJECT

References

September 28, 2020

### 7.0 REFERENCES

- Cowardin, L.M., V. Carter, F. Golet, and E. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. FWS/OBS-79/31. U.S. Department of the Interior, Fish and Wildlife Service, Biological Services Program, Washington, D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. Available online at <http://www.npwrc.usgs.gov/resource/1998/classwet/classwet.htm> (Version 04DEC98).
- Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. The National Wetland Plant List: 2014 Update of Wetland Ratings. *Phytoneuron* 2014-41: 1-42.
- Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. *Phytoneuron* 2016-30: 1-17.
- Mack, J.J. 2001. Ohio Rapid Assessment Method for Wetlands, Manual for Using Version 5.0. Ohio EPA Technical Bulletin Wetland/2001-1-1. Ohio Environmental Protection Agency, Division of Surface Water, 401 Wetland Ecology Unit, Columbus, Ohio.
- Ohio Environmental Protection Agency. 2006. Methods for Assessing Habitat in Flowing Waters: Using the Qualitative Habitat Evaluation Index (QHEI). Ohio EPA Division of Surface Water, Columbus, Ohio.
- OEPA. 2012. Field Evaluation Manual for Ohio's Primary Headwater Habitat Streams, Version 3.0. Ohio EPA Division of Surface Water, Columbus, Ohio. 117 pp.
- U.S. Army Corps of Engineers (USACE), Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. (TR Y-87-1). Vicksburg, MS: US Army Engineers Waterways Experiment Station.
- USACE. 2002. Issuance of Nationwide Permits; Notice, 67 Fed. Reg. 10. January 15, 2002. Federal Register: The Daily Journal of the United States. Available at <https://www.gpo.gov/fdsys/pkg/FR-2002-01-15/pdf/02-539.pdf>
- USACE. 2005. Guidance on Ordinary High Water Mark Identification. (Regulatory Guidance Letter, No. 05-05). Available online at <http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/GuidanceLetters.aspx>. Accessed August 2020.
- USACE. 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, C. V. Noble, and J. F. Berkowitz. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- USACE. 2020. The Navigable Waters Protection Rule: Definition of "Waters of the United States"; Vol 85, No. 77. Fed. Reg. 22250. April 21, 2020. Federal Register: The Daily Journal of the United States.



## ADDITIONAL HYDRAULIC IMPROVEMENTS PROJECT

### References

September 28, 2020

Available at <https://www.federalregister.gov/documents/2020/04/21/2020-02500/the-navigable-waters-protection-rule-definition-of-waters-of-the-united-states>.

U.S. Department of Agriculture Natural Resources Conservation Service (USDA). 2018. *Field Indicators of Hydric Soils of the United States, Version 8.2*. Available online at [https://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs142p2\\_053171.pdf](https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_053171.pdf). Accessed August 2020.

U.S. Department of Agriculture Natural Resources Conservation Service (USDA). 2020a. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/>. Accessed August 2020.

USDA. 2020b. Soil Data Access – Hydric Soils List. Hancock County, Ohio. Accessed August 2020 at: [https://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcseprd1316620.html](https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1316620.html).

U.S. Fish and Wildlife Service (USFWS). 2020. [Wetlands Spatial Data Layer]. *Wetland Geodatabase, National Wetlands Inventory*. Accessed August 2020.

