Section 594 Ohio and North Dakota Environmental Infrastructure Program

Draft Environmental Assessment
Draft Finding of No Significant Impact

Glenwood Wastewater Collection and Treatment Project, Preble County, Ohio

United States Army Corps of Engineers
Louisville District

January 2024

DRAFT FINDING OF NO SIGNIFICANT IMPACT

Glenwood Wastewater Collection and Treatment Project, Preble County, Ohio

The U.S. Army Corps of Engineers, Louisville District (USACE) has conducted an Environmental Assessment (EA) in accordance with the National Environmental Policy Act of 1969, as amended, for the Glenwood Wastewater Collection and Treatment Project, which addresses the need for sanitary sewer services in the Glenwood community in Preble County, Ohio.

The Draft EA, date [PENDING] incorporated herein by reference, evaluated various alternatives that would provide reliable sanitary sewer service to the community of Glenwood while removing failing septic systems from service in the study area. The Recommended Plan is to construct an extended aeration wastewater treatment plant (WWTP) and a gravity sewer system and includes:

- Construction of a 25,359-foot gravity sewer collection system,
- Construction of an extended aeration WWTP,
- Construction of a 1000-foot-long access road, and
- Construction of two pump stations.

In addition to a "no action", five alternatives were evaluated. The alternatives included a gravity collection system with extended aeration treatment, a gravity collection system with lagoon treatment, a Septic Tank Effluent Pumping (STEP) sewer collection system with packed bed media treatment, a grinder sewer collection system with extended aeration treatment, and a grinder sewer collection system with lagoon treatment. Comparison of alternatives and selection of the Recommended Plan are addressed in Section 2.0 of the below EA.

For all alternatives, the potential effects were evaluated, as appropriate. A summary assessment of the potential effects of the Recommended Plan are listed in Table i.

Table i. Summary of Potential Effects of the Recommended Plan

	Insignificant effects	Insignificant effects as a result of mitigation	Resource unaffected by action
Aesthetics	☒	☐	☐
Air quality	☒	☐	☐
Wetlands	☒	☐	☐
Aquatic habitat/Water quality	☒	☐	☐
Floodplains	☒	☐	☐
Invasive species	☒	☐	☐
Terrestrial habitat	☒	☐	☐

Threatened/Endangered species/critical habitat	☒	☐	☐
Historic properties	☐	☒	☐
Other cultural resources	☐	☒	☐
Floodplains	☒	☐	☐
Hazardous, toxic & radioactive waste	☒	☐	☐
Land use	☒	☐	☐
Noise levels	☒	☐	☐
Socioeconomics	☐	☐	☒
Environmental justice	☐	☐	☒
Soils	☒	☐	☐
Tribal trust resources	☐	☐	☒
Climate	☒	☐	☐
Prime and unique farmland	☒	☐	☐
Transportation and traffic	☒	☐	☐
Health and Safety	☐	☐	☒

All practical and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the Recommended Plan. Best management practices (BMPs) as detailed in the Draft EA will be implemented, if appropriate, to minimize impacts. BMPs include, but are not limited to, stormwater protection devices, reseeding de-vegetated areas, and restoring disturbed wetland/stream areas to their previous contours after construction is completed.

The project nonfederal sponsor will be responsible for all mitigation associated with the Recommended Plan.

Public review of the draft EA and Finding of No Significant Impact (FONSI) was completed on [PENDING]. All comments submitted during the public review period will be responded to in the Final EA and FONSI, and any necessary changes will be incorporated.

Pursuant to Section 7 of the Endangered Species Act of 1973, as amended, USACE determined that the Recommended Plan may affect but is not likely to adversely affect the following federally listed species or their designated critical habitat: Indiana bat, northern long-eared bat, tricolored bat, and monarch butterfly. The U.S. Fish and Wildlife Service concurred with USACE's determinations on [PENDING].

Pursuant to Section 7 of the Endangered Species Act of 1973, as amended, USACE determined that the Recommended Plan would have no effect on the following federally listed species or their designated critical habitat: whooping crane and eastern Massasauga.

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, USACE determined that historic properties may be adversely affected by the Recommended Plan. USACE and the Ohio State Historic Preservation Officer (SHPO) entered in a Programmatic Agreement (PA) dated [PENDING]. USACE shall implement all terms and conditions resulting from the agreement that are its responsibility in order to minimize adverse impacts to historic properties and comply with

Section 106 of the NHPA.

A water quality certification pursuant to Section 401 of the Clean Water Act will be acquired by the nonfederal sponsor prior to construction.

All applicable environmental laws have been considered and coordination with appropriate agencies and officials has been completed.

Technical, environmental, and economic criteria used in the formulation of alternative plans were those specified in the Water Resources Council's 1983 Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies. All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on this report, the reviews by other Federal, State and local agencies, Tribes, input of the public, and the review by my staff, it is my determination that the Recommended Plan would not cause significant adverse effects on the quality of the human environment; therefore, preparation of an Environmental Impact Statement is not required.

_____ _____

Date

Reyn L. Mann
Colonel, U.S. Army
District Commander

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1.0 Project Description

1.1 Project Background and Authorization

The purpose of this Environmental Assessment (EA) is to analyze the potential environmental impacts related to the proposed Glenwood Wastewater Collection and Treatment Project, Preble County, Ohio (Project), and to determine whether the preparation of an Environmental Impact Statement (EIS) is required.

The proposed Project would be carried out through a project partnership agreement between Preble County (Non-Federal Sponsor) and the Louisville District United States Army Corps of Engineers (USACE) established under the authority of Section 594 of the Water Resources Development Act (WRDA) of 1999 (Public Law 106-53, 113 STAT 381), as amended. Section 594 authorizes federal design and construction assistance to non-federal interests to carry out water-related environmental infrastructure and resource protection and development projects in Ohio and North Dakota.

This EA was prepared pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) Regulations (40 CFR 1500-1508), and USACE Engineer Regulation ER 200-2-2, *Policy and Procedures for Implementing NEPA* (33 CFR Part 230). This EA describes all alternatives evaluated during plan formulation, the existing conditions of the human environment in the vicinity of the Project Area, and evaluation of potential impacts associated with the proposed action and no action alternative.

1.2 Purpose and Need

The purpose of this project is to deliver a cost-effective, environmentally-sound approach to meet both the existing and future sanitary sewer needs for the residents of Glenwood, OH. The plan for sewage improvements would correct current unsanitary conditions occurring within the service area.

Wastewater treatment within the service area is currently provided by individual on-lot septic tank systems. In most cases, these systems discharge untreated sewage into ditches, drainage ways, and underground tile lines with eventual discharge into Bantas Fork, which is immediately north and west of the Project area. The Glenwood community was identified as a localized area of concern by the Ohio EPA (OEPA) due to these issues.

The completion of a new sewage collection system would allow for controlled and quality growth of residential and non-residential entities within the Glenwood sanitary service area and bring the area into compliance with federal and state water quality requirements. The Project would follow the guidelines set forth under the Ohio and North Dakota Environmental Infrastructure Program.

1.3 Location

Glenwood, an unincorporated community, is located between Twin and Lanier Townships along U.S. Hwy 35 between Eaten and West Alexandria at the center of Preble County, Ohio (Figure 1). It is along U.S. Hwy 35, approximately three miles east of Eaton, Ohio, and approximately 2.5 miles west of West Alexandria, Ohio. The project area is within the 8-digit U.S. Geological Survey (USGS) Hydrologic Unit Code (HUC) 05080002, which is the Lower Great Miami Watershed (USGS 2023).

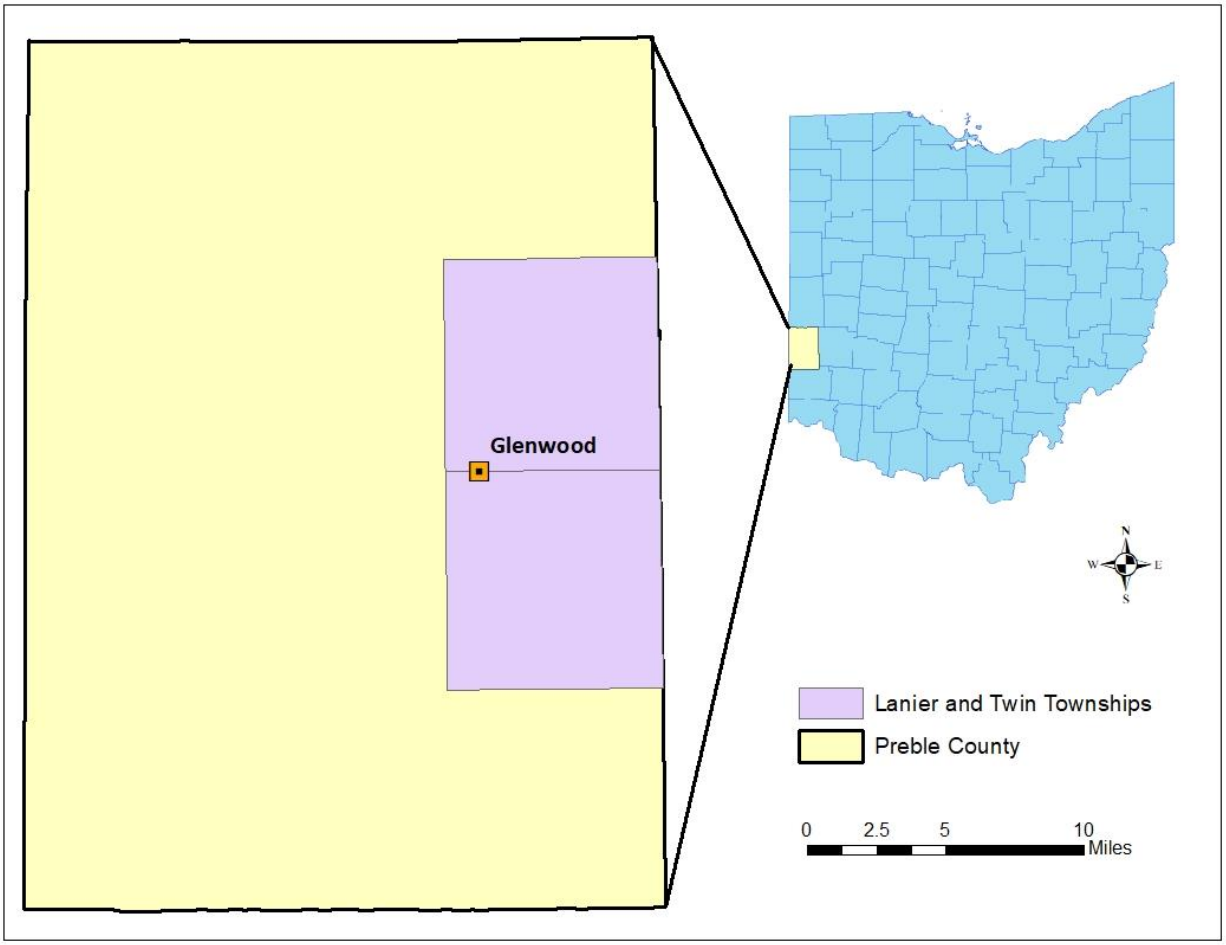

Figure 1 - General location of Glenwood Ohio.

2.0 RECOMMENDED PLAN AND ALTERNATIVES

The analysis presented below was taken from the Non-Federal Sponsor's consultant, who created a feasibility report in May of 2019 detailing the development of the Recommended Plan and other alternatives (CDM Smith 2019). It includes a description of the No Action Alternative (NAA), individual measures considered (Section 2.2), and the analysis of five action alternatives, including the Recommended Plan (Section 2.3).

2.1 No Action Alternative

Under the NAA, improperly treated wastewater from individual residences would continue to drain into the surrounding natural waterways negatively impacting local water quality. Specifically, individual septic systems in the Glenwood service area would continue to malfunction resulting in surface ponding and discharge of improperly treated septic tank effluent. High fecal coliform levels in roadside ditches would continue to preclude compliance with Ohio's Water Quality Standards (WQS) and present potential health risks to area residents. Although the NAA would not meet the purpose and need of the project, CEQ regulations require analysis of the NAA to serve as a baseline against which to measure the environmental impacts of other action alternatives and to evaluate the adequacy of the Recommended Plan in meeting the purpose and need of the action.

2.2 Measures Considered

Measures are defined as individual components that can be pieced together to form alternatives. The following measures in sections 2.2.1 and 2.2.2 were combined to create the alternatives given in section 2.3.

2.2.1 Collection Systems Considered

2.2.1.1 Gravity Sewer System

In this system, wastewater flows by gravity, except where pumping stations are required, and the system is devoid of moving parts. Pump stations are added to the gravity system to overcome elevation problems within areas of rolling terrain to avoid extremely deep installation requirements when transporting sewage over long distances. The system eliminates private septic tanks and leeching systems and replaces them with a sewer pipe that connects the building to the main sewer line.

Advantages:

- Design standards and procedures are well established,
- System can handle grit and solids,
- Lower production of hydrogen sulfide at minimum velocity, and
- Higher excess capacity for future system growth.

Disadvantages:

- Slope requirements can require deeper excavation,
- Pumping and lift stations may be required to overcome slope and elevation requirements,
- Deeper manholes that require confined space entry are required,
- Higher dilution of sewage by groundwater and other sources, and
- High bedrock could increase construction cost.

2.2.1.2 Septic Tank Effluent Pump (STEP)

This system would collect the effluent from each household's septic tank then utilize a small pump and force main or a small diameter gravity system to transport the wastewater.

Advantages

- Lower dilution levels of sewage by groundwater and other sources reduced,
- Cleanouts and valve assemblies are less expensive than manholes, and
- Pipe size and depth requirements are reduced,

Disadvantages

- Mechanical components require greater institutional involvement,
- Higher Operations, Maintenance, and Repair (OMR) costs due to the number of septic tanks and pumps,
- Life cycle replacement costs of the system are higher,
- Power outages can result in limited use of pumps, and
- Requires solid removal as part of septic tank maintenance.

2.2.1.3 Grinder Pump Sewer System

In this system, wastewater from the house flows into a grinder pump station basin, which is connected to a force main that follows the existing topography.

Advantages

- Slope and pipe alignment are not as critical as gravity sewers due to pumps being utilized instead of gravity,
- Pipe size and depth requirements are reduced, and
- Cleanouts and valve assembles are less expensive than manholes.

Disadvantages

- Less flexibility for system expansion,
- Less range of flow capacity,
- Power outages can result in limited use for pumps, and
- Periodic maintenance.

2.2.2 Treatment Systems Considered

2.2.2.1 New Wastewater Treatment Plant – Extended Aeration

The first measure for a new wastewater treatment plant utilizes extended aeration. Extended aeration is a modified form of the activated sludge treatment process and is ideal for smaller flows. For the purpose of this study, it will be assumed that the proposed treatment facility would consist of mechanical screening and grit removal as primary treatment. Secondary treatment would be the extended aeration process and clarification. This would be followed by

tertiary filtration, Ultraviolet (UV) disinfection, post aeration, and sludge treatment for on-land application.

Advantages

- Modular – ready for installation,
- Routinely maintains good effluent quality,
- Highest capacity to accept increased wastewater flows,
- Relatively odorless and noiseless operation, and
- Requires less land than facultative lagoon system.

Disadvantages

- Increased power consumption,
- Increased OMR Costs, and
- More frequent sludge handling.

2.2.2.2 New Wastewater Treatment Plant – Facultative Lagoon System

The second measure for the new wastewater treatment plant for the Glenwood Area considered in this study is a facultative lagoon system. The primary treatment for wastewater in this case is also screening. This would help to minimize floatables that could potentially accumulate in the lagoon.

A lagoon is a passive method of providing treatment by retaining wastewater for many months allowing microbes to break down the waste. In this process, sludge would be produced as a by-product which settles to the bottom until dredged.

Advantages

- Easy to operate,
- Requires little energy, and
- Smaller quantity of removal material.

Disadvantages

- Difficult to control or predict ammonia levels,
- Require large areas of land, and
- Burrowing animals could cause damage.

2.3 Alternatives Analysis

The measures discussed in section 2.2 were combined in different combinations to create the alternatives outlined in Table 1 below

Table 1 - Summary of alternatives

Alternative	Collection	Treatment	Present Worth
1	Gravity	Extended Aeration	$ 8,562,105
2	Gravity	Lagoon	$ 8,519,159
3	STEP Sewer	Packed Bed Media	$ 9,996,548
4	Grinder Sewer	Extended Aeration	$ 9,530,984
5	Grinder Sewer	Lagoon	$ 9,488,038
No Action	None	None	*Unknown

* The cost cannot be $0 due to the associated costs of leaving the current issues unabated

2.3.1 Alternative 1 (Recommended Plan)

Alternative 1 would entail the construction of a gravity sewer collection system and an approximately one acre extended aeration style wastewater treatment plant (Figure 2). The construction of the wastewater treatment plant would entail the construction of an approximately 1,000-foot-long private access drive leading from U.S. Hwy 35 (Figure 2). Additionally, a 660-foot-long effluent outfall pipe would be installed below ground from the treatment plant to the southern tributary of Bantas Fork (Figure 2). The system would include two lift stations along U.S. Hwy 35, one near Stover Road and one near the proposed access road (Figure 2). A force main would connect and transport wastewater from the lift station to the WWTP. A contractor storage and laydown area would be designated along the south side of U.S. Hwy 35. This alternative is being recommend because it is cost effective (Table 1), reliable, requires less land to be disturbed and altered, and can grow as the community grows.

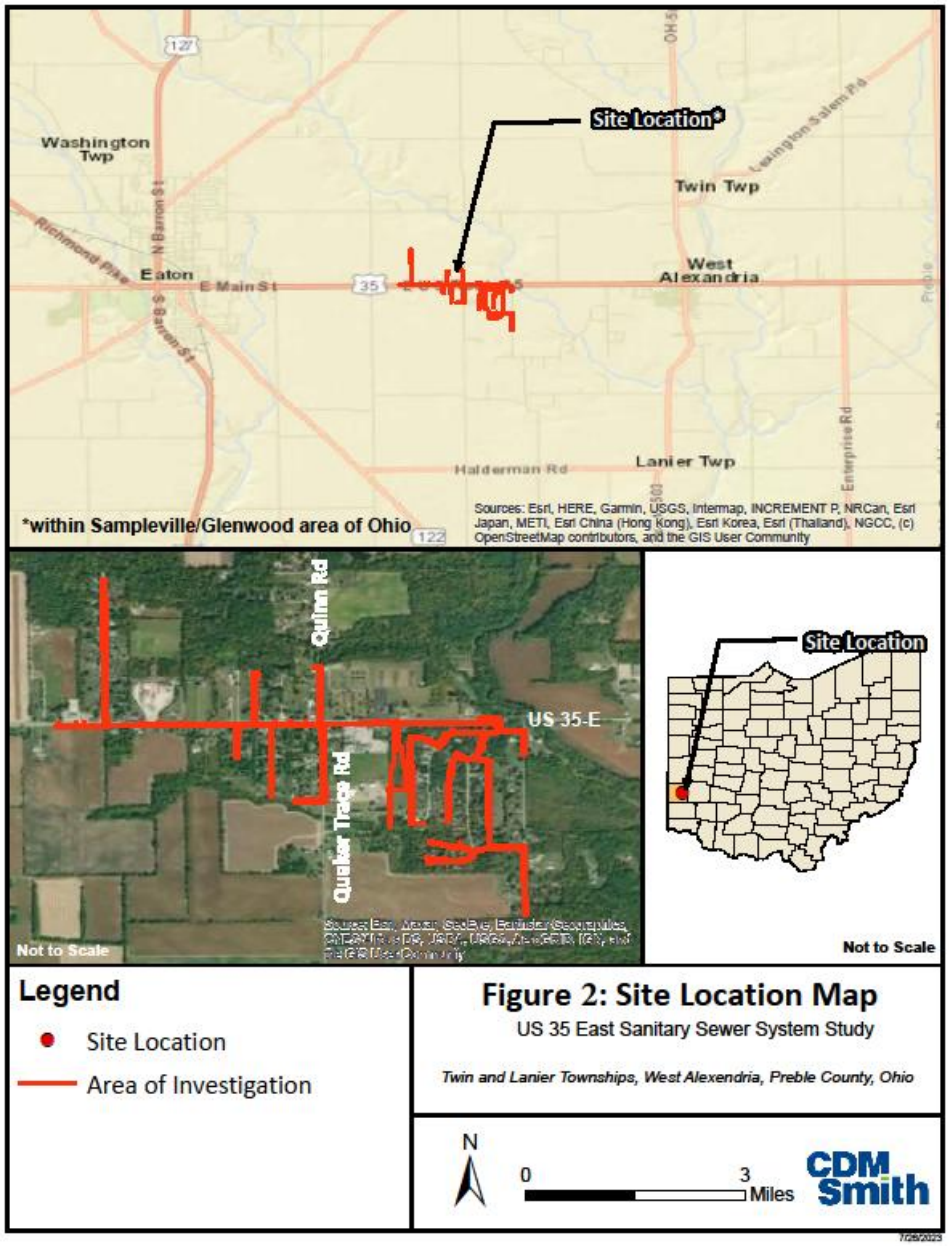

Figure 2 - Proposed Action Alternative for Glenwood Wastewater Collection and Treatment Project.

2.3.2 Other alternatives considered

Alternatives 2, 4, and 5 contain similar elements to each other and the Recommended Plan but were not considered further. Alternatives 2 and 5 were not considered further because the Non-Federal Sponsor was not confident that they would be able to acquire 42 available acres for the lagoon style wastewater treatment plant. Alternative 4 was not considered further due to the higher cost of the grinder pump sewer collection system, the lack of flexibility with flow rates, and the lack of flexibility if the system were to be expanded.

Alternative 3 is the installation of the STEP sewage collection system, with a packed bed media treatment system. This alternative was eliminated from consideration due to high initial costs, as well as high operation and maintenance costs caused by the increased number of pumps.

3.0 ENVIRONMENTAL SETTING AND CONSEQUENCES

CEQ's NEPA Implementing Regulations require that an EA identify the likely environmental effects of a proposed project and that the agency determine whether those impacts may be significant. Effects (or impacts) are changes to the human environment from the Recommended Plan or alternatives that are reasonably foreseeable and include direct effects, indirect effects, and/or cumulative effects, as defined by 40 C.F.R. § 1508.1(g). Effects may include ecological, aesthetic, historic, cultural, economic, social, or health effects, and can be either beneficial or adverse.

In considering whether the effects of the Recommended Plan are significant, agencies shall analyze the potentially affected environment and degree of the effects of the action (40 C.F.R. § 1501.3(b)). In considering the potentially affected environment, agencies should consider the affected area and its resources, understanding that significance varies with the setting of the Recommended Plan. Agencies should consider connected actions including actions that automatically trigger other actions, that cannot or will not proceed unless other actions are taken previously or simultaneously or are independent parts of a larger action and depend on the larger action for their justification (40 C.F.R. § 1501.9(e)). In considering the degree of the effects of the action, agencies should consider both short-term and long-term effects, both beneficial and adverse effects, effects on public health and safety, and effects that would violate laws protecting the environment. The term "degree" is not defined in the governing regulations, but generally refers to the magnitude of change that would result from the alternatives evaluated herein.

All potentially relevant resource areas were initially considered for analysis in this EA. Some resource topics are not discussed, or the discussion is limited in scope, due to the lack of anticipated effect from the alternatives on the resource or because that resource is not located within the affected environment.

This section presents the adverse and beneficial environmental effects of the Recommended Plan and the NAA. The section is organized by resource topic, with the effects of alternatives discussed under each resource topic. Impacts are quantified whenever possible. Qualitative descriptions of impacts are explained by accompanying text where used.

Qualitative definitions/descriptions of impacts as used in this section of the EA include:

Degree:

- No Effect, or Negligible – a resource would not be affected, or the effects would be at or below the level of detection, and changes would not be of any measurable or perceptible consequence.
- Minor – effects on a resource would be detectable, although the effects would be localized, small, and of little consequence to the sustainability of the resource. Mitigation measures, if needed to offset adverse effects, would be simple and achievable.
- Moderate – effects on a resource would be readily detectable, localized, and measurable. Mitigation measures, if needed to offset adverse effects, would be extensive and likely achievable.
- Significant – effects on a resource would be obvious and would have substantial consequences. The resource would be severely impaired so that it is no longer functional in the project area. Mitigation measures to offset the adverse effects would be extensive, and success of the mitigation measures would not be guaranteed.

Duration:

- Short-term – temporary effects caused by the construction and/or implementation of a selected alternative.
- Long-term – caused by an alternative after construction has been completed and/or when it is in full and complete operation.

Unless otherwise specified, the Non-Federal Sponsor would be required to obtain all applicable permits and follow all stipulation therein for the Project. In addition, the Non-Federal Sponsor would be responsible for all mitigation necessitated by project activities.

3.1 Land Use

3.1.1 Existing Condition

The Multi Resolution Land Characteristics Consortium's (MRLC) National Land Cover Database (NLCD) indicates that most of the Project area falls within developed light intensity and developed medium/high intensity land cover types. The rest of the project area is either mixed forest or cultivated crop fields. The light intensity land cover type corresponds to residential housing and roadside habitat. The three medium/high intensity land cover polygons correspond to an RV sales lot, a department of transportation building, and a truck/trailer repair business (MRLC 2019)(Google 2023).

3.1.2 Environmental Consequences

3.1.2.1 No Action Alternative

The NAA would have no effect on short- or long-term land use since no construction would occur.

3.1.2.2 Recommended Plan

The sewage collection system construction would temporarily disturb ground within residential and roadside areas; however, land use would continue to be the same. Areas of road that are dug up would be repaired and any areas along road right-of-way (ROW) or in yards that are disturbed would be backfilled and reseeded. Therefore, the sewage collection system is expected to have no effect on land use.

The wastewater treatment plant is proposed to be placed approximately 0.2 miles south of U.S. Hwy 35 and 0.2 miles east of County Hwy 65 (Figure 2). The proposed Project area is mostly early successional shrub/scrub habitat, with some young forest immediately north of the proposed site. This area would be converted to a wastewater treatment plant, access road, and maintained lawn. The project boundary, Figure 2, is approximately 15 acres, and of that approximately one acre of land would be altered. The shrub/scrub and young forest land that would be altered are common within the project boundary and surrounding area. Therefore, there would be a minor long-term adverse effects on land use.

3.2 Climate

3.2.1 Existing Condition

Climate data was gathered from the nearest National Oceanic and Atmospheric Administration (NOAA) weather station in Eaton, Ohio (USC00332485), which is located approximately six miles west of Glenwood (39.7328, -84.6353) at 1,002 feet above mean sea level (National Oceanic and Atmospheric Administration 2020). This station collected temperature and precipitation data between 1981 and 2010. The climate of the area is generally temperate with cold winters and warm summers. The average daily temperature is 51.3°F. The average hottest month is July with a mean daily high of 85.0°F. The coldest average month is January, with the mean daily low being 17.3°F. The average yearly precipitation is 41.1 inches. The wettest average month is May (5.1 inches), and the driest average month is February (2.22 inches). Greenhouse Gas (GHG) emissions currently occur in relation to the existing septic systems that are currently used within the project area, and include carbon dioxide (CO2), methane (CH4), and nitrous oxide (N20) (One Water Ohio 2023).

3.2.2 Environmental Consequences

3.2.2.1 No Action Alternative

Under the NAA, GHG emissions from the septic systems would continue to be static, and therefore, represent no change in long term impacts to climactic conditions.

3.2.2.2 Recommended Plan

The Recommended Plan could result in a negligible to minor adverse impact on long term climate conditions due to standard day to day operations of the facility releasing CO2, CH4, and N2O. In addition, short term minor adverse impacts to climate would occur during construction due to GHG emissions from construction equipment. In both the long and short-term impacts, emissions would represent only a fraction of overall emissions within the broader region; therefore, these impacts are not considered significant.

3.3 Terrestrial Habitat

3.3.1 Existing Condition

The Project area is located within the Loamy High Lime Till Plains Level IV Ecoregion, which is within the Eastern Corn Belt Plains (USEPA 2023a). The landscape is predominantly a rolling till plain, with extensive glacial deposits of Wisconsinan age. This area is characterized by extensive corn, soybean, wheat, and livestock farming. Prior to farming becoming the dominant land use, beech forest, oak-sugar maple forest, and elm-ash swamp grew on nearly level terrain (bplant 2023). Soils are described in Section 3.6.

The terrestrial habitats located in the vicinity of and within the Project boundary (Figure 2) consist of mowed lawns, urban forests, agricultural fields, and urban shrub-scrub successional habitat.

3.3.2 Environmental Consequences

3.3.2.1 No Action Alternative

Since no construction would occur under the NAA, it would not have the potential to impact terrestrial habitat.

3.3.2.2 Recommended Plan

The Recommended Plan would result in both short- and long-term minor adverse impacts to terrestrial habitat. The wastewater line, during its construction, would result in short-term disturbance due to open trenching throughout its length. After construction is completed, soils would be returned and the disturbed areas would be reseeded, resulting in minimal long-term adverse impacts. The sewer line runs through forested backyard habitat and due to potential root issues, trees nearby the line would be removed, converting small amounts of forested habitat to herbaceous in these backyard settings. Due to the common nature of these urban forested backyard habitats and the limited project scope, the conversion would not represent a significant adverse impact to terrestrial habitat.

The wastewater treatment plant is proposed to be installed in an area classified as mixed forest by the NLCD (MRLC 2019). Aerial imagery indicates that the proposed area is an early successional scrub-shrub habitat within a vacant land plot, which would be converted to a wastewater facility and maintained lawn (Google 2023). This habitat, being in a disturbed urban environment, would be relatively low quality for local wildlife. Additionally, the habitat type is

very common in and around the project area. These factors indicate that the wastewater treatment plant development would represent a minor long-term adverse impact to terrestrial habitat but would not adversely impact a significant amount of habitat or any outstanding habitat resources.

3.4 Aquatic Habitat/Water Quality

3.4.1 Existing Conditions

Section 303(d) of the Clean Water Act (CWA) requires States, Territories, and authorized Tribes to list and prioritize waters for which technology-based limits alone do not ensure attainment of water quality standards. The CWA and the United States Environmental Protection Agency (USEPA) regulations require that Total Maximum Daily Load (TMDL) be developed for all waters on the section 303(d) lists. A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation or attribution of that amount to the pollutant's sources. Lists of 303(d) waters are made available to the public and submitted to the USEPA and the OEPA. The process of formulating TMDLs for specific pollutants is a method by which impaired water body segments are identified and restoration solutions are developed. Ultimately, the goal of TMDL process is full attainment of biological and chemical WQS and, subsequently, removal of water bodies from the 303(d) list (USEPA 2009).

The Project area falls within the Bantas Fork Watershed (050800020301). Bantas Fork is considered impaired for aquatic life as well as fish/shellfish consumption (USEPA 2023b). It is also on the USEPA's 303(d) list with identified issues including ammonia, low oxygen, and nitrogen/phosphorous. Other tributaries associated with Bantas Fork have not been analyzed by the USEPA so their impairment status is unknown (USEPA 2023b). The Non-Federal Sponsor's consultant identified seven streams within the project area including one ephemeral stream and six intermittent streams. Total estimated linear feet of streams within the Project area is 1,203. Two palustrine emergent (PEM) wetlands were also identified by the Non-Federal Sponsor's consultant and are discussed in further detail in Section 3.7 (CDM Smith 2023).

3.4.2 Environmental consequences

3.4.2.1 No Action Alternative

Under the NAA, existing septic system leaks would continue and worsen over time, increasing nutrient and fecal coliform levels, leading to minor to moderate negative long-term adverse impacts to local aquatic resources.

3.4.2.2 Recommended Plan

The Recommended Plan would result in moderate long-term improved water quality for the Bantas Fork Watershed due to reduced risk of raw sewage discharge. Minor to moderate short-term adverse impacts to streams would occur during construction as the Recommended Plan calls for open trenching at stream crossings. According to the Preliminary Jurisdictional Determination (PJD) signed by Huntington District USACE on November 14th, 2023, 1,014 linear feet across five stream segments would be temporarily impacted due to trenching. Post construction, however, stream contours would be returned to their pre-construction conditions,

minimizing permanent adverse impacts. Increased turbidity and temporary adverse impacts to stream flow would occur during this timeframe, however, this would be mitigated by a stormwater pollution prevention plan (SWPPP). According to the signed PJD, approximately 30 linear feet of permanent adverse impacts would occur associated with the outfall of the WWTP where rip rap would be installed. In addition, 159 linear feet of permanent adverse impacts would occur to an ephemeral drainage ditch due to the installation of a stormwater outfall. The project proponent has a signed PJD under Nationwide Permit (NWP) 39 and 58 and would be responsible for any mitigation requirements. Due to the limited nature of these long-term minor adverse impacts and potential mitigation, if applicable, these impacts are considered a minor adverse impact.

The WWTP would have an outfall releasing treated effluent back into the environment, which would be covered by a National Pollutant Discharge Elimination System Permit (NPDES), which would minimize adverse impacts to water quality.

3.5 Floodplains

3.5.1 Existing Conditions

Executive Order 11988 requires Federal agencies to avoid to the extent possible long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.

Federal Emergency Management Agency (FEMA) flood maps within the USEPA's NEPAssist web application indicates that approximately 200 feet of the proposed sanitary sewer line falls within a Zone A special flood hazard area (SFHA) in the western portion of the Project area along Woodside Drive(USEPA 2023c, FEMA 2023). A copy of the FEMA floodplain map from NEPAssist can be found in Appendix B.

3.5.2 Environmental Consequences

3.5.2.1 No Action Alternative

No floodplain impacts would occur under the NAA since no construction would occur.

3.5.2.2 Recommended Plan

Under the Recommended Plan, trenching would occur along approximately 200 feet of a Zone A SFHA. Due to the sanitary sewer line being below grade, the sanitary sewer system would have no impact on the SFHA within this area. The proposed WWTP and the proposed sewer lift stations are not within the existing SFHA's and would therefore not impact them.

3.6 Soils and Prime and Unique Farmland

3.6.1 Existing Condition

The National Resources Conservation Service's (NRCS) Web Soil Survey report indicates that soil map units designated as prime farmland and prime farmland if drained occur within the project

disturbance area for both the WWTP and the sanitary sewer line. For the full NRCS soil report, please refer to Appendix C.

3.6.2 Environmental Consequences

3.6.2.1 No Action Alternative

No prime or unique farmland would be converted due to the NAA since no ground disturbance would occur, thus Project activities would not impact prime or unique farmland.