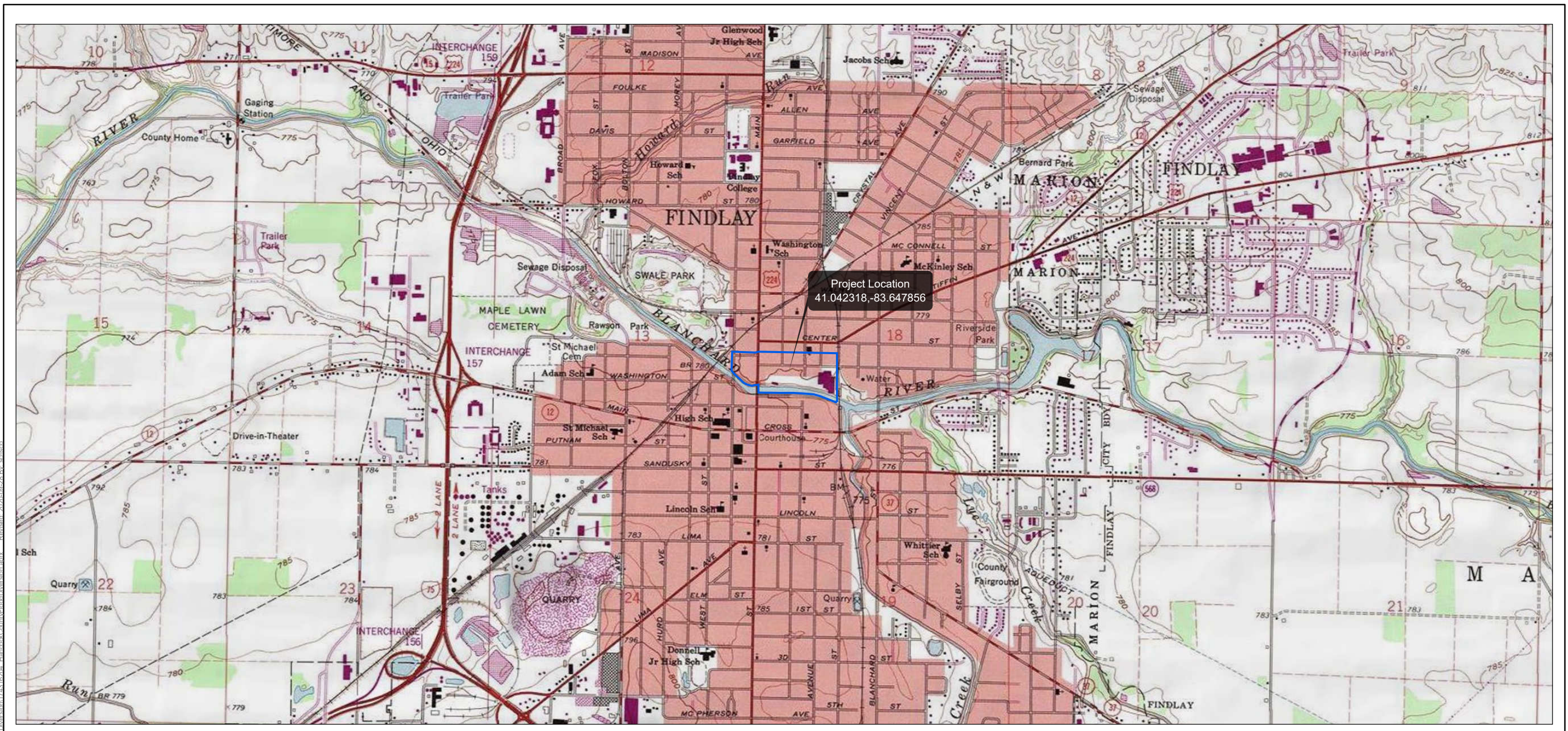




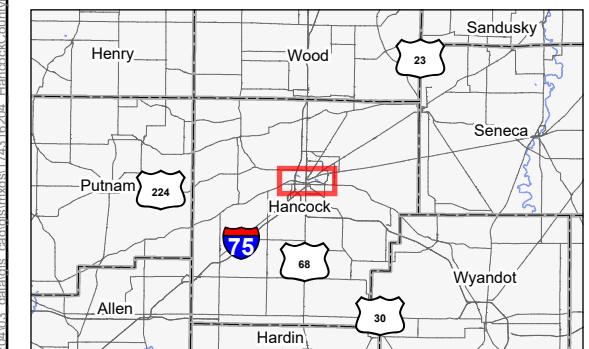
## Appendix A FIGURES

### FIGURE 1. PROJECT LOCATION MAP

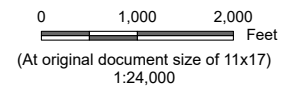




Project Location  
41.042318, -83.647856



Legend  
 Project Area



Project Location: Hancock County, OH  
 Prepared by SEC on 2020-08-20  
 TR by JH on 2020-08-20  
 IR by NTN on 2020-09-28

Client/Project: Maumee Watershed Conservancy District  
 Additional Hydraulic Improvements Project  
 174316204

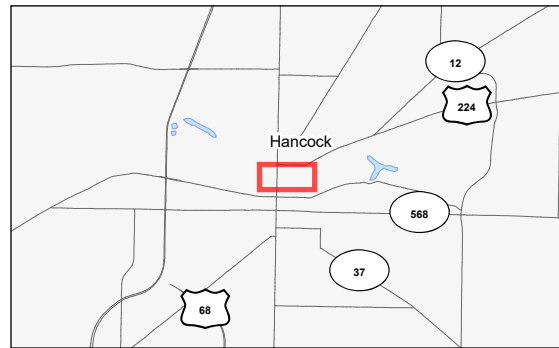
Figure No. 1

Title: Project Location Map

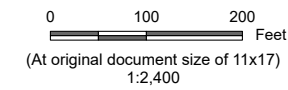
Notes  
 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet  
 2. Data Sources: Stantec, USGS, NADS  
 3. Background: 7.5' USGS Topographic Quadrangles

**FIGURE 2. NRCS SOIL SURVEY MAP**





- Legend**
- Project Area Limits of Construction
  - NRCS Soil Survey Data
  - Hydric Soil Rating
  - Predominately Hydric Soil
  - Partially Hydric Soil
  - Non-Hydric Soil



*Project Location*  
Hancock County, OH

Prepared by SEC on 2020-08-20  
TR by JH on 2020-08-20  
IR by NTN on 2020-09-29

*Client/Project*  
Maumee Watershed Conservancy District  
Additional Hydraulic Improvements Project

174316204

*Figure No.*  
**2**

*Title*  
**NRCS Soil Survey Map**

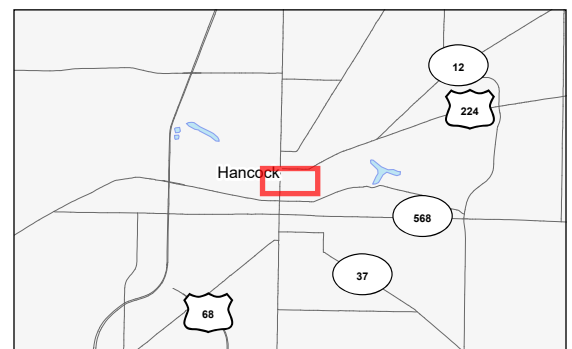
V:\174316204\03\_data\soils\_cad\soils\mxd\174316204\_HancockCountyEloodDiverison.aprx Revised: 2020-09-29 Bv: sc:isco

**FIGURE 3. NATIONAL WETLANDS INVENTORY MAP**

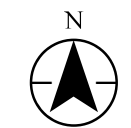
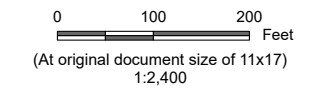




V:\174316204\03\_data\analysis\_endstates\174316204\_HancockCounty\Flood\Diversion.aprx Revised: 2020-08-28 Bv: scisco



- Legend**
- Project Area Limits of Construction
  - National Wetlands Inventory Feature
  - National Hydrography Dataset
  - ~ Perennial Stream\*
  - - - Intermittent Stream\*
  - Waterbody



*Project Location*  
Hancock County, OH

Prepared by SEC on 2020-08-20  
TR by JH on 2020-08-20  
IR by NTN on 2020-09-28

*Client/Project*  
Maumee Watershed Conservancy District  
Additional Hydraulic Improvements Project

174316204

*Figure No.*  
**3**

*Title*  
**National Wetlands Inventory Map**

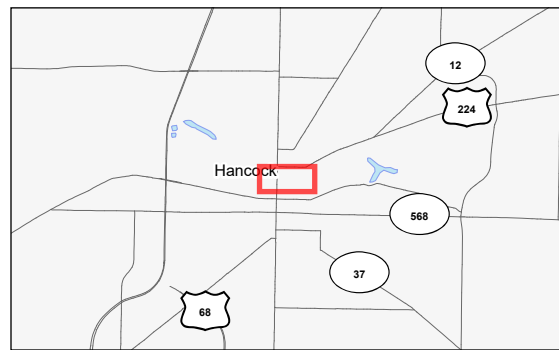
**Notes**  
 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet  
 2. Data Sources: Stantec, MWCD, USGS, USFWS, OGRIP, USDA  
 3. Background: 2017 NAIP

\*No Features Within Data Frame

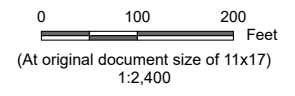
Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

**FIGURE 4. WETLAND AND WATERBODY DELINEATION MAP**





- Legend**
- Project Area Limits of Construction
  - Photo Location
  - Wetland Determination Sample Point
  - ▲ Existing Culvert
  - Upland Drainage Feature
  - ~ Field Delineated Waterway



*Project Location*  
Hancock County, OH

Prepared by SEC on 2020-08-20  
TR by JH on 2020-08-20  
IR by AK on 2020-09-02

*Client/Project*  
Maumee Watershed Conservancy District  
Additional Hydraulic Improvements Project

174316204

*Figure No.*  
**4**

*Title*  
**Wetland and Waterbody Delineation Map**

**Notes**  
 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet  
 2. Data Sources: Stantec, MWCD, USGS, USDA, OGRIP  
 3. Background: 2017 NAIP

V:\174316204\174316204\_03\_data\analysis\_end\shp\shp\174316204\_HancockCountyEloodDiverison.aprx ... Revised: 2020/09/21 Bcr.scisaco



## **Appendix B**      **DATA FORMS**

### **B.1 WETLAND DETERMINATION DATA FORMS**



Project/Site: <b>Additional Hydraulic Improvements Project</b>		Stantec Project #: <b>174316204</b>	Date: <b>07/22/20</b>
Applicant: <b>Maumee Watershed Conservancy District</b>		Investigator #1: <b>Aaron Kwolek</b>	Investigator #2: <b>Kate Bomar</b>
Soil Unit: <b>Urban Land</b>	NW1/WW1 Classification: <b>N/A</b>		County: <b>Hancock</b>
Landform: <b>Rise</b>	Local Relief: <b>Convex</b>	State: <b>Ohio</b>	Wetland ID: <b>Non-JD</b>
Slope (%): <b>1</b>	Latitude: <b>41.041585</b>	Longitude: <b>-83.650470</b>	Sample Point: <b>SP01</b>
Datum: <b>N/A</b>			Community ID: <b>Upland</b>
Are climatic/hydrologic conditions on the site typical for this time of year? (if no, explain in remarks)			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> significantly disturbed?		Are normal circumstances present?	
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> naturally problematic?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Section: <b>13</b>			Township: <b>1N</b>
Range: <b>10E</b>			

**SUMMARY OF FINDINGS**

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Hydric Soils Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is This Sampling Point Within A Wetland?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Remarks:

**HYDROLOGY**

Wetland Hydrology Indicators (Check here if indicators are not present)

<p><u>Primary:</u></p> <input type="checkbox"/> A1 - Surface Water <input type="checkbox"/> A2 - High Water Table <input type="checkbox"/> A3 - Saturation <input type="checkbox"/> B1 - Water Marks <input type="checkbox"/> B2 - Sediment Deposits <input type="checkbox"/> B3 - Drift Deposits <input type="checkbox"/> B4 - Algal Mat or Crust <input type="checkbox"/> B5 - Iron Deposits <input type="checkbox"/> B7 - Inundation Visible on Aerial Imagery <input type="checkbox"/> B8 - Sparsely Vegetated Concave Surface	<input type="checkbox"/> B9 - Water-Stained Leaves <input type="checkbox"/> B13 - Aquatic Fauna <input type="checkbox"/> B15 - Marl Deposits <input type="checkbox"/> C1 - Hydrogen Sulfide Odor <input type="checkbox"/> C3 - Oxidized Rhizospheres on Living Roots <input type="checkbox"/> C4 - Presence of Reduced Iron <input type="checkbox"/> C6 - Recent Iron Reduction in Tilled Soils <input type="checkbox"/> C7 - Thin Muck Surface <input type="checkbox"/> Other (Explain in Remarks)	<p><u>Secondary:</u></p> <input type="checkbox"/> B6 - Surface Soil Cracks <input type="checkbox"/> B10 - Drainage Patterns <input type="checkbox"/> B16 - Moss Trim Lines <input type="checkbox"/> C2 - Dry-Season Water Table <input type="checkbox"/> C8 - Crayfish Burrows <input type="checkbox"/> C9 - Saturation Visible on Aerial Imagery <input type="checkbox"/> D1 - Stunted or Stressed Plants <input type="checkbox"/> D2 - Geomorphic Position <input type="checkbox"/> D3 - Shallow Aquitard <input type="checkbox"/> D4 - Microtopographic Relief <input checked="" type="checkbox"/> D5 - FAC-Neutral Test
---	---	---

**Field Observations:**

Surface Water Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Depth: (in.)	<b>Wetland Hydrology Present?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Water Table Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Depth: (in.)	
Saturation Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Depth: (in.)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **N/A**

Remarks:

**SOILS**

Map Unit Name: **Urban Land** Series Drainage Class: **[E.g. Well Drained, Moderately Well Dra]**

**Profile Description** (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)

Top Depth	Bottom Depth	Horizon	Matrix			Redox Features				Texture (e.g. clay, sand, loam)	
			Color (Moist)	%		Color (Moist)	%	Type	Location		
0	8	1	10YR	4/4	100	--	--	--	--	--	silty clay loam
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--