3.6.2.2 Recommended Plan

The Recommended Plan would see a minor long-term adverse impact to prime farmland due to the conversion of roughly one to four acres of prime farmland to nonagricultural uses. The NRCS was contacted to comply with the Farmland Protection Policy Act (FPPA). It was determined that the proposed WWTP conversion required no further action because it scored 86.7 points on the site assessment section of NRCS form AD-1006, of which the cutoff for significance is 160 points as stated by 7 C.F.R. § 658.4(c)(2). See Appendix C for a copy of completed form AD-1006. The sanitary sewer system portion of the line occurs below grade and within known urban ROW's or housing developments and would thus, not represent a conversion of prime or unique farmland. Minor short-term soil adverse impacts would occur due to trenching activities along the length of the line, however, disturbed areas would be backfilled and restored to their pre-construction conditions, and would thus, not represent a significant adverse impact to soils.

3.7 Wetlands

3.7.1 Existing Condition

Wetlands need to be considered for federal projects under CWA Section 404 and Executive Order 11990. Wetlands are defined as: Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (USACE 1987).

The Non-Federal Sponsor's consultant conducted a wetland delineation in accordance with the 1987 USACE Wetland Delineation Manual and Midwest regional supplement. The Non-Federal Sponsor's consultant provided their report, which received a PJD from USACE Huntington District on November 14th, 2023, for NWP 39 and 58. The wetland delineation identified two palustrine emergent wetlands (PEM) within their area of interest (AOI), totaling 0.012 acres. PEM wetlands are defined as freshwater wetland habitat consisting of less than 30% aerial coverage of woody tree and shrub species. Common species within a PEM wetland include cattails (*Typha spp.),* sedges (*Carex spp.*), bulrushes (*Scirpus spp.*), and other semi aquatic species (FGDC 2013). Both wetlands are Class 1 as determined by the Ohio Rapid Assessment Method (ORAM) for wetland classification. Class 1 wetlands are defined by Ohio Administrative Code Rule 3745-1-54(C)(1) as wetlands which "...support minimal wildlife habitat, and minimal hydrological and recreational functions," and as wetlands which "...do not provide critical habitat for threatened or endangered species or contain rare, threatened or endangered species." In addition, Category 1

wetlands are often hydrologically isolated, and have some or all of the following characteristics: low species diversity, no significant habitat or wildlife use, limited potential to achieve beneficial wetland functions, and/or a predominance of non-native species (OEPA, 2001; CDM Smith, 2023). For the full Draft WOTUS report from the Non-Federal Sponsor's consultant, please refer to Appendix A.

3.7.2 Environmental Consequences

3.7.2.1 No Action Alternative

Under the NAA, untreated septic effluent would continue to be released by malfunctioning septic systems, which would work its way into aquatic resources within the watershed, potentially causing moderate long-term adverse impacts to nearby wetland habitats via fecal coliform and nutrient contamination.

3.7.2.2 Recommended Plan

Under the Recommended Plan, approximately 0.012 acres of wetlands would experience short-term minor adverse impacts during construction. Vegetation would be removed, and a trench would be constructed before inserting the new sewer line into the ground. Post construction, however, contours are anticipated to be put back to pre-construction conditions and vegetation could regrow. Due to this, permanent losses of PEM wetlands due to the Recommended Plan would be minimal. These activities are covered under CWA Section 404 NWP 39 and 58, which the Non-Federal Sponsor's consultant obtained. The two wetlands are classified as Category 1 wetlands under the OHEPA's ORAM model. When avoidance is not possible, minimization measures are limited to having stormwater controls installed during construction (OEPA 2001). If all stipulations of the NWP are followed, project activities are anticipated to have a negligible to minor adverse effect on wetland habitats.

3.8 Wild and Scenic Rivers

Desktop analysis conducted via the National Park Service's (NPS) Wild and Scenic Rivers mapper indicates that no wild and scenic rivers are present within or nearby to the Project area (NPS 2023). Therefore, no impacts to these resources are anticipated as part of the NAA or Recommended Plan.

3.9 Hazardous, Toxic, and Radioactive Waste (HTRW)

3.9.1 Existing Condition

A Phase I HTRW Environmental Site Assessment was conducted by the Non-Federal Sponsor's consultant to identify environmental conditions and to identify the potential presence of HTRW contamination located within or nearby the project's construction work limits. The report identified three Bureau of Underground Storage Tank Regulations (BUSTR) sites within 1/4 of a mile of the project area; Ohio Department of Transportation (ODOT) underground storage tank (UST), an unspecified release at a private residence, and UST's at Save a Lot Gas. Save a Lot Gas and the ODOT UST's did have reported releases, however, they were granted no further action

(NFA) status and the tanks have since been removed (CDM Smith 2021). Due to this, it is unlikely there is still contamination present. The private residence did not involve UST's but a release of an unknown substance was confirmed. No additional information was within the BUSTR database regarding this release (CDM Smith 2021). For the full HTRW report from the Non-Federal Sponsor's consultant, please refer to Appendix D. Further review indicates that one National Pollution Discharge Elimination System (NPDES) water discharger occurs on Stover Road nearby the Project area (USEPA 2023c).

3.9.2 Environmental Consequences

3.9.2.1 No Action Alternative

Since no construction would occur, the HTRW sites would have no additional impact to the NAA, and the NAA would not create any new HTRW sites.

3.9.2.2 Recommended Plan

The Recommended Plan would introduce one new NPDES water discharger due to the WWTP and its outfall. Long-term adverse impacts due to this would be negligible if the NPDES permit is followed. The two BUSTR identified UST and UST release sites have received NFA designation and are unlikely to have the potential to contaminate the disturbance area (CDM Smith 2021). The unknown release did not involve an underground storage tank and since further information was not provided, it is unlikely that a release of petroleum occurred (CDM Smith 2021). The NPDES water discharger nearby the project boundaries on Stover Road has no violations identified, therefore would have no effect on Project activities (USEPA 2023c).

3.10 Cultural Resources

3.10.1 Existing Condition

Several steps were taken to identify cultural resources within the proposed Project area. These included a background check of the National Register of Historic Places (NRHP), the Louisville District Geographic Information System, the Ohio History Connection's Ohio Archaeological Inventory and Ohio Historic Inventory (both available online), and previous cultural resource survey reports that have occurred near the vicinity of the Project. The purpose of this records search was to identify and locate any previously recorded cultural resources or historic properties that could be affected by the proposed Project. The online records review of the Ohio Archaeological and Historic Inventories occurred on July 22, 2020. The online search found no known prehistoric or historic archaeological sites or above ground structures within the Project location. It also determined that no previously recorded historic properties listed on the NRHP are located within the Project area. An unevaluated barn (older than 50 years of age) was noted during the August 20, 2020, site visit and is located within the contractor work limits of the proposed wastewater treatment plant. No archaeological sites were located within a 0.5-mile radius of the proposed Project. No archaeological surveys have been previously conducted with the Project area.

3.10.2.1 No Action Alternative

The NAA would have no effect on cultural resources or historic properties since no construction would occur.

3.10.2.2 Proposed Action

The Recommended Plan may have an adverse effect on historic properties including the unevaluated barn greater than 50 years of age located within the Project area. USACE will evaluate the barn and would continue to complete identification and evaluation efforts for any other currently unidentified properties within the Recommended Plan under the terms of the draft Programmatic Agreement (PA). The draft PA is currently being reviewed by the SHPO, Indian tribes, consulting parties, and the public. A copy of the draft PA can be found in Appendix E and copies of all agency and Indian tribe communications can be found in Appendix F.

3.11 Threatened and Endangered Species

3.11.1 Existing Condition

The Endangered Species Act of 1973 requires Federal agencies to consider the effects of actions on federally listed endangered, threatened, and/or candidate species. The United States Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) provides information on endangered and threatened species that have potential to occur within the project disturbance area. The IPaC report indicates that the Indiana bat (*Myotis sodalis*), northern long-eared bat (*Myotis septentrionalis*), tricolored bat (*Perimyotis subflavus*), whooping crane (*Grus americana*), eastern Massasauga (*Sistrurus catenatus*), and monarch butterfly (*Danaus plexippus*) have ranges that intersect with the project disturbance area (USFWS 2023). For the full USFWS IPaC report, please refer to Appendix G.

The Indiana bat was listed by USFWS as endangered in 1967. Indiana bats hibernate during winter in caves. For hibernation, they require cool, humid caves with stable temperatures, under 50° F, but above freezing. Very few caves within the range of the species have these conditions. If bats are disturbed or cave temperatures increase during hibernation, more energy is needed, and hibernating bats may starve (USFWS 2006). In the spring, Indiana bats emerge from hibernation and migrate to summer roost sites where they usually roost under loose tree bark of dead or dying trees. During summer, males roost alone or in small groups, while females roost in larger groups of up to 100 bats or more. Indiana bats also forage in or along the edges of forested areas. Indiana bats are found over most of the eastern half of the United States. Almost half of all Indiana bats (207,000 in 2005) hibernate in caves in southern Indiana. The 2005 population estimate was about 457,000 Indiana bats, half as many as when the species was listed as endangered in 1967 (USFWS, 2006). Loss and fragmentation of forest habitat are among the major threats to Indiana bat populations. Other threats include white-nose syndrome, winter disturbance, and environmental contaminants (USFWS, 2006).

The tricolored bat was proposed as endangered on September 13th, 2022. This species occurs in caves and mines during the winter months. In its extreme southern range, species would make use of culverts, man-made structures, and trees for hibernacula. During the summer months, this species makes use of waterways, wetlands, and other riparian areas for forage and roosts in the leaf clusters or bark of trees (USFWS 2023b). The primary threats to this species are wind turbines and white nose syndrome. In addition, clearing of forested forage habitat also has adverse impacts on this species (NatureServe 2023a).

The northern long-eared bat was listed as threatened by USFWS in 2015 and later reclassified as endangered on November 30th, 2022. The species decline has been mainly attributed to white-nose syndrome. The bats spend the winter months hibernating in caves and mines. During the summer months, the bats roost singly or in colonies underneath bark or in cavities or crevices of both snags and live trees (USFWS 2015). The primary threat to this species is white nose syndrome, which caused severe population losses in all hibernacula that were infected. Additional threats include loss of summer habitat, which includes roosting trees and other forested areas, and wind turbine strikes (USFWS 2015).

The whooping crane was listed by USFWS as endangered in 1970. The whooping crane's range within this region is designated as an experimental population that is non-essential (EXPN). Non-essential experimental populations are treated as threatened species on National Wildlife Refuge and National Park land but are treated as a candidate species on private land, however, federal agencies must not jeopardize their existence (USFWS 2023a). This species prefers nesting in dense vegetation in shallow ponds, wet prairies, or along the margins of lakes. During migration, this species makes use of palustrine wetlands and occasionally cropland for forage (NatureServe 2023b). Primary threats to this species include accidental shooting, wind energy related bird strikes, electrocution due to power lines, disease, and development impacts at their wintering and breeding ranges. Individuals found in Ohio are primarily migrants of the eastern population migrating between Florida and Wisconsin (NatureServe 2023b).

The eastern Massasauga was listed by USFWS on September 30th, 2015. It prefers wetland habitats such as sphagnum bogs, shrub dominated peat bogs, wet meadows, and floodplain areas. It also forages in nearby uplands associated with these wetland habitats. The primary threat to this species is destruction of habitat and habitat fragmentation. In addition, this species is also threatened by intentional killing due to anti-snake sentiment and general poaching (NatureServe 2023c).

The monarch butterfly was listed as a candidate species on December 15th, 2020. Monarch butterflies are an iconic species with an annual, multigenerational, migratory life cycle and a cross-continental migratory range covering portions of Canada, the US and Mexico. To complete their life cycle, monarch caterpillars must feed on milkweed (*Asclepias spp.*) plants while adults feed on nectar from a variety of blooming plants. Threatened by habitat loss, climate change, pesticide applications, natural enemies, and other abiotic and biotic stressors, however,

monarch butterfly populations are in decline (USFWS 2023c). This species migrates to its breeding locations in Mexico and California starting November and lasting until early March (Monarch Joint Venture 2023).

There are no federally designated critical habitats found within the project area.

3.11.2 Environmental Consequences

3.11.2.1 No Action Alternative

The NAA would see the continued uncontrolled sewage releases from aging septic infrastructure, resulting in moderate long-term adverse impacts due to degradation of nearby aquatic habitat.

3.11.2.2 Recommended Plan

The Project area has limited amounts of forested habitat within the disturbance area of the WWTP and the proposed access road. Approximately one acre would be cleared, which could have summer roosting habitat for all three listed bat species. In addition to clearing associated with the WWTP, individual trees would need to be removed along the length of the proposed sanitary sewer line due to concerns about roost systems. There are no caves or rock shelters within or nearby the project area according to the Ohio Department of Natural Resources (ODNR) Ohio Bat Conservation Plan (ODNR 2018). The loss of habitat would negatively impact summer roosting habitat, however, clearing activities are scheduled to occur outside the primary summer roosting period, therefore, adverse impacts would be minimized. Due to these factors, it is anticipated that the Recommended Plan, *may affect, but is not likely to adversely affect* the Indiana bat, long eared bat, and tricolored bat.

The whooping crane would occur within the Project area during migration season. Open trenching would temporarily adversely impact PEM wetlands and intermittent streams within the project area. After construction is completed, the original contours within the streams and wetlands would be restored, resulting in minimal long-term adverse impacts. The PEM wetland habitat that would be temporarily impacted are Category 1 wetlands, which represents the lowest quality as defined by ORAM (CDM Smith 2023). Adverse stream impacts would be localized and minor during construction due to the limited scope of the project. Migrating individuals that happen to be nearby the Project area would likely prefer higher quality habitat associated with Bantas Fork rather than the low-quality habitat within the Project area. Additionally, project structures, such as the WWTP and the pump stations, would be low to the ground and highly visible, and therefore would not pose a strike risk to individuals. Due to these factors, project activities are anticipated to have *no effect* on the whooping crane experimental population.

Habitat for the eastern Massasauga is limited to nonexistent within the Project area. PEM wetlands would be temporarily impacted during construction due to open trenching. Post construction, however, preexisting contours would be restored, and the vegetation would regrow, resulting in minimal long-term adverse impacts. The PEM wetlands that would be

impacted are of low quality according to ORAM (CDM Smith 2023) and do not have the qualities that represent good eastern Massasauga habitat. Due to this, it is unlikely this species would be present within the project area as everything else is urban habitat. Due to the lack of habitat within the Project area and limited impacts, project activities are anticipated to have *no effect* on the eastern Massasauga.

The monarch butterfly would be present in the Project area during the spring and summer months. Short-term adverse impacts associated within the sewer line disturbance limit would occur during construction, however, after construction and reseeding is completed, the habitat would revert to its former state. The WWTP and corresponding access road could potentially have milkweed or other wildflower forage, which would be impacted by development. Approximately one acre of land would be cleared. Due to these factors, it is anticipated that Project activities *may affect, not likely to adversely affect* the monarch butterfly. As a candidate species, the monarch butterfly does not currently have federal protections.

3.12 Air Quality

3.12.1 Existing Condition

The Clean Air Act (CAA) allows the U.S. Environmental Protection Agency (USEPA) to set air quality standards for pollutants considered harmful to public health and welfare. The National Ambient Air Quality Standards (NAAQS) set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. These standards have been established for six criteria pollutants including carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and sulfur dioxide (SO_2), and each State is required to develop implementation plans for each pollutant. Areas are generally designated as being either in “attainment” of the standards for the pollutants listed above or in “nonattainment”.

Nonattainment areas are required by the CAA to comply with the NAAQS standards through the evaluation and development of a maintenance plan. The U.S. EPA makes a conformity determination to assure that the actions within the maintenance plan conform to the respective State’s implementation plan for each nonattainment pollutant.

The EPA Green Book provides Nonattainment/Maintenance Area Status for each county by year for all criteria pollutants. Preble County, Ohio is classified as in “attainment” for criteria pollutants as of July 14th, 2023 (USEPA 2023d). Preble County was last in nonattainment in 1994 for 1-Hour Ozone levels but was returned to maintenance on March 10, 1995.

3.12.2 Environmental Consequences

3.12.2.1 No Action Alternative

The NAA would not impact air quality since no structures would be constructed and current emissions levels would continue.

3.12.2.2 Recommended Plan

The Recommended Plan would result in short-term adverse impacts to air quality due to exhaust from construction equipment, dust, and other construction related emissions. Given construction would not occur 24 hours a day, any emissions would dissipate during off periods and would return to normal levels post construction. The proposed WWTP and associated pumps would increase electricity usage, which would permanently increase CO2 production from local power plants, however, adverse impacts within the Project area would be minor. The sanitary sewer system and associated WWTP would also produce methane and nitrogen dioxide in the process of breaking down waste. Exact metrics are unavailable due to a lack of a means of calculating the predicted emissions of these facilities; however, it is anticipated that emissions would be similar to those of the existing septic systems, and therefore represent a minor long-term adverse impact to local air quality.

3.13 Noise

3.13.1 Existing Condition

Noise in the vicinity of the Project area is characterized by light traffic in town with noise created by farm and lawn care equipment.

Noise is measured as Day Night average noise levels (DNL) in "A-weighted" decibels that the human ear is most sensitive to (dBA). There are no Federal standards for allowable noise levels. According to the Department of Housing and Urban Development Guidelines, DNLs below 65 dBA are normally acceptable levels of exterior noise in residential areas. The Federal Aviation Administration (FAA) denotes a DNL above 65 dBA as the level of significant noise impact. Several other agencies, including the Federal Energy Regulatory Commission, use a DNL criterion of 55 dBA as the threshold for defining noise impacts in suburban and rural residential areas. The USACE Safety and Health Requirements Manual provides criteria for short-term permissible noise exposure levels (see Table 2), for consideration of hearing protection or the need to administer sound reduction controls (USACE 2014).

Table 2 - Permissible Non-Department of Defense Noise Exposures

Duration/day (hours)	Noise level (dBA)
8	90
6	92
4	95
3	97
2	100
1.2	102
1	105

3.13.2 Environmental Consequences

3.13.2.1 No Action Alternative

There would be no change in noise levels under the NAA since no construction would occur, and thus no new sources of noise would be introduced into the Project area.

3.13.2.2 Proposed Action

Short-term noise associated with the Recommended Plan would be limited to that generated during construction. The noise associated with construction would be short-term and would only occur during daylight hours. Construction noise would be similar to that of farm equipment and other small machinery used in the local area. Construction equipment would be operated during daylight hours; therefore, a reasonable exposure time of two hours would be expected during the time residents may be home during the day. Peak outdoor noise levels ranging from 78-90 dBA would occur during the time in which equipment is directly in front of or in proximity to homes and businesses (within 25-100 feet). A maximum noise exposure of approximately 98 dBA, for one hour could occur if equipment were within 10 feet of homes and business (OSHA 2011). The noise projections do not account for screening objects, such as trees, outbuildings or other objects that muffle and reduce the noise being emitted. The outdoor construction noise would be further muffled while residents are inside their homes. These limited exposures and time intervals are within allowable USACE safety levels. Further, they are similar to typical neighborhood noise generated by gas powered lawnmowers in the local area. Long-term adverse noise impacts are associated with the proposed lift stations and the proposed wastewater treatment plant, as they would increase noise levels immediately adjacent to the structures, however, would be far below permissible thresholds as the closest residential dwelling is 300 feet away.

3.14 Socioeconomic Conditions

3.14.1 Existing Conditions

Executive Order 12898 *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (Exec. Order No. 12,898, 1994) requires that, to the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, each Federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Mariana Islands.

Executive Order 13985 *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government* (Exec. Order No. 13,985, 2021) promotes racial equity and support for underserved communities and allocation of resources to address the historic failure

to invest sufficiently, justly, and equally in underserved communities, as well as individuals from those communities.

Executive Order 14008 *Tackling the Climate Crisis at Home and Abroad* (Exec. Order No. 14,008, 2021) established the Justice40 Initiative with the goal that 40 percent of the overall benefits of certain investments, including climate change and clean water infrastructure flow to disadvantaged communities.

The CEQ defines a minority population as an area having greater than 50% of its population made up of minority groups or having a meaningfully greater percentage of minority representation than the national average. It defines a low-income population as one identified with the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty. In identifying low-income populations, agencies may consider as a community either a group of individuals living in geographic proximity to one another, or a set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect (CEQ 1997). Desktop analysis conducted via the CEQ'S Climate and Environmental Justice Screening Tool (CEJST) indicates that Preble County tracts 39135430100 and 39135440100 are not classified as disadvantaged and do not meet the threshold for the definition of a minority population (CEQ 2023).

The USEPA's Environmental Justice Screening Tool (EJSCREEN) generated a report for the general project area. Environmental Justice indicators were generally in line with state and national averages, though an unusually high exposure to particulate matter was indicated. The approximate population within the project area was 300 across 117 households. The average income per capita was $30,366. Low-income residences represent 18% of the population and minority groups represent 10% (USEPA 2023e). For the full EJSCREEN report within the project area, please refer to Appendix H.

3.14.2 Environmental Consequences

3.14.2.1 No Action Alternative

Under the NAA, untreated sewage would continue to enter the environment from malfunctioning septic systems, which could adversely impact human health. However, the NAA would not be expected to affect low-income populations any more than the general population.

3.14.2.2 Recommended Plan

The Recommended Plan would reduce the potential for untreated sewage entering the human environment, therefore improving health and safety metrics for the local population. Due to this, it is anticipated that Project activities would produce a moderate beneficial effect to the local population.

3.15 Aesthetics

3.15.1 Existing Conditions

The project area landscape is dominated by a residential neighborhood, with homes, mowed lawns, and local businesses. There are some views of agriculture and deciduous forest, which may offer opportunities to see wildlife. The architecture within the project area is from the mid to late 20th century to the early 21st century.

3.15.2 Environmental Consequences

3.15.2.1 No Action Alternative

Implementation of the NAA is not expected adversely impact the scenic quality of the area since no construction would occur.

3.15.2.2 Recommended Plan

Minor short-term adverse impacts to the scenic quality of the area due to open trenching on both roadsides and on private property could occur. After construction is complete, conditions should return to their previous state. Minor long-term adverse impacts would occur to aesthetics due to the construction of the wastewater treatment facility, which would be within the viewshed of multiple roads within the area. In addition, trees are anticipated to be cut down within the disturbance area of the sewer line. This could represent a negligible to minor long-term adverse impact to aesthetics as there would be fewer trees visible within the project area.

3.16 Transportation and Traffic

3.16.1 Existing Condition

Traffic throughout the project area can be characterized by light residential traffic along residential roads and moderate cross state traffic along U.S. Hwy 35.

3.16.2 Environmental Consequences

3.16.2.1 No Action Alternative

No impacts to transportation and traffic are anticipated to occur from the NAA since no construction would occur.

3.16.2.2 Recommended Plan

Construction of the Recommended Plan would result in some short-term minor adverse delays and potential detours in the normal traffic flow. Construction on and near road surfaces would be in compliance with Ohio Department of Transportation (ODOT) guidelines. All appropriate ODOT guidelines for traffic control would be implemented and emergency access would be maintained. There would be no new traffic patterns as the result of the Recommended Plan and as such, no long-term adverse impact would occur.

3.17 Cumulative Effects

USACE must consider the cumulative effects of the proposed Project on the environment as stipulated in NEPA and its implementing regulations. Cumulative effects are "the impact on the

environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or Non-Federal) or person undertakes such actions." Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 C.F.R. § 1508.1(g)(3), Council on Environmental Quality [CEQ] Regulations).

The cumulative effects analysis is based on the potential effects of the proposed Project when added to similar impacts from other projects in the region. An inherent part of the cumulative effects analysis is the uncertainty surrounding actions that have not yet been fully developed. The CEQ regulations provide for the inclusion of uncertainties in the analysis and states that "when an agency is evaluating reasonably foreseeable significant adverse effects on the human environment...and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking" (40 C.F.R. Part 1502.21).

According to the Preble County website, current projects include road resurfacing in multiple locations throughout the county and a bridge rehabilitation project (Preble County 2023). None of the listed ongoing projects were within the same watershed as the proposed Project. The Non-Federal Sponsor was not aware of any other projects within the impacted watershed.

Due to minor to negligible adverse impacts to the following resources, the Recommended Plan would not meaningfully contribute to cumulative impacts to land use, terrestrial habitat, floodplains, wild and scenic rivers, environmental justice, and transportation/traffic.

Road widening projects and other roadside development would have similar impacts to water quality, aquatic habitat, and wetlands. Since they fall under similar nationwide permits with the same general conditions, impacts of the other current projects are expected to be similarly minor, and thus, not significant cumulatively.

The other known projects occur within similar low quality roadside habitats or involve different resource types in the case of the bridge rehabilitation. Due to this, cumulative impacts to ESA species are anticipated to be negligible cumulatively.

Other proposed projects could permanently alter plots of prime farmland. While exact amounts at the other projects are unknown, it can be inferred that they would be similarly small due to the limited general scope of road widening projects and road resurfacing projects. In addition, being in other areas of the County, the other projects would likely be impacting a different prime farmland soil map unit. Finally, these additional adverse impacts would likely be in urbanized areas like roadside ROW’s. Due to these factors, cumulative impacts to prime farmland are not expected to be significant.

While the Recommended Plan does have minor adverse impacts to noise, cumulative noise impacts can only be within the Project area itself, rather than a larger region. Because the other

projects aren't occurring within the project area's community, no cumulative adverse impacts are anticipated.

The Recommended Plan would cause minor long-term adverse impacts to aesthetics due to the WWTP being viewable from a few areas of residence. The other known development projects due not include similar impacts, and would thus, not be significant cumulatively.

Climate change is an inherently globally cumulative issue. That is, one atom of a GHG released anywhere on earth is equivalent to that same atom being released in a different area. According to the EPA, three sectors of the U.S. economy produce 75% of the GHG's that are emitted each year, which are transportation, electricity production, and industry. It is extremely challenging to quantify the exact amount of GHG's that would be released from the implementation of the Recommended Plan or the NAA, however it could be reasonably assumed that the releases for either plan would be entirely negligible with regards to the global climate change issue. Thus, cumulative adverse effects to the climate from the Recommended Plan are negligible.

4.0 STATUS OF ENVIRONMENTAL COMPLIANCE

The EA and FONSI are in in the process of being in compliance with all local, State, and Federal statutes as well as Executive Orders. Compliance status is documented below in Table 3. Prior to construction, the project proponent will obtain all appropriate state, local, and federal permits including, but not limited to a Section 401 water quality certification, a Section 404 USACE CWA permit, a floodplain development permit, and a NPDES permit.

Table 3 - Environmental Compliance Status

Statute/Executive Order	Full	In Progress
National Environmental Policy Act		X
Fish and Wildlife Coordination Act		X
Endangered Species Act		X
Clean Water Act	X	
Wild and Scenic Rivers Act	X	
Clean Air Act	X	
National Historic Preservation Act		X
Comprehensive, Environmental Response, Compensation and Liability Act	X	
Resource Conservation and Recovery Act	X	
Toxic Substances Control Act	X	
Quiet Communities Act	X	
Farmland Protection Act	X	
Executive Order 11988 Floodplain Management	X	
Executive Order 11990 Protection of Wetlands	X	

Executive Order 12898 Environmental Justice in Minority Populations and Low-Income Populations	X	

5.0 REQUIRED COORDINATION

5.1 Agencies Contacted

Coordination with the following entities was conducted prior to the public review period: NRCS Farm Production and Conservation (FPAC) Ohio, USACE Huntington District (LRH), and Ohio Environmental Protection Agency (OEPA). Agencies, organizations, persons, and Tribes that are going to be contacted for public review of the proposed project can be found in Table 4.

Table 4 - Agencies, Organizations, Persons, and Tribes to be contacted for public review of Glenwood Wastewater Collection and Treatment Project, Preble County, Ohio.

Stakeholder Type	Agency/Organization/Person/Tribe
Tribes	The Miami Tribe of Oklahoma
	Nottawaseppi Huron Band of the Potawatomi
	Forest County Potawatomi
	Absentee-Shawnee Tribe of Oklahoma
	Eastern Shawnee Tribe of Oklahoma
	Shawnee Tribe of Oklahoma
	Citizen Potawatomi Nation
	Hannahville Indian Community
	Gun Lake Tribe
	Pokagon Band of Potawatomi
	Saginaw Chippewa Indian Tribe of Michigan
	Lac Vieux Desert Band of Lake Superior
	Lac du Flambeau Band of Lake Superior
	Sault Ste Marie Tribe of Chippewa
	Bad River Band of Lake Superior Chippewa
	Keweenaw Bay Indian Community
	Lac Courte Oreilles Band of Chippewa
	Red Cliff Band of Lake Superior Chippewa
	Red Lake Chippewa
	St. Croix Chippewa Community
	Fon du lac Band of Chippewa
	Bois Forte Band of Chippewa
	Grand Portage Band of Lake Superior Chippewa
	Leech Lake Band of Ojibwe
	Mille Lacs Band of Ojibwe
	Grand Traverse Band of Ottawa and Chippewa
	Little River Band of Ottawa
	Ottawa Tribe of Oklahoma
	Little Traverse Bay Band of Odawa
	Peoria Tribe of Oklahoma
	Sac and Fox Tribe of Mississippi in Iowa
	Sac and Fox Nation of Oklahoma
	Oneida Nation of New York
	Oneida Nation of Wisconsin
	Delaware Nation of Oklahoma
	Delaware Tribe of Indians Oklahoma
	Wyandotte Nation of Oklahoma

State Agencies	ODNR Office of Environmental Review
	Ohio History Connection
	Ohio Environmental Protection Agency
	Ohio Department of Transportation
	Ohio Division of Drinking and Ground Water
	Ohio Office of Compliance assistance and Pollution Prevention
	Ohio Division of Surface Water
Federal Agencies	U.S. Fish and Wildlife Service, Ohio Field Office
	Environmental Protection Agency, Region 5 Office
	U.S. Geological Survey Ohio-Kentucky-Indiana Water Science Center
	National Resource Conservation Service, Ohio Office
	United States Army Corps of Engineers Huntington District
	Advisory Council on Historic Preservation
Local Governments	Twin Township
	Lanier Township
	County Judge Executive
	County Engineer Office
	Planning and Zoning Office
	Roads Department
Elected Officials	Senator J.D. Vance
	Senator Sherrod Brown
	Congressman Warren Davidson
Non-governmental Organizations	The Nature Conservancy of Ohio
	Ohio Citizen Action
	Ohio Environmental Council
	Ohio River Foundation
	Ohio Stream Preservation
	Sierra Club, Ohio Chapter
	Rivers Unlimited
	River Fields

The SHPO, the Miami Tribe of Oklahoma, Shawnee Tribe, Eastern Shawnee Tribe of Oklahoma, Absentee-Shawnee Tribe of Oklahoma, Citizen Potawatomi Nation, Forest County Potawatomi, Hannahville Indian Community, Match-e-be-nash-she-wish Band of Pottawatomi Indians, Nottawaseppi Huron Band of Potawatomi, Pokagon Band of Potawatomi, Saginaw Chippewa Indian Tribe of Michigan, Lac Vieux Desert Band of Lake Superior, Lac du Flambeau Band of Lake Superior, Sault Ste Marie Tribe of Chippewa, Bad River Band of Lake Superior Chippewa, Keweenaw Bay Indian Community, Lac Courte Oreilles Band of Chippewa, Red Cliff Band of Lake Superior Chippewa, Red Lake Chippewa, St. Croix Chippewa Community, Fon du lac Band of Chippewa, Bois Forte Band of Chippewa, Grand Portage Band of Lake Superior Chippewa, Mille Lacs Band of Ojibwe, Grand Traverse Band of Ottawa and Chippewa, Little River Band of Ottawa, Ottawa Tribe of Oklahoma, Little Traverse Bay Band of Odawa, Peoria Tribe of Oklahoma, Sac and Fox Nation of Oklahoma, Oneida Nation of New York, Oneida Nation of Wisconsin, Delaware Nation of Oklahoma, Delaware Tribe of Indians Oklahoma, and Wyandotte Nation of Oklahoma were contacted September 21, 2023 about the project and USACE's request to develop a PA. The Advisory Council on Historic Preservation was contacted about the project and USACE's request to develop a PA on September 22, 2023. The SHPO responded on October 20, 2023, stating they

agreed with USACE's request and asked USACE to develop a draft PA for review. The Forest County Potawatomi (FCP) responded on September 21, 2023, requesting they wanted to be a consulting party for this project. The ACHP responded on October 6, 2023, that USACE should continue to consult with the SHPO, Indian tribes, and other consulting parties and provide a status update to the ACHP on June 14, 2024. USACE emailed a draft PA to the SHPO and FCP on October 26, 2023. See Appendix E for a copy of the draft PA.

5.2 Public Review and Comments

The draft EA and unsigned FONSI will be made available for public review for a period of 30 days beginning on [PENDING], as required under USACE's NEPA regulations. A copy will be circulated to the local community and local, state and Federal government agencies for a 30-day review/comment period.

6.0 CONCLUSION

Wastewater treatment within Glenwood is currently provided by individual on-lot systems consisting of either a septic tank or an aeration unit. In most cases, these systems discharge untreated sewage to ditches, drainage ways, and underground tile lines with eventual discharge to the Bantas Fork Watershed. The completion of a new sewage collection system would allow for controlled and quality growth of residential and non-residential entities within the Glenwood sanitary service area and bring the area into compliance with federal and state water quality requirements. Construction would take place within private property and public road ROW within the Glenwood community. Short-term adverse effects associated with the construction of the Recommended Plan would be negligible to minor. BMPs and other mitigation measures would be implemented during construction in accordance with the applicable permit stipulations. Long-term adverse impacts due to the sanitary sewer system installation are anticipated to be negligible to minor. No significant adverse impacts have been identified as a result of implementation of the proposed Project. As a result of these findings, USACE does not expect to prepare an Environmental Impact Statement for the proposed Project.

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Appendix A. WOTUS and NWP

CELRH-RDN

Permit Number: LRH-2023-651-GMR
Name
of Permittee: Kyle Cross
Preble County Engineer
1000 Preble Drive
Eaton, OH 45320

Date of Issuance: November 14, 2023

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:

Huntington District
U.S. Army Corps of Engineers
502 8th Street
Huntington, West Virginia 25701-2070
Attn: CELRH-RDN

Please note that your permitted activity is subject to a compliance inspection by a United States Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

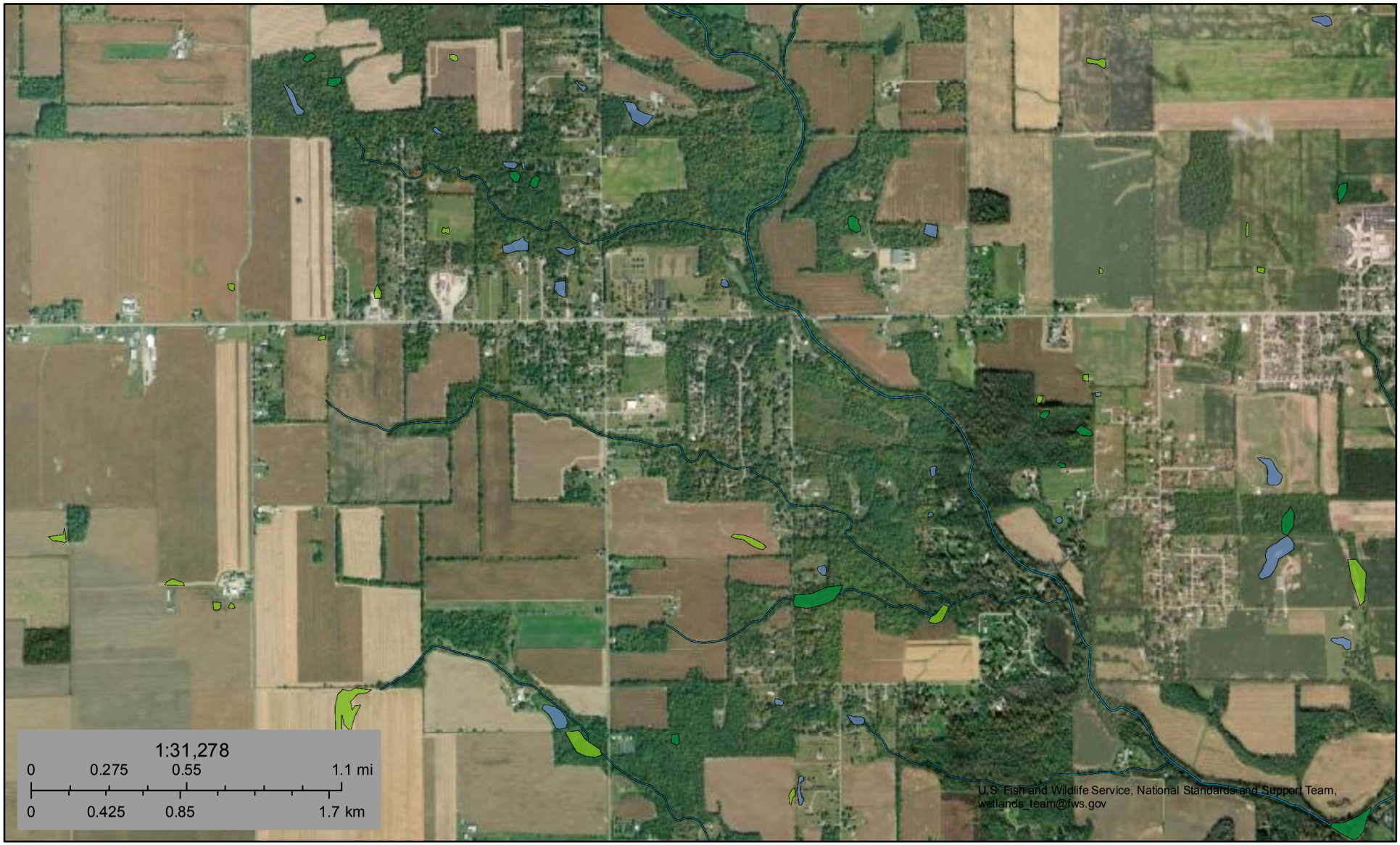
I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit conditions.

_____ _____
Signature of Permittee Date

PM: Kyle Moore

U.S. Fish and Wildlife Service
National Wetlands Inventory

Wastewater Collection and Treatment



May 23, 2023

Wetlands

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

DEPARTMENT OF THE ARMY
HUNTINGTON DISTRICT, CORPS OF ENGINEERS
502 EIGHTH STREET
HUNTINGTON, WEST VIRGINIA 25701-2070

REPLY TO
ATTENTION OF

November 14, 2023

Regulatory Division
North Branch
LRH-2023-651-GMR-Unnamed Tributary (UT) to Bantas Fork

PRELIMINARY JURISDICTIONAL DETERMINATION,
NATIONWIDE PERMIT NO. 39 & NO. 58 VERIFICATIONS

R. Kyle Cross
Preble County Engineer
1000 Preble Drive
Eaton, Ohio 45320

Dear R. Kyle Cross:

I refer to the pre-construction notification (PCN) concerning the construction of the Preble County Sanitary District 6 Phase 1 Sanitary Sewer and Phase 2 Wastewater Treatment Plant Project. The proposed wastewater treatment plant and associated sewer line project is located at 3434 US 35, in Twin and Lanier Townships, Preble County, Ohio (39.743909 latitude, -84.57250 longitude). On-site waters are in the watershed of Bantas Fork, an indirect tributary to the Great Miami River, a traditional navigable water of the United States. We have assigned the following file number to your PCN: LRH-2023-651-GMR-UT to Bantas Fork. Please reference this file number on all future correspondence related to this subject proposal.

The United States Army Corps of Engineers' (Corps) authority to regulate waters of the United States is based on the definitions and limits of jurisdiction contained in 33 CFR Part 328 and 33 CFR Part 329. Section 404 of the Clean Water Act (Section 404) requires a DA permit be obtained prior to discharging dredged and/or fill material into waters of the United States, including wetlands. Section 10 of the Rivers and Harbors Act of 1899 (Section 10) requires a DA permit be obtained for any work in, on, over or under a navigable water.

The proposed project, as described in the submitted information, has been reviewed in accordance with Section 404 and Section 10. Based on your description of the proposed work, it has been determined that this project would involve the discharge of dredged and/or fill material into waters of the United States and is subject to the requirements of Section 404.

Preliminary Jurisdictional Determination

Based on the review of the aquatic resources in the July 2023, report, this office has determined that three (3) wetlands totaling 0.034 acre and eight (8) streams totaling 3,869 linear feet are located on the site, as described in the enclosed PJD Form. This office has determined that these waters **may** be jurisdictional waters of the U.S. in accordance with the Regulatory Guidance Letter (RGL) for JDs issued by the Corps on October 31, 2016 (RGL No. 16-01). As indicated in the guidance,

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this PJD is non-binding and cannot be appealed (33 CFR 331.2) and only provides a written indication that waters of the U.S., including wetlands, may be present on-site.

You have declined to exercise the option to obtain an approved JD in this instance and at this time for the aquatic resources within the PJD boundary. For the purposes of the determination of impacts, compensatory mitigation, and other resource protection measures for activities that require authorization from this office, the aquatic resources described in the enclosed PJD Form will be evaluated as if they are waters of the U.S.

Enclosed please find two (2) copies of the PJD Form. If you agree with the findings of this PJD and understand your options regarding the same, please sign and date one (1) copy of the form and return it to this office within 30 days of receipt of this letter. You should submit the signed copy via email to kyle.m.moore@usace.army.mil or to the following address:

U.S. Army Corps of Engineers
Huntington District, Regulatory Division
Attn: Mr. Kyle Moore (LRH-2023-651-GMR-UT to Bantas Fork)
502 8th Street
Huntington, West Virginia 25701

Nationwide Permits No. 39 and No. 58

In the submitted PCN materials submitted to this office, you have requested DA authorization for the proposed temporary discharge of dredged and/or fill material into approximately 1,014 linear feet (0.1 acre) of five (5) streams (Stream Segment 4, 5, 6, 9, and 11), and 0.012 acre of two (2) wetlands (Wetland 1, and Wet Ditch 2), and the permanent discharge of dredged and/or fill material into approximately 189 linear feet (0.013 acre) of two (2) streams (Streams 1A and 10) in association with the construction of the Preble County Sanitary District 6 Phase 1 Sanitary Sewer and Phase 2 Wastewater Treatment Plant Project. Specifically, the proposed discharges will be required with the construction of one (1) effluent outfall associated with the wastewater treatment plant, one (1) stormwater outfall, and the installation of sewer line via open cut-trench at eight (8) single and complete locations. All temporary fill material will be removed at the completion of work and the area will be returned to preconstruction conditions and contours. All work would be conducted in accordance with the drawings titled "*Overall Site Plan"* for the wastewater treatment plant construction activities and *"Key Map Plan"* for the sewer line construction activities submitted with the PCN materials.

Based on your description of the proposed work, and other information available to us, it has been determined the proposed discharge of dredged and/or fill material into waters of the United States in conjunction with the proposed project meets the criteria for Nationwide Permit (NWP) No. 39 and No. 58 (enclosed) under the January 13, 2021 Federal Register, Reissuance of NWPs (86 FR 2744) provided you comply with all terms and conditions of the enclosed material and the enclosed special conditions. Please be aware this NWP verification does not obviate the requirement to obtain any other federal, state, or local assent required by law for the activities. This letter does not grant any property rights or exclusive privileges or authorize any injury to the property or rights of others.

This verification is valid until the expiration date of the NWPs, unless the NWP authorization is modified, suspended, or revoked. The verification will remain valid if the NWP authorization is reissued without modification or the activity complies with any subsequent modification of the NWP authorization. The 2021 NWPs published January 13, 2021 in the Federal Register (86 FR 2744), are scheduled to be modified, reissued, or revoked on March 14, 2026. Prior to this date, it is not necessary to contact this office for re-verification of your project unless the plans for the proposed activity are modified. Furthermore, if you commence or under contract to commence this activity before March 14, 2026, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this NWP.

A copy of the NWPs and this verification letter must be kept at the site during construction. Upon completion of the activities authorized by this NWP verification, the enclosed certification must be signed and returned to this office. If you have any questions concerning the above, please contact Kyle Moore of the North Branch at 606-202-0861, by mail at the above address, or by email at kyle.m.moore@usace.army.mil.

Sincerely,

Andrew J. Wendt
Regulatory Project Manager
North Branch

Enclosures
Cc: via email
Susan Brownstein
CDM Smith, Inc.
brownsteinsj@cdmsmith.com

Micah Cothren
United States Army Corps of Engineers - Louisville District
Micah.V.Cothren@usace.army.mil

Table 1. Authorized discharges of dredged and/or fill material within waters of the United States associated with the Preble County Sanitary District 6 Phase 1 Sanitary Sewer and Phase 2 Wastewater Treatment Plant, LRH-2023-651-GMR-UT to Bantas Fork

Aquatic Resource	Latitude (°N)	Longitude (°W)	Flow Regime or Cowardin Class	Length (lf) and/or Acres (ac) of Fill	Single and Complete Project	Fill Duration and Pertinent Information
Wetland 1	39.7369	-84.5663	Emergent	0.006 acre	1	NWP 58 Temporary – Open cut trench and backfill.
Wet Ditch 2	39.7464	-84.5863	Emergent	0.006 acre	2	NWP 58 Temporary – Open cut trench and backfill.
Stream 1A	39.7441	-84.5726	Ephemeral	159 linear feet 0.01 ac	1	NWP 58 Permanent – Stormwater Outfall
Stream 4	39.7368	-84.5665	Intermittent	68 linear feet 0.008 ac	3	NWP 58 Temporary – Open cut trench and backfill.
Stream 5	39.7437	-84.5701	Intermittent	466 linear feet 0.05 ac	4	NWP 58 Temporary – Open cut trench and backfill.
Stream 6	39.7383	-84.5689	Intermittent	88 linear feet 0.02 ac	5	NWP 58 Temporary – Open cut trench and backfill.
Stream 9	39.7500	-84.5728	Intermittent	64 linear feet 0.006 ac	6	NWP 58 Temporary – Open cut trench and backfill.
Stream 10	39.7393	-84.5728	Intermittent	30 linear feet 0.003 ac	7	NWP 39 - Permanent Outfall - Riprap
Stream 11	39.7421	-84.5701	Ephemeral	328 linear feet 0.02 ac	8	NWP 58 Temporary – Open cut trench and backfill.

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SPECIAL CONDITIONS FOR NATIONWIDE PERMITS 39 AND 58 VERIFICATIONS THE PREBLE COUNTY SANITARY DISTRICT 6 PHASE 1 SANITARY SEWER AND PHASE 2 WASTEWATER TREATMENT PLANT PROJECT LRH-2023-651-GMR-UT TO BANTAS FORK

PAGE 1 OF 2

1. All work would be conducted in accordance with the drawings titled "*Overall Site Plan"* for the wastewater treatment plant construction activities and *"Key Map Plan"* for the sewer line construction activities submitted with the PCN materials.

2. Enclosed is a copy of Nationwide Permits 39 and 58, which will be kept at the site during construction. A copy of the nationwide permit verifications, special conditions, and the submitted construction plans must be kept at the site during construction. The permittee will supply a copy of these documents to their project engineer responsible for construction activities.

3. Construction activities will be performed during low flow conditions to the greatest extent practicable. Additionally, appropriate site specific best management practices for sediment and erosion control will be fully implemented during construction activities at the site.

4. Upon completion of the activity authorized by this Nationwide Permit verification, the enclosed certification must be signed and returned to this office along with as-built drawings showing the location and configuration, as well as all pertinent dimensions and elevations of the activity authorized under this Nationwide Permit verification.

5. No area for which grading has been completed will be unseeded or unmulched for longer than 14 days. All disturbed areas will be seeded and/or revegetated with native species and approved seed mixes (where practicable) after completion of construction activities for stabilization and to help preclude the establishment of non-native invasive species.

6. Should new information regarding the scope and/or impacts of the project become available that was not submitted to this office during our review of the proposal, the permittee will submit written information concerning proposed modification(s) to this office for review and evaluation, as soon as practicable.

7. In the event any previously unknown historic or archaeological sites or human remains are uncovered while accomplishing the activity authorized by this nationwide permit authorization, the permittee must cease all work in waters of the United States immediately and contact local, state and county law enforcement offices (only contact law enforcement on findings of human remains), the Corps at 304-399-5210 and Ohio State Historic Preservation Office at 614-298-2000. The Corps will initiate the Federal, state and tribal coordination required to comply with the National Historic Preservation Act and applicable state and local laws and regulations. Federally recognized tribes are afforded a government-to-government status as sovereign nations and consultation is required under Executive Order 13175 and 36 CFR Part 800.

SPECIAL CONDITIONS FOR NATIONWIDE PERMITS 39 AND 58 VERIFICATIONS THE PREBLE COUNTY SANITARY DISTRICT 6 PHASE 1 SANITARY SEWER AND PHASE 2 WASTEWATER TREATMENT PLANT PROJECT LRH-2023-651-GMR-UT TO BANTAS FORK

PAGE 2 OF 2

8. Section 7 obligations under Endangered Species Act must be reconsidered if new information reveals impacts of the project that may affect federally listed species or critical habitat in a manner not previously considered, the proposed project is subsequently modified to include activities which were not considered during Section 7 consultation with the United States Fish and Wildlife Service, or new species are listed or critical habitat designated that might be affected by the subject project.

9. The project site lies within the range of the Indiana bat (*Myotis sodalis*), a federally-listed endangered species, the northern long-eared bat (*Myotis septentrionalis*), a federally-listed threatened species, and the tricolored bat (*Perimyotis subflavus*), a proposed federally-listed endangered species. Several factors have contributed to the three (3) species decline, including habitat loss, fragmentation of habitat and the disease White Nose Syndrome. During winter, the three (3) bat species hibernate in caves and abandoned mines. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields, and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥3 inches diameter at breast height (dbh) that have any exfoliating bark, cracks, crevices, hollows and/or cavities), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other forested/wooded habitat. The permittee shall preserve wooded/forested habitats exhibiting any of the characteristics listed above wherever possible. Should suitable habitat be present that cannot be saved during construction activities, any trees ≥3 inches dbh shall only be cut between October 1 – March 31.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Preble County Engineer	File Number: LRH-2023-651-GMR	Date: November 14, 2023

Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
	APPROVED JURISDICTIONAL DETERMINATION	D
X	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/CECW/Pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:

Kyle Moore
Huntington District Corps of Engineers
CE-RDN
10557 McKelvey Road
Cincinnati, OH 45240
(606) 202-0861
Kyle.m.moore@usace.army.mil

If you only have questions regarding the appeal process you may also contact:
Katherine A. McCafferty
Regulatory Administrative Appeals Officer
U.S. Army Corps of Engineers,
Great Lakes and Ohio River Division
550 Main Street, Room 10780
Cincinnati, Ohio 45202-3222
Office Phone: 513-684-2699, FAX: 513-684-2460
e-mail: katherine.a.mccafferty@usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.		
_____ Signature of appellant or agent.	Date:	Telephone number:

Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD: November 14, 2023

B. NAME AND ADDRESS OF PERSON REQUESTING PJD: R. Kyle Cross, 1000 Preble Drive, Eaton, Ohio 45320

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: LRH-2023-651-GMR-UT to Bantas Fork

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: Ohio County/parish/borough: Preble County City: Twin and Lanier Townships

Center coordinates of site (lat/long in degree decimal format):

Lat.: 39.743909 Long.: -84.5725

Universal Transverse Mercator: NAD83

Name of nearest waterbody: Bantas Fork

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date: November 2, 2023

☐ Field Determination. Date(s):

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)
			SEE ATTACHMENT		

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:

- [x] Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
  Map: Figure 7a in report referenced below.
- [x] Data sheets prepared/submitted by or on behalf of the PJD requestor.
  - [x] Office concurs with data sheets/delineation report.
  - [ ] Office does not concur with data sheets/delineation report. Rationale: Delineation Report dated July 2023.
- [ ] 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.
- [x] U.S. Geological Survey map(s). Cite scale & quad name: Ohio 1:24K - West Alexandria.
- [x] Natural Resources Conservation Service Soil Survey. Citation: Figure 6 in report referenced above.
- [x] National wetlands inventory map(s). Cite name: Figure 5 in report referenced above.
- [ ] State/local wetland inventory map(s): _____.
- [x] FEMA/FIRM maps: In report referenced above.
- [ ] 100-year Floodplain Elevation is: _____.(National Geodetic Vertical Datum of 1929)
- [x] Photographs: [x] Aerial (Name & Date): Appendix F in report referenced above.
  or [x] Other (Name & Date): Appendix A in report referenced above.
- [ ] Previous determination(s). File no. and date of response letter: _____.
- [ ] Other information (please specify): _____.

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.

K L M. Moore
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.

RGL 16-01: 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	39.7441	-84.5726	0.017 acre	Wetland	Section 404
Wetland 2	39.7383	-84.5687	0.011 acre	Wetland	Section 404
Wet Ditch 2	39.7464	-84.5863	0.006 acre	Wetland	Section 404
Stream 1A	39.7441	-84.5726	505 linear feet	Non-wetland water	Section 404
Stream 1B	39.7441	-84.5711	403 linear feet	Non-wetland water	Section 404
Stream 4	39.7368	-84.5665	148 linear feet	Non-wetland water	Section 404
Stream 5	39.7437	-84.5701	1,366 linear feet	Non-wetland water	Section 404
Stream 6	39.7383	-84.5689	665 linear feet	Non-wetland water	Section 404
Stream 9	39.75	-84.5864	254 linear feet	Non-wetland water	Section 404
Stream 10	39.7393	-84.5728	200 linear feet	Non-wetland water	Section 404
Stream 11	39.7425	-84.5697	328 linear feet	Non-wetland water	Section 404

Glenwood Area Sanitary Sewer Wetlands & Waters of the United States Field Investigation

US 35 East,
Twin and Lanier Townships,
West Alexandria,
Preble County, Ohio

Prepared For:
Preble County, Ohio

March 2021, Updated July 2023

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Section 1
Introduction

1.1 Project Information

Date of 2020 Field Investigation:
October 7, 12, and 13, 2020

Date of 2023 Field Investigation:
June 8 and 9, 2023

Various Locations Along:
Latitude: 39.743909 Longitude: -84.572501
Twin and Lanier Townships
West Alexandria and Lewisburg Quadrangles
Preble County, Ohio

1.2 Project Background

Environmental Scientists, Nicholas Revetta and Kate Moran, of CDM Smith Inc. (CDM Smith) conducted Waters of the U.S. (WOTUS) Determinations/Wetland Delineations for the Glenwood Area Sanitary Sewer Project on October 7, 12, and 13, 2020. In 2022, the proposed sanitary sewer route was modified which affected the area of investigation. Therefore, the survey team investigated the new portions of the modified route on June 8 and 9, 2023. A few site features that were delineated in 2020 are outside of the 2023 area of investigation (AOI). The following report outlines the original features that were investigated in 2020, articulates which of those WOTUS/wetlands are still or are not impacted by the 2023 AOI, and details new WOTUS/wetland features found in the 2023 survey.

The project site is located in the Glenwood area, specifically between Woodside Drive and Stover Road in eastern Preble County, Ohio (OH) as depicted in **Figure 1a**, and the West Alexandria and Lewisburg, OH quadrangles (USGS 7.5' topographic map).

The Glenwood area is not served by a central sewer service but by individual home sewage treatment systems (HSTS). Sampling efforts in this area have revealed *E. coli* bacteria counts that indicate the HSTS have either failed or otherwise have been providing insufficient treatment. Previous evaluations of collection and treatment alternatives resulted in the recommendation to construct a gravity sewer system that delivers wastewater to a package extended aeration wastewater treatment plant (WWTP).

The project will include the construction of this proposed sanitary sewer system and associated WWTP. The WWTP will be constructed on a parcel of land located at approximately 39.740944, -84.572476, and the associated sanitary sewer system along the routes depicted in **Figure 2**. The

WOTUS Determinations/Wetland Delineations were conducted throughout the AOI. The surveys focused on the impacts of the construction of the WWTP and associated sewer lines to determine if any aquatic resources are present at these locations.

1.3 Project Area Description

Project Area

The AOI for the WOTUS Determinations/Wetland Delineations conducted for the Glenwood Area Sanitary Sewer Project includes the entirety of the proposed WWTP parcel and the routes of the proposed sanitary sewer pipeline (**Figure 1a**). The 2020 survey included an additional 50-foot buffer around these limits of disturbance to ensure the identification of any waterways that could potentially be impacted by project activities. The 2023 survey evaluated the water resources within the 2023 AOI without a 50-ft buffer, as the survey team had been on site previously and determined this was not a necessity for this project site. **Figure 1b** shows the 2020 AOI compared to the 2023 AOI.

Topography and Drainage

The elevation of the project area ranges from approximately 900-980 feet above mean sea level. The portion of the project site where the WWTP will be located ranges from approximately 950 to 960 feet above mean sea level. The highest elevation throughout the project area is to the west, and the land gradually slopes eastward toward Bantas Fork, as depicted in **Figures 2a and 2b**. The roads throughout the project area convey surface water runoff from rain events toward the numerous roadside drainage ditches present, which all flow toward the nearest local relief. This water appears to follow the general topography of the landscape, and ultimately discharges into Bantas Fork to the east. The United States Geological Society (USGS) maps two intermittent streams running through the most northern and most southern portions of the AOI (**Figure 3**). Additional discussion detailing the NWI mapped habitats and general flow direction are provided in the section below.

Based on Flood Map Service Center data provided by the Federal Emergency Management Agency (FEMA), the majority of the project area is located within an area of minimal flood hazard (Zone X), with the exception of the northern portion of the sewer route on Woodside Dr. where the USGS intermittent stream flows under the road and its floodway is designated as having a 1% Annual Chance Flood Hazard (Zone A) (FEMA 2020). **Figures 4a** and **4b** depict the areas of the project within Zone A and those that come near Bantas Fork, which is designated as a regulatory floodway (Zone AE) (FEMA 2020).

National Wetland Inventory (NWI) Mapped Features

According to data provided by the NWI, two water features were mapped within the AOI, as depicted in **Figure 5**. The previously identified intermittent stream that crosses Woodside Dr. is designated as a 3.10-acre riverine, intermittent, streambed, seasonally flooded (R4SBC) habitat. The second NWI mapped riverine habitat within the project area was identified at the southwestern extent of the investigated area, flowing west-to-east across multiple roads, toward Bantas Fork. This stream was identified by the NWI as a 5.75-acre riverine, intermittent, streambed, seasonally flooded (R4SBC) habitat.

In addition to those features mapped within the project boundaries, NWI mapping identified four palustrine, unconsolidated bottom, intermittently exposed (PUBG) ponds (0.21-acre, 0.46-acre, 0.73-acre, and 1.31-acre) and one freshwater palustrine emergent (PEM) wetland (0.18-acre) mapped north of US 35, adjacent to the pipeline routes and outside of the area of investigation. All of these features were mapped outside of the proposed project area and associated 50-foot buffer. Additional streams were identified by the NWI throughout the surrounding area; however, no other waterways were mapped within or adjacent to the investigated area.

Soil Associations and Series

According to data provided by the Natural Resource Conservation Service (NRCS), there are eight soil types present throughout the project area, with most of the site being comprised of Celina silt loam (2-6% slopes) (**Figure 6**). The Celina series consists of very deep, moderately well drained soils that are moderately deep to dense till. These soils formed from loess and the underlying loamy till of till plains and moraines (NRCS 2023a). **Table 1** below details those soil types present within the area of investigation based on a Custom Soil Resource Report from the NRCS Web Soil Survey (NRCS 2023b).

Table 1. NRCS Soil Survey Mapping Units and Component Soil Characteristics

Map Unit	Percent of AOI	Component and Percent	Drainage	Depth to Water Table	Flooding/ Ponding	Hydrologic Soil Group	Hydric
CeB - Celina silt loam, 2 to 6 percent slopes	29.4	Celina and similar soils: 85 percent Minor components: 15 percent	Moderately well drained	About 12 to 30 inches	None / None	C/D	No
CtA - Crosby-Celina silt loams, 0 to 2 percent slopes	13.2	Crosby and similar soils: 60 percent Celina and similar soils: 25 percent Minor components: 15 percent	Somewhat poorly drained	About 6 to 24 inches	None / None	C/D	No
CtB - Crosby-Celina silt loams, 2 to 4 percent slopes, eroded	7.2	Crosby and similar soils: 60 percent Celina, eroded, and similar soils: 30 percent Minor components: 10 percent	Somewhat poorly drained	About 6 to 24 inches	None / None	C/D	No
KnA - Kokomo silt loam, 0 to 1 percent slopes	6.4	Kokomo and similar soils: 90 percent Minor components: 10 percent	Very poorly drained	About 0 to 6 inches	None / Frequent	C/D	Yes
MeC2 - Miamian silt loam, 6 to 12 percent slopes, eroded	18.6	Miamian and similar soils: 85 percent Minor components: 15 percent	Well drained	About 30 to 42 inches	None / None	C	No
MeD2 - Miamian silt loam, 12 to 18 percent slopes, eroded	2.9	Miamian, eroded, and similar soils: 90 percent	Well drained	About 30 to 42 inches	None / None	C	No

		Minor components: 10 percent					
MfB - Miamian-Celina silt loams, 2 to 6 percent slopes	13.1	Miamian and similar soils: 60 percent Celina and similar soils: 30 percent Minor components: 10 percent	Well drained	About 30 to 42 inches	None / None	C	No
MfB2 - Miamian-Celina silt loams, 2 to 6 percent slopes, eroded	9.2	Miamian, eroded, and similar soils: 60 percent Celina, eroded, and similar soils: 30 percent Minor components: 10 percent	Well Drained	About 20 to 42 inches	None / None	C	No

Natural Resources Conservation Service (NRCS), United States Department of Agriculture, Web Soil Survey Custom Soil Resource Report for Ohio July 12, 2023.

Based on the data provided by the NRCS Custom Soil Resource Report and recorded in **Table 1** above, Kokomo and similar soils series within the area of investigation are reported as hydric. This, combined with minor components that could be hydric, indicates that the project area has the potential to support wetland habitats.

Section 2
Field Investigation

Despite being useful preliminary site evaluation and desktop delineation tools, third-party mappers and database resources often significantly underestimate the total number/extent of streams and wetlands or incorrectly characterize the types of aquatic features present. Therefore, a field investigation of the project area was first conducted in 2020 and again in 2023 to determine the presence of stream and wetland systems within those limits. Site photographs from the field investigation are provided in **Appendix A**. As previously stated, the 2020 AOI included the proposed limits of disturbance and a buffer, which extended beyond the boundaries of the project area for 50 feet or until a property line was encountered, whichever occurred first. The proposed sewer route was modified in 2022, and the sewer lines have been designed through residential yards. To update the findings of this report, the 2023 field investigation only surveyed those areas that were not previously surveyed in 2020. **Figure 1b** overlays the 2020 AOI and 2023 AOI as a comparison of the two proposed sewer routes.

Wetland habitats, tributaries, roadside ditches, water conveyances, and any other applicable aquatic features located within and extending 50 feet beyond the proposed project area were assessed and characterized to determine potential jurisdictional status as wetlands or WOTUS. The subsections below describe the findings and determinations resulting from the site investigation. The features that were originally included in 2020's area of investigation and have since been omitted from the project scope are also discussed below.

Site Conditions

Weather conditions during the field investigation were as follows:

October 7, 2020: 53°F/82°F; fair with a max wind speed of 21 miles per hour (MPH) and 0.00-inches of precipitation.

October 12, 2020: 55°F/73°F; cloudy with a max wind speed of 26 MPH and 0.00-inches of measurable precipitation, although very light rain was present in the evening.

October 13, 2020: 42°F/69°F; fair with a max wind speed of 16 MPH and 0.17-inches of precipitation from the night prior to the field investigation.

A total of 1.03-inches of precipitation was reported throughout the month leading up to the field investigation, with the most recent rain event occurring on October 5, 2020. While the average rainfall throughout the month leading up to the investigation was slightly below the historic average, conditions were consistent with historic weather for the area. As a result, it is assumed that the area of investigation was exhibiting normal conditions during the time of the site evaluation.

June 8, 2023: 51°F/75°F; sunny with a max wind speed of 12 MPH and 0.00-inches of precipitation.

June 9, 2023: 54°F/78°F; sunny with a max wind speed of 10 MPH and 0.00-inches of measurable precipitation, although very light rain was present in the evening.

A total of 1.97-inches of precipitation was reported throughout the month leading up to the field investigation, with the most recent rain event occurring on June 7, 2023, with 0.12-inches of rain. While the average rainfall throughout the month leading up to the investigation was slightly below the historic average, conditions were consistent with historic weather for the area. As a result, it is assumed that the area of investigation was exhibiting normal conditions during the time of the site evaluation.

2.1 Wetlands

Although NWI mapping did not indicate any wetlands as being present within the project boundary, the following four wetlands were identified during the field investigation: Wetland 1, Wetland 2, Wet Ditch 2 and Wet Ditch 3. However, Wet Ditch 3 is no longer included within the updated 2023 AOI. Therefore, only the three aforementioned wetlands remain in the AOI are discussed below.

Wetland 1 and Wetland 2 were both identified as wetlands located within stream channels which were heavily vegetated and did not contain any flowing water at the time of the field investigation. In addition, two wet roadside drainage ditches containing standing water (Wet Ditch 1 and Wet Ditch 2) were identified within the project area and assessed. Wet Ditch 1 did not meet the three criteria necessary to constitute a wetland habitat, as indicated in the wetland data sheet located in **Appendix B**. Wet Ditch 2 did meet all three required wetland criteria. During rain events or times of heavy flow, it is likely that surface water fills the ditches and streams containing these wetland habitats, which all ultimately discharge east into Bantas Fork. Details of the three wetlands identified within the area of investigation are described in detail in the subsections below.

Wetlands were delineated following the U.S. Army Corps of Engineers (USACE) 1987 Wetland Delineation Manual, 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) and assessed following the Ohio Rapid Assessment Method for Wetlands (ORAM). In accordance with USACE Wetland Delineation protocols, the wetland boundary was established by identifying the margins where hydrophytic (wetland) plants, hydric soils, and evidence of wetland hydrology were present. The wetland boundary was recorded using a survey-grade Trimble GPS unit with sub-meter accuracy. While assessing the boundary, evidence of wetland vegetation and hydrology were visually identified continuously, and hydric soils were investigated at least every 20 feet using a soil auger and spade to confirm the presence/absence of hydric soils. Characterization of the full soil profile was investigated at a depth of at least 20 inches (assuming no refusal or collapsed hole due to water/saturation) via digging a soil pit at the locations of the formal wetland and upland determination plots. Wetland data sheets and the associated upland data sheets are provided in **Appendix B,** and the completed ORAM forms are in **Appendix C**. **Figure 7a and 7b-1 through 7b-11** depict each water resource found in the 2020 and 2023 AOIs.

2.1.1 2020 Investigation

Wetland 1

Wetland 1 is located within the channel of Stream Segment 4 off Stover Road and was identified as a 0.017-acre palustrine emergent (PEM) wetland. To best characterize the overall wetland habitat and differences in vegetation observed within the boundary of Wetland 1 on either side of the Stover Road bridge, two wetland plots, Wetland Plot 1-1 and Wetland Plot 1-2 (0.007-acre and 0.010-acre, respectively), were evaluated. Although vegetation was not present under the bridge, the wetland boundaries depicted on **Figure 7b-9** are likely connected via the high groundwater table and surface water runoff that is present within the channel when adequate flow is available.

Surface water was observed in the channel during the time of the assessment; however, no flow was observed, and the only water present was located within shallow pools. In addition to surface water being present, indicators of wetland hydrology in Wetland 1 included a high-water table, saturation, water marks, aquatic fauna (tadpoles), crayfish burrows, and vegetation passing the FAC-neutral test.

Wetland Plot 1-1 was analyzed on the east side of Stover Road (**Figure 7b-9**). At this location, the wetland is comprised entirely of a dense herbaceous stratum dominated by rice cutgrass (*Leersia oryzoides*), devil's beggarticks (*Bidens frondosa*), and low smartweed (*Persicaria longiseta*). The dominance test scored 100%, and the prevalence index reported a total of 2.00, supporting the determination that hydrophytic vegetation is present.

The observed vegetation was indicative of an emergent wetland habitat, and the soil profile at the center of the plot was analyzed to determine the presence/absence of hydric soils. The soil profile from Wetland Plot 1-1 is provided below:

Table 2. Wetland 1, Wetland Plot 1-1 Soil Profile

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type	Loc		
0 – 8"	10YR 3/2	75%	No redox features				Sandy Loam	Very organic
	10YR 4/2	25%						
8 – 12"	10YR 3/2	75%	10YR 6/4	5	C	M	Sandy Loam	Very organic - 10% gravel
	10YR 3/2	20%						
12 – 20"	10YR 4/1	80%	No redox features				Sandy Loam	Very organic - 10% gravel
	10YR 3/4	20%						

The soil profile satisfied the conditions of the following hydric soil indicators: depleted below dark surface (A11) and depleted matrix (F3).

Wetland Plot 1-1 met all criteria necessary to constitute a wetland habitat and scored 9 points on the ORAM, classifying it as a Category 1 wetland.