**NRCS Hydric Soil Field Indicators** (check here if indicators are not present)

<input type="checkbox"/> A1 - Histosol <input type="checkbox"/> A2 - Histic Epipedon <input type="checkbox"/> A3 - Black Histic <input type="checkbox"/> A4 - Hydrogen Sulfide <input type="checkbox"/> A5 - Stratified Layers <input type="checkbox"/> A11 - Depleted Below Dark Surface <input type="checkbox"/> A12 - Thick Dark Surface <input type="checkbox"/> S1 - Sandy Muck Mineral <input type="checkbox"/> S4 - Sandy Gleyed Matrix <input type="checkbox"/> S5 - Sandy Redox <input type="checkbox"/> S6 - Stripped Dark Matrix <input type="checkbox"/> S7 - Dark Surface (LRR R, MLRA 149B)	<input type="checkbox"/> S8 - Polyvalue Below Surface (LRR R, MLRA 149B) <input type="checkbox"/> S9 - Thin Dark Surface (LRR R, MLRA 149B) <input type="checkbox"/> S11 - High Chroma Sands <input type="checkbox"/> F1 - Loamy Mucky Mineral (LRR K, L) <input type="checkbox"/> F2 - Loamy Gleyed Matrix <input type="checkbox"/> F3 - Depleted Matrix <input type="checkbox"/> F6 - Redox Dark Surface <input type="checkbox"/> F7 - Depleted Dark Surface <input type="checkbox"/> F8 - Redox Depressions	<p><b>Indicators for Problematic Soils</b><sup>1</sup></p> <input type="checkbox"/> A10 - 2 cm Muck (LRR K, L, MLRA 149B) <input type="checkbox"/> A16 - Coast Prairie Redox (LRR K, L, R) <input type="checkbox"/> S3 - 5cm Mucky Peat of Peat (LRR K, L, R) <input type="checkbox"/> S7 - Dark Surface (LRR K, L, M) <input type="checkbox"/> S8 - Polyvalue Below Surface (LRR K, L) <input type="checkbox"/> S9 - Thin Dark Surface (LRR K, L) <input type="checkbox"/> F12 - Iron-Manganese Masses (LRR K, L, R) <input type="checkbox"/> F19 - Piedmont Floodplain Soils (MLRA 149B) <input type="checkbox"/> F21 - Red Parent Material <input type="checkbox"/> TA6 - Mesic Spodic (MLRA 144A, 145, 149B) <input type="checkbox"/> TF12 - Very Shallow Dark Surface <input type="checkbox"/> Other (Explain in Remarks)
--	--	---

<sup>1</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (If Observed)** **Rock** **8"**

**Hydric Soil Present?**  Yes  No

Remarks:

Project/Site: **Additional Hydraulic Improvements Project**

Wetland ID: **Non-JD**

Sample Point: **SP01**

**VEGETATION** (Species identified in all uppercase are non-native species.)

Tree Stratum (Plot size: 10 meter radius)					<b>Dominance Test Worksheet</b>
1.	Species Name	% Cover	Dominant	Ind. Status	
2.	--	--	--	--	
3.	--	--	--	--	
4.	--	--	--	--	
5.	--	--	--	--	
6.	--	--	--	--	
7.	--	--	--	--	
8.	--	--	--	--	
9.	--	--	--	--	
10.	--	--	--	--	
		Total Cover =	0		

**Prevalence Index Worksheet**

Total % Cover of:

OBL spp.	40	x 1 =	40
FACW spp.	135	x 2 =	270
FAC spp.	10	x 3 =	30
FACU spp.	0	x 4 =	0
UPL spp.	0	x 5 =	0
Total		185 (A)	340 (B)

Prevalence Index = B/A = 1.838

Sapling/Shrub Stratum (Plot size: 5 meter radius)				
1.	<i>Fraxinus pennsylvanica</i>	40	Y	FACW
2.	<i>Salix nigra</i>	40	Y	OBL
3.	<i>Ulmus americana</i>	10	N	FACW
4.	<i>Populus deltoides</i>	10	N	FAC
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
		Total Cover =	100	

**Hydrophytic Vegetation Indicators:**

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Rapid Test for Hydrophytic Vegetation
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Dominance Test is > 50%
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Prevalence Index is ≤ 3.0 *
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Morphological Adaptations (Explain) *
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Problem Hydrophytic Vegetation (Explain) *

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

Herb Stratum (Plot size: 2 meter radius)				
1.	<i>Phalaris arundinacea</i>	85	Y	FACW
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
11.	--	--	--	--
12.	--	--	--	--
13.	--	--	--	--
14.	--	--	--	--
15.	--	--	--	--
		Total Cover =	85	

**Definitions of Vegetation Strata:**

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

**Sapling/Shrub** - Woody plants less than 3 in. DBH and greater than 3.28 ft. 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.

Woody Vine Stratum (Plot size: 10 meter radius)				
1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
		Total Cover =	0	

**Hydrophytic Vegetation Present**  Yes  No

Remarks:

**Additional Remarks:**

Project/Site: <b>Additional Hydraulic Improvements Project</b>		Stantec Project #: <b>174316204</b>	Date: <b>07/22/20</b>
Applicant: <b>Maumee Watershed Conservancy District</b>			County: <b>Hancock</b>
Investigator #1: <b>Aaron Kwolek</b>	Investigator #2: <b>Kate Bomar</b>		State: <b>Ohio</b>
Soil Unit: <b>Urban Land</b>	NW1/WW1 Classification: <b>N/A</b>		Wetland ID: <b>Non-JD</b>
Landform: <b>Rise</b>	Local Relief: <b>Convex</b>		Sample Point: <b>SP02</b>
Slope (%): <b>1</b>	Latitude: <b>41.041589</b>	Longitude: <b>-83.649867</b>	Community ID: <b>Upland</b>
Are climatic/hydrologic conditions on the site typical for this time of year? (if no, explain in remarks)			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> significantly disturbed?		Are normal circumstances present?	
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> naturally problematic?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Section: <b>18</b>			Township: <b>1N</b>
Range: <b>11E</b>			

**SUMMARY OF FINDINGS**

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Hydric Soils Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is This Sampling Point Within A Wetland?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Remarks:

**HYDROLOGY**

Wetland Hydrology Indicators (Check here if indicators are not present)