On the west side of Stover Road, the wetland is also comprised entirely of a dense herbaceous stratum, however, this section of the wetland is dominated by winged loosestrife (*Lythrum alatum*) in addition to devil's beggarticks, low smartweed, and rice cutgrass. The dominance test

scored 100%, and the prevalence index reported a total of 1.85, supporting the determination that hydrophytic vegetation is present.

The observed vegetation in Wetland Plot 1-2 was indicative of an emergent wetland habitat, and the soil profile at the center of the plot was analyzed to determine the presence/absence of hydric soils. The soil profile from Wetland Plot 1-2 is provided below:

Table 3. Wetland 1, Wetland Plot 1-2 Soil Profile

0 – 6"	10YR 3/2	80%	10YR 4/1	20%	D	M	Sandy Loam	Very organic
6 – 18"	10YR 4/2	10%	10YR 2/1	90%	RM	M	Sandy Loam	Very organic – 5% gravel
18 – 24"	10YR 5/2	2%	10YR 2/1	98%	RM	M	Sandy Loam	Very organic – 1% gravel

The soil profile satisfied the conditions of the following hydric soil indicators: depleted below dark surface (A11), depleted matrix (F3), and redox dak surface (F6).

Wetland Plot 1-2 met all criteria necessary to constitute a wetland habitat and scored 9 points on the ORAM, classifying it as a Category 1 wetland.

Wetland 2

Wetland 2 was identified as a 0.011-acre palustrine emergent (PEM) wetland located within the channel of Stream Segment 6 as it crosses Vanessa Drive. Similar to Wetland 1, vegetation was not present under the bridge the channel passes through, so two distinct, but connected wetland areas (0.007-acre and 0.004-acre) for the overall Wetland 2 habitat are depicted in **Figure 7b-8**. Unlike Wetland 1, the wetland boundaries on either side of the road contained nearly identical characteristics, so only one wetland determination plot was evaluated. The two areas of Wetland 2 on either side of Vanessa Drive are connected via a high groundwater table and surface water runoff that is present within the channel when adequate flow is available.

Surface water was not observed within the wetland boundary, however, standing water was observed in the unvegetated channel downstream in shallow pools during the time of the assessment. Despite an absence of standing water within the area of investigation, indicators of wetland hydrology included a high-water table, saturation, crayfish burrows, and vegetation passing the FAC-neutral test.

Wetland 2 is comprised entirely of a dense herbaceous stratum dominated by rice cutgrass. The dominance test scored 100%, and the prevalence index reported a total of 1.42, supporting the determination that hydrophytic vegetation is present.

The observed vegetation was indicative of an emergent wetland habitat, and the soil profile at the center of the plot was evaluated to determine the presence/absence of hydric soils. The soil profile for Wetland 2 is provided below:

Table 4. Wetland 2 Soil Profile

Depth	Matrix	Redox Features	Texture	Remarks

(inches)	Color (moist)	%	Color (moist)	%	Type	Loc		
0 – 4"	10YR 3/2	85%	10YR 3/1	13%	D	M	Sandy Clay	Very organic
			10YR 5/3	2%				
4 – 20"	10YR 4/1	80%	10YR 3/1	15%	D	M	Mucky Clay	5% gravel
			10YR 8/4	3%				
			10YR 6/6	2%	C	M		Prominent redox concentrations

The soil profile satisfied the conditions of the following hydric soil indicators: depleted below dark surface (A11), depleted matrix (F3), and redox dark surface (F6).

Wetland Plot 2 met all criteria necessary to constitute a wetland habitat and scored 9 points on the ORAM, classifying it as a Category 1 wetland.

Wet Ditch 2

Wet Ditch 2 was identified as a 0.006-acre palustrine emergent (PEM) wetland and is located within a narrow roadside drainage ditch adjacent to Woodside Drive, north of US 35, as depicted in **Figure 7b-2**. Due to the long and narrow shape of the wetland habitat, the vegetation was analyzed throughout a rectangular area of 6' x 30' to avoid including the adjacent maintained residential lawn. The vegetation passed the FAC-neutral test, and water marks were observed on the vegetation within the ditch, both of which are indicators of wetland hydrology.

The wetland consists primarily of herbaceous vegetation, which is dominated by narrow leaf cattails (*Typha angustifolia*); although black willow (*Salix nigra*) and green ash (*Fraxinus pennsylvanica*) were also dominant within the sapling/shrub stratum. The dominance test scored 100%, and the prevalence index reported a total of 1.16, supporting the determination that hydrophytic vegetation is present.

The observed vegetation was indicative of an emergent wetland habitat, and the soil profile at the center of the plot was evaluated to determine the presence/absence of hydric soils. The soil profile from Wet Ditch 2 is provided in **Table 5** below:

Table 5. Wet Ditch 2 Soil Profile

Depth	Matrix	Redox Features					Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type	Loc		
0 – 8"	10YR 3/2	70%	10YR 5/8	30%	C	M	Silty Clay	
8 – 20"	10YR 4/6	90%	10YR 3/1	5%	D	M	Silty Clay	Loose – 5% gravel
			10YR 6/1	5%	D	M		

The soil profile satisfied the conditions of the depleted matrix (F3) and redox dark surface (F6) hydric soil indicators.

Wet Ditch 2 met all criteria necessary to constitute a wetland habitat and scored 4 points on the ORAM, classifying it as a Category 1 wetland.

Wetlands 1 and 2, and Wet Ditch 2 are within the project AOI/limits of disturbance and therefore could be impacted by the proposed project. While these wetlands are likely of low quality, consultation with USACE and Ohio EPA is recommended.

2.1.2 2023 Investigation – No Longer Impacted by Sewer Construction

As previously stated, in 2022, the AOI was redrawn and therefore, some of the previously delineated site features are no longer impacted by the construction of the WWTP and its conveyance infrastructure. **One of the previously delineated wetlands was Wet Ditch 3, which now falls outside the 2023 AOI.**

Wet Ditch 3

The updated AOI of 2023 determines that Wet Ditch 3 is no longer included in the site's area of concern and is no longer impacted by construction. However, it was delineated in 2020 and was identified as a 0.016-acre palustrine emergent (PEM) wetland located within a narrow roadside drainage ditch adjacent to US 35, immediately north of the road. Due to the long and narrow shape of the wetland habitat, the vegetation was evaluated throughout a rectangular area of 6' x 30' in order to avoid including the adjacent maintained residential lawn. Surface water was observed in the ditch during the time of the assessment; however, no flow was present. In addition to surface water being present, indicators of wetland hydrology included a high-water table, saturation, water marks, and vegetation passing the FAC-neutral test.

The wetland consists primarily of herbaceous vegetation, which was dominated by narrow leaf cattail and rice cutgrass. The dominance test scored 100%, and the prevalence index reported a total of 1.10, supporting the determination that hydrophytic vegetation is present.

The observed vegetation was indicative of an emergent wetland habitat, and the soil profile at the center of the plot was analyzed to determine the presence/absence of hydric soils. The soil profile from Wet Ditch 3 is provided in **Table 6** below.

Table 6. Wet Ditch 3 Soil Profile

Depth	Matrix	Redox Features					Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type	Loc		
0 – 16"	10YR 3/2	55%	10YR 2/1	45%	RM	M	Sandy Silt	Large amounts gravel

The soil profile satisfied the conditions of the following hydric soil indicators: depleted matrix (F3).

Wet Ditch 3 met all criteria necessary to constitute a wetland habitat and scored 4 points on the ORAM, classifying it as a Category 1 wetland.

2.2 Streams

Nine stream segments were identified within the 2023 area of investigation and were assessed using the Environmental Protection Agency (EPA) Rapid Bioassessment Protocols (RBP) for low Gradient Streams and the Ohio Qualitative Habitat Evaluation Index (QHEI). The completed EPA RBP assessment sheets are in **Appendix D,** and the completed Ohio QHEI forms are in **Appendix E**. The locations of the stream segments are depicted in **Figures 7b-1, 7b-3, 7b-**

4, 7b-6, 7b-7, 7b-8, 7b-9, and 7b-10. The streams that were omitted from site area in 2023 are also discussed below and depicted in their respective figures.

The subsections below detail the findings from the field investigation and provide reasoning for the scores each segment received based on the RBP and QHEI assessments. These valuation metrics provide scores to describe the stream condition based on various habitat parameters that label a stream either optimal, suboptimal, marginal, or poor condition (according to the RBP assessment) or excellent, good, fair, poor, or very poor condition (according to the QHEI assessment).

2.2.1 2020 Investigation

Stream Segments 1A and 1B

Stream Segments 1A and 1B were not reported on NWI or USGS mapping. The stream begins as an ephemeral channel flowing southwest to northeast toward US 35 on the parcel of the proposed WWTP as depicted in **Figure 7b-3**. The stream originates from a 50-inch culvert pipe and several smaller polyvinyl chloride (PVC) pipes directing water off the neighboring fields to the south and west. This portion of the stream channel is labeled as Stream Segment 1A and was dry at the time of the 2020 field investigation.

This channel continues northward toward US 35 until it comes to a confluence with a 50-inch culvert immediately south of US 35, at which point, the stream widens holding standing water, contains a more defined bed and bank, and varied habitat diversity. Based on these characteristics, the stream was determined to transition to an intermittent channel at this confluence where it turns east toward Bantas Fork, running parallel to US 35, and is labeled as Stream Segment 1B.

The channel substrate of Stream Segment 1A is primarily composed of cobble and sand with a moderate amount of embeddedness. Instream cover is extensive and dominated by honeysuckle throughout the riparian zone, but the channel contains moderate erosion, low sinuosity, poor development, and is heavily channelized. The channel morphology consists of approximately 40% riffles, 50% runs, and 10% pools.

The final RBP score for Stream Segment 1A was 85/200, and the final QHEI score was 48/100. Therefore, the stream was in marginal condition according to the RBP and fair condition according to the QHEI.

The channel substrate of Stream Segment 1B is primarily composed of cobble and gravel with a normal amount of embeddedness. Instream cover is extensive, as the stream segment runs parallel to US 35 within forested land adjacent to the road. The channel contains moderate erosion, low sinuosity, fair development, and is heavily channelized. The channel morphology consists of approximately 40% riffles, 40% runs, and 20% pools.

The final RBP score for Stream Segment 1B was 95/200, and the final QHEI score was 54/100. Therefore, the stream was in marginal condition according to the RBP and fair condition according to the QHEI.

Stream Segments 1A and 1B ultimately connect and flow into Stream Segments 5A and 5B (discussed below), then discharging into Bantas Fork on the east side of Stover Road, as such this stream can be considered an unnamed tributary to Bantas Fork (UNT-1 to Bantas Fork).

Stream Segment 4

Stream Segment 4 is a portion of a larger stream that was identified on both NWI and USGS mapping as an intermittent stream flowing west-to-east throughout the project area. Although the channel was dry at the time of the field investigation, well-developed bed, bank, channel morphology, habitat diversity, and a distinguishable high-water mark were observed. Multiple segments of this larger stream (herein referred to as UNT-2 to Bantas Fork) are in proximity to the project area and were assessed during the field investigation. Stream Segments 4, 6, and 10 all describe various segments of this same intermittent stream, along with Stream Segments 7 and 8 (but these two segments are now outside of the 2023 AOI). The section of this waterbody that was characterized as Stream Segment 4 was the portion of the stream that crosses under the Stover Road bridge at the southeastern extent of the project area, as depicted in **Figure 7b-9**.

At this location, the channel substrate is primarily composed of silt and cobble, with extensive embeddedness. Instream cover is nearly absent, and the channel contains moderate erosion, low sinuosity, fair development, and is showing signs of extensive channelization. The channel morphology of this channel segment consists of approximately 20% riffles, 70% runs, and 10% pools.

The final RBP score for this stream segment was 63/200 and the final QHEI score was 26/100. Therefore, the stream was in marginal condition according to the RBP and very poor condition according to the QHEI.

Stream Segment 5

Stream Segment 5 was not identified on NWI or USGS mapping and was dry at the time of the field investigation. This stream segment was assessed as it crosses under the Rebecca Drive bridge just south of US 35, flowing west-to-east, as depicted in **Figure 7b-3**. The 2023 investigation delineated an additional portion of Stream 5, which is now labeled as 5B. Segment 5 includes both the original Stream 5A and the recently delineated 5B. Stream Segment 5 makes up UNT-1 to Bantas Fork along with Stream 1.

This stream segment was determined to constitute an intermittent channel based on the well-defined bed, bank, original high-water mark, and varied habitat diversity that was observed during the field investigation.

The channel substrate is primarily composed of silt, with a moderate amount of embeddedness. Instream cover is sparse, with nearly all the cover present on the western portion of the channel. The stream contained little erosion, moderate sinuosity, fair development, and is showing signs of recovering channelization. The channel morphology of this channel segment consists of approximately 60% riffles, 10% runs, and 30% pools.

The final RBP score for this stream segment was 83/200 and the final QHEI score was 36/100. Therefore, the stream was in marginal condition according to the RBP and poor condition according to the QHEI.

Stream Segment 6

Stream Segment 6 is within UNT-2 to Bantas Fork, as was described in Stream Segment 4. Although this segment of the stream channel was also dry at the time of the field investigation, well-developed bed, bank, channel morphology, habitat diversity, and a distinguishable high-water mark were observed. This intermittent stream segment crosses over Vanessa Drive, as depicted in **Figure 7b-8**.

In the 2023 investigation, Stream Segment 6 was updated to encompass more areas in addition to the space under the bridge, and now also includes Stream Segments 6A, 6B and 6C.

At this location, the channel substrate is primarily composed of silt and boulders, with moderate embeddedness. Instream cover is sparse, and the channel contains little erosion, low sinuosity, fair development, and is showing signs of extensive channelization. The channel morphology of this channel segment consists of approximately 30% riffles, 40% runs, and 30% pools.

The final RBP score for this stream segment was 70/200 and the final QHEI score was 38/100. Therefore, the stream was in marginal condition according to the RBP and poor condition according to the QHEI.

Stream Segment 9

Stream Segment 9 was identified on both NWI and USGS mapping as an intermittent stream (UNT-3 to Bantas Fork) flowing west-to-east under Woodside Drive through a concrete channel, as depicted in **Figure 7b-1**. Stream Segment 9 flows through the northwestern extent of the project area and was dry at the time of the field investigation. Despite no flow being exhibited at the time of the field investigation, the channel contained a well-developed bed and bank.

At this location, the channel substrate is primarily composed of cobble and artificial substrate (e.g., riprap and concrete), with moderate embeddedness. Instream cover is nearly absent, and the channel contains severe erosion, no sinuosity, poor development, and is showing signs of extensive channelization. The channel morphology of this channel segment consists of approximately 70% runs and 30% pools. During the time of the field investigation, it appeared that burnt organic material and ashes had been dumped in the channel.

The final RBP score for this stream segment was 31/200 and the final QHEI score was 19/100. Therefore, the stream was in poor condition according to the RBP and very poor condition according to the QHEI.

Stream Segment 10

Stream Segment 10 is the most upstream section of UNT-2 to Bantas Fork that was analyzed as part of this field investigation and was described in Stream Segments 4, 6, 7, and 8. Similar to the segments previous discussed, this segment of the stream channel was also dry at the time of the field investigation but contained well-developed bed, bank, channel morphology, habitat diversity, and a distinguishable high-water mark. This intermittent segment was the portion of the stream that passes through a metal culvert under a private drive west of CH 65 and south of US 35. In the 2023 investigation, Stream Segment 10 was determined to be an outfall location and is depicted in **Figure 7b-7**.

At this location, the channel substrate is primarily composed of cobble and sand with moderate embeddedness. Instream cover is moderate, and the channel contains little/moderate erosion, low sinuosity, fair development, and is showing signs of extensive channelization. The channel morphology of this channel segment consists of approximately 20% riffles, 50% runs, and 30% pools.

The final RBP score for this stream segment was 58/200 and the final QHEI score was 46.5/100. Therefore, the stream was in marginal condition according to the RBP and fair condition according to the QHEI.

2.2.2 2023 Investigation – No Longer Impacted by Sewer Construction

The following sections outline the **features of these streams that were initially delineated in 2020 but are no longer included in the 2023 AOI.**

Stream Segment 2 (Bantas Fork)

Stream Segment 2 (Bantas Fork) was identified on both NWI and USGS mapping as a perennial stream flowing north to south. The perennial section of this waterbody that was investigated was the portion that crosses under the US 35 bridge at the eastern extent of the 2020 AOI, as depicted in **Figure 7b-11**.

The channel substrate is primarily composed of cobble and gravel, with a moderate amount of embeddedness. Instream cover is sparse, but the channel contains little erosion, moderate sinuosity, good development, and recovering channelization. The channel morphology of this channel segment consists of approximately 50% riffles, 30% runs, and 20% pools.

The final RBP score for this stream segment was 143/200 and the final QHEI score was 68.5/100. Therefore, the stream was in suboptimal condition according to the RBP and good condition according to the QHEI.

Though Bantas Fork is no longer included in the AOI, it is still a noteworthy parameter of the site as it would receive sediment and possible debris from construction of the sanitary sewer flowing from UNT-1 to Bantas Fork. This is because the new sanitary sewer route is planned to follow the Stream 1/Stream 5 (UNT-1 to Bantas Fork) channel (Figure 7b-3), which discharges to Bantas Fork just south of US-35.

Stream Segment 3

Due to the change in route, Stream Segment 3 is no longer impacted by the 2023 AOI. In 2020, Stream Segment 3 was not reported on NWI or USGS mapping and was dry at the time of the field investigation. This stream segment was determined to constitute an intermittent channel based on the well-defined bed, bank, original high watermark, and varied habitat diversity as it crosses under the Stover Road bridge at the southeastern extent of the project area, as depicted in **Figure 7b-10**.

The channel substrate is primarily composed of silt and sand, with a moderate amount of embeddedness. Instream cover is moderate, and the channel contains moderate erosion, low sinuosity, fair development, and was showing signs of recovering channelization during the 2020

investigation. The channel morphology of this channel segment consists of approximately 35% riffles, 35% runs, and 30% pools.

The final RBP score for this stream segment was 78/200 and the final QHEI score was 40/100. Therefore, the stream was in marginal condition according to the RBP and poor condition according to the QHEI.

Stream Segment 7

Stream Segment 7 is a portion of UNT-2 to Bantas Fork, as was described in Stream Segments 4 and 6. Similar to the segments previous discussed, this segment is omitted from the AOI due to the sewer route change. In the 2020 field investigation, it contained a well-developed bed, bank, channel morphology, habitat diversity, and a distinguishable high-water mark. This intermittent segment was the portion of the stream that passes adjacent to Sample Drive, as depicted in **Figure 7b-6**.

At this location, the channel substrate is primarily composed of cobble and boulders, with moderate embeddedness. Instream cover is moderate, and the channel contains moderate erosion, low sinuosity, poor development, and is showing signs of extensive channelization. The channel morphology of this channel segment consists of approximately 10% riffles, 85% runs, and 5% pools.

The final RBP score for this stream segment was 71/200 and the final QHEI score was 45/100. Therefore, the stream was in marginal condition according to the RBP and fair condition according to the QHEI.

Stream Segment 8

Stream Segment 8 is a portion of UNT-1 Bantas Fork and is omitted from the 2023 AOI due to the sewer route revision. This segment of the stream channel was also dry at the time of the field investigation in 2020 but contained well-developed bed, bank, channel morphology, habitat diversity, and a distinguishable high-water mark. This intermittent segment was on the portion of the stream that passes under the CH 65 bridge, as depicted in **Figures 7b-6**.

At this location, the channel substrate is primarily composed of cobble and sand, with moderate embeddedness. Instream cover is moderate, and the channel contains little moderate erosion, low sinuosity, poor development, and is showing signs of extensive channelization. The channel morphology of this channel segment consists of approximately 20% riffles and 80% runs.

The final RBP score for this stream segment was 52/200 and the final QHEI score was 35/100. Therefore, the stream was in marginal condition according to the RBP and poor condition according to the QHEI.

2.2.3 2023 Investigation – Added to AOI

Stream Segment 11

During the 2023 field investigations a small ephemeral channel (Stream segment 11) was identified on the south side of Vanessa Dr near Lee Ct. (**Figure 7b-4**). This small channel originates from a grassy swale behind 227 Vanessa Dr. At its widest, the channel was about 1-ft narrowing to about 6-inches as it flows towards the culvert under Vanessa Dr. Throughout the

channel the average bank height was approximately 6-inches, and the substrate consisted of a silt and gravel bottom. As of the 2023 Supreme Court of the United States ruling in the Sackett V. EPA, this ephemeral channel is not jurisdictional.

Section 3
Conclusions

In 2020, the project area for the Preble County WWTP site and associated conveyance infrastructure was surveyed for the presence of wetlands and WOTUS. In 2023, an additional field investigation was performed in response to a change in AOI. Within the most recently articulated AOI, three emergent wetland habitats were identified. One of the wetlands was located within roadside drainage ditches (Wet Ditch 2), and two were located within semi-dry streambeds (Wetland 1 and Wetland 2).

Wet Ditch 2 has the potential to be impacted by construction of the sanitary sewer, however, the conveyance line will be placed within the center of the road. This decreases the likelihood of impacts to Wet Ditch 2. Wetland 1 is likely to be impacted by the sanitary sewer construction, unless the conveyance line is trenched directly in the middle of Stover Rd. Any variation of this would likely cause impacts to Wetland 1. Wetland 2 will not be directly impacted by construction, however the portion of the sanitary sewer route crosses Stream Segment 6C upstream of the wetlands. Precautions should be taken to prevent silt from travelling downstream and accumulating in the wetland.

These three wetlands all likely fall within federal USACE jurisdiction as they share a surface water connection to the perennial Bantas Fork. Although Wet Ditch 2 was identified within roadside drainage ditches, like Wetland 1 and Wetland 2, during rain events or times of adequate flow, any surface water present within these wetlands flows eastward toward the perennial Bantas Fork. Wetland locations included in the AOI and their details are summarized below in **Table 7**.

Table 7. Wetland Summary

Wetland ID	Photos	Latitude/ Longitude	Anticipated Wetland Impact (ac)[1]	NWI	Cowardin	Likely Jurisdictional
Wetland 1	6-15	39.7369, -84.5663	TBD	No	PEM	Yes
Wetland 2	31-36	39.7383, -84.5687	TBD	No	PEM	Yes
Wet Ditch 2	41-45	39.7464, -84.5863	TBD	No	PEM	Yes

[1] Wetland impacts are possible; however, this will be confirmed during advanced design of the project.

The field delineation assessed nine stream segments within the area of investigation, three of which (Stream Segments 4, 6, and 10), are all segments of the same channel (i.e., -2 to Bantas Fork). Stream Segment 1A, located within the parcel of the proposed WWTP, was identified as an ephemeral stream until it reaches a confluence with a culvert running parallel to US 35, at which point, the stream transitions to an intermittent channel (Stream Segment 1B). Stream 1 connects with the intermittent Stream 5 (UNT-1 to Bantas Fork) then flows into Bantas Fork.

In the recent 2023 investigation, an additional stream was also delineated in the new AOI. Stream Segment 11 is a grassy, ephemeral channel that was not included in the original area of investigation in 2020. Except for the perennial Bantas Fork, every other channel assessed during

the investigation was identified as intermittent. Details of the streams included in the AOI are summarized below in **Table 8**.

Table 8. Stream Summary

Stream ID[1]	Photos	Latitude/ Longitude	Anticipated Stream Impact (If)[2]	USGS Blue line	Assessed Stream Category	Likely Jurisdictional
Stream Segment 1A	99-106	39.7441, -84.5726	TBD	No	Ephemeral	No
Stream Segment 1B	106-112	39.7441, -84.5711	TBD	No	Intermittent	Yes
Stream Segment 4	8-25	39.7368, -84.5665	TBD	Intermittent	Intermittent	Yes
Stream Segment 5	113-156	39.7437, -84.5701	TBD	No	Intermittent	Yes
Stream Segment 6	31-58	39.7383, -84.5689	TBD	Intermittent	Intermittent	Yes
Stream Segment 9	83-88	39.7500, -84.5864	TBD	Intermittent	Intermittent	Yes
Stream Segment 10	64-66	39.7393, -84.5728	TBD	Intermittent	Intermittent	Yes

[1] All stream segments are apart of a larger stream channels. These stream channels are all UNTs to Bantas Fork.
[2] Stream impacts should be avoided and minimized with final impact calculations determined during advanced design.

No additional waters or wetlands were observed in or adjacent to the area of investigation. Due to the limited footprint and the nature of project activities, it is assumed that the project would qualify for authorization under Nationwide Permit 12 for Utility Line Activities for Water and Other Substances.

The final determination of jurisdictional waters is ultimately made by USACE. A jurisdictional determination should be requested from the USACE to confirm delineated boundaries and that the wetland falls within USACE jurisdiction. If wetland impacts are necessary to complete project activities, additional permitting and mitigation may be required.

Section 4
References

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Appendix A

Site Photograph Log

US 35 Glenwood Area Sanitary Sewer

Twin and Lanier Townships, West Alexandria, Preble County, Ohio

Photograph 1 – Upland Plot 1. Upland plot 1 dominated by goldenrod. 10/7/2020.

Photograph 2 – Upland Plot 1. Standing at Upland Plot 1 facing North. 10/7/2020.

Photograph 3 – Upland Plot 1. Standing at Upland Plot 1 facing West. 10/7/2020.

Photograph 4 – Upland Plot 1. Standing at Upland Plot 1 facing South. 10/7/2020.

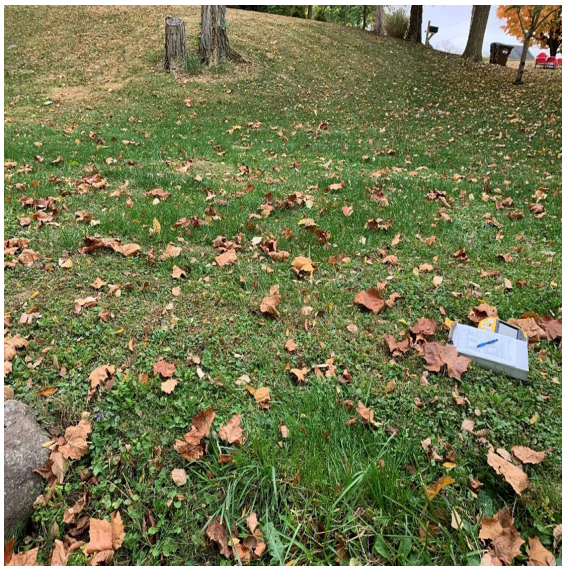
Photograph 5 – Upland Plot 1. Standing at Upland Plot 1 facing East. 10/7/2020.

Photograph 6 – Wetland 1. Wetland Plot 1-1. 10/7/2020.

Photograph 7 – Wetland 1. Standing in Wetland Plot 1-1 facing north. Stream bank lined with cobble. 10/7/2020.

Photograph 8 – Wetland 1. Standing at Wetland Plot 1-1 within Stream Segment 4, facing Northwest. Stream Segment 4 flows under Stover Rd. 10/7/2020.

Photograph 9 – Wetland 1. Wetland Plot 1-1, facing Southeast, looking downstream within Stream Segment 4. 10/7/2020.



Photograph 10 – Wetland 1. Standing at Wetland Plot 1-1, facing South into a maintain residential lawn. 10/7/2020.

Photograph 11 – Upland Plot 2 for Wetland 1. Upland Plot 2 - paired plot for Wetland Plot 1-1. 10/7/2020.

Photograph 12 – Upland Plot 2 for Wetland 1. Facing West from Upland Plot 2, overlooking Stover Rd and residential yards. 10/7/2020.

Photograph 13 – Upland Plot 2 for Wetland 1. Facing South from Upland Plot 2, overlooking Stover Rd and residential yards. 10/7/2020.

Photograph 14 – Upland Plot 2 for Wetland 1. Facing East from Upland Plot 2, Stream Segment 4 and residential yards. 10/7/2020.

Photograph 15 – Upland Plot 2 for Wetland 1. Facing North from Upland Plot 2, Stream Segment 4 and residential yards. 10/7/2020.

Photograph 16 – Wetland 1. Looking at Wetland Plot 1-2, located on North of Stream Segment 4 and West of Stover Rd. 10/7/2020.

Photograph 17 – Wetland 1. Facing Northwest from Wetland Plot 1-2, overlooking the upstream area of Stream Segment 4. 10/7/2020.

Photograph 18 – Wetland 1. Facing Southeast from Wetland Plot 1-2, overlooking the bridge for Stover Rd. 10/7/2020.

Photograph 19 – Wetland 1. Facing South from Wetland Plot 1-2, over residential properties. 10/7/2020.

Photograph 20 – Wetland 1. Facing North from Wetland Plot 1-2, over residential properties. 10/7/2020.

Photograph 21 – Upland Plot 3 for Wetland 1. Facing Upland Plot 3 (Paired plot for Wetland Plot 1-2). 10/7/2020.

Photograph 22 – Upland Plot 3 for Wetland 1. Facing East from Upland Plot 3, overlooking Stover Rd. 10/7/2020.

Photograph 23 – Upland Plot 3 for Wetland 1. Facing North from Upland Plot 3, overlooking Stover Rd. 10/7/2020.

Photograph 24 – Upland Plot 3 for Wetland 1. Facing West from Upland Plot 3, overlooking a residential yard. 10/7/2020.

Photograph 25 – Upland Plot 3 for Wetland 1. Facing South from Upland Plot 3, overlooking Stream Segment 4 and a residential yard. 10/7/2020.

Photograph 26 – Wet Ditch 1. Facing Wet Ditch Plot 1, east of Rebecca Dr. This site will no longer be impacted by the sanitary sewer construction. 10/7/2020.

Photograph 27 – Wet Ditch 1. Facing North from Wet Ditch 1, overlooking Rebecca Dr. 10/7/2020.

Photograph 28 – Wet Ditch 1. Facing South from Wet Ditch 1, overlooking Rebecca Dr. 10/7/2020.

Photograph 29 – Wet Ditch 1. Facing West from Wet Ditch 1, overlooking Rebecca Dr. 10/7/2020.

Photograph 30 – Wet Ditch 1. Facing East from Wet Ditch 1, overlooking a residential property. 10/7/2020.

Photograph 31 – Wetland 2. Wetland Plot 2 location for Wetland 2 within Stream Segment 6. 10/12/2020.

Photograph 32 – Wetland 2. Standing at Wetland Plot 2, looking East over Wetland 2 and Stream Segment 6. Stream Segment 6 flows under a private residential bridge. 10/12/2020.

Photograph 33 – Wetland 2. Standing at Wetland Plot 2, looking North at the left bank of Stream Segment 6. 10/12/2020.

Photograph 34 – Wetland 2. Standing at Wetland Plot 2, looking South at the right bank of Stream Segment 6. 10/12/2020.

Photograph 35 – Wetland 2. Standing at Wetland Plot 2, looking West at the upstream portion of Segment 6. Stream Segment 6 flows through a box culvert under Vanessa Dr. 10/12/2020.

Photograph 36 – Upland Plot 4 for Wetland 2. Upland Plot 4 (paired plot for Wetland 2) located south of Stream Segment 6 and West of Vanessa Dr. 10/12/2020.

Photograph 37 – Upland Plot 4 for Wetland 2. Standing at Upland Plot 4, looking North over Stream Segment 6 and Vanessa Dr. 10/12/2020.

Photograph 38 – Upland Plot 4 for Wetland 2. Standing at Upland Plot 4, looking West over the downstream portion of Stream Segment 6 and Vanessa Dr. 10/12/2020.

Photograph 39 – Upland Plot 4 for Wetland 2. Standing at Upland Plot 4, looking East over the upstream portion of Stream Segment 6 10/12/2020.

Photograph 40 – Upland Plot 4 for Wetland 2. Standing at Upland Plot 4, looking South over Vanessa Dr. and a residential yard. 10/12/2020.

Photograph 41 – Wetland 2/Stream Segment 6A. Standing on top of the right bank of Stream Segment 6A, facing Northwest, overlooking Wetland 2, Stream Segment 6A, and the box culvert under Vanessa Dr. Wetland 2 remains vegetated 3 years after the initial 2020 survey. 6/8/2023.

Photograph 42 – Wetland 2/Stream Segment 6A. Standing on top of the right bank of Stream Segment 6A, facing Northeast, overlooking Wetland 2 and the private residential bridge crossing Stream Segment 6. Wetland 2 remains vegetated 3 years after the initial 2020 survey. 6/8/2023.

Photograph 43 – Stream Segment 6B. Standing on top of the right bank of Stream Segment 6, facing Southeast, overlooking Stream Segment 6, just downstream of the private residential bridge. The new sanitary sewer route crosses this stream segment just inside the forested area of the channel. 6/8/2023.

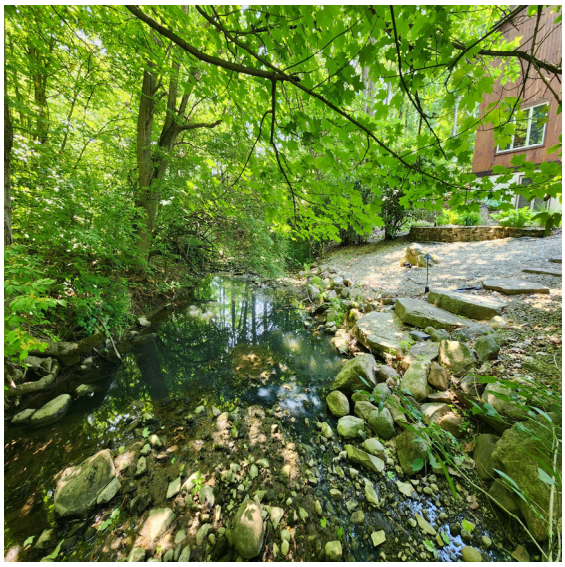
Photograph 44 – Stream Segment 6B. Standing within Stream Segment 6B, downstream of the private residential bridge. Water was present in the intermittent channel during the time of the survey. 6/8/2023.

Photograph 45 – Stream Segment 6B. Facing Northwest, standing within Stream Segment 6B, downstream of the private residential bridge and within the forested area. The sanitary sewer will cut through this portion of Stream Segment 6B. 6/8/2023.

Photograph 46 – Stream Segment 6B. Facing Southeast, standing within Stream Segment 6B, downstream of the private residential bridge and within the forested area. The sanitary sewer will cut through this portion of Stream Segment 6B. 6/8/2023.

Photograph 47 – Stream Segment 6B. Facing Southwest, towards the right bank of Stream Segment 6B. The sanitary sewer will cut through this portion of Stream Segment 6B. 6/8/2023.

Photograph 48 – Stream Segment 6B. Facing Northeast, towards the left bank of Stream Segment 6B. The sanitary sewer will cut through this portion of Stream Segment 6B. 6/8/2023.