<p><u>Primary:</u></p> <input type="checkbox"/> A1 - Surface Water <input type="checkbox"/> A2 - High Water Table <input type="checkbox"/> A3 - Saturation <input type="checkbox"/> B1 - Water Marks <input type="checkbox"/> B2 - Sediment Deposits <input type="checkbox"/> B3 - Drift Deposits <input type="checkbox"/> B4 - Algal Mat or Crust <input type="checkbox"/> B5 - Iron Deposits <input type="checkbox"/> B7 - Inundation Visible on Aerial Imagery <input type="checkbox"/> B8 - Sparsely Vegetated Concave Surface	<input type="checkbox"/> B9 - Water-Stained Leaves <input type="checkbox"/> B13 - Aquatic Fauna <input type="checkbox"/> B15 - Marl Deposits <input type="checkbox"/> C1 - Hydrogen Sulfide Odor <input type="checkbox"/> C3 - Oxidized Rhizospheres on Living Roots <input type="checkbox"/> C4 - Presence of Reduced Iron <input type="checkbox"/> C6 - Recent Iron Reduction in Tilled Soils <input type="checkbox"/> C7 - Thin Muck Surface <input type="checkbox"/> Other (Explain in Remarks)	<p><u>Secondary:</u></p> <input type="checkbox"/> B6 - Surface Soil Cracks <input type="checkbox"/> B10 - Drainage Patterns <input type="checkbox"/> B16 - Moss Trim Lines <input type="checkbox"/> C2 - Dry-Season Water Table <input type="checkbox"/> C8 - Crayfish Burrows <input type="checkbox"/> C9 - Saturation Visible on Aerial Imagery <input type="checkbox"/> D1 - Stunted or Stressed Plants <input type="checkbox"/> D2 - Geomorphic Position <input type="checkbox"/> D3 - Shallow Aquitard <input type="checkbox"/> D4 - Microtopographic Relief <input checked="" type="checkbox"/> D5 - FAC-Neutral Test
---	---	---

**Field Observations:**

Surface Water Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Depth: (in.)	<b>Wetland Hydrology Present?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Water Table Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Depth: (in.)	
Saturation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Depth: (in.)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: **N/A**

Remarks:

**SOILS**

Map Unit Name: **Urban Land** Series Drainage Class: **[E.g. Well Drained, Moderately Well Dra**

**Profile Description** (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)

Top Depth	Bottom Depth	Horizon	Matrix			Redox Features				Texture (e.g. clay, sand, loam)	
			Color (Moist)	%		Color (Moist)	%	Type	Location		
0	8	1	2.5Y	3/2	100	--	--	--	--	--	silty clay loam
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--

**NRCS Hydric Soil Field Indicators** (check here if indicators are not present)

<input type="checkbox"/> A1 - Histosol <input type="checkbox"/> A2 - Histic Epipedon <input type="checkbox"/> A3 - Black Histic <input type="checkbox"/> A4 - Hydrogen Sulfide <input type="checkbox"/> A5 - Stratified Layers <input type="checkbox"/> A11 - Depleted Below Dark Surface <input type="checkbox"/> A12 - Thick Dark Surface <input type="checkbox"/> S1 - Sandy Muck Mineral <input type="checkbox"/> S4 - Sandy Gleyed Matrix <input type="checkbox"/> S5 - Sandy Redox <input type="checkbox"/> S6 - Stripped Dark Matrix <input type="checkbox"/> S7 - Dark Surface (LRR R, MLRA 149B)	<input type="checkbox"/> S8 - Polyvalue Below Surface (LRR R, MLRA 149B) <input type="checkbox"/> S9 - Thin Dark Surface (LRR R, MLRA 149B) <input type="checkbox"/> S11 - High Chroma Sands <input type="checkbox"/> F1 - Loamy Mucky Mineral (LRR K, L) <input type="checkbox"/> F2 - Loamy Gleyed Matrix <input type="checkbox"/> F3 - Depleted Matrix <input type="checkbox"/> F6 - Redox Dark Surface <input type="checkbox"/> F7 - Depleted Dark Surface <input type="checkbox"/> F8 - Redox Depressions	<p><b>Indicators for Problematic Soils</b><sup>1</sup></p> <input type="checkbox"/> A10 - 2 cm Muck (LRR K, L, MLRA 149B) <input type="checkbox"/> A16 - Coast Prairie Redox (LRR K, L, R) <input type="checkbox"/> S3 - 5cm Mucky Peat of Peat (LRR K, L, R) <input type="checkbox"/> S7 - Dark Surface (LRR K, L, M) <input type="checkbox"/> S8 - Polyvalue Below Surface (LRR K, L) <input type="checkbox"/> S9 - Thin Dark Surface (LRR K, L) <input type="checkbox"/> F12 - Iron-Manganese Masses (LRR K, L, R) <input type="checkbox"/> F19 - Piedmont Floodplain Soils (MLRA 149B) <input type="checkbox"/> F21 - Red Parent Material <input type="checkbox"/> TA6 - Mesic Spodic (MLRA 144A, 145, 149B) <input type="checkbox"/> TF12 - Very Shallow Dark Surface <input type="checkbox"/> Other (Explain in Remarks)
--	--	---

<sup>1</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (If Observed)**  Rock  8"

**Hydric Soil Present?**  Yes  No

Remarks:

Project/Site: **Additional Hydraulic Improvements Project**

Wetland ID: **Non-JD**

Sample Point: **SP02**

**VEGETATION** (Species identified in all uppercase are non-native species.)

Tree Stratum (Plot size: 10 meter radius)					<b>Dominance Test Worksheet</b>  Number of Dominant Species that are OBL, FACW, or FAC: <u>  2  </u> (A)  Total Number of Dominant Species Across All Strata: <u>  2  </u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u> 100% </u> (A/B)
#	Species Name	% Cover	Dominant	Ind. Status	
1.	--	--	--	--	
2.	--	--	--	--	
3.	--	--	--	--	
4.	--	--	--	--	
5.	--	--	--	--	
6.	--	--	--	--	
7.	--	--	--	--	
8.	--	--	--	--	
9.	--	--	--	--	
10.	--	--	--	--	
Total Cover =		<b>0</b>			
Sapling/Shrub Stratum (Plot size: 5 meter radius)					<b>Prevalence Index Worksheet</b> Total % Cover of: <span style="float: right;">Multiply by:</span> OBL spp. <u>  95  </u> x 1 = <u>  95  </u> FACW spp. <u>  85  </u> x 2 = <u> 170  </u> FAC spp. <u>  0  </u> x 3 = <u>  0  </u> FACU spp. <u>  0  </u> x 4 = <u>  0  </u> UPL spp. <u>  0  </u> x 5 = <u>  0  </u>  Total <u> 180 </u> (A) <span style="float: right;"><u> 265 </u> (B)</span>  Prevalence Index = B/A = <u> 1.472 </u>
#	Species Name	% Cover	Dominant	Ind. Status	
1.	<i>Salix nigra</i>	95	Y	OBL	
2.	--	--	--	--	
3.	--	--	--	--	
4.	--	--	--	--	
5.	--	--	--	--	
6.	--	--	--	--	
7.	--	--	--	--	
8.	--	--	--	--	
9.	--	--	--	--	
10.	--	--	--	--	
Total Cover =		<b>95</b>			
Herb Stratum (Plot size: 2 meter radius)					<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Dominance Test is > 50% <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Prevalence Index is ≤ 3.0 * <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Morphological Adaptations (Explain) * <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Problem Hydrophytic Vegetation (Explain) *  * Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
#	Species Name	% Cover	Dominant	Ind. Status	
1.	<i>Phalaris arundinacea</i>	85	Y	FACW	
2.	--	--	--	--	
3.	--	--	--	--	
4.	--	--	--	--	
5.	--	--	--	--	
6.	--	--	--	--	
7.	--	--	--	--	
8.	--	--	--	--	
9.	--	--	--	--	
10.	--	--	--	--	
11.	--	--	--	--	
12.	--	--	--	--	
13.	--	--	--	--	
14.	--	--	--	--	
15.	--	--	--	--	
Total Cover =		<b>85</b>			
Woody Vine Stratum (Plot size: 10 meter radius)					<b>Definitions of Vegetation Strata:</b>  <p style="margin-left: 40px;"><b>Tree</b> - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.</p> <p style="margin-left: 40px;"><b>Sapling/Shrub</b> - Woody plants less than 3 in. DBH and greater than 3.28 ft. tall.</p> <p style="margin-left: 40px;"><b>Herb</b> - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall.</p> <p style="margin-left: 40px;"><b>Woody Vines</b> - All woody vines greater than 3.28 ft. in height.</p>
#	Species Name	% Cover	Dominant	Ind. Status	
1.	--	--	--	--	
2.	--	--	--	--	
3.	--	--	--	--	
4.	--	--	--	--	
5.	--	--	--	--	
Total Cover =		<b>0</b>			

Remarks:

**Additional Remarks:**

**Hydrophytic Vegetation Present**  Yes  No

## B.2 QHEI DATA FORM



Stream & Location: Additional Hydraulic Improvements Project RM: \_\_\_\_\_ Date: 07/22/06  
Stream 1 / Blanchard River Scorers Full Name & Affiliation: Arcan Kwalek / Stantec

River Code: \_\_\_\_\_ STORET #: \_\_\_\_\_ Lat./ Long.: 41.0414 183.6505 Office verified location   
(NAD 83 - decimal)

**1] SUBSTRATE** Check ONLY Two substrate TYPE BOXES: estimate % or note every type present

<b>BEST TYPES</b>		<b>OTHER TYPES</b>		<b>ORIGIN</b>		<b>QUALITY</b>		<b>Substrate</b> <span style="border: 1px solid black; border-radius: 50%; padding: 5px;">16</span> Maximum 20
<input type="checkbox"/> BLDG / SLABS [10]	<input checked="" type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/> SILT	<input type="checkbox"/> HEAVY [-2]	<input type="checkbox"/> MODERATE [-1]	
<input type="checkbox"/> BOULDER [9]	<input checked="" type="checkbox"/> X	<input type="checkbox"/> DETRITUS [3]	<input checked="" type="checkbox"/> X	<input checked="" type="checkbox"/> TILLS [1]	<input type="checkbox"/> WETLANDS [0]	<input type="checkbox"/> NORMAL [0]	<input type="checkbox"/> FREE [1]	
<input checked="" type="checkbox"/> COBBLE [8]	<input checked="" type="checkbox"/> X	<input type="checkbox"/> MUCK [2]	<input checked="" type="checkbox"/> X	<input type="checkbox"/> HARDPAN [0]	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> EXTENSIVE [-2]	<input checked="" type="checkbox"/> MODERATE [-1]	
<input checked="" type="checkbox"/> GRAVEL [7]	<input checked="" type="checkbox"/> X	<input type="checkbox"/> SILT [2]	<input checked="" type="checkbox"/> X	<input type="checkbox"/> RIP/RAP [0]	<input type="checkbox"/> LACUSTURINE [0]	<input type="checkbox"/> NORMAL [0]	<input type="checkbox"/> NONE [1]	
<input type="checkbox"/> SAND [6]	<input checked="" type="checkbox"/> X	<input type="checkbox"/> ARTIFICIAL [0]		<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> COAL FINES [-2]			
<input type="checkbox"/> BEDROCK [5]	<input checked="" type="checkbox"/> X							

NUMBER OF BEST TYPES: 4 or more [2] sludge from point-sources)  3 or less [0]

Comments \_\_\_\_\_

**2] INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> POOLS > 70cm [2]	<input type="checkbox"/> OXBOWS, BACKWATERS [1]	<b>AMOUNT</b> Check ONE (Or 2 & average) <input type="checkbox"/> EXTENSIVE >75% [11] <input type="checkbox"/> MODERATE 25-75% [7] <input checked="" type="checkbox"/> SPARSE 5-25% [3] <input type="checkbox"/> NEARLY ABSENT <5% [1]
<input type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> ROOTWADS [1]	<input type="checkbox"/> AQUATIC MACROPHYTES [1]	
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]	<input checked="" type="checkbox"/> LOGS OR WOODY DEBRIS [1]	<b>Cover</b> Maximum 20 <span style="border: 1px solid black; border-radius: 50%; padding: 5px;">6</span>