Photograph 49 – Stream Segment 6B. Facing Southeast, towards area just downstream of where the sanitary sewer is to be constructed. Homeowners have constructed rock stairs down to a pool in the stream channel. Pool smelled of sewage and was a murky black color at the time of the 2023 survey. 6/8/2023.

Photograph 50 – Sewer route just south of Stream Segment 6C. Facing Northwest, on the property of 527 Vanessa Dr. looking over the proposed sanitary sewer route. 6/8/2023.

Photograph 51 – Sewer route crossing of Stream Segment 6C. Facing North, on the property of 527 Vanessa Dr. looking over the proposed sanitary sewer route that crosses Stream Segment 6C. 6/8/2023.

Photograph 52 – Sewer route crossing of Stream Segment 6C. Facing Northwest, overlooking the western sewer crossing of Stream Segment 6C. Murky black waters smelling of sewage were present throughout the channel at the time of the survey. 6/8/2023.

Photograph 53 – Upstream of Wetland 2. Minimal water was present in the channel at this point of the stream. 6/8/2023.

Photograph 54 – Stream Segment 6C. Area just downstream of proposed sanitary sewer crossing. 6/8/2023.

Photograph 55 – Sewer route crossing of Stream Segment 6C. Water present in the channel was black, cloudy, and smelled of sewage. 6/8/2023.

Photograph 56 – Sewer route crossing of Stream Segment 6C. Part of the proposed sanitary sewer route will cut into the right bank of Stream Segment 6C at this point in the property of 527 Vanessa Dr. 6/8/2023.

Photograph 57 – Upstream Area of Stream Segment 6C. Upstream of the sewer route crossing of Stream Segment 6C. Sediment became heavily sedimented at this point in the channel. . 6/8/2023.

Photograph 58 – Discharge Pipes in Stream Segment 6C. At least three PVC or plastic pipes enter and discharge into Stream Segment 6C. 6/8/2023.

Photograph 59 – Vanessa to Stover Rd Route. Facing East, overview of sanitary sewer route. Electrical wires and poles are located within the honeysuckle and wooded strip area to the south of the driveway. 6/8/2023.

Photograph 60 – Vanessa to Stover Rd Route. Facing West, overview of sanitary sewer route. The route splits two residential properties within a thin wooded area. 6/8/2023.

Photograph 61 – Stream Segment 3. Facing West, overview of Stream Segment 3. As the sewer route changed, this stream channel is no longer impacted. 10/12/2020.

Photograph 62 – Stream Segment 3. Facing East, overview of Stream Segment 3. The stream channel was dry at the time of the survey. 10/12/2020.

Photograph 63 – Stream Segment 3. Facing West overlooking the bridge culvert under Stover Rd. 10/12/2020.

Photograph 64 – Stream Segment 10. Facing West, overview of sanitary sewer route and proposed outfall location. The outfall would discharge into an ephemeral channel. 10/12/2020.

Photograph 65 – Stream Segment 10. Facing Northeast, an existing corrugated metal culvert is present. The culvert is under a private drive. 10/12/2020.

Photograph 66 – Stream Segment 10. Facing East, downstream of the sanitary sewer route and proposed outfall location. A larger pool is located 25-ft downstream of the road culvert outlet. This pool was filled with water at the time of the survey. 10/12/2020.

Photograph 67 – Stream Segment 8. Facing East, Towards Quaker Trace Rd. As the sanitary sewer route changed, this stream segment is no longer impacted by the proposed construction. 10/12/2020.

Photograph 68 – Stream Segment 8. Facing West, the upstream area was dry at the time of the survey. 10/12/2020.

Photograph 69 – Stream Segment 8. Facing East, the area downstream of the bridge for Quaker Trace Rd was partially armored with cement blocks. 10/12/2020.

Photograph 70 – Stream Segment 7. Facing West, the upstream area was dry at the time of the survey. 10/12/2020.

Photograph 71 – Stream Segment 7. Facing Southeast, the stream channel was filled with boulders and cobble. 10/12/2020.

Photograph 72 – Stream Segment 7. Facing West, Honeysuckle dominated the shrub layer. 10/12/2020.

Photograph 73 – Wet Ditch 2. Wet Ditch 2, is located on the east side of Woodside Dr. 10/12/2020.

Photograph 74 – Wet Ditch 2. Facing South, Wet Ditch 2 was dominated by Narrow-Leaf Cat Tail . 10/12/2020.

Photograph 75 – Wet Ditch 2. Facing North, A small portion of the wetland contained black willow. 10/12/2020.

Photograph 76 – Wet Ditch 2. Facing West, a residential property with a maintained lawn was directly adjacent to the wetland. 10/12/2020.

Photograph 77 – Wet Ditch 2. Facing East, Woodside Dr was directly adjacent to the wetland. 10/12/2020.

Photograph 78 – Upland Plot for Wet Ditch 2. Paired plot to Wet Ditch 2, was within the Woodside Drive right-of-way. 10/12/2020.

Photograph 79 – Upland Plot for Wet Ditch 2. Paired plot to Wet Ditch 2, consisted of maintained grass. 10/12/2020.

Photograph 80 – Upland Plot for Wet Ditch 2. Gravel and road debris was prominent within the upland plot. 10/12/2020.

Photograph 81 – Upland Plot for Wet Ditch 2. Residential properties surrounded both the upland and wetland plots. 10/12/2020.

Photograph 82 – Upland Plot for Wet Ditch 2. A corrugated metal culvert was piped below the driveway to 152 Woodside Dr. 10/12/2020.

Photograph 83 – Stream Segment 9. Facing Northwest looking upstream towards Woodside Dr. The channel had some standing water at the time of the survey, but was mostly dry. 10/12/2020.

Photograph 84 – Stream Segment 9. Facing Northwest looking upstream towards a private residential bridge that was constructed over the stream channel. 10/12/2020.

Photograph 85 – Stream Segment 9. Facing west, looking through the cement box culvert under Woodside Dr. A PVC pipe comes into the box culvert on the north wall.10/12/2020.

Photograph 86 – Stream Segment 9. Facing Northwest looking upstream, burned leaves filled the upstream portion of the stream channel at the time of the survey. 10/12/2020.

Photograph 87 – Stream Segment 9. Facing Southeast, towards woodside dr. Cobble and gravel were the dominant substrates. 10/12/2020.

Photograph 88 – Stream Segment 9. Facing Northwest looking upstream towards a private residential bridge that was constructed over the stream channel. 10/12/2020.

Photograph 89 – Wet Ditch 3. Wet Ditch 3 was surveyed in 2020 and was a part of the 2020 proposed sewer route. As the route has shifted to the south side of US 35 East, this wetland should not be impacted by the sanitary sewer construction. 10/13/2020.

Photograph 90 – Wet Ditch 3. Wet Ditch 3, contained a narrow wetland of cattails. 10/13/2020.

Photograph 91 – Wet Ditch 3. Facing east, to the north of Wet Ditch 3 was a residential property. 10/13/2020.

Photograph 92 – Wet Ditch 3. Facing South US-35 E was directly adjected to Wet Ditch 3. 10/13/2020.

Photograph 93 – Wet Ditch 3. Facing East, a culvert outlet directs water into Wet Ditch 3. 10/13/2020.

Photograph 94 – Upland Plot 6 for Wet Ditch 3. Upland Plot 6 is a paired plat for Wet Ditch 3. 10/13/2020.

Photograph 95 – Upland Plot 6 for Wet Ditch 3. Facing South, the upland plot was within a maintained grassy residential lawn. 10/13/2020.

Photograph 96 – Upland Plot 6 for Wet Ditch 3. Facing east, much of the upland plot was dominated by maintained grass. 10/13/2020.

Photograph 97 – Upland Plot 6 for Wet Ditch 3. Facing west, much of the upland plot was dominated by maintained grass. 10/13/2020.

Photograph 98 – Upland Plot 6 for Wet Ditch 3. Facing North, a small path of shrubs and trees was just north of the upland plot. 10/13/2020.

Photograph 99 – Stream Segment 1A. Facing Southwest towards neighboring field. 10/13/2020.

Photograph 100 – Stream Segment 1A. Facing Northeast toward the initial downstream area of Stream Segment 1A. 10/13/2020

Photograph 101 – Stream Segment 1A. Facing Southwest, looking upstream at the secondary drainage channel that starts Stream Segment 1A. 10/13/2020

Photograph 102 – Stream Segment 1A. Standing at the large, corrugated plastic pipe that directs the two southern drainage channels into Stream Segment 1A. 10/13/2020

Photograph 103 – Stream Segment 1A. Facing Northeast, Stream Segment 1A origin at location of drainage channels that meet and flow into the large, corrugated plastic pipe. 10/13/2020

Photograph 104 – Stream Segment 1A. Facing Southwest, Stream Segment 1A facing towards the drainage pipe outlet. 10/13/2020

Photograph 105 – Stream Segment 1A. Facing Southwest, mid-reach, facing upstream. Understory vegetation was thick with amur honeysuckle. This portion of the stream will be impacted by the construction of the wastewater treatment plant. An outfall will be constructed just upstream of this photolocation. 10/13/2020

Photograph 106 – Stream Segment 1A. Facing Northeast, looking downstream at a shallow pool located approximately 150-ft east from the existing structure on the property. 10/13/2020

Photograph 107 – Stream Segment 1B. Facing East, Culvert under wastewater treatment plant property that drains into Stream Segment 1A and 1B. Stream segment 1A flows into Stream Segment 1B near this culvert. 10/13/2020

Photograph 108 – Stream Segment 1B. Facing West, at the culvert that is under the driveway to the wastewater treatment plant property. The Base of the culvert contains a small pool, but no flowing water at the time of the survey. 10/13/2020

Photograph 109 – Stream Segment 1B. Facing West, culvert drainage area facing upstream, at the confluence of Stream Segments 1A and 1B. Ephemeral Stream Segment transitions to intermittent Stream Segment 1B at this location. 10/13/2020.

Photograph 110 – Stream Segment 1B. Facing Northwest, looking downstream, standing water was present in the channel at the time of the survey. 10/13/2020

Photograph 111 – Stream Segment 1B. Facing South, overlooking Stream Segment 1B. This portion of Stream Segment 1B will not be disturbed by construction, however the most upstream portion of the Stream Segment 1B will be and construction on Stream Segment 1A could flow downstream and impact Stream Segment 1B. 10/13/2020

Photograph 112 – Stream Segment 1B. Stream Segment 1B along US-35 E, facing upstream (west) containing small pools. 10/13/2020

Photograph 113 – Stream Segment 5A. Stream Segment 5A, surveyed in 2020, based on aerial imagery, connects to Stream Segment 1B and thus Stream Segment 1A. 10/13/2020

Photograph 114 – Stream Segment 5A. Stream Segment 5A flows through a cement road culvert under Rebecca Dr. Water filled the channel at the time of the survey. 10/13/2020

Photograph 115 – Stream Segment 5A. Facing west, at the road culvert outlet under Rebecca Dr. 10/13/2020

Photograph 116 – Stream Segment 5A. Facing East, looking at the Rebecca Dr. road culvert inlet. 10/13/2020

Photograph 117 – Stream Segment 5A. Facing West, looking at the upstream portion of Stream Segment 5A. 10/13/2020

Photograph 118 – Stream Segment 5B. Facing South, looking towards Stream Segment 5A. A chain link fence prevented the survey crew from following the stream channel to where it connects to Stream Segment 5A. 6/8/2023.

Photograph 119 – Stream Segment 5B. Facing East, a residential bridge crosses the intermittent stream channel. Water filled the Stream Segment 5B at the time of the survey. 6/8/2023.

Photograph 120 – Stream Segment 5B. Facing South (upstream), the channel is filled with a significant amount of sediment and vegetation has started to establish itself on the sediment. 6/8/2023.

Photograph 121 – Stream Segment 5B. Multiple corrugated plastic pipes discharge to the stream at this point. 6/8/2023.

Photograph 122 – Stream Segment 5B. Facing South, the right bank of the stream channel shows some erosion. The riparian area at this point has been cut down to a maintained lawn. 6/8/2023.

Photograph 123 – Stream Segment 5B. Facing Southeast (downstream), the channel banks are approximately 1-ft in this area. 6/8/2023.

Photograph 124 – Stream Segment 5B. Facing West (upstream), a residential lawn is on the right bank and a home is on the left bank. 6/8/2023.

Photograph 125 – Stream Segment 5B. Facing Northwest (upstream), downstream of the residential properties on the stream channel, the area becomes forested. 6/8/2023.

Photograph 126 – Stream Segment 5B. Facing Southeast, the stream channel becomes mostly dry at this point. Some small pools of water were present in the low spots of the channel. 6/8/2023.

Photograph 127 – Stream Segment 5B. A small drainage channel comes into Stream Segment 5B. Water was present in Stream Segment 5B at this location in the channel. 6/8/2023.

Photograph 128 – Stream Segment 5B. Facing Northwest, the stream channel has a significant amount of overhanging vegetation, but it was mostly amur honeysuckle. 6/8/2023.

Photograph 129 – Stream Segment 5B. Facing Northeast, the stream channel banks were approximately 3-4-ft in this portion of the stream. 6/8/2023.

Photograph 130 – Stream Segment 5B. Facing West, a small structure is located on top of the left bank. Old swing sets and other building materials are within the stream at this location . 6/8/2023.

Photograph 131 – Stream Segment 5B. Facing Southwest, the stream channel substrate included cobble, gravel, and sand. 6/8/2023.

Photograph 132 – Stream Segment 5B. Facing Northeast, within the proposed sanitary sewer route. Sycamore trees were prevalent within this portion of the stream channel. 6/8/2023.

Photograph 133 – Stream Segment 5B. A corrugated metal culvert (approximately 36" pipe) conveys Stream Segment 5B. This culvert is for a grassy drive on a property near 3642 US-35 leading to an old barn uphill. 6/8/2023.

Photograph 134 – Stream Segment 5B. Facing Northwest, towards the culvert inlet. 6/8/2023.

Photograph 132 – Stream Segment 5B. Facing West, upstream of the culvert near 3642 US-35. 6/8/2023.

Photograph 136 – Stream Segment 5B. Facing Southeast, the stream channel downstream of the culvert becomes a forested meadow. 6/8/2023.

Photograph 137 – Stream Segment 5B. Facing North, a small outbuilding with a maintained lawn is located within the proposed sanitary sewer alignment. 6/8/2023.

Photograph 138 – Stream Segment 5B. Facing South, a mown path leads up to a barn. The culvert allows the stream to flow under this path. 6/8/2023.

Photograph 139– Stream Segment 5B. Facing Southwest, significant erosion was present on the right bank. 6/8/2023.

Photograph 140 – Stream Segment 5B. Facing Northwest, Stream Segment 5B becomes more sedimented likely due to the erosion upstream. 6/8/2023.

Photograph 141 – Stream Segment 5B. Facing East, the stream becomes forested again with overhanging honeysuckle, from the forested meadow that was upstream. 6/8/2023.

Photograph 142 – Stream Segment 5B. Facing South, the riparian area is interspersed between forested areas and meadow. 6/8/2023.

Photograph 143 – Stream Segment 5B. Facing North, the left bank has some erosion. 6/8/2023.

Photograph 144 – Stream Segment 5B. Facing South, the stream contained pools of water, but no fish or other apparent aquatic organisms. 6/8/2023.

Photograph 145 – Stream Segment 5B. Facing Southwest, a pvc is piped to the stream on the right bank. 6/8/2023.

Photograph 146 – Stream Segment 5B. Facing South, the stream has erosion along both banks in this area. An old bridge has been washed out. 6/8/2023.

Photograph 147 – Stream Segment 5B. Facing Southwest, an old staircase is uphill from the stream channel. 6/8/2023.

Photograph 148 – Stream Segment 5B. Fallen trees and heavy sediment form a small dam within the stream channel, creating a deep pool at its base. 6/8/2023.

Photograph 149 – Stream Segment 5B. Facing Southeast, into the stream's riparian area. No floodplain wetlands were found. 6/8/2023.

Photograph 150 – Stream Segment 5B. Facing Southeast, just downstream of the pool created by the fallen log dam. The pool and water within the channel is about 50-ft long. 6/8/2023.

Photograph 151 – Stream Segment 5B. Facing Northeast, standing at the end of the pool. The channel substrate in this portion of the stream is predominately gravel and silt. 6/8/2023.

Photograph 152 – Stream Segment 5B. The stream channel widens to about 12-ft downstream of the pool. Water slowly flowed through portions of the channel, mostly along the left bank. 6/8/2023.

Photograph 153 – Stream Segment 5B. Facing Southeast, another shallow pool forms along the left bank. This pool was about 6-inches deep. 6/8/2023.

Photograph 154 – Stream Segment 5B. Facing, East, as the stream channel becomes closer to Stover Rd the more open the forest canopy became. 6/8/2023.

Photograph 155 – Stream Segment 5B. Facing Northeast, more erosion was present on the left bank than right as the stream approaches the culvert under Stover Rd. 6/8/2023.

Photograph 156 – Stream Segment 5B. Facing east, a cement culvert under Stover Rd. conveys Stream Segment 5B towards Bantas Creek. 6/8/2023.

Photograph 157 – Bantas Fork (Stream Segment 2). Facing Northwest, upstream of the US-35 E bridge. Bantas Fork is no longer directly impacted by the construction of the sanitary sewer. 10/13/2020.

Photograph 158 – Bantas Fork (Stream Segment 2). Facing West, upstream of the US-35 E bridge. Sediment and construction debris could travel downstream from Stream Segments 1A, 1B, 5A, and 5B (UNT to Bantas Fork) and enter Bantas Fork. 10/13/2020.

Photograph 159 – Bantas Fork (Stream Segment 2). Facing Northeast, under the US-35 E bridge. 10/13/2020.

Photograph 160 – Bantas Fork (Stream Segment 2). Facing west, overlooking an existing outfall that discharges into Bantas Fork. 10/13/2020.

Photograph 161 – Bantas Fork (Stream Segment 2). Facing Northwest, overlooking Bantas Fork and US-35 bridge. 10/13/2020.

Photograph 162 – Bantas Fork (Stream Segment 2). Facing Southeast, overlooking the downstream area of Bantas Fork within Stream Segment 2. 10/13/2020.

Photograph 163 – Stream Segment 11. Stream Segment 11 drains to a 12-inch cement culvert under Vanessa Dr. A small PVC pipe discharges directly into the road culvert. 6/9/2023.

Photograph 164 – Stream Segment 11. Stream Segment 11 is a small ephemeral channel with both banks being approximately 6-inches high. 6/9/2023.

Photograph 165 – Stream Segment 11. Facing Northeast towards Vanessa Dr. Maintained lawn makes up the channel's riparian area. 6/9/2023.

Photograph 166 – Stream Segment 11. Facing Southwest, away from Vanessa Dr. The channel is still present but becomes shallower and filled with grass. 6/9/2023.

Photograph 167 – Stream Segment 11. Facing South, standing water is in the channel during the time of the survey. 6/9/2023.

Photograph 168 – Stream Segment 11. Facing South, a 2-inch broken PVC pipe is piped into the ephemeral channel. As the pipe actively discharged water during the site visit, it is likely the source of the standing water in the channel. 6/9/2023.

Photograph 169 – Stream Segment 11. Facing North, the ephemeral channel becomes wider to about 1-ft wide. 6/9/2023.

Photograph 170 – Stream Segment 11. Facing Southwest, the substrate of Stream Segment 11 becomes gravel with some cobble. 6/9/2023.

Photograph 171 – Stream Segment 11. A residential bridge has been built over Stream Segment 11. 6/9/2023.

Photograph 172 – Stream Segment 11. Facing Southwest, Stream Segment 11 begins as a shallow grassy swale. 6/9/2023.

Photograph 173 – Sanitary Sewer Route. The proposed sanitary sewer route behind 227 Vanessa Dr. 6/9/2023.

Photograph 174 – Sanitary Sewer Route. The proposed sanitary sewer route between 227 Vanessa Dr., 267 Vanessa Dr., and 250 Rebecca Dr. 6/9/2023.

Photograph 175 – Sanitary Sewer Route. Proposed sanitary sewer route between 307 Vanessa Dr. 347 Vanessa Dr., 330 Rebecca Dr. and 290 Rebecca Dr. 6/9/2023.

Photograph 176 – Sanitary Sewer Route. Proposed sanitary sewer route between 387 Vanessa Dr. 347 Vanessa Dr., 330 Rebecca Dr. and 366 Rebecca Dr. 6/9/2023.

Photograph 177 – Sanitary Sewer Route. Proposed sanitary sewer route between 460 Vanessa Dr, 420 Vanessa Dr., 397 Stover Rd. and 381 Stover Rd. 6/9/2023.

Photograph 178 – Sanitary Sewer Route. Proposed sanitary sewer route between 260 Vanessa Dr., 177 Stover Rd, and 161 Stover Rd. 6/9/2023.

Photograph 179 – Sanitary Sewer Route. Proposed sanitary sewer route between 260 Vanessa Dr. 6/9/2023.

Photograph 180 – Sanitary Sewer Route. Proposed sanitary sewer route between 220 Vanessa Dr. 153 Stover Rd, and 127 Stover Rd. 6/9/2023.

Photograph 181 – Sanitary Sewer Route.
Proposed sanitary sewer route between 172 Vanessa Dr. 115 Stover Rd., and 66 Lee Ct. 6/9/2023.

Appendix B

United States Army Corps of Engineers Wetland Determination Plot Data Sheets

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Preble County Waste Water Treatment Plant | City/County: Preble County | Sampling Date: 10/12/2020

Applicant/Owner: Preble County, Ohio | State: OH | Sampling Point: WetPlot1-1

Investigator(s): N. Revetta, K. Moran | Section, Township, Range: Twin Township

Landform (hillside, terrace, etc.): In-stream wetland | Local relief (concave, convex, none): Concave

Slope (%): <5% | Lat: 39.7369 | Long: -84.5663 | Datum:

Soil Map Unit Name: MeC2 | NWI classification: N/A

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
In-stream wetland adjacent to residential properties. No vegetation present under bridge, but one contiguous wetland is present via connected soils and waters. Two wetland plots were collected on either side of bridge (WetPlot1-1 and WetPlot1-2) due to differences in vegetation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5'x30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		

Sapling/Shrub Stratum (Plot size: 5'x30')			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		

Herb Stratum (Plot size: 5')			
1. *Leersia oryzoides*	30	Yes	OBL
2. *Bidens frondosa*	15	Yes	FACW
3. *Persicaria longiseta*	15	Yes	FAC
4. *Lythrum alatum*	10	No	OBL
5. *Glechoma hederacea*	5	No	FACU
6. *Rumex crispus*	5	No	FAC
7. *Symphyotrichum ericoides*	5	No	FACU
8.			
9.			
10.			
	85	=Total Cover	

Woody Vine Stratum (Plot size: 5'x30')			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	15	x 2 =	30
FAC species	20	x 3 =	60
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	85 (A)		170 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Wetland plot analyzed only within sterambed to avoid including upland plants emanating from adjacent residential lawns from impacting vegetation scores.

SOIL

Sampling Point: WetPlot1-1

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	75						Sandy loam - very organic
	10YR 4/2	25						
8-12	10YR 3/2	75	10YR 6/4	5	C	M		Sandy loam - very organic - 10% gravel
	10YR 3/2	20						
12-20	10YR 4/1	80						Sandy loam - very organic - 10% gravel
	10YR 3/4	20						

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- X 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)
- X Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ 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)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- X Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches):	0	
Water Table Present?	Yes X	No ___	Depth (inches):	8	
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches):	0	**Wetland Hydrology Present?** **Yes** X **No** ___

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Preble County Waste Water Treatment Plant | City/County: Preble County | Sampling Date: 10/12/2020

Applicant/Owner: Preble County, Ohio | State: OH | Sampling Point: WetPlot1-2

Investigator(s): N. Revetta, K. Moran | Section, Township, Range: Twin Township

Landform (hillside, terrace, etc.): In-stream wetland | Local relief (concave, convex, none): Concave

Slope (%): <5% | Lat: 39.7368 | Long: -84.5663 | Datum:

Soil Map Unit Name: MeC2 | NWI classification: N/A

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
In-stream wetland adjacent to residential properties. No vegetation present under bridge, but one contiguous wetland is present via connected soils and waters. Two wetland plots were collected on either side of bridge (WetPlot1-1 and WetPlot1-2) due to differences in vegetation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5'x30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 5'x30')			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bidens frondosa*	20	Yes	FACW
2. *Persicaria longiseta*	15	Yes	FAC
3. *Lythrum alatum*	15	Yes	OBL
4. *Leersia oryzoides*	15	Yes	OBL
5. *Typha latifolia*	10	No	OBL
6. *Centella asiatica*	10	No	FACW
7. *Packera glabella*	10	No	FACW
8. *Symphyotrichum ericoides*	5	No	FACU
9.			
10.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 5'x30')			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	40	x 2 =	80
FAC species	15	x 3 =	45
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	100 (A)		185 (B)

Prevalence Index = B/A = 1.85

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Wetland plot analyzed only within sterambed to avoid including upland plants emanating from adjacent residential lawns from impacting vegetation scores.

SOIL

Sampling Point: WetPlot1-2

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	80	10YR 4/1	20	D	M		Sandy loam - very organic
6-18	10YR 4/2	10	10YR 2/1	90	RM	M		Sandy loam - very organic, 5% gravel
18-24	10YR 5/2	2	10YR 2/1	98	RM	M		Sandy loam - very organic, 1% gravel

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- X 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)
- X Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- X Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- X Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches):	0	
Water Table Present?	Yes X	No ___	Depth (inches):	8	
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches):	0	**Wetland Hydrology Present?** **Yes** X **No** ___

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Preble County Waste Water Treatment Plant City/County: Preble County Sampling Date: 10/12/2020

Applicant/Owner: Preble County, Ohio State: OH Sampling Point: WetPlot2

Investigator(s): N. Revetta, K. Moran Section, Township, Range: Lanier Township

Landform (hillside, terrace, etc.): In-stream Local relief (concave, convex, none): Concave

Slope (%): <5% Lat: 39.7383, Long: -84.5687 Datum:

Soil Map Unit Name: MeC2 NWI classification: N/A

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

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Wetland located within dry streambed.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5')			
1. *Leersia oryzoides*	75	Yes	OBL
2. *Persicaria longiseta*	15	No	FAC
3. *Packera glabella*	2	No	FACW
4. *Rumex crispus*	1	No	FAC
5. *Asclepias syriaca*	1	No	FACU
6. *Acalypha rhomboidea*	1	No	FACU
7.			
8.			
9.			
10.			
	95 =Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	75	x 1 =	75
FACW species	2	x 2 =	4
FAC species	16	x 3 =	48
FACU species	2	x 4 =	8
UPL species	0	x 5 =	0
Column Totals:	95 (A)		135 (B)

Prevalence Index = B/A = 1.42

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

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

SOIL

Sampling Point: WetPlot2

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	85	10YR 3/1	13	D	M		Sandy clay - very organic
			10YR 5/3	2				
4-20	10YR 4/1	80	10YR 3/1	15	D	M		Mucky clay - 5% gravel
			10YR 8/4	3				
			10YR 6/6	2	C	M		Prominent redox concentrations

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

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10)
X Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ 5 cm Mucky Peat or Peat (S3)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
X Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Coast Prairie Redox (A16)
___ Iron-Manganese Masses (F12)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
X High Water Table (A2)
X 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)
___ True Aquatic Plants (B14)
___ 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)
___ Gauge or Well Data (D9)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
X Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): 0

Water Table Present? Yes X No ___ Depth (inches): 6

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 6

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Preble County Waste Water Treatment Plant | City/County: Preble County | Sampling Date: 10/12/2020

Applicant/Owner: Preble County, Ohio | State: OH | Sampling Point: WetDitchPlot1

Investigator(s): N. Revetta, K. Moran | Section, Township, Range: Lanier Township

Landform (hillside, terrace, etc.): Roadside drainage ditch | Local relief (concave, convex, none): Concave

Slope (%): <5% | Lat: 39.740581 | Long: -84.570940 | Datum:

Soil Map Unit Name: CtA | NWI classification: N/A

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Long and narrow roadside ditch approximately 2ft x 30ft containing standing water - one of many interconnected ditches spanning multiple properties - this is the only section containing water and wetland plants. Maintained mowed lawn immediately adjacent to ditch.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pinus virginiana*	10	Yes	UPL
2.			
3.			
4.			
5.			
	10	=Total Cover	
Sapling/Shrub Stratum (Plot size: 30')			
1. *Miscanthus sinensis*	5	Yes	UPL
2.			
3.			
4.			
5.			
	5	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Lolium perenne*	75	Yes	FACU
2. *Echinochloa crus-galli*	10	No	FACW
3. *Cyperus strigosus*	5	No	FACW
4. *Trifolium repens*	5	No	FACU
5. *Tridens flavus*	2	No	UPL
6. *Eclipta prostrata*	1	No	FACW
7. *Glechoma hederacea*	1	No	FACU
8. *Cichorium intybus*	1	No	FACU
9.			
10.			
	100	=Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	16	x 2 =	32
FAC species	0	x 3 =	0
FACU species	82	x 4 =	328
UPL species	17	x 5 =	85
Column Totals:	115 (A)		445 (B)

Prevalence Index = B/A = 3.87

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No X

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

SOIL

Sampling Point: WetDitchPlot

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 5/1	30	7.5YR 5/8	10	C	M		Clay
	10YR 4/1	70						
6-20	7.5YR 2.5/2	2	7.5YR 5/8	20	C	M		Clay - 10% gravel
	10YR 4/1	70						
	10YR 4/2	8						

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

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ 5 cm Mucky Peat or Peat (S3)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Coast Prairie Redox (A16)
___ Iron-Manganese Masses (F12)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ____

Remarks:
This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

X Surface Water (A1)
X 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)
___ True Aquatic Plants (B14)
___ 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)
___ Gauge or Well Data (D9)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	X	No ____	Depth (inches):	0
Water Table Present?	Yes	X	No ____	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes	X	No ____	Depth (inches):	0

Wetland Hydrology Present? **Yes** X **No** ____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Preble County Waste Water Treatment Plant | City/County: Preble County | Sampling Date: 10/12/2020

Applicant/Owner: Preble County, Ohio | State: OH | Sampling Point: WetDitchPlot2

Investigator(s): N. Revetta, K. Moran | Section, Township, Range: Lanier Township

Landform (hillside, terrace, etc.): Roadside drainage ditch | Local relief (concave, convex, none): Concave

Slope (%): <5% | Lat: 39.7464 | Long: -84.5863 | Datum:

Soil Map Unit Name: KnA | NWI classification: N/A

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Long and narrow roadside ditch approximately 6ft x 30ft containing standing water - Maintained mowed lawn immediately adjacent to ditch.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 6' x 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 6' x 30')			
1. *Salix nigra*	10	Yes	OBL
2. *Fraxinus pennsylvanica*	5	Yes	FACW
3.			
4.			
5.			
	15 =Total Cover		
Herb Stratum (Plot size: 5')			
1. *Bidens frondosa*	2	No	FACW
2. *Leersia oryzoides*	2	No	OBL
3. *Epilobium coloratum*	1	No	OBL
4. *Solidago rugosa*	1	No	FAC
5. *Euthamia graminifolia*	1	No	FACW
6. *Erigeron canadensis*	1	No	FACU
7. *Lycopus americanus*	1	No	OBL
8. *Pyrus calleryana*	1	No	UPL
9. *Typha angustifolia*	85	Yes	OBL
10.			
	95 =Total Cover		
Woody Vine Stratum (Plot size: 6' x 30')			
1. *Vitis riparia*	1	No	FACW
2.			
	1 =Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	99	x 1 =	99
FACW species	9	x 2 =	18
FAC species	1	x 3 =	3
FACU species	1	x 4 =	4
UPL species	1	x 5 =	5
Column Totals:	111 (A)		129 (B)

Prevalence Index = B/A = 1.16

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

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

SOIL

Sampling Point: WetDitchPlot2

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	70	10YR 5/8	30	C	M		Silty clay
8-20	10YR 4/6	90	10YR 3/1	5	D	M		Silty clay - loose, 5% gravel
			10YR 6/1	5	D	M		

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

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ 5 cm Mucky Peat or Peat (S3)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
_X_ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Coast Prairie Redox (A16)
___ Iron-Manganese Masses (F12)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** ____

Remarks:
This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
_X_ 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)
___ True Aquatic Plants (B14)
___ 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)
___ Gauge or Well Data (D9)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
_X_ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No _X_ Depth (inches): ____

Water Table Present? Yes ____ No _X_ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No _X_ Depth (inches): ____

Wetland Hydrology Present? **Yes** _X_ **No** ____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Preble County Waste Water Treatment Plant | City/County: Preble County | Sampling Date: 10/13/2020

Applicant/Owner: Preble County, Ohio | State: OH | Sampling Point: WetDitchPlot3

Investigator(s): N. Revetta, K. Moran | Section, Township, Range: Lanier Township

Landform (hillside, terrace, etc.): Roadside drainage ditch | Local relief (concave, convex, none): None

Slope (%): <1% | Lat: 39.7443 | Long: -84.5715 | Datum:

Soil Map Unit Name: CeB | NWI classification: N/A

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

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Long and narrow roadside ditch approximately 6ft x 30ft containing standing water - Maintained mowed lawn immediately adjacent to ditch.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 6' x 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 6' x 30')			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5')			
1. *Typha angustifolia*	60	Yes	OBL
2. *Leersia oryzoides*	25	Yes	OBL
3. *Mentha spicata*	5	No	FACW
4. *Eupatorium perfoliatum*	5	No	OBL
5. *Persicaria punctata*	2	No	OBL
6. *Rosa multiflora*	1	No	FACU
7.			
8.			
9.			
10.			
	98	=Total Cover	
Woody Vine Stratum (Plot size: 6' x 30')			
1. *Vitis riparia*	2	No	FACW
2.			
	2	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	92	x 1 =	92
FACW species	7	x 2 =	14
FAC species	0	x 3 =	0
FACU species	1	x 4 =	4
UPL species	0	x 5 =	0
Column Totals:	100 (A)		110 (B)

Prevalence Index = B/A = 1.10

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ____

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

SOIL

Sampling Point: WetDitchPlot3

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	45	10YR 3/2	55	RM	M		Sandy Silt - Large amounts gravel

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hole collapsed after reaching a depth of 16 inches. This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- X 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)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- X Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 0		
Water Table Present?	Yes X	No ___	Depth (inches): 0		
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0	**Wetland Hydrology Present?**	**Yes** X **No** ___

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Preble County Waste Water Treatment Plant | City/County: Preble County | Sampling Date: 10/7/2020