Comments \_\_\_\_\_

**3] CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

<b>SINUOSITY</b>	<b>DEVELOPMENT</b>	<b>CHANNELIZATION</b>	<b>STABILITY</b>	<b>Channel</b> Maximum 20 <span style="border: 1px solid black; border-radius: 50%; padding: 5px;">12</span>
<input type="checkbox"/> HIGH [4] <input checked="" type="checkbox"/> MODERATE [3] <input type="checkbox"/> LOW [2] <input type="checkbox"/> NONE [1]	<input type="checkbox"/> EXCELLENT [7] <input checked="" type="checkbox"/> GOOD [5] <input type="checkbox"/> FAIR [3] <input type="checkbox"/> POOR [1]	<input type="checkbox"/> NONE [6] <input type="checkbox"/> RECOVERED [4] <input checked="" type="checkbox"/> RECOVERING [3] <input type="checkbox"/> RECENT OR NO RECOVERY [1]	<input type="checkbox"/> HIGH [3] <input checked="" type="checkbox"/> MODERATE [2] <input type="checkbox"/> LOW [1]	

Comments \_\_\_\_\_

**4] BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

<b>EROSION</b>	<b>RIPARIAN WIDTH</b>	<b>FLOOD PLAIN QUALITY</b>	<b>Recreation Potential</b> Primary Contact Secondary Contact <small>(circle one and comment on back)</small>
<input checked="" type="checkbox"/> NONE / LITTLE [3] <input checked="" type="checkbox"/> MODERATE [2] <input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> WIDE > 50m [4] <input type="checkbox"/> MODERATE 10-50m [3] <input type="checkbox"/> NARROW 5-10m [2] <input checked="" type="checkbox"/> VERY NARROW < 5m [1] <input checked="" type="checkbox"/> NONE [0]	<input type="checkbox"/> FOREST, SWAMP [3] <input type="checkbox"/> SHRUB OR OLD FIELD [2] <input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1] <input type="checkbox"/> FENCED PASTURE [1] <input type="checkbox"/> OPEN PASTURE, ROWCROP [0]	

Comments \_\_\_\_\_

**5] POOL / GLIDE AND RIFFLE / RUN QUALITY**

<b>MAXIMUM DEPTH</b> Check ONE (ONLY!)	<b>CHANNEL WIDTH</b> Check ONE (Or 2 & average)	<b>CURRENT VELOCITY</b> Check ALL that apply	<b>Pool / Current</b> Maximum 12 <span style="border: 1px solid black; border-radius: 50%; padding: 5px;">5</span>
<input type="checkbox"/> > 1m [6] <input type="checkbox"/> 0.7-1m [4] <input checked="" type="checkbox"/> 0.4-0.7m [2] <input type="checkbox"/> 0.2-0.4m [1] <input type="checkbox"/> < 0.2m [0]	<input checked="" type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2] <input type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1] <input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [0]	<input type="checkbox"/> TORRENTIAL [-1] <input type="checkbox"/> VERY FAST [1] <input type="checkbox"/> FAST [1] <input checked="" type="checkbox"/> MODERATE [1] <input type="checkbox"/> SLOW [1] <input type="checkbox"/> INTERSTITIAL [-1] <input type="checkbox"/> INTERMITTENT [-2] <input type="checkbox"/> EDDIES [1]	

Comments \_\_\_\_\_

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:  NO RIFFLE [metric=0]

<b>RIFFLE DEPTH</b>	<b>RUN DEPTH</b>	<b>RIFFLE / RUN SUBSTRATE</b>	<b>RIFFLE / RUN EMBEDDEDNESS</b>
<input checked="" type="checkbox"/> BEST AREAS > 10cm [2] <input type="checkbox"/> BEST AREAS 5-10cm [1] <input type="checkbox"/> BEST AREAS < 5cm [metric=0]	<input type="checkbox"/> MAXIMUM > 50cm [2] <input checked="" type="checkbox"/> MAXIMUM < 50cm [1]	<input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2] <input checked="" type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1] <input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> NONE [2] <input type="checkbox"/> LOW [1] <input checked="" type="checkbox"/> MODERATE [0] <input type="checkbox"/> EXTENSIVE [-1]

Comments \_\_\_\_\_

**6] GRADIENT** (3.61 ft/mi)  VERY LOW - LOW [2-4]  MODERATE [6-10]  HIGH - VERY HIGH [10-6]

**DRAINAGE AREA** (330 mi<sup>2</sup>)

% POOL: 10 % GLIDE: 5 % RUN: 25 % RIFFLE: 60

**Gradient** Maximum 10 8

Comment RE: Reach consistency/Is reach typical of stream? R  
 CSO cutbanks upstream, trash (nets/cass) within river, recent dam removal etc.

**AJ SAMPLING REACH**  
 Check ALL that apply

**METHOD STAGE**

- BOAT
- WADE
- L. LINE
- OTHER
- NORMAL
- HIGH
- UP
- LOW
- DRY

**DISTANCE**

- 0.5 Km
- 0.2 Km
- 0.15 Km
- 0.12 Km
- OTHER

**CLARITY**

- 1st -sample pass-
- 2nd
- < 20 cm
- 20-40 cm
- 40-70 cm
- > 70 cm/CTB
- SECCHI DEPTH

**CANOPY**

- > 85% - OPEN
- 55% - < 85%
- 30% - < 55%
- 10% - < 30%
- < 10% - CLOSED

**CJ RECREATION**

- AREA
- DEPTH
- POOL:  > 100ft  > 3ft

**BJ AESTHETICS**

- NUISANCE ALGAE
- INVASIVE MACROPHYTES
- EXCESS TURBIDITY
- DISCOLORATION
- FOAM / SCUM
- OIL SHEEN
- TRASH / LITTER
- NUISANCE ODOR
- SLUDGE DEPOSITS
- CSOs/SSOs/OUTFALLS