Applicant/Owner: Preble County, Ohio | State: OH | Sampling Point: UpPlot1

Investigator(s): N. Revetta, K. Moran | Section, Township, Range: Lanier Township

Landform (hillside, terrace, etc.): Flat upland area | Local relief (concave, convex, none): None

Slope (%): <1% | Lat: 39.741502 | Long: -84.572617 | Datum:

Soil Map Unit Name: CtA | NWI classification: N/A

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

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Elaeagnus umbellata*	5	Yes	UPL
2. *Cornus florida*	5	Yes	FACU
3.			
4.			
5.			
	10	=Total Cover	
Sapling/Shrub Stratum (Plot size: 30')			
1. *Juniperus virginiana*	10	Yes	FACU
2. *Betula lenta*	10	Yes	FACU
3. *Lonicera japonica*	5	No	FACU
4. *Rosa multiflora*	5	No	FACU
5. *Cornus florida*	5	No	FACU
	35	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Solidago rugosa*	85	Yes	FAC
2. *Dipsacus sativus*	5	No	UPL
3. *Toxicodendron radicans*	5	No	FAC
4. *Rosa multiflora*	4	No	FACU
5. *Symphyotrichum ericoides*	1	No	FACU
6.			
7.			
8.			
9.			
10.			
	100	=Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	90	x 3 =	270
FACU species	45	x 4 =	180
UPL species	10	x 5 =	50
Column Totals:	145 (A)		500 (B)

Prevalence Index = B/A = 3.45

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ____ **No** X

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

SOIL

Sampling Point: UpPlot1

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 6/3	50						Dry loose silt
	10YR 6/4	50						
8-20	10YR 6/4	100						Dry loose silt

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

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ 5 cm Mucky Peat or Peat (S3)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Coast Prairie Redox (A16)
___ Iron-Manganese Masses (F12)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:
This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ 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)
___ True Aquatic Plants (B14)
___ 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)
___ Gauge or Well Data (D9)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes ____ No X Depth (inches): ____
Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Preble County Waste Water Treatment Plant City/County: Preble County Sampling Date: 10/12/2020

Applicant/Owner: Preble County, Ohio State: OH Sampling Point: UpPlot2

Investigator(s): N. Revetta, K. Moran Section, Township, Range: Lanier Township

Landform (hillside, terrace, etc.): Hillside Local relief (concave, convex, none): None

Slope (%): 10% Lat: 39.736823 Long: -84.566431 Datum:

Soil Map Unit Name: MeC2 NWI classification: N/A

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

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Edge of sloping hillside of maintained grass yard of residential properties adjacent to road and in-stream wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Prunus serotina*	15	Yes	FACU
2.			
3.			
4.			
5.			
	15	=Total Cover	
Sapling/Shrub Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Lolium perenne*	95	Yes	FACU
2. *Trifolium repens*	2	No	FACU
3. *Symphyotrichum laeve*	1	No	FACU
4. *Persicaria longiseta*	1	No	FAC
5. *Rumex crispus*	1	No	FAC
6.			
7.			
8.			
9.			
10.			
	100	=Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	2	x 3 =	6
FACU species	113	x 4 =	452
UPL species	0	x 5 =	0
Column Totals:	115 (A)		458 (B)

Prevalence Index = B/A = 3.98

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No X

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

SOIL

Sampling Point: UpPlot2

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
	10YR 5/4	90						Silty clay - 10% gravel
	10YR 5/3	10						

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

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ 5 cm Mucky Peat or Peat (S3)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Coast Prairie Redox (A16)
___ Iron-Manganese Masses (F12)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:
Soils likely fill from road. This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ 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)
___ True Aquatic Plants (B14)
___ 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)
___ Gauge or Well Data (D9)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes ____ No X Depth (inches): ____
Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Preble County Waste Water Treatment Plant City/County: Preble County Sampling Date: 10/12/2020

Applicant/Owner: Preble County, Ohio State: OH Sampling Point: UpPlot3

Investigator(s): N. Revetta, K. Moran Section, Township, Range: Lanier Township

Landform (hillside, terrace, etc.): Toe of slope Local relief (concave, convex, none): None

Slope (%): 5% Lat: 39.736922 Long: -84.566570 Datum:

Soil Map Unit Name: MeC2 NWI classification: N/A

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

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Toe of slope between road and adjacent wetland. Located within maintained grass lawn.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Prunus serotina*	15	Yes	FACU
2.			
3.			
4.			
5.			
	15	=Total Cover	
Sapling/Shrub Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Lolium perenne*	95	Yes	FACU
2. *Trifolium repens*	3	No	FACU
3. *Lysimachia nummularia*	1	No	FACW
4. *Setaria pumila*	1	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	100	=Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	1	x 2 =	2
FAC species	1	x 3 =	3
FACU species	113	x 4 =	452
UPL species	0	x 5 =	0
Column Totals:	115 (A)		457 (B)

Prevalence Index = B/A = 3.97

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No X

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

SOIL

Sampling Point: UpPlot3

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 5/3	90						Silty clay - very compact
	10YR 5/4	10						

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

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ 5 cm Mucky Peat or Peat (S3)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Coast Prairie Redox (A16)
___ Iron-Manganese Masses (F12)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:
Soils likely fill from road. This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ 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)
___ True Aquatic Plants (B14)
___ 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)
___ Gauge or Well Data (D9)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes ____ No X Depth (inches): ____
Saturation Present? Yes ____ No X Depth (inches): ____
(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Preble County Waste Water Treatment Plant | City/County: Preble County | Sampling Date: 10/12/2020

Applicant/Owner: Preble County, Ohio | State: OH | Sampling Point: UpPlot4

Investigator(s): N. Revetta, K. Moran | Section, Township, Range: Lanier Township

Landform (hillside, terrace, etc.): Top of slope by road above streambank | Local relief (concave, convex, none): Concave

Slope (%): 10% | Lat: 39.738262 | Long: -84.569000 | Datum:

Soil Map Unit Name: MeC2 | NWI classification: N/A

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

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 30')			
1. *Elaeagnus umbellata*	15	Yes	UPL
2. *Liriodendron tulipifera*	15	Yes	FACU
3. *Morus alba*	10	Yes	FAC
4. *Pinus strobus*	5	No	FACU
5.			
	45 =Total Cover		
Herb Stratum (Plot size: 5')			
1. *Lolium perenne*	70	Yes	FACU
2. *Solidago rugosa*	20	Yes	FAC
3. *Alliaria petiolata*	10	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	90	x 4 =	360
UPL species	15	x 5 =	75
Column Totals:	145 (A)		555 (B)

Prevalence Index = B/A = 3.83

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ____ **No** X

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

SOIL

Sampling Point: UpPlot4

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 5/4							Silty clay
6-20	10YR 5/4							Silty clay - 10% gravel

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

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ 5 cm Mucky Peat or Peat (S3)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Coast Prairie Redox (A16)
___ Iron-Manganese Masses (F12)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:
This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ 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)
___ True Aquatic Plants (B14)
___ 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)
___ Gauge or Well Data (D9)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes ____ No X Depth (inches): ____
Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Preble County Waste Water Treatment Plant City/County: Preble County Sampling Date: 10/12/2020

Applicant/Owner: Preble County, Ohio State: OH Sampling Point: UpPlot5

Investigator(s): N. Revetta, K. Moran Section, Township, Range: Twin Township

Landform (hillside, terrace, etc.): Toe of slope Local relief (concave, convex, none): None

Slope (%): <1% Lat: 39.746526 Long: -84.586378 Datum:

Soil Map Unit Name: KnA NWI classification: N/A

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

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Grassy row between wetland and road assesd with an area of approximately 6ft x 30ft.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 6' x 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 6' x 30')			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5')			
1. *Lolium perenne*	95	Yes	FACU
2. *Setaria pumila*	3	No	FAC
3. *Trifolium repens*	2	No	FACU
4. *Taraxacum officinale*	1	No	FACU
5. *Geum canadense*	1	No	FAC
6.			
7.			
8.			
9.			
10.			
	102 =Total Cover		
Woody Vine Stratum (Plot size: 6' x 30')			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	4	x 3 =	12
FACU species	98	x 4 =	392
UPL species	0	x 5 =	0
Column Totals:	102 (A)		404 (B)

Prevalence Index = B/A = 3.96

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ____ **No** X

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

SOIL

Sampling Point: UpPlot5

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 5/2	100						Silt - loose
4-20	10YR 5/2	100						Silt - loose, 30% gravel

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

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ 5 cm Mucky Peat or Peat (S3)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Coast Prairie Redox (A16)
___ Iron-Manganese Masses (F12)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:
Soils likely fill from road. This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ 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)
___ True Aquatic Plants (B14)
___ 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)
___ Gauge or Well Data (D9)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes ____ No X Depth (inches): ____
Saturation Present? Yes ____ No X Depth (inches): ____
(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Preble County Waste Water Treatment Plant | City/County: Preble County | Sampling Date: 10/13/2020

Applicant/Owner: Preble County, Ohio | State: OH | Sampling Point: UpPlot 6

Investigator(s): N. Revetta, K. Moran | Section, Township, Range: Lanier Township

Landform (hillside, terrace, etc.): Toe of slope | Local relief (concave, convex, none): None

Slope (%): <1% | Lat: 39.744362 | Long: -84.571520 | Datum:

Soil Map Unit Name: CeB | NWI classification: N/A

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

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Grassy row adjacent to wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 6' x 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Juniperus virginiana*	10	Yes	FACU
2. *Picea abies*	10	Yes	UPL
3. *Lonicera japonica*	10	Yes	FACU
4.			
5.			
	30	=Total Cover	

Sapling/Shrub Stratum (Plot size: 6' x 30')			
1. *Lonicera japonica*	5	Yes	FACU
2. *Phytolacca americana*	3	Yes	FACU
3. *Verbascum thapsus*	2	Yes	UPL
4.			
5.			
	10	=Total Cover	

Herb Stratum (Plot size: 5')			
1. *Lolium perenne*	75	Yes	FACU
2. *Trifolium repens*	10	No	FACU
3. *Alliaria petiolata*	3	No	FAC
4. *Setaria faberi*	1	No	FACU
5. *Tridens flavus*	1	No	UPL
6.			
7.			
8.			
9.			
10.			
	90	=Total Cover	

Woody Vine Stratum (Plot size: 6' x 30')			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	3	x 3 =	9
FACU species	114	x 4 =	456
UPL species	13	x 5 =	65
Column Totals:	130 (A)		530 (B)
Prevalence Index = B/A =			4.08

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ____ **No** X

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

SOIL

Sampling Point: UpPlot 6

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 5/3	98						Silt - small amounts clay
	10YR 4/1	2						
12-20	10YR 5/3	80						Silt - small amounts clay
	10YR 5/4	15						
	10YR 4/1	5						

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

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
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___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
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___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Coast Prairie Redox (A16)
___ Iron-Manganese Masses (F12)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:
Soils likely fill from road. This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ 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)
___ True Aquatic Plants (B14)
___ 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)
___ Gauge or Well Data (D9)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes ____ No X Depth (inches): ____
Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

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

Remarks:

Appendix C

Ohio Rapid Assessment Method (ORAM) for Wetlands Data Sheets

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:	N. Revetta K. Moran
Date:	10/12/2020
Affiliation:	CDM Smith
Address:	445 Hutchinson Ave, Suite 820, Columbus, OH 43235 8845 Governor's Hill Drive, Suite 430, Cincinnati, OH 45249
Phone Number:	614-847-6829 513-716-6527
e-mail address:	revettanp@cdmsmith.com moranka@cdmsmith.com
Name of Wetland:	Wetland 1
Vegetation Communit(ies):	Emergent - located in-stream - primarily dominated by rice cutgrass (Leersia oryzoides)
HGM Class(es):	Depressional
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.	See attached figures

Lat/Long or UTM Coordinate 39.7369, -84.5663	
USGS Quad Name NE Columbus	
County Preble	
Township Lanier	
Section and Subsection N/A	
Hydrologic Unit Code N/A	
Site Visit 10/12/2020	
National Wetland Inventory Map Not shown	
Ohio Wetland Inventory Map Not shown	
Soil Survey MeC2	
Delineation report/map See attached report	

Name of Wetland: Wetland 1	
Wetland Size (acres, hectares): 0.017-acres	

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.

See attached figures

Comments, Narrative Discussion, Justification of Category Changes:

See attached report for detailed delineation metrics and discussions.

Final score : 9 **Category:**	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 *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, 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 *Sphagnum* 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	0ak Opening species	wet prairie species
Lythrum salicaria	*Zygadenus elegans var. glaucus*	*Calla palustris*	*Carex cryptolepis*	*Calamagrostis canadensis*
Myriophyllum spicatum	*Cacalia plantaginea*	*Carex atlantica var. capillacea*	*Carex lasiocarpa*	*Calamogrostis stricta*
Najas minor	*Carex flava*	*Carex echinata*	*Carex stricta*	*Carex atherodes*
Phalaris arundinacea	*Carex sterilis*	*Carex oligosperma*	*Cladium mariscoides*	*Carex buxbaumii*
Phragmites australis	*Carex stricta*	*Carex trisperma*	*Calamagrostis stricta*	*Carex pellita*
Potamogeton crispus	*Deschampsia caespitosa*	*Chamaedaphne calyculata*	*Calamagrostis canadensis*	*Carex sartwellii*
Ranunculus ficaria	*Eleocharis rostellata*	*Decodon verticillatus*	*Quercus palustris*	*Gentiana andrewsii*
Rhamnus frangula	*Eriophorum viridicarinatum*	*Eriophorum virginicum*		*Helianthus grosseserratus*
Typha angustifolia	*Gentianopsis spp.*	*Larix laricina*		*Liatris spicata*
Typha xglauca	*Lobelia kalmii*	*Nemopanthus mucronatus*		*Lysimachia quadriflora*
	Parnassia glauca	*Schechzeria palustris*		*Lythrum alatum*
	Potentilla fruticosa	*Sphagnum spp.*		*Pycnanthemum virginianum*
	Rhamnus alnifolia	*Vaccinium macrocarpon*		*Silphium terebinthinaceum*
	Rhynchospora capillacea	*Vaccinium corymbosum*		*Sorghastrum nutans*
	Salix candida	*Vaccinium oxycoccos*		*Spartina pectinata*
	Salix myricoides	*Woodwardia virginica*		*Solidago riddellii*
	Salix serissima	*Xyris difformis*		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Preble County WWTP	**Rater(s):** N. Revetta; K. Moran	**Date:** 10/12/2020

Metric 1. Wetland Area (size).

max 6 pts.	subtotal
0	0

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)
- [X] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

max 14 pts.	subtotal
3	3

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)
- [X] 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), shrub land, young second growth forest. (5)
- [X] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

max 30 pts.	subtotal
9	12

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [ ] Precipitation (1)
- [X] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [X] 100 year floodplain (1)
- [X] 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)
- [X] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [X] 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)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [X] stormwater input
- [X] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [X] other *Housing/residential development

Metric 4. Habitat Alteration and Development.

max 20 pts.	subtotal
4	16

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [X] 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)
- [X] 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)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [X] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [X] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

subtotal this page
16

last revised 1 February 2001 jjm

Site: Preble County WWTP	**Rater(s):** N. Revetta; K. Moran	**Date:** 10/12/2020

16
subtotal first page

-10 | 6
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)
- [x] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

3 | 9
max 20 pts. | subtotal

Metric 6. Plant communities, interspersion, microtopography.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [1] Aquatic bed
- [1] Emergent
- [1] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [x] 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)
- [x] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [0] Vegetated hummucks/tussucks
- [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

9

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES (NO)	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES (NO)	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES (NO)	If yes, Category 3.
	Question 4. Significant bird habitat	YES (NO)	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES (NO)	If yes, Category 1.
	Question 6. Bogs	YES (NO)	If yes, Category 3.
	Question 7. Fens	YES (NO)	If yes, Category 3.
	Question 8a. Old Growth Forest	YES (NO)	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES (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		
	Metric 2. Buffers and surrounding land use		
	Metric 3. Hydrology		
	Metric 4. Habitat		
	Metric 5. Special Wetland Communities		
	Metric 6. Plant communities, interspersion, microtopography		
	TOTAL SCORE	9	Category based on score breakpoints

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	(NO)	Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* 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
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	(NO)	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.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	(NO)	Is quantitative rating score *greater* than the Category 2 scoring threshold *(including* 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
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	(YES) Wetland is assigned to the appropriate category based on the scoring range	NO	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.
Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	(NO)	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).
Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* 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?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	(NO) Wetland is assigned to category as determined by the ORAM.	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.

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:	N. Revetta K. Moran
Date:	10/12/2020
Affiliation:	CDM Smith
Address:	445 Hutchinson Ave, Suite 820, Columbus, OH 43235 8845 Governor's Hill Drive, Suite 430, Cincinnati, OH 45249
Phone Number:	614-847-6829 513-716-6527
e-mail address:	revettanp@cdmsmith.com moranka@cdmsmith.com
Name of Wetland:	Wetland 2
Vegetation Communit(ies):	Emergent - located in-stream - primarily dominated by rice cutgrass (Leersia oryzoides)
HGM Class(es):	Depressional

Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.

See attached figures

Lat/Long or UTM Coordinate 39.7383, -84.5687	
USGS Quad Name West Alexandria	
County Preble	
Township Lanier	
Section and Subsection N/A	
Hydrologic Unit Code N/A	
Site Visit 10/12/2020	
National Wetland Inventory Map Not shown	
Ohio Wetland Inventory Map Not shown	
Soil Survey MeC2	
Delineation report/map See attached report	

Name of Wetland: Wetland 2

Wetland Size (acres, hectares): 0.011-acres

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.

See attached figures

Comments, Narrative Discussion, Justification of Category Changes:

See attached report for detailed delineation metrics and discussions.

Final score : 9 **Category:** 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 *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, 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 *Sphagnum* 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	0ak Opening species	wet prairie species
Lythrum salicaria	*Zygadenus elegans var. glaucus*	*Calla palustris*	*Carex cryptolepis*	*Calamagrostis canadensis*
Myriophyllum spicatum	*Cacalia plantaginea*	*Carex atlantica var. capillacea*	*Carex lasiocarpa*	*Calamogrostis stricta*
Najas minor	*Carex flava*	*Carex echinata*	*Carex stricta*	*Carex atherodes*
Phalaris arundinacea	*Carex sterilis*	*Carex oligosperma*	*Cladium mariscoides*	*Carex buxbaumii*
Phragmites australis	*Carex stricta*	*Carex trisperma*	*Calamagrostis stricta*	*Carex pellita*
Potamogeton crispus	*Deschampsia caespitosa*	*Chamaedaphne calyculata*	*Calamagrostis canadensis*	*Carex sartwellii*
Ranunculus ficaria	*Eleocharis rostellata*	*Decodon verticillatus*	*Quercus palustris*	*Gentiana andrewsii*
Rhamnus frangula	*Eriophorum viridicarinatum*	*Eriophorum virginicum*		*Helianthus grosseserratus*
Typha angustifolia	*Gentianopsis spp.*	*Larix laricina*		*Liatris spicata*
Typha xglauca	*Lobelia kalmii*	*Nemopanthus mucronatus*		*Lysimachia quadriflora*
	Parnassia glauca	*Schechzeria palustris*		*Lythrum alatum*
	Potentilla fruticosa	*Sphagnum spp.*		*Pycnanthemum virginianum*
	Rhamnus alnifolia	*Vaccinium macrocarpon*		*Silphium terebinthinaceum*
	Rhynchospora capillacea	*Vaccinium corymbosum*		*Sorghastrum nutans*
	Salix candida	*Vaccinium oxycoccos*		*Spartina pectinata*
	Salix myricoides	*Woodwardia virginica*		*Solidago riddellii*
	Salix serissima	*Xyris difformis*		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Preble County WWTP	**Rater(s):** N. Revetta; K. Moran	**Date:** 10/12/2020

Metric 1. Wetland Area (size).

max 6 pts.	subtotal
0	0

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)
- [X] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

max 14 pts.	subtotal
3	3

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)
- [X] 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), shrub land, young second growth forest. (5)
- [X] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

max 30 pts.	subtotal
9	12

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [ ] Precipitation (1)
- [X] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [X] 100 year floodplain (1)
- [X] 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)
- [X] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [X] 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)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [X] stormwater input
- [X] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [X] other *Housing/residential development

Metric 4. Habitat Alteration and Development.

max 20 pts.	subtotal
4	16

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [X] 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)
- [X] 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)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [X] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [X] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

subtotal this page
16

last revised 1 February 2001 jjm

Site: Preble County WWTP	**Rater(s):** N. Revetta; K. Moran	**Date:** 10/12/2020

16
subtotal first page

-10 | 6
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)
- [x] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

3 | 9
max 20 pts. | subtotal

Metric 6. Plant communities, interspersion, microtopography.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [1] Aquatic bed
- [1] Emergent
- [1] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [x] 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)
- [x] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [0] Vegetated hummucks/tussucks
- [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

9

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES (NO)	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES (NO)	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES (NO)	If yes, Category 3.
	Question 4. Significant bird habitat	YES (NO)	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES (NO)	If yes, Category 1.
	Question 6. Bogs	YES (NO)	If yes, Category 3.
	Question 7. Fens	YES (NO)	If yes, Category 3.
	Question 8a. Old Growth Forest	YES (NO)	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES (NO)	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES (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		
	Metric 2. Buffers and surrounding land use		
	Metric 3. Hydrology		
	Metric 4. Habitat		
	Metric 5. Special Wetland Communities		
	Metric 6. Plant communities, interspersion, microtopography		
	TOTAL SCORE	9	Category based on score breakpoints

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	(NO)	Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* 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
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	(NO)	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.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	(NO)	Is quantitative rating score *greater* than the Category 2 scoring threshold *(including* 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
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	(YES) Wetland is assigned to the appropriate category based on the scoring range	NO	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.
Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	(NO)	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).
Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* 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?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	(NO) Wetland is assigned to category as determined by the ORAM.	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.

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:	N. Revetta K. Moran
Date:	10/12/2020
Affiliation:	CDM Smith
Address:	445 Hutchinson Ave, Suite 820, Columbus, OH 43235 8845 Governor's Hill Drive, Suite 430, Cincinnati, OH 45249
Phone Number:	614-847-6829 513-716-6527
e-mail address:	revettanp@cdmsmith.com moranka@cdmsmith.com
Name of Wetland:	Wet Ditch 2
Vegetation Communit(ies):	Emergent - roadside drainage ditch primarily dominated by narrowleaf cattails (Typha angustifolia)
HGM Class(es):	Depressional

Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.

See attached figures

Lat/Long or UTM Coordinate 39.7464, -84.5863	
USGS Quad Name West Alexandria	
County Preble	
Township Twin	
Section and Subsection N/A	
Hydrologic Unit Code N/A	
Site Visit 10/12/2020	
National Wetland Inventory Map Not shown	
Ohio Wetland Inventory Map Not shown	
Soil Survey KnA	
Delineation report/map See attached report	

Name of Wetland: Wet Ditch 2	
Wetland Size (acres, hectares): 0.006-acres	

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.

See attached figures

Comments, Narrative Discussion, Justification of Category Changes:

See attached report for detailed delineation metrics and discussions.

Final score : 4 **Category:**	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 *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, 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 *Sphagnum* 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	0ak Opening species	wet prairie species
Lythrum salicaria	*Zygadenus elegans var. glaucus*	*Calla palustris*	*Carex cryptolepis*	*Calamagrostis canadensis*
Myriophyllum spicatum	*Cacalia plantaginea*	*Carex atlantica var. capillacea*	*Carex lasiocarpa*	*Calamogrostis stricta*
Najas minor	*Carex flava*	*Carex echinata*	*Carex stricta*	*Carex atherodes*
Phalaris arundinacea	*Carex sterilis*	*Carex oligosperma*	*Cladium mariscoides*	*Carex buxbaumii*
Phragmites australis	*Carex stricta*	*Carex trisperma*	*Calamagrostis stricta*	*Carex pellita*
Potamogeton crispus	*Deschampsia caespitosa*	*Chamaedaphne calyculata*	*Calamagrostis canadensis*	*Carex sartwellii*
Ranunculus ficaria	*Eleocharis rostellata*	*Decodon verticillatus*	*Quercus palustris*	*Gentiana andrewsii*
Rhamnus frangula	*Eriophorum viridicarinatum*	*Eriophorum virginicum*		*Helianthus grosseserratus*
Typha angustifolia	*Gentianopsis spp.*	*Larix laricina*		*Liatris spicata*
Typha xglauca	*Lobelia kalmii*	*Nemopanthus mucronatus*		*Lysimachia quadriflora*
	Parnassia glauca	*Schechzeria palustris*		*Lythrum alatum*
	Potentilla fruticosa	*Sphagnum spp.*		*Pycnanthemum virginianum*
	Rhamnus alnifolia	*Vaccinium macrocarpon*		*Silphium terebinthinaceum*
	Rhynchospora capillacea	*Vaccinium corymbosum*		*Sorghastrum nutans*
	Salix candida	*Vaccinium oxycoccos*		*Spartina pectinata*
	Salix myricoides	*Woodwardia virginica*		*Solidago riddellii*
	Salix serissima	*Xyris difformis*		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Preble County WWTP	**Rater(s):** N. Revetta; K. Moran	**Date:** 10/12/2020

Metric 1. Wetland Area (size).

0	0
max 6 pts.	subtotal

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)
- [X] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

3	3
max 14 pts.	subtotal

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)
- [X] 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), shrub land, young second growth forest. (5)
- [X] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

6	9
max 30 pts.	subtotal

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [X] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [X] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [X] 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)
- [X] <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)
- [X] 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)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [X] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [X] other *Housing/residential development

Metric 4. Habitat Alteration and Development.

3	12
max 20 pts.	subtotal

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [X] 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)
- [X] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [X] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [X] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [X] nutrient enrichment

12
subtotal this page

last revised 1 February 2001 jjm

*Significant residential trash present

Site: Preble County WWTP	**Rater(s):** N. Revetta; K. Moran	**Date:** 10/12/2020

12
subtotal first page

-10 | 2
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)
X	Category 1 Wetland. See Question 1 Qualitative Rating (-10)

2 | 4
max 20 pts. | subtotal

Metric 6. Plant communities, interspersion, microtopography.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

	Aquatic bed
1	Emergent
1	Shrub
	Forest
	Mudflats
	Open water
	Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

	High (5)
	Moderately high(4)
	Moderate (3)
	Moderately low (2)
X	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)
X	Sparse 5-25% cover (-1)
	Nearly absent <5% cover (0)
	Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

0	Vegetated hummucks/tussucks
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

4

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES 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		
	Metric 2. Buffers and surrounding land use		
	Metric 3. Hydrology		
	Metric 4. Habitat		
	Metric 5. Special Wetland Communities		
	Metric 6. Plant communities, interspersion, microtopography		
	TOTAL SCORE	3	Category based on score breakpoints

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	(NO)	Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* 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
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	(NO)	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.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	(NO)	Is quantitative rating score *greater* than the Category 2 scoring threshold *(including* 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
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	(YES) Wetland is assigned to the appropriate category based on the scoring range	NO	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.
Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	(NO)	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).
Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* 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?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	(NO) Wetland is assigned to category as determined by the ORAM.	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.

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:	N. Revetta K. Moran
Date:	10/13/2020
Affiliation:	CDM Smith
Address:	445 Hutchinson Ave, Suite 820, Columbus, OH 43235 8845 Governor's Hill Drive, Suite 430, Cincinnati, OH 45249
Phone Number:	614-847-6829 513-716-6527
e-mail address:	revettanp@cdmsmith.com moranka@cdmsmith.com
Name of Wetland:	Wet Ditch 3
Vegetation Communit(ies):	Emergent - roadside drainage ditch primarily dominated by narrowleaf cattails (Typha angustifolia)
HGM Class(es):	Depressional

Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.

See attached figures

Lat/Long or UTM Coordinate	39.7443, -84.5715
USGS Quad Name	West Alexandria
County	Preble
Township	Twin
Section and Subsection	N/A
Hydrologic Unit Code	N/A
Site Visit	10/12/2020
National Wetland Inventory Map	Not shown
Ohio Wetland Inventory Map	Not shown
Soil Survey	CeB
Delineation report/map	See attached report

Name of Wetland: Wet Ditch 3	
Wetland Size (acres, hectares): 0.016-acres	

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.

See attached figures

Comments, Narrative Discussion, Justification of Category Changes:

See attached report for detailed delineation metrics and discussions.

Final score : 4 **Category:**	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 *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, 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 *Sphagnum* 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	0ak Opening species	wet prairie species
Lythrum salicaria	*Zygadenus elegans var. glaucus*	*Calla palustris*	*Carex cryptolepis*	*Calamagrostis canadensis*
Myriophyllum spicatum	*Cacalia plantaginea*	*Carex atlantica var. capillacea*	*Carex lasiocarpa*	*Calamogrostis stricta*
Najas minor	*Carex flava*	*Carex echinata*	*Carex stricta*	*Carex atherodes*
Phalaris arundinacea	*Carex sterilis*	*Carex oligosperma*	*Cladium mariscoides*	*Carex buxbaumii*
Phragmites australis	*Carex stricta*	*Carex trisperma*	*Calamagrostis stricta*	*Carex pellita*
Potamogeton crispus	*Deschampsia caespitosa*	*Chamaedaphne calyculata*	*Calamagrostis canadensis*	*Carex sartwellii*
Ranunculus ficaria	*Eleocharis rostellata*	*Decodon verticillatus*	*Quercus palustris*	*Gentiana andrewsii*
Rhamnus frangula	*Eriophorum viridicarinatum*	*Eriophorum virginicum*		*Helianthus grosseserratus*
Typha angustifolia	*Gentianopsis spp.*	*Larix laricina*		*Liatris spicata*
Typha xglauca	*Lobelia kalmii*	*Nemopanthus mucronatus*		*Lysimachia quadriflora*
	Parnassia glauca	*Schechzeria palustris*		*Lythrum alatum*
	Potentilla fruticosa	*Sphagnum spp.*		*Pycnanthemum virginianum*
	Rhamnus alnifolia	*Vaccinium macrocarpon*		*Silphium terebinthinaceum*
	Rhynchospora capillacea	*Vaccinium corymbosum*		*Sorghastrum nutans*
	Salix candida	*Vaccinium oxycoccos*		*Spartina pectinata*
	Salix myricoides	*Woodwardia virginica*		*Solidago riddellii*
	Salix serissima	*Xyris difformis*		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Preble County WWTP	**Rater(s):** N. Revetta; K. Moran	**Date:** 10/12/2020

Metric 1. Wetland Area (size).

0	0
max 6 pts.	subtotal

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)
- [X] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

3	3
max 14 pts.	subtotal

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)
- [X] 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), shrub land, young second growth forest. (5)
- [X] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

6	9
max 30 pts.	subtotal

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [X] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [X] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [X] 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)
- [X] <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)
- [X] 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)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [X] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [X] other *Housing/residential development

Metric 4. Habitat Alteration and Development.

3	12
max 20 pts.	subtotal

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [X] 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)
- [X] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [X] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [X] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [X] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [X] nutrient enrichment

12
subtotal this page

last revised 1 February 2001 jjm

*Significant residential trash present

Site: Preble County WWTP	**Rater(s):** N. Revetta; K. Moran	**Date:** 10/12/2020

12
subtotal first page

-10 | 2
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)
X	Category 1 Wetland. See Question 1 Qualitative Rating (-10)

2 | 4
max 20 pts. | subtotal

Metric 6. Plant communities, interspersion, microtopography.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

	Aquatic bed
1	Emergent
1	Shrub
	Forest
	Mudflats
	Open water
	Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

	High (5)
	Moderately high(4)
	Moderate (3)
	Moderately low (2)
X	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)
X	Sparse 5-25% cover (-1)
	Nearly absent <5% cover (0)
	Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

0	Vegetated hummucks/tussucks
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

4

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES 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		
	Metric 2. Buffers and surrounding land use		
	Metric 3. Hydrology		
	Metric 4. Habitat		
	Metric 5. Special Wetland Communities		
	Metric 6. Plant communities, interspersion, microtopography		
	TOTAL SCORE	3	Category based on score breakpoints

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	(NO)	Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* 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
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	(NO)	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.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	(NO)	Is quantitative rating score *greater* than the Category 2 scoring threshold *(including* 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
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	(YES) Wetland is assigned to the appropriate category based on the scoring range	NO	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.
Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	(NO)	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).
Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* 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?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	(NO) Wetland is assigned to category as determined by the ORAM.	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.

Final Category

Choose one	Category 1	Category 2	Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Appendix D

Environmental Protection Agency Rapid Bioassessment Protocols for Low Gradient Streams Data Sheets

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME S1- unnamed tributary to Bantas Fork	LOCATION Lanier Township, Preble County, Ohio	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT 39.7441 LONG -84.5726	RIVER BASIN Bantas Fork Watershed	
STORET #	AGENCY	
INVESTIGATORS Nick Revetta & Kate Moran		
FORM COMPLETED BY Kate Moran	DATE 10/7/2020 TIME 2:00 AM (PM)	REASON FOR SURVEY Utility Line Construction and WOTUS Survey

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 (12) 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 (9) 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 (3) 2 1 0Sssssss

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 **[7]** 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 **[9]** 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 7 (LB)	Left Bank 10 9	8 **[7]** 6	5 4 3	2 1 0
SCORE 6 (RB)	Right Bank 10 9	8 7 **[6]**	5 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 2 (LB)	Left Bank 10 9	8 7 6	5 4 3	**[2]** 1 0
SCORE 2 (RB)	Right Bank 10 9	8 7 6	5 4 3	**[2]** 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 5 (LB)	Left Bank 10 9	8 7 6	**[5]** 4 3	2 1 0
SCORE 7 (RB)	Right Bank 10 9	8 **[7]** 6	5 4 3	2 1 0

Total Score 96

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME Bantas Fork (S2)	LOCATION Twin and Lanier Townships, Preble County, Ohio	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT 39.7442 LONG -84.5660	RIVER BASIN Bantas Fork Watershed, Tributary to Twin Creek.	
STORET #	AGENCY CDM Smith	
INVESTIGATORS Nick Revetta & Kate Moran		
FORM COMPLETED BY Nick Revetta	DATE 10/13/2020 TIME 9:00 (AM) PM	REASON FOR SURVEY Utility Line Construction and WOTUS Survey

	Habitat Parameter	Condition Category			
		Optimal	**Suboptimal**	**Marginal**	**Poor**
Parameters to be evaluated in sampling reach	**1. Epifaunal Substrate/ Available Cover**	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 **(18)** 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	20 19 18 17 16	15 **(14)** 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	20 19 18 17 16	15 14 13 **(12)** 11	10 9 8 7 6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 **(16)**	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 **(12)** 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 **[14]** 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 **[11]**	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 7 (LB)	Left Bank 10 9	8 **[7]** 6	5 4 3	2 1 0
SCORE 7 (RB)	Right Bank 10 9	8 **[7]** 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 9 (LB)	Left Bank 10 **[9]**	8 7 6	5 4 3	2 1 0
SCORE 9 (RB)	Right Bank 10 **[9]**	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 7 (LB)	Left Bank 10 9	8 **[7]** 6	5 4 3	2 1 0
SCORE 7 (RB)	Right Bank 10 9	8 **[7]** 6	5 4 3	2 1 0

Total Score 143

Main stem of Bantas Fork Creek (HUC050800020301), which is a tributary to Twin Creek (HUC 050800020205).

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME S3 unnamed tributary to Bantas Fork	LOCATION Lanier Township, Preble County, Ohio	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT 39.7347 LONG -84.5664	RIVER BASIN Bantas Fork Watershed	
STORET #	AGENCY CDM Smith	
INVESTIGATORS Kate Moran & Nick Revetta		
FORM COMPLETED BY Nick Revetta	DATE 10/12/20 TIME 8:00 AM (PM)	REASON FOR SURVEY Utility Line Construction and WOTUS Survey

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5) 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 (0)

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 **11**	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 **6**	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE ___ (LB)	Left Bank 10 9	8 7 **6**	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	**5** 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE ___ (LB)	Left Bank 10 9	8 **7** 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	**5** 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE ___ (LB)	Left Bank 10 9	8 **7** 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 **4** 3	2 1 0

Total Score 78

Note- Surveyed stream segment was dry during time of survey

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME S4 unnamed tributary to Bantas Fork	LOCATION Lanier Township, Preble County, Ohio	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT 39.7368 LONG -84.5665	RIVER BASIN	
STORET #	AGENCY CDM Smith	
INVESTIGATORS Kate Moran & Nick Revetta		
FORM COMPLETED BY Kate Moran	DATE 10/12/20 TIME 10:30 (AM) PM	REASON FOR SURVEY Utility Line Construction and WOTUS Survey

Parameters to be evaluated in sampling reach	Habitat Parameter	Condition Category			
		Optimal	**Suboptimal**	**Marginal**	**Poor**
	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 (1) 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 (2) 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 (1) 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 **[7]** 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 **[3]** 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 5 (LB)	Left Bank 10 9	8 7 6	**[5]** 4 3	2 1 0
SCORE 5 (RB)	Right Bank 10 9	8 7 6	**[5]** 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 6 (LB)	Left Bank 10 9	8 7 **[6]**	5 4 3	2 1 0
SCORE 6 (RB)	Right Bank 10 9	8 7 **[6]**	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 0 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 **[0]**
SCORE 0 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 **[0]**

Total Score 63

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME S5 unnamed tributary to Bantas Fork	LOCATION Lanier Township, Preble County, Ohio	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT 39.7437 LONG -84.5701	RIVER BASIN	
STORET #	AGENCY CDM Smith	
INVESTIGATORS Nick Revetta & Kate Moran		
FORM COMPLETED BY Nick Revetta	DATE 10/12/20 TIME 1:30 AM (PM)	REASON FOR SURVEY Utility Line Construction and WOTUS Survey

Parameters to be evaluated in sampling reach	Habitat Parameter	Condition Category			
		Optimal	**Suboptimal**	**Marginal**	**Poor**
	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5) 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 (7) 6	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 (7) 6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 (7) 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	(15) 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 **[8]** 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 **[8]** 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 8 (LB)	Left Bank 10 9	**[8]** 7 6	5 4 3	2 1 0
SCORE 8 (RB)	Right Bank 10 9	**[8]** 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 2 (LB)	Left Bank 10 9	8 7 6	5 4 3	**[2]** 1 0
SCORE 2 (RB)	Right Bank 10 9	8 7 6	5 4 3	**[2]** 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 3 (LB)	Left Bank 10 9	8 7 6	5 4 **[3]**	2 1 0
SCORE 3 (RB)	Right Bank 10 9	8 7 6	5 4 **[3]**	2 1 0

Total Score 83

Notes:
1) Upstream section is forested.
2) all downstream sections run through residential property with maintained grass yards.

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME S6 unnamed tributary to Bantas Fork	LOCATION Lanier Township, Preble County, Ohio	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT 39.7383 LONG -84.5689	RIVER BASIN Bantas Fork Watershed	
STORET #	AGENCY CDM Smith	
INVESTIGATORS Kate Moran & Nick Revetta		
FORM COMPLETED BY Nick Revetta	DATE 10/12/20 TIME 1:00 AM (PM)	REASON FOR SURVEY Utility Line Construction and WOTUS Survey

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	**1. Epifaunal Substrate/ Available Cover**	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 (3) 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 (0)

Note- At time of survey no water in portion of channel evaulated.

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 **[8]** 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 **[3]** 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 6 (LB)	Left Bank 10 9	8 7 **[6]**	5 4 3	2 1 0
SCORE 6 (RB)	Right Bank 10 9	8 7 **[6]**	5 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 4 (LB)	Left Bank 10 9	8 7 6	5 **[4]** 3	2 1 0
SCORE 4 (RB)	Right Bank 10 9	8 7 6	5 **[4]** 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 4 (LB)	Left Bank 10 9	8 7 6	5 **[4]** 3	2 1 0
SCORE 4 (RB)	Right Bank 10 9	8 7 6	5 **[4]** 3	2 1 0

Total Score 70

Notes:
1) Mostly invasive or ornamental vegetation on banks.
2) Wetland vegetation growing in channel due to it being dry.
3) Upstream reach, above culvert, is forested.

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME S7 unnamed tributary to Bantas Fork	LOCATION Lanier Township, Preble County, Ohio	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT 39.7404 LONG -84.5784	RIVER BASIN Bantas Fork Watershed	
STORET #	AGENCY CDM Smith	
INVESTIGATORS Nick Revetta & Kate Moran		
FORM COMPLETED BY Kate Moran	DATE 10/12/20 TIME 2:30 AM (PM)	REASON FOR SURVEY Utility Line Construction and WOTUS Survey

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 (12) 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 (2) 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 (0)

Note- At time of survey no water in portion of channel evaulated.

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 **[12]** 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 **[6]**	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 3 (LB)	Left Bank 10 9	8 7 6	5 4 **[3]**	2 1 0
SCORE 4 (RB)	Right Bank 10 9	8 7 6	5 **[4]** 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 5 (LB)	Left Bank 10 9	8 7 6	**[5]** 4 3	2 1 0
SCORE 5 (RB)	Right Bank 10 9	8 7 6	**[5]** 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 2 (LB)	Left Bank 10 9	8 7 6	5 4 3	**[2]** 1 0
SCORE 1 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 **[1]** 0

Total Score 71

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME S8; Unnamed Tributary to Bantas Fork	LOCATION Lanier Township, Preble County, Ohio	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT 39.7396 LONG -84.5760	RIVER BASIN Bantas Fork Watershed	
STORET #	AGENCY CDM Smith	
INVESTIGATORS Nick Revetta & Kate Moran		
FORM COMPLETED BY Kate Moran	DATE 10/12/20 TIME 3:00 AM (PM)	REASON FOR SURVEY Utility Line Construction and WOTUS Survey

	Habitat Parameter	Condition Category			
		Optimal	**Suboptimal**	**Marginal**	**Poor**
Parameters to be evaluated in sampling reach	**1. Epifaunal Substrate/ Available Cover**	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 (1) 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 (7) 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 (0)

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 **[6]**	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 **[4]** 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 3 (LB)	Left Bank 10 9	8 7 6	5 4 **[3]**	2 1 0
SCORE 5 (RB)	Right Bank 10 9	8 7 6	**[5]** 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 4 (LB)	Left Bank 10 9	8 7 6	5 **[4]** 3	2 1 0
SCORE 5 (RB)	Right Bank 10 9	8 7 6	**[5]** 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 0 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 **[0]**
SCORE 1 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 **[1]** 0

Total Score 52

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME S9,Unnamed Tributary to Bantas Fork	LOCATION Twin Township, Preble County, Ohio	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT 39.7500 LONG -84.5864	RIVER BASIN Bantas Fork Watershed	
STORET #	AGENCY CDM Smith	
INVESTIGATORS Nick Revetta & Kate Moran		
FORM COMPLETED BY Kate Moran	DATE 10/12/20 TIME 3:28 AM (PM)	REASON FOR SURVEY Utility Line Construction and WOTUS Survey

	Habitat Parameter	Condition Category			
		Optimal	**Suboptimal**	**Marginal**	**Poor**
Parameters to be evaluated in sampling reach	**1. Epifaunal Substrate/ Available Cover**	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5) 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 (0)
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 (3) 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 (0)

Note- Surveyed section of channel was dry at time of survey.

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 **6**	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 **2** 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	**2** 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 **3**	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	**2** 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	**2** 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 **0**
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 **0**

Total Score 31

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME S10 Unnamed tributary to Bantas Fork	LOCATION Lanier Township, Preble County, Ohio	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT 39.7593 LONG -84.5728	RIVER BASIN Bantas Fork Watershed	
STORET #	AGENCY CDM Smith	
INVESTIGATORS Kate Moran & Nick Revetta		
FORM COMPLETED BY Kate Moran	DATE 10/12/20 TIME 4:30 AM (PM)	REASON FOR SURVEY Utility Line Construction and WOTUS Survey

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 (7) 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 (3) 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 (2) 1 0

Note- Standing water in pool, but dry in remainder of surveyed stream reach.

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 **[8]** 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 **[4]** 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 3 (LB)	Left Bank 10 9	8 7 6	5 4 **[3]**	2 1 0
SCORE 3 (RB)	Right Bank 10 9	8 7 6	5 4 **[3]**	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 4 (LB)	Left Bank 10 9	8 7 6	5 **[4]** 3	2 1 0
SCORE 4 (RB)	Right Bank 10 9	8 7 6	5 **[4]** 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 1 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 **[1]** 0
SCORE 1 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 **[1]** 0

Total Score 58

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME Stream 5B	LOCATION Preble County, Ohio	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT _____ LONG _____	RIVER BASIN Preble County, Ohio	
STORET #	AGENCY	
INVESTIGATORS Nick Revetta & Kate Moran		
FORM COMPLETED BY	DATE 6/8/23 TIME _____ AM PM	REASON FOR SURVEY

	Habitat Parameter	Condition Category			
		Optimal	**Suboptimal**	**Marginal**	**Poor**
Parameters to be evaluated in sampling reach	**1. Epifaunal Substrate/ Available Cover**	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 13 12 (11)	10 9 8 7 6	5 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5) 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 **(13)** 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	**(15)** 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE ___ (LB)	Left Bank 10 9	8 7 **(6)**	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 **(6)**	5 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 **(4)** 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 **(4)** 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 **(4)** 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 **(1)** 0

Total Score 103

Appendix E

Ohio Qualitative Habitat Evaluation Index (QHEI) for Streams Data Sheets

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

OhioEPA

QHEI Score: 50

Stream & Location: S1; Lanier Township, Preble County, Ohio RM: _ _ _._ Date: 10/ 07 / 20

Kate Moran & Nick Revetta Scorers Full Name & Affiliation: CDM Smith

River Code: _ _ _ - _ _ _ - _ _ _ STORET #: _ _ _ _ _ _ Lat./ Long.: (NAD 83 - decimal °) 39 _ . 7441 _ _ /84 . 5726 _ Office verified location ☐

1] SUBSTRATE

Check *ONLY* **Two** substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]	0	0	☐ ☐ HARDPAN [4]	0	0
☐ ☐ BOULDER [9]	1	5	☐ ☐ DETRITUS [3]	0	0
☑ ☐ COBBLE [8]	25	70	☐ ☐ MUCK [2]	0	0
☐ ☐ GRAVEL [7]	8	5	☐ ☐ SILT [2]	10	5
☑ ☐ SAND [6]	55	10	☐ ☐ ARTIFICIAL [0]	1	5
☐ ☐ BEDROCK [5]	0	0			

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☑ 4 or more [2] ☐ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN: ☐ LIMESTONE [1] ☑ TILLS [1] ☐ WETLANDS [0] ☐ HARDPAN [0] ☐ SANDSTONE [0] ☐ RIP/RAP [0] ☐ LACUSTURINE [0] ☐ SHALE [-1] ☐ COAL FINES [-2]

QUALITY

SILT: ☐ HEAVY [-2] ☐ MODERATE [-1] ☑ NORMAL [0] ☐ FREE [1]

EMBEDDEDNESS: ☐ EXTENSIVE [-2] ☐ MODERATE [-1] ☑ NORMAL [0] ☐ NONE [1]

Comments

Substrate 17 Maximum 20

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.

1	UNDERCUT BANKS [1]	0	POOLS > 70cm [2]	0	OXBOWS, BACKWATERS [1]
2	OVERHANGING VEGETATION [1]	0	ROOTWADS [1]	0	AQUATIC MACROPHYTES [1]
0	SHALLOWS (IN SLOW WATER) [1]	2	BOULDERS [1]	2	LOGS OR WOODY DEBRIS [1]
0	ROOTMATS [1]				

AMOUNT Check ONE (*Or 2 & average*)

☑ EXTENSIVE >75% [11] ☐ MODERATE 25-75% [7] ☐ SPARSE 5-<25% [3] ☐ NEARLY ABSENT <5% [1]

Comments

Cover Maximum 20: 15

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY: ☐ HIGH [4] ☐ MODERATE [3] ☑ LOW [2] ☐ NONE [1]

DEVELOPMENT: ☐ EXCELLENT [7] ☐ GOOD [5] ☐ FAIR [3] ☑ POOR [1]

CHANNELIZATION: ☐ NONE [6] ☐ RECOVERED [4] ☐ RECOVERING [3] ☑ RECENT OR NO RECOVERY [1]

STABILITY: ☐ HIGH [3] ☐ MODERATE [2] ☑ LOW [1]

Comments

Channel Maximum 20: 5

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for *EACH BANK* (*Or 2 per bank & average*)

River right looking downstream

EROSION L	EROSION R	
☐	☐	NONE / LITTLE [3]
☑	☑	MODERATE [2]
☐	☐	HEAVY / SEVERE [1]

RIPARIAN WIDTH L	RIPARIAN WIDTH R	
☐	☐	WIDE > 50m [4]
☑	☑	MODERATE 10-50m [3]
☐	☐	NARROW 5-10m [2]
☐	☐	VERY NARROW < 5m [1]
☐	☐	NONE [0]

FLOOD PLAIN QUALITY L	FLOOD PLAIN QUALITY R	
☑	☑	FOREST, SWAMP [3]
☐	☐	SHRUB OR OLD FIELD [2]
☐	☑	RESIDENTIAL, PARK, NEW FIELD [1]
☑	☐	FENCED PASTURE [1]
☐	☐	OPEN PASTURE, ROWCROP [0]

	L	R
CONSERVATION TILLAGE [1]	☐	☐
URBAN OR INDUSTRIAL [0]	☐	☐
MINING / CONSTRUCTION [0]	☐	☐

Indicate predominant land use(s) past 100m riparian.

Comments

Outside of the riparian area, the left bank is predominately mown field, while the right bank is residential housing

Riparian Maximum 10: 7

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH Check **ONE** (*ONLY!*)

☐ > 1m [6] ☐ 0.7-<1m [4] ☐ 0.4-<0.7m [2] ☐ 0.2-<0.4m [1] ☑ < 0.2m [0]

CHANNEL WIDTH Check ONE (*Or 2 & average*)

☐ POOL WIDTH > RIFFLE WIDTH [2] ☑ POOL WIDTH = RIFFLE WIDTH [1] ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY Check ALL that apply

☐ TORRENTIAL [-1] ☐ VERY FAST [1] ☐ FAST [1] ☐ MODERATE [1] ☐ SLOW [1] ☐ INTERSTITIAL [-1] ☑ INTERMITTENT [-2] ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

The channel is ephemeral through the main property parcel, then changes to intermittent along the road way

Pool / Current Maximum 12: -1

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH: ☐ BEST AREAS > 10cm [2] ☐ BEST AREAS 5-10cm [1] ☑ BEST AREAS < 5cm [metric=0]

RUN DEPTH: ☐ MAXIMUM > 50cm [2] ☑ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE: ☐ STABLE (e.g., Cobble, Boulder) [2] ☑ MOD. STABLE (e.g., Large Gravel) [1] ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS: ☐ NONE [2] ☑ LOW [1] ☐ MODERATE [0] ☐ EXTENSIVE [-1]

Comments: Channel dry execpt small pools in the lower portion of the stream.

Riffle / Run Maximum 8: 3

6] GRADIENT (ft/mi)

DRAINAGE AREA 4% gradient (mi²)

☑ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

%POOL: 20 %GLIDE: 0 %RUN: 40 %RIFFLE: 40

Gradient Maximum 10: 4

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-		2nd
☐	HIGH	☐
☐	UP	☐
☐	NORMAL	☐
☐	LOW	☐
☑	DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☑ OTHER

See figure

_____ meters

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

1st pass _____ cm

2nd _____ cm

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Channel reach is a section of an unnamed tributary of Bantas Fork Creek (HUC050800020301), which is a part of the larger Twin Creek Watershed (HUC 050800020205).

Stream begins as an ephmeral drainage, where water drains off neighboring property and diverted through a 24" plastic culvert.

Once the channel meets the piped ditch the stream becomes intermittent.

Note on clarity - The bottom was visible, but water depth was on average <= 3 inches.

B] AESTHETICS

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

C] RECREATION

POOL: ☐ >100ft² ☑ >3ft (AREA / DEPTH)

D] 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

Circle some & *COMMENT*

water originates from runoff from a semi-maintained field that is directed through a coluvert. The stream runs through but private property and directly adjact to the road right of way.

E] 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_20 / TILE / H_20 TABLE

ACID / MINE / QUARRY / FLOW

NATURAL / WETLAND / STAGNANT

PARK / GOLF / LAWN / HOME

ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:

See figure.

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 68.5

Stream & Location: S2/Bantas Fork; Twin and Lanier Townships, Preble County, Ohio **RM:** _ _ _._ **Date:** 10 / 13 / 20 _

Scorers Full Name & Affiliation: Kate Moran & Nick Revetta, CDM Smith

River Code: _ _ _-_ _ _-_ _ _ **STORET #:** _ _ _ _ _ _ **Lat./ Long.:** (NAD 83 - decimal °) 39 . 7442 / 84 . 5660 Office verified location ☐

1] SUBSTRATE

Check **ONLY Two** substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]	0	0	☐ ☐ HARDPAN [4]	0	0
☐ ☐ BOULDER [9]	5	0	☐ ☐ DETRITUS [3]	0	0
☑ ☐ COBBLE [8]	35	50	☐ ☐ MUCK [2]	0	0
☑ ☐ GRAVEL [7]	30	35	☐ ☐ SILT [2]	10	5
☐ ☐ SAND [6]	20	10	☐ ☐ ARTIFICIAL [0]	0	0
☐ ☐ BEDROCK [5]	0	0			

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☑ 4 or more [2] ☐ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☐ LIMESTONE [1]
- ☑ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY

SILT
- ☐ HEAVY [-2]
- ☐ MODERATE [-1]
- ☑ NORMAL [0]
- ☐ FREE [1]

EMBEDDEDNESS
- ☐ EXTENSIVE [-2]
- ☐ MODERATE [-1]
- ☑ NORMAL [0]
- ☐ NONE [1]

Substrate 18 *Maximum 20*

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.

1	UNDERCUT BANKS [1]	2	POOLS > 70cm [2]	0	OXBOWS, BACKWATERS [1]
2	OVERHANGING VEGETATION [1]	1	ROOTWADS [1]	0	AQUATIC MACROPHYTES [1]
2	SHALLOWS (IN SLOW WATER) [1]	0	BOULDERS [1]	1	LOGS OR WOODY DEBRIS [1]
1	ROOTMATS [1]				

AMOUNT

Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ☐ MODERATE 25-75% [7]
- ☑ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Comments

Cover 11 *Maximum 20*

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY
- ☐ HIGH [4]
- ☑ MODERATE [3]
- ☐ LOW [2]
- ☐ NONE [1]

DEVELOPMENT
- ☐ EXCELLENT [7]
- ☑ GOOD [5]
- ☐ FAIR [3]
- ☐ POOR [1]

CHANNELIZATION
- ☐ NONE [6]
- ☑ RECOVERED [4]
- ☑ RECOVERING [3]
- ☐ RECENT OR NO RECOVERY [1]

STABILITY
- ☐ HIGH [3]
- ☑ MODERATE [2]
- ☐ LOW [1]

Comments

Channel 13.5 *Maximum 20*

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for ***EACH BANK*** (*Or 2 per bank & average*)

River right looking downstream

EROSION

L	R	
☑	☑	NONE / LITTLE [3]
☐	☐	MODERATE [2]
☐	☐	HEAVY / SEVERE [1]

RIPARIAN WIDTH

L	R	
☐	☐	WIDE > 50m [4]
☑	☑	MODERATE 10-50m [3]
☐	☐	NARROW 5-10m [2]
☐	☐	VERY NARROW < 5m [1]
☐	☐	NONE [0]

FLOOD PLAIN QUALITY

L	R	
☑	☑	FOREST, SWAMP [3]
☐	☐	SHRUB OR OLD FIELD [2]
☑	☑	RESIDENTIAL, PARK, NEW FIELD [1]
☑	☑	FENCED PASTURE [1]
☐	☐	OPEN PASTURE, ROWCROP [0]

L	R	
☐	☐	CONSERVATION TILLAGE [1]
☐	☐	URBAN OR INDUSTRIAL [0]
☐	☐	MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Comments

Stream immediately adjacent and flowing into Bantas Fork.

Riparian 7.5 *Maximum 10*

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check **ONE** (*ONLY!*)
- ☑ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH

Check ONE (*Or 2 & average*)
- ☐ POOL WIDTH > RIFFLE WIDTH [2]
- ☑ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply
- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ☐ FAST [1]
- ☑ MODERATE [1]
- ☐ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☐ INTERMITTENT [-2]
- ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current 8 *Maximum 12*

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
- ☐ BEST AREAS > 10cm [2]
- ☑ BEST AREAS 5-10cm [1]
- ☐ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ☐ MAXIMUM > 50cm [2]
- ☑ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☑ STABLE (e.g., Cobble, Boulder) [2]
- ☑ MOD. STABLE (e.g., Large Gravel) [1]
- ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☑ NONE [2]
- ☑ LOW [1]
- ☐ MODERATE [0]
- ☐ EXTENSIVE [-1]

Comments

Riffle / Run 4.5 *Maximum 8*

6] GRADIENT

DRAINAGE AREA (mi²)

ft/mi)
- ☐ VERY LOW - LOW [2-4]
- ☑ MODERATE [6-10]
- ☐ HIGH - VERY HIGH [10-6]

%POOL: 20 %GLIDE: 0 %RUN: 30 %RIFFLE: 50

Gradient 6 *Maximum 10*

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-		2nd
☐	HIGH	☐
☐	UP	☐
☐	NORMAL	☐
☐	LOW	☐
☐	DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☑ OTHER

30 meters

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

1st pass _____ cm

2nd _____ cm

C] RECREATION

POOL: AREA ☐ >100ft² DEPTH ☐ >3ft

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Main stem of Bantas Fork Creek (HUC050800020301), which is a tributary to Twin Creek (HUC 050800020205).

Able to see to bottom of pools.

Riprap under bridge.

Wastewater Treatment Plant outfall located on right bank, approximately 50 ft downstream of bridge.

B] AESTHETICS

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

D] MAINTENANCE

Circle some & *COMMENT*

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

E] 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_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 40

Stream & Location: S3; Lanier Township, Preble County, Ohio **RM:** _ _ _._ **Date:** 10 / 12 / 20

Scorers Full Name & Affiliation: Nick Revetta & Kate Moran, CDM Smith

River Code: _ _ _-_ _ _-_ _ _ **STORET #:** _ _ _ _ _ _ **Lat./ Long.:** (NAD 83 - decimal °) 39 . 7347 / 84 . 5664 **Office verified location** ☐

1] SUBSTRATE

Check *ONLY* **Two** substrate *TYPE BOXES*; estimate % or note every type present

Check ONE (*Or 2 & average*)

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]	0	0	☐ ☐ HARDPAN [4]	0	0
☐ ☐ BOULDER [9]	5	5	☐ ☐ DETRITUS [3]	0	0
☐ ☐ COBBLE [8]	10	10	☐ ☐ MUCK [2]	0	0
☐ ☐ GRAVEL [7]	10	10	☑ ☐ SILT [2]	50	50
☑ ☐ SAND [6]	25	25	☐ ☐ ARTIFICIAL [0]	0	0
☐ ☐ BEDROCK [5]					

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☑ 4 or more [2] ☐ 3 or less [0]

ORIGIN	SILT	QUALITY
☐ LIMESTONE [1]		☐ HEAVY [-2]
☑ TILLS [1]		☑ MODERATE [-1]
☐ WETLANDS [0]		☐ NORMAL [0]
☐ HARDPAN [0]		☐ FREE [1]
☐ SANDSTONE [0]	EMBEDDEDNESS	☐ EXTENSIVE [-2]
☐ RIP/RAP [0]		☑ MODERATE [-1]
☐ LACUSTURINE [0]		☐ NORMAL [0]
☐ SHALE [-1]		☐ NONE [1]
☐ COAL FINES [-2]		

Substrate 9 *Maximum 20*

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.

0 UNDERCUT BANKS [1]	2 POOLS > 70cm [2]	0 OXBOWS, BACKWATERS [1]
1 OVERHANGING VEGETATION [1]	0 ROOTWADS [1]	0 AQUATIC MACROPHYTES [1]
0 SHALLOWS (IN SLOW WATER) [1]	1 BOULDERS [1]	2 LOGS OR WOODY DEBRIS [1]
0 ROOTMATS [1]		

AMOUNT (Check ONE (*Or 2 & average*))

☐ EXTENSIVE >75% [11]
☑ MODERATE 25-75% [7]
☐ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Comments

Stream dry at time of survey, evidence of pools apprent, intermittent channel.

Cover *Maximum 20* 12

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☑ MODERATE [2]
☑ LOW [2]	☑ FAIR [3]	☑ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel *Maximum 20* 10

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for ***EACH BANK*** (*Or 2 per bank & average*)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	(L R)
☐ ☐ NONE / LITTLE [3]	☐ ☐ WIDE > 50m [4]	☑ ☐ FOREST, SWAMP [3]	☐ ☐ CONSERVATION TILLAGE [1]
☑ ☑ MODERATE [2]	☑ ☐ MODERATE 10-50m [3]	☐ ☐ SHRUB OR OLD FIELD [2]	☐ ☐ URBAN OR INDUSTRIAL [0]
☐ ☐ HEAVY / SEVERE [1]	☐ ☐ NARROW 5-10m [2]	☐ ☑ RESIDENTIAL, PARK, NEW FIELD [1]	☐ ☐ MINING / CONSTRUCTION [0]
	☐ ☑ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]	
	☐ ☐ NONE [0]	☐ ☐ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian *Maximum 10* 4

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH (Check **ONE** (*ONLY!*))

☐ > 1m [6]
☐ 0.7-<1m [4]
☐ 0.4-<0.7m [2]
☐ 0.2-<0.4m [1]
☑ < 0.2m [0]

CHANNEL WIDTH (Check ONE (*Or 2 & average*))

☑ POOL WIDTH > RIFFLE WIDTH [2]
☐ POOL WIDTH = RIFFLE WIDTH [1]
☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY (Check ALL that apply)

☐ TORRENTIAL [-1]	☐ SLOW [1]
☐ VERY FAST [1]	☐ INTERSTITIAL [-1]
☐ FAST [1]	☑ INTERMITTENT [-2]
☐ MODERATE [1]	☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments Stream dry and cannot determine depth, measured as 0.

Pool / Current *Maximum 12* 0

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

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

Comments

Riffle / Run *Maximum 8* 3

6] GRADIENT (ft/mi)

DRAINAGE AREA (mi²)

☑ VERY LOW - LOW [2-4]
☐ MODERATE [6-10]
☐ HIGH - VERY HIGH [10-6]

%POOL: 30 %GLIDE: 0
%RUN: 35 %RIFFLE: 35

Gradient *Maximum 10* 2

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☑ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☑ OTHER

30 meters

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

1st pass _____ cm

2nd _____ cm

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Channel is an unnamed tributary of Bantas Fork Creek (HUC050800020301), which is apart of the larger Twin Creek Watershed (HUC 050800020205).

B] AESTHETICS

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

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

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

E] 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_20 / TILE / H_20 TABLE

ACID / MINE / QUARRY / FLOW

NATURAL / WETLAND / STAGNANT

PARK / GOLF / LAWN / HOME

ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:

See figure.

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 26

Stream & Location: S4; Lanier Township, Preble County Ohio **RM:** _ _ _._ **Date:** 10 / 12 / 20

Scorers Full Name & Affiliation: Kate Moran & Nick Revetta, CDM Smith

River Code: _ _ _ - _ _ _ - _ _ _ **STORET #:** _ _ _ _ _ _ **Lat./ Long.:** (NAD 83 - decimal °) 39 . 7368 / 84 . 5665 Office verified location ☐

1] SUBSTRATE

Check *ONLY* **Two** substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]	0	0	☐ ☐ HARDPAN [4]	0	0
☐ ☐ BOULDER [9]	2	20	☐ ☐ DETRITUS [3]	0	0
☑ ☐ COBBLE [8]	30	25	☐ ☐ MUCK [2]	0	0
☐ ☐ GRAVEL [7]	10	13	☑ ☐ SILT [2]	55	40
☐ ☐ SAND [6]	0	0	☐ ☐ ARTIFICIAL [0]	3	2
☐ ☐ BEDROCK [5]	0	0			

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☐ LIMESTONE [1]
- ☑ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

SILT / EMBEDDEDNESS

QUALITY
- ☑ HEAVY [-2]
- ☐ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ FREE [1]
- ☑ EXTENSIVE [-2]
- ☐ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ NONE [1]

Substrate 7 *Maximum 20*

Comments

Instream wetlands dominate the channel.

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.

0 UNDERCUT BANKS [1]	1 POOLS > 70cm [2]	0 OXBOWS, BACKWATERS [1]
0 OVERHANGING VEGETATION [1]	0 ROOTWADS [1]	0 AQUATIC MACROPHYTES [1]
0 SHALLOWS (IN SLOW WATER) [1]	2 BOULDERS [1]	0 LOGS OR WOODY DEBRIS [1]
0 ROOTMATS [1]		

AMOUNT

Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ☐ MODERATE 25-75% [7]
- ☐ SPARSE 5-<25% [3]
- ☑ NEARLY ABSENT <5% [1]

Comments

Cover *Maximum 20* 4

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY
- ☐ HIGH [4]
- ☐ MODERATE [3]
- ☑ LOW [2]
- ☐ NONE [1]

DEVELOPMENT
- ☐ EXCELLENT [7]
- ☐ GOOD [5]
- ☑ FAIR [3]
- ☐ POOR [1]

CHANNELIZATION
- ☐ NONE [6]
- ☐ RECOVERED [4]
- ☐ RECOVERING [3]
- ☑ RECENT OR NO RECOVERY [1]

STABILITY
- ☐ HIGH [3]
- ☐ MODERATE [2]
- ☑ LOW [1]

Comments

Downstream of bridge is extensively armoured with placed boulders.

Channel *Maximum 20* 7

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for ***EACH BANK*** (*Or 2 per bank & average*)

River right looking downstream

EROSION

L	R	
☐	☐	NONE / LITTLE [3]
☑	☑	MODERATE [2]
☐	☐	HEAVY / SEVERE [1]

RIPARIAN WIDTH

L	R	
☐	☐	WIDE > 50m [4]
☐	☐	MODERATE 10-50m [3]
☐	☐	NARROW 5-10m [2]
☐	☐	VERY NARROW < 5m [1]
☑	☑	NONE [0]

FLOOD PLAIN QUALITY

L	R	
☐	☐	FOREST, SWAMP [3]
☐	☐	SHRUB OR OLD FIELD [2]
☑	☑	RESIDENTIAL, PARK, NEW FIELD [1]
☐	☐	FENCED PASTURE [1]
☐	☐	OPEN PASTURE, ROWCROP [0]

L	R	
☐	☐	CONSERVATION TILLAGE [1]
☐	☐	URBAN OR INDUSTRIAL [0]
☐	☐	MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Comments

Upstream banks more eroded than downstream of the bridge.

Riparian *Maximum 10* 3

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check **ONE** (*ONLY!*)
- ☐ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☑ < 0.2m [0]

CHANNEL WIDTH

Check ONE (*Or 2 & average*)
- ☑ POOL WIDTH > RIFFLE WIDTH [2]
- ☐ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply

☐ TORRENTIAL [-1]	☐ SLOW [1]
☐ VERY FAST [1]	☐ INTERSTITIAL [-1]
☐ FAST [1]	☑ INTERMITTENT [-2]
☐ MODERATE [1]	☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments No flowing water at time of survey, pool under bridge is standing water.

Pool / Current *Maximum 12* 0

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
- ☐ BEST AREAS > 10cm [2]
- ☑ BEST AREAS 5-10cm [1]
- ☐ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ☐ MAXIMUM > 50cm [2]
- ☑ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☑ STABLE (e.g., Cobble, Boulder) [2]
- ☐ MOD. STABLE (e.g., Large Gravel) [1]
- ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☐ NONE [2]
- ☐ LOW [1]
- ☐ MODERATE [0]
- ☑ EXTENSIVE [-1]

Comments

Riffle / Run *Maximum 8* 3

6] GRADIENT

DRAINAGE AREA (ft/mi) (mi²)

- ☑ VERY LOW - LOW [2-4]
- ☐ MODERATE [6-10]
- ☐ HIGH - VERY HIGH [10-6]

%POOL: 10 %GLIDE: 0 %RUN: 70 %RIFFLE: 20

Gradient *Maximum 10* 2

A] SAMPLED REACH

Check ALL that apply

METHOD

- [ ] BOAT
- [x] WADE
- [ ] L. LINE
- [ ] OTHER

STAGE

1st -sample pass-		2nd
☐	HIGH	☐
☐	UP	☐
☐	NORMAL	☐
☑	LOW	☐
☐	DRY	☐

DISTANCE

- [ ] 0.5 Km
- [ ] 0.2 Km
- [ ] 0.15 Km
- [ ] 0.12 Km
- [x] OTHER

30 meters

CLARITY

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

CANOPY

- [x] > 85%- OPEN
- [ ] 55%-<85%
- [ ] 30%-<55%
- [ ] 10%-<30%
- [ ] <10%- CLOSED

1st pass _____ cm

2nd _____ cm

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Channel reach is a section of an unnamed tributary of Bantas Fork Creek (HUC050800020301), which is a part of the larger Twin Creek Watershed (HUC 050800020205).