**DJ MAINTENANCE**

- PUBLIC / PRIVATE / BOTH / NA
- ACTIVE / HISTORIC / BOTH / NA
- YOUNG-SUCCESSION-OLD
- SPRAY / SNAG / REMOVED
- MODIFIED / DIPPED OUT / NA
- LEVEED / ONE SIDED
- RELOCATED / CUTOFFS
- MOVING-BEDLOAD-STABLE
- ARMoured / SLUMPS
- ISLANDS / SCoured
- IMPOUNDED / DESICCATED
- FLOOD CONTROL / DRAINAGE

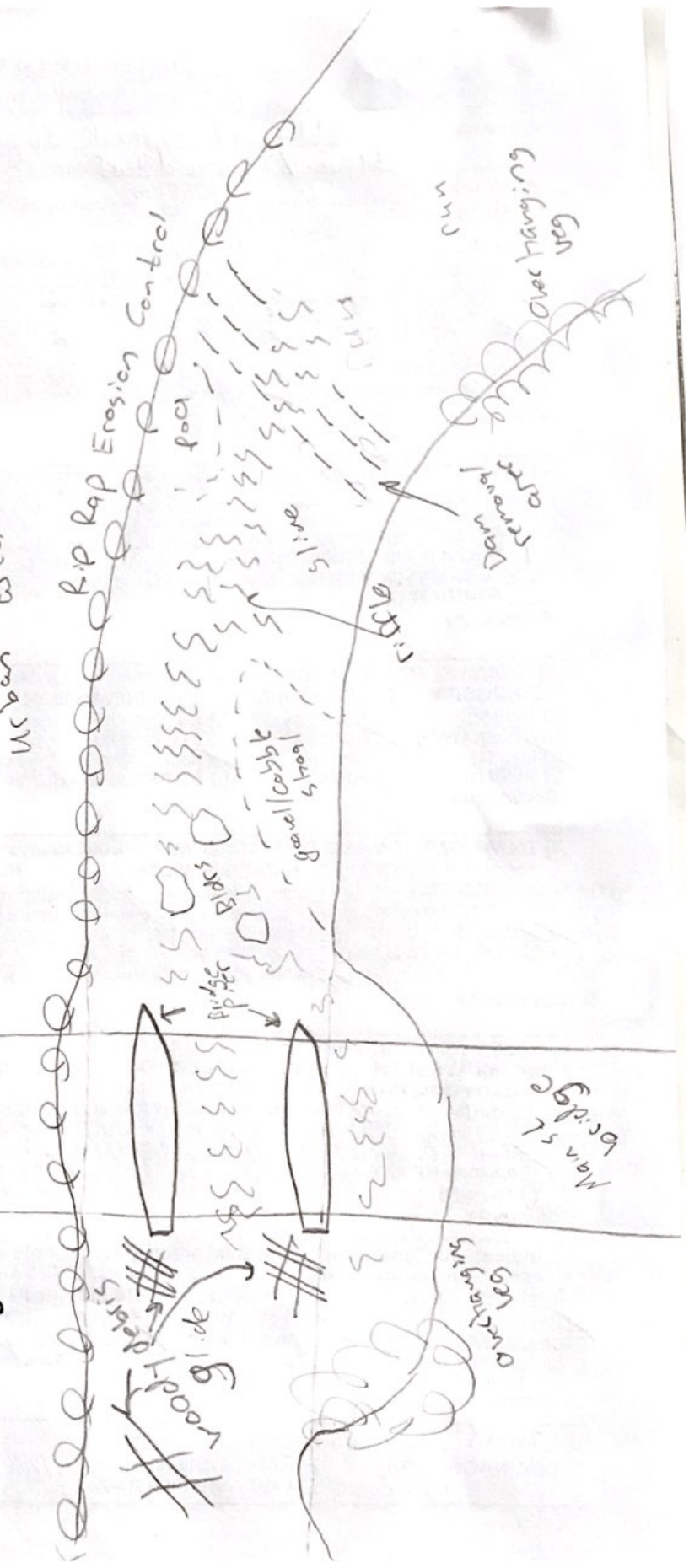
**EJ ISSUES**

- WWTP / CSO / NPDES / INDUSTRY
- HARDENED / URBAN / DIRT&GRIME
- CONTAMINATED / LANDFILL
- BMPs-CONSTRUCTION-SEDIMENT
- LOGGING / IRRIGATION / COOLING
- BANK EROSION / SURFACE
- FALSE BANK / MANURE / LAGOON
- WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE
- ACID / MINE / QUARRY / FLOW
- NATURAL / WETLAND / STAGNANT
- PARK / GOLF / LAWN / HOME
- ATMOSPHERE / DATA PAUCITY

**FJ MEASUREMENTS**

- width
- depth
- max. depth
- bankfull width
- bankfull x depth
- W/D ratio
- bankfull max. depth
- floodprone x width
- entrench. ratio
- Legacy Trees

**Stream Drawing:**





## Appendix C PHOTOGRAPHS



Maumee Watershed Conservation District  
Additional Hydraulic Improvements Project  
Hancock County, Ohio



Photo Location 1. View of Stream 1/Blanchard River. Photograph taken facing upstream/east.



Photo Location 1. View of Stream 1/Blanchard River. Photograph taken facing downstream/west.

Maumee Watershed Conservation District  
Additional Hydraulic Improvements Project  
Hancock County, Ohio



Photo Location 2. View of Stream 1/Blanchard River. Photograph taken facing upstream/east.



Photo Location 2. View of Stream 1/Blanchard River. Photograph taken facing downstream/west.



Photo Location 3. View of wetland determination sample point SP01. Photograph taken facing north.



Photo Location 3. View of wetland determination sample point SP01. Photograph taken facing south.



Photo Location 4. View of wetland determination sample point SP02. Photograph taken facing east.



Photo Location 4. View of wetland determination sample point SP02. Photograph taken facing northwest.

Maumee Watershed Conservation District  
Additional Hydraulic Improvements Project  
Hancock County, Ohio



Photo Location 5. View of industrial habitat. Photograph taken facing east.



Photo Location 6. View of maintained lawn habitat. Photograph taken facing south.



Photo Location 7. View of mixed early successional/second growth riparian forest.  
Photograph taken facing southeast.