Note on clarity: Able to see to bottom, but depth of water averaged about 5-inches.

B] AESTHETICS

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

C] RECREATION

POOL: AREA ☐ >100ft² DEPTH ☐ >3ft

D] 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

Circle some & *COMMENT*

Maintained lawn to top of bank.
It is assumed most maintenance is private, but mainteance around bridge area is public.

E] 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_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 36

Stream & Location: S5; Lanier Township, Preble County, Ohio **RM:** _ _ _._ **Date:** 10 / 12 / 20 _

Scorers Full Name & Affiliation: Nick Revetta & Kate Moran, CDM Smith

River Code: _ _ _ - _ _ _ - _ _ _ **STORET #:** _ _ _ _ _ _ _ **Lat./ Long.:** (NAD 83 - decimal °) 39 . 7437 / 84 . 5701 Office verified location ☐

1] SUBSTRATE

Check **ONLY Two** substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]	0	0	☐ ☐ HARDPAN [4]	0	0
☐ ☐ BOULDER [9]	10	10	☐ ☐ DETRITUS [3]	0	0
☐ ☐ COBBLE [8]	15	15	☐ ☐ MUCK [2]	0	0
☐ ☐ GRAVEL [7]	10	10	☑ ☐ SILT [2]	65	65
☐ ☐ SAND [6]	0	0	☐ ☐ ARTIFICIAL [0]	0	0
☐ ☐ BEDROCK [5]	0	0			

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☐ LIMESTONE [1]
- ☑ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY

SILT
- ☐ HEAVY [-2]
- ☑ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ FREE [1]

EMBEDDEDNESS
- ☐ EXTENSIVE [-2]
- ☑ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ NONE [1]

Comments

Substrate 1 *Maximum 20*

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.

0 UNDERCUT BANKS [1]	1 POOLS > 70cm [2]	0 OXBOWS, BACKWATERS [1]
0 OVERHANGING VEGETATION [1]	0 ROOTWADS [1]	0 AQUATIC MACROPHYTES [1]
0 SHALLOWS (IN SLOW WATER) [1]	2 BOULDERS [1]	0 LOGS OR WOODY DEBRIS [1]
0 ROOTMATS [1]		

AMOUNT

Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ☐ MODERATE 25-75% [7]
- ☑ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Comments

Stream piped under road through concrete culvert channel. Channel is flanked by maintained residential lawns.

Cover 6 *Maximum 20*

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY
- ☐ HIGH [4]
- ☑ MODERATE [3]
- ☐ LOW [2]
- ☐ NONE [1]

DEVELOPMENT
- ☐ EXCELLENT [7]
- ☐ GOOD [5]
- ☑ FAIR [3]
- ☐ POOR [1]

CHANNELIZATION
- ☐ NONE [6]
- ☐ RECOVERED [4]
- ☑ RECOVERING [3]
- ☐ RECENT OR NO RECOVERY [1]

STABILITY
- ☐ HIGH [3]
- ☑ MODERATE [2]
- ☐ LOW [1]

Comments

Bank armoured by boulder and grout in downstream section.

Channel 11 *Maximum 20*

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for ***EACH BANK*** (*Or 2 per bank & average*)

River right looking downstream

EROSION L	EROSION R	
☑	☑	NONE / LITTLE [3]
☐	☐	MODERATE [2]
☐	☐	HEAVY / SEVERE [1]

RIPARIAN WIDTH L	RIPARIAN WIDTH R	
☐	☐	WIDE > 50m [4]
☐	☐	MODERATE 10-50m [3]
☑	☑	NARROW 5-10m [2]
☐	☐	VERY NARROW < 5m [1]
☐	☐	NONE [0]

FLOOD PLAIN QUALITY L	FLOOD PLAIN QUALITY R	
☑	☑	FOREST, SWAMP [3]
☐	☐	SHRUB OR OLD FIELD [2]
☑	☑	RESIDENTIAL, PARK, NEW FIELD [1]
☐	☐	FENCED PASTURE [1]
☐	☐	OPEN PASTURE, ROWCROP [0]

	L	R
CONSERVATION TILLAGE [1]	☐	☐
URBAN OR INDUSTRIAL [0]	☐	☐
MINING / CONSTRUCTION [0]	☐	☐

Indicate predominant land use(s) past 100m riparian.

Comments

Upstream of bridge has a forested riparian area and downstream of bridge is maintained lawn/open.

Riparian 7 *Maximum 10*

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check **ONE** (*ONLY!*)
- ☐ > 1m [6]
- ☑ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH

Check ONE (*Or 2 & average*)
- ☑ POOL WIDTH > RIFFLE WIDTH [2]
- ☐ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply
- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ☐ FAST [1]
- ☐ MODERATE [1]
- ☑ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☐ INTERMITTENT [-2]
- ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current 7 *Maximum 12*

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
- ☐ BEST AREAS > 10cm [2]
- ☑ BEST AREAS 5-10cm [1]
- ☐ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ☐ MAXIMUM > 50cm [2]
- ☑ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☐ STABLE (e.g., Cobble, Boulder) [2]
- ☐ MOD. STABLE (e.g., Large Gravel) [1]
- ☑ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☐ NONE [2]
- ☐ LOW [1]
- ☑ MODERATE [0]
- ☐ EXTENSIVE [-1]

Comments

Riffle / Run 2 *Maximum 8*

6] GRADIENT

(ft/mi) ☑ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (mi^2)

%POOL: 30 %GLIDE: 0 %RUN: 10 %RIFFLE: 60

Gradient 2 *Maximum 10*

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass- 2nd	
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☑ OTHER

30 meters

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

1st pass _____ cm

2nd _____ cm

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Channel reach is a section of an unnamed tributary of Bantas Fork Creek (HUC050800020301), which is a part of the larger Twin Creek Watershed (HUC 050800020205).

Canopy open downstream of bridge and forested upstream.

Landowner discussed history of sewage dumping into channel from an upstream trailer park.

Bank armoured by boulder and grout in downstream section.

B] AESTHETICS

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

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

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

E] 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_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:

See figure.

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 38

Stream & Location: S6; Lanier Township, Preble County, Ohio **RM:** _ _ _._ **Date:** 10/ 12 / 20

Scorers Full Name & Affiliation: Nick Revetta & Kate Moran, CDM Smith

River Code: _ _ _-_ _ _-_ _ _ **STORET #:** _ _ _ _ _ _ **Lat./ Long.:** (NAD 83 - decimal °) 39 . 7383 _ /84 . 5689 _ Office verified location ☐

1] SUBSTRATE

Check **ONLY Two** substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]	0	0	☐ ☐ HARDPAN [4]	0	0
☑ ☐ BOULDER [9]	30	30	☐ ☐ DETRITUS [3]	0	0
☐ ☐ COBBLE [8]	15	15	☐ ☐ MUCK [2]	0	0
☐ ☐ GRAVEL [7]	15	15	☑ ☐ SILT [2]	30	30
☐ ☐ SAND [6]	10	10	☐ ☐ ARTIFICIAL [0]	0	0
☐ ☐ BEDROCK [5]	0	0			

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☑ 4 or more [2] ☐ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☐ LIMESTONE [1]
- ☑ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY

SILT
- ☐ HEAVY [-2]
- ☐ MODERATE [-1]
- ☑ NORMAL [0]
- ☐ FREE [1]

EMBEDDEDNESS
- ☐ EXTENSIVE [-2]
- ☐ MODERATE [-1]
- ☑ NORMAL [0]
- ☐ NONE [1]

Substrate 14 *Maximum 20*

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.

0 UNDERCUT BANKS [1]	0 POOLS > 70cm [2]	0 OXBOWS, BACKWATERS [1]
2 OVERHANGING VEGETATION [1]	0 ROOTWADS [1]	0 AQUATIC MACROPHYTES [1]
2 SHALLOWS (IN SLOW WATER) [1]	0 BOULDERS [1]	0 LOGS OR WOODY DEBRIS [1]
0 ROOTMATS [1]		

AMOUNT

Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ☐ MODERATE 25-75% [7]
- ☑ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Comments

Cover *Maximum 20* 5

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY
- ☐ HIGH [4]
- ☐ MODERATE [3]
- ☑ LOW [2]
- ☐ NONE [1]

DEVELOPMENT
- ☐ EXCELLENT [7]
- ☐ GOOD [5]
- ☑ FAIR [3]
- ☐ POOR [1]

CHANNELIZATION
- ☐ NONE [6]
- ☐ RECOVERED [4]
- ☐ RECOVERING [3]
- ☑ RECENT OR NO RECOVERY [1]

STABILITY
- ☐ HIGH [3]
- ☑ MODERATE [2]
- ☐ LOW [1]

Comments

Assessed reach dry during time of survey.

Channel *Maximum 20* 8

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for ***EACH BANK*** (*Or 2 per bank & average*)

River right looking downstream

EROSION

L	R	
☑	☑	NONE / LITTLE [3]
☐	☐	MODERATE [2]
☐	☐	HEAVY / SEVERE [1]

RIPARIAN WIDTH

L	R	
☐	☐	WIDE > 50m [4]
☐	☐	MODERATE 10-50m [3]
☐	☐	NARROW 5-10m [2]
☑	☑	VERY NARROW < 5m [1]
☐	☐	NONE [0]

FLOOD PLAIN QUALITY

L	R	
☐	☐	FOREST, SWAMP [3]
☐	☐	SHRUB OR OLD FIELD [2]
☑	☑	RESIDENTIAL, PARK, NEW FIELD [1]
☐	☐	FENCED PASTURE [1]
☐	☐	OPEN PASTURE, ROWCROP [0]

L	R	
☐	☐	CONSERVATION TILLAGE [1]
☐	☐	URBAN OR INDUSTRIAL [0]
☐	☐	MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian *Maximum 10* 5

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check **ONE** (*ONLY!*)
- ☐ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☑ < 0.2m [0]

CHANNEL WIDTH

Check ONE (*Or 2 & average*)
- ☑ POOL WIDTH > RIFFLE WIDTH [2]
- ☐ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply
- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ☐ FAST [1]
- ☐ MODERATE [1]
- ☐ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☑ INTERMITTENT [-2]
- ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current *Maximum 12* 0

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
- ☑ BEST AREAS > 10cm [2]
- ☐ BEST AREAS 5-10cm [1]
- ☐ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ☐ MAXIMUM > 50cm [2]
- ☑ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☐ STABLE (e.g., Cobble, Boulder) [2]
- ☑ MOD. STABLE (e.g., Large Gravel) [1]
- ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☐ NONE [2]
- ☐ LOW [1]
- ☑ MODERATE [0]
- ☐ EXTENSIVE [-1]

Comments

Riffle / Run *Maximum 8* 4

6] GRADIENT (ft/mi)

DRAINAGE AREA (mi²)
- ☑ VERY LOW - LOW [2-4]
- ☐ MODERATE [6-10]
- ☐ HIGH - VERY HIGH [10-6]

%POOL: 30 **%GLIDE:** 0 **%RUN:** 40 **%RIFFLE:** 30

Gradient *Maximum 10* 2

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☑ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☑ OTHER

30 meters

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

pass 1st _____ cm

pass 2nd _____ cm

C] RECREATION

POOL: AREA ☐ >100ft² DEPTH ☐ >3ft

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Channel reach is a section of an unnamed tributary of Bantas Fork Creek (HUC050800020301), which is a part of the larger Twin Creek Watershed (HUC 050800020205).

Stream stretch was dry at time of survey.

B] AESTHETICS

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

D] MAINTENANCE

Circle some & *COMMENT*

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

E] 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_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:

See figure.

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 45

Stream & Location: S7; Lanier Township, Preble County, Ohio **RM:** _ _ _._ **Date:** 10 / 12 / 20

Scorers Full Name & Affiliation: Nick Revetta & Kate Moran, CDM Smith

River Code: _ _ _ - _ _ _ - _ _ _ **STORET #:** _ _ _ _ _ _ **Lat./ Long.:** (NAD 83 - decimal °) 39 . 7404 / 84 . 5784 **Office verified location** ☐

1] SUBSTRATE

Check *ONLY* **Two** substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]	0	0	☐ ☐ HARDPAN [4]	0	0
☑ ☐ BOULDER [9]	20	20	☐ ☐ DETRITUS [3]	0	0
☑ ☐ COBBLE [8]	50	60	☐ ☐ MUCK [2]	0	0
☐ ☐ GRAVEL [7]	10	10	☐ ☐ SILT [2]	5	5
☐ ☐ SAND [6]	15	5	☐ ☐ ARTIFICIAL [0]	0	0
☐ ☐ BEDROCK [5]	0	0			

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☑ 4 or more [2] ☐ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☐ LIMESTONE [1]
- ☑ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY

SILT
- ☐ HEAVY [-2]
- ☐ MODERATE [-1]
- ☑ NORMAL [0]
- ☐ FREE [1]

EMBEDDEDNESS
- ☐ EXTENSIVE [-2]
- ☐ MODERATE [-1]
- ☑ NORMAL [0]
- ☐ NONE [1]

Substrate 18 *Maximum 20*

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.

0 UNDERCUT BANKS [1]	1 POOLS > 70cm [2]	0 OXBOWS, BACKWATERS [1]
2 OVERHANGING VEGETATION [1]	1 ROOTWADS [1]	0 AQUATIC MACROPHYTES [1]
0 SHALLOWS (IN SLOW WATER) [1]	2 BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]
0 ROOTMATS [1]		

AMOUNT

Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ☑ MODERATE 25-75% [7]
- ☐ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Cover *Maximum 20* 13

Comments

Cover dominated by honeysuckle

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY
- ☐ HIGH [4]
- ☐ MODERATE [3]
- ☑ LOW [2]
- ☐ NONE [1]

DEVELOPMENT
- ☐ EXCELLENT [7]
- ☐ GOOD [5]
- ☐ FAIR [3]
- ☑ POOR [1]

CHANNELIZATION
- ☐ NONE [6]
- ☐ RECOVERED [4]
- ☐ RECOVERING [3]
- ☑ RECENT OR NO RECOVERY [1]

STABILITY
- ☐ HIGH [3]
- ☐ MODERATE [2]
- ☑ LOW [1]

Channel *Maximum 20* 5

Comments

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for ***EACH BANK*** (*Or 2 per bank & average*)

River right looking downstream

EROSION

L	R	
☐	☐	NONE / LITTLE [3]
☑	☑	MODERATE [2]
☐	☐	HEAVY / SEVERE [1]

RIPARIAN WIDTH

L	R	
☐	☐	WIDE > 50m [4]
☐	☐	MODERATE 10-50m [3]
☐	☑	NARROW 5-10m [2]
☑	☐	VERY NARROW < 5m [1]
☐	☐	NONE [0]

FLOOD PLAIN QUALITY

L	R	
☐	☐	FOREST, SWAMP [3]
☐	☐	SHRUB OR OLD FIELD [2]
☐	☑	RESIDENTIAL, PARK, NEW FIELD [1]
☐	☐	FENCED PASTURE [1]
☑	☐	OPEN PASTURE, ROWCROP [0]

L	R	
☐	☐	CONSERVATION TILLAGE [1]
☐	☐	URBAN OR INDUSTRIAL [0]
☐	☐	MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Riparian *Maximum 10* 4

Comments

Farm field on left bank outside of riparian area and residential area on right bank.

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check **ONE** (*ONLY!*)
- ☐ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☑ < 0.2m [0]

CHANNEL WIDTH

Check ONE (*Or 2 & average*)
- ☐ POOL WIDTH > RIFFLE WIDTH [2]
- ☑ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply

☐ TORRENTIAL [-1]	☐ SLOW [1]
☐ VERY FAST [1]	☐ INTERSTITIAL [-1]
☐ FAST [1]	☑ INTERMITTENT [-2]
☐ MODERATE [1]	☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Pool / Current *Maximum 12* -1

Comments Stream reach was dry at time of assessment.

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
- ☐ BEST AREAS > 10cm [2]
- ☐ BEST AREAS 5-10cm [1]
- ☑ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ☐ MAXIMUM > 50cm [2]
- ☑ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☑ STABLE (e.g., Cobble, Boulder) [2]
- ☐ MOD. STABLE (e.g., Large Gravel) [1]
- ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☐ NONE [2]
- ☑ LOW [1]
- ☐ MODERATE [0]
- ☐ EXTENSIVE [-1]

Riffle / Run *Maximum 8* 4

Comments

6] GRADIENT

DRAINAGE AREA (ft/mi) (mi²)

- ☑ VERY LOW - LOW [2-4]
- ☐ MODERATE [6-10]
- ☐ HIGH - VERY HIGH [10-6]

%POOL: 5 %GLIDE: 0 %RUN: 85 %RIFFLE: 10

Gradient *Maximum 10* 2

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-		2nd
☐	HIGH	☐
☐	UP	☐
☐	NORMAL	☐
☐	LOW	☐
☑	DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☑ OTHER

70 meters

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

1st pass _____ cm

2nd _____ cm

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Channel reach is a section of an unnamed tributary of Bantas Fork Creek (HUC050800020301), which is a part of the larger Twin Creek Watershed (HUC 050800020205).

B] AESTHETICS

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

C] RECREATION

POOL: AREA ☐ >100ft² DEPTH ☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

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

E] 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_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:

See figure.

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 35

Stream & Location: S8-Unnamed Tributary to Bantas Fork; Lanier Township, Preble County, Ohio **RM:** _ _ _._ **Date:** 10 / 12 / 20

Scorers Full Name & Affiliation: Kate Moran & Nick Revetta, CDM Smith

River Code: _ _ _ - _ _ _ - _ _ _ **STORET #:** _ _ _ _ _ _ **Lat./ Long.:** (NAD 83 - decimal °) 39 . 7396 / 84 . 5760 Office verified location ☐

1] SUBSTRATE

Check **ONLY Two** substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ BLDR /SLABS [10]	0	0	☐ HARDPAN [4]	0	0
☐ BOULDER [9]	0	0	☐ DETRITUS [3]	0	0
☑ COBBLE [8]	40	50	☐ MUCK [2]	0	0
☐ GRAVEL [7]	15	10	☐ SILT [2]	15	5
☑ SAND [6]	25	30	☐ ARTIFICIAL [0]	5	5
☐ BEDROCK [5]	0	0			

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☐ LIMESTONE [1]
- ☑ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY

SILT
- ☐ HEAVY [-2]
- ☑ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ FREE [1]

EMBEDDEDNESS
- ☐ EXTENSIVE [-2]
- ☑ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ NONE [1]

Substrate 13 *Maximum 20*

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.

0 UNDERCUT BANKS [1]	0 POOLS > 70cm [2]	0 OXBOWS, BACKWATERS [1]
2 OVERHANGING VEGETATION [1]	1 ROOTWADS [1]	0 AQUATIC MACROPHYTES [1]
0 SHALLOWS (IN SLOW WATER) [1]	1 BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]
0 ROOTMATS [1]		

AMOUNT

Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ☑ MODERATE 25-75% [7]
- ☐ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Cover 10 *Maximum 20*

Comments

Upstream of bridge an farm field runs next to the stream on the left bank and a house and property is on the right bank. Stream banks and riparian area more modified downstream of bridge.

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY
- ☐ HIGH [4]
- ☐ MODERATE [3]
- ☑ LOW [2]
- ☐ NONE [1]

DEVELOPMENT
- ☐ EXCELLENT [7]
- ☐ GOOD [5]
- ☐ FAIR [3]
- ☑ POOR [1]

CHANNELIZATION
- ☐ NONE [6]
- ☐ RECOVERED [4]
- ☐ RECOVERING [3]
- ☑ RECENT OR NO RECOVERY [1]

STABILITY
- ☐ HIGH [3]
- ☐ MODERATE [2]
- ☑ LOW [1]

Channel 5 *Maximum 20*

Comments

Riprap places around base of bridge.

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for ***EACH BANK*** (*Or 2 per bank & average*)

River right looking downstream

EROSION

L	R	
☐	☐	NONE / LITTLE [3]
☑	☑	MODERATE [2]
☐	☐	HEAVY / SEVERE [1]

RIPARIAN WIDTH

L	R	
☐	☐	WIDE > 50m [4]
☐	☐	MODERATE 10-50m [3]
☐	☑	NARROW 5-10m [2]
☑	☐	VERY NARROW < 5m [1]
☐	☐	NONE [0]

FLOOD PLAIN QUALITY

L	R	
☐	☐	FOREST, SWAMP [3]
☐	☐	SHRUB OR OLD FIELD [2]
☑	☐	RESIDENTIAL, PARK, NEW FIELD [1]
☐	☐	FENCED PASTURE [1]
☐	☑	OPEN PASTURE, ROWCROP [0]

L	R	
☐	☑	CONSERVATION TILLAGE [1]
☑	☐	URBAN OR INDUSTRIAL [0]
☐	☐	MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Riparian 4 *Maximum 10*

Comments

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check **ONE** (*ONLY!*)
- ☐ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☑ < 0.2m [0]

CHANNEL WIDTH

Check ONE (*Or 2 & average*)
- ☐ POOL WIDTH > RIFFLE WIDTH [2]
- ☐ POOL WIDTH = RIFFLE WIDTH [1]
- ☑ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply

☐ TORRENTIAL [-1]	☐ SLOW [1]
☐ VERY FAST [1]	☐ INTERSTITIAL [-1]
☐ FAST [1]	☑ INTERMITTENT [-2]
☐ MODERATE [1]	☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Pool / Current -2 *Maximum 12*

Comments Heavy vegetation removal downstream of bridge in riparian area.

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
- ☐ BEST AREAS > 10cm [2]
- ☐ BEST AREAS 5-10cm [1]
- ☑ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ☐ MAXIMUM > 50cm [2]
- ☑ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☑ STABLE (e.g., Cobble, Boulder) [2]
- ☐ MOD. STABLE (e.g., Large Gravel) [1]
- ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☐ NONE [2]
- ☐ LOW [1]
- ☑ MODERATE [0]
- ☐ EXTENSIVE [-1]

Riffle / Run 3 *Maximum 8*

Comments

6] GRADIENT

DRAINAGE AREA (ft/mi) (mi²)

- ☑ VERY LOW - LOW [2-4]
- ☐ MODERATE [6-10]
- ☐ HIGH - VERY HIGH [10-6]

%POOL: 0 %GLIDE: 0 %RUN: 80 %RIFFLE: 20

Gradient 2 *Maximum 10*

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☑ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☑ OTHER

30 meters

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

1st pass _____ cm

2nd _____ cm

C] RECREATION

POOL: ☐ >100ft² ☐ >3ft (AREA DEPTH)

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Channel reach is a section of an unnamed tributary of Bantas Fork Creek (HUC050800020301), which is a part of the larger Twin Creek Watershed (HUC 050800020205).

B] AESTHETICS

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

D] MAINTENANCE

Circle some & *COMMENT*

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

E] 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_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / **HOME**
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:

See figure.

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 19

Stream & Location: S9; Twin Township, Preble County, Ohio **RM:** _ _ _._ **Date:** 10 / 12 / 20

Scorers Full Name & Affiliation: Kate Moran & Nick Revetta, CDM Smith

River Code: _ _ _ - _ _ _ - _ _ _ **STORET #:** _ _ _ _ _ _ _ **Lat./ Long.:** (NAD 83 - decimal °) 39 . 7500 / 84 . 5864 Office verified location ☐

1] SUBSTRATE

Check *ONLY* **Two** substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]	0	0	☐ ☐ HARDPAN [4]	0	0
☐ ☐ BOULDER [9]	5	10	☐ ☐ DETRITUS [3]	0	0
☑ ☐ COBBLE [8]	30	30	☐ ☐ MUCK [2]	0	0
☐ ☐ GRAVEL [7]	0	0	☐ ☐ SILT [2]	15	10
☐ ☐ SAND [6]	10	10	☑ ☐ ARTIFICIAL [0]	40	40
☐ ☐ BEDROCK [5]	0	0			

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☐ LIMESTONE [1]
- ☑ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY

SILT
- ☐ HEAVY [-2]
- ☑ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ FREE [1]

EMBEDDEDNESS
- ☐ EXTENSIVE [-2]
- ☑ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ NONE [1]

Substrate 7 *Maximum 20*

Comments

Highly maintained stream segment. Burning of leaves in channel and cemented banks near bridge.

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.

0 UNDERCUT BANKS [1]	0 POOLS > 70cm [2]	0 OXBOWS, BACKWATERS [1]
1 OVERHANGING VEGETATION [1]	0 ROOTWADS [1]	0 AQUATIC MACROPHYTES [1]
0 SHALLOWS (IN SLOW WATER) [1]	1 BOULDERS [1]	0 LOGS OR WOODY DEBRIS [1]
0 ROOTMATS [1]		

AMOUNT

Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ☐ MODERATE 25-75% [7]
- ☐ SPARSE 5-<25% [3]
- ☑ NEARLY ABSENT <5% [1]

Comments

Cover 3 *Maximum 20*

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY
- ☐ HIGH [4]
- ☐ MODERATE [3]
- ☐ LOW [2]
- ☑ NONE [1]

DEVELOPMENT
- ☐ EXCELLENT [7]
- ☐ GOOD [5]
- ☐ FAIR [3]
- ☑ POOR [1]

CHANNELIZATION
- ☐ NONE [6]
- ☐ RECOVERED [4]
- ☐ RECOVERING [3]
- ☑ RECENT OR NO RECOVERY [1]

STABILITY
- ☐ HIGH [3]
- ☐ MODERATE [2]
- ☑ LOW [1]

Comments

Channel 4 *Maximum 20*

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for ***EACH BANK*** (*Or 2 per bank & average*)

River right looking downstream

EROSION

L	R	
☐	☐	NONE / LITTLE [3]
☐	☐	MODERATE [2]
☑	☑	HEAVY / SEVERE [1]

RIPARIAN WIDTH

L	R	
☐	☐	WIDE > 50m [4]
☐	☐	MODERATE 10-50m [3]
☐	☐	NARROW 5-10m [2]
☐	☐	VERY NARROW < 5m [1]
☑	☑	NONE [0]

FLOOD PLAIN QUALITY

L	R	
☐	☐	FOREST, SWAMP [3]
☐	☐	SHRUB OR OLD FIELD [2]
☑	☑	RESIDENTIAL, PARK, NEW FIELD [1]
☐	☐	FENCED PASTURE [1]
☐	☐	OPEN PASTURE, ROWCROP [0]

L	R	
☑	☑	CONSERVATION TILLAGE [1]
☐	☐	URBAN OR INDUSTRIAL [0]
☐	☐	MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Comments

Both banks eroding for about 50 ft on either side of the bridge.

Riparian 3 *Maximum 10*

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check **ONE** (*ONLY!*)
- ☐ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☑ < 0.2m [0]

CHANNEL WIDTH

Check ONE (*Or 2 & average*)
- ☐ POOL WIDTH > RIFFLE WIDTH [2]
- ☐ POOL WIDTH = RIFFLE WIDTH [1]
- ☑ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply
- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ☐ FAST [1]
- ☐ MODERATE [1]
- ☐ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☑ INTERMITTENT [-2]
- ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

No pools presnt, stream dry at time of survey.

Pool / Current -2 *Maximum 12*

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
- ☐ BEST AREAS > 10cm [2]
- ☐ BEST AREAS 5-10cm [1]
- ☑ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ☐ MAXIMUM > 50cm [2]
- ☑ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☑ STABLE (e.g., Cobble, Boulder) [2]
- ☐ MOD. STABLE (e.g., Large Gravel) [1]
- ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☐ NONE [2]
- ☐ LOW [1]
- ☑ MODERATE [0]
- ☐ EXTENSIVE [-1]

Comments

Riffle / Run 3 *Maximum 8*

6] GRADIENT

DRAINAGE AREA (ft/mi) (mi²)

- ☑ VERY LOW - LOW [2-4]
- ☐ MODERATE [6-10]
- ☐ HIGH - VERY HIGH [10-6]

%POOL: 0 %GLIDE: 0 %RUN: 70 %RIFFLE: 30

Gradient 2 *Maximum 10*

A] SAMPLED REACH

Check ALL that apply

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Channel reach is a section of an unnamed tributary of Bantas Fork Creek (HUC050800020301), which is a part of the larger Twin Creek Watershed (HUC 050800020205).

METHOD

- ☐ BOAT
- ☑ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☑ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☑ OTHER

30 meters

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

1st pass _____ cm

2nd _____ cm

B] AESTHETICS

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

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

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

E] 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_20 / TILE / H_20 TABLE

ACID / MINE / QUARRY / FLOW

NATURAL / WETLAND / STAGNANT

PARK / GOLF / LAWN / HOME

ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:

See figure.

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 46.5

Stream & Location: S10; Lanier Township, Preble County, Ohio **RM:** _ _ _._ **Date:** 10/ 12 / 20

Scorers Full Name & Affiliation: Kate Moran & Nick Revetta, CDM Smith

River Code: _ _ _-_ _ _-_ _ _ **STORET #:** _ _ _ _ _ _ _ **Lat./ Long.:** (NAD 83 - decimal °) 39 . 7393 _ /84 . 5728 _ **Office verified location** ☐

1] SUBSTRATE

Check **ONLY Two** substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ BLDR /SLABS [10]	0	0	☐ HARDPAN [4]	0	0
☐ BOULDER [9]	5	15	☐ DETRITUS [3]	0	0
☑ COBBLE [8]	40	35	☐ MUCK [2]	0	0
☐ GRAVEL [7]	5	10	☐ SILT [2]	20	15
☑ SAND [6]	30	20	☐ ARTIFICIAL [0]	0	5
☐ BEDROCK [5]	0				

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☑ 4 or more [2] ☐ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☐ LIMESTONE [1]
- ☑ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY

SILT
- ☐ HEAVY [-2]
- ☑ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ FREE [1]

EMBEDDEDNESS
- ☐ EXTENSIVE [-2]
- ☑ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ NONE [1]

Substrate 15 *Maximum 20*

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.

1 UNDERCUT BANKS [1]	1 POOLS > 70cm [2]	0 OXBOWS, BACKWATERS [1]
1 OVERHANGING VEGETATION [1]	1 ROOTWADS [1]	0 AQUATIC MACROPHYTES [1]
1 SHALLOWS (IN SLOW WATER) [1]	1 BOULDERS [1]	2 LOGS OR WOODY DEBRIS [1]
0 ROOTMATS [1]		

AMOUNT

Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ☑ MODERATE 25-75% [7]
- ☐ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Comments

Cover *Maximum 20* 15

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY
- ☐ HIGH [4]
- ☐ MODERATE [3]
- ☑ LOW [2]
- ☐ NONE [1]

DEVELOPMENT
- ☐ EXCELLENT [7]
- ☐ GOOD [5]
- ☑ FAIR [3]
- ☐ POOR [1]

CHANNELIZATION
- ☐ NONE [6]
- ☐ RECOVERED [4]
- ☐ RECOVERING [3]
- ☑ RECENT OR NO RECOVERY [1]

STABILITY
- ☐ HIGH [3]
- ☐ MODERATE [2]
- ☑ LOW [1]

Comments

Channel *Maximum 20* 7

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for ***EACH BANK*** (*Or 2 per bank & average*)

River right looking downstream

EROSION

L	R	
☑	☐	NONE / LITTLE [3]
☐	☑	MODERATE [2]
☐	☐	HEAVY / SEVERE [1]

RIPARIAN WIDTH

L	R	
☐	☐	WIDE > 50m [4]
☐	☐	MODERATE 10-50m [3]
☐	☐	NARROW 5-10m [2]
☑	☑	VERY NARROW < 5m [1]
☐	☐	NONE [0]

FLOOD PLAIN QUALITY

L	R	
☐	☐	FOREST, SWAMP [3]
☑	☑	SHRUB OR OLD FIELD [2]
☐	☐	RESIDENTIAL, PARK, NEW FIELD [1]
☐	☐	FENCED PASTURE [1]
☐	☐	OPEN PASTURE, ROWCROP [0]

L	R	
☑	☑	CONSERVATION TILLAGE [1]
☐	☐	URBAN OR INDUSTRIAL [0]
☐	☐	MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian *Maximum 10* 6.5

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check **ONE** (*ONLY!*)
- ☐ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☑ < 0.2m [0]

CHANNEL WIDTH

Check ONE (*Or 2 & average*)
- ☐ POOL WIDTH > RIFFLE WIDTH [2]
- ☑ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply

☐ TORRENTIAL [-1]	☐ SLOW [1]
☐ VERY FAST [1]	☐ INTERSTITIAL [-1]
☐ FAST [1]	☑ INTERMITTENT [-2]
☐ MODERATE [1]	☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current *Maximum 12* -1

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
- ☐ BEST AREAS > 10cm [2]
- ☐ BEST AREAS 5-10cm [1]
- ☑ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ☐ MAXIMUM > 50cm [2]
- ☑ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☐ STABLE (e.g., Cobble, Boulder) [2]
- ☑ MOD. STABLE (e.g., Large Gravel) [1]
- ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☐ NONE [2]
- ☐ LOW [1]
- ☑ MODERATE [0]
- ☐ EXTENSIVE [-1]

Comments

Riffle / Run *Maximum 8* 2

6] GRADIENT

DRAINAGE AREA (ft/mi) (mi²)

- ☑ VERY LOW - LOW [2-4]
- ☐ MODERATE [6-10]
- ☐ HIGH - VERY HIGH [10-6]

%POOL: 30 %GLIDE: 0 %RUN: 50 %RIFFLE: 20

Gradient *Maximum 10* 2

A] SAMPLED REACH

Check ALL that apply

METHOD

- [ ] BOAT
- [x] WADE
- [ ] L. LINE
- [ ] OTHER

STAGE

1st -sample pass-	2nd
[ ] HIGH	[ ]
[ ] UP	[ ]
[ ] NORMAL	[ ]
[x] LOW	[ ]
[x] DRY	[ ]

DISTANCE

- [ ] 0.5 Km
- [ ] 0.2 Km
- [ ] 0.15 Km
- [ ] 0.12 Km
- [x] OTHER

30 meters

CLARITY

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

CANOPY

- [ ] > 85%- OPEN
- [ ] 55%-<85%
- [x] 30%-<55%
- [ ] 10%-<30%
- [ ] <10%- CLOSED

pass 1st _____ cm

pass 2nd _____ cm

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Channel reach is a section of an unnamed tributary of Bantas Fork Creek (HUC050800020301), which is a part of the larger Twin Creek Watershed (HUC 050800020205).

Standing water in pool area; clarity of the pool was none- water stagnant/brownish black. Stream channel was dry in the surveyed section, except the pool.

B] AESTHETICS

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

C] RECREATION

POOL: AREA [ ] >100ft² DEPTH [ ] >3ft

D] MAINTENANCE

Circle some & *COMMENT*

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

E] 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_20 / TILE / H_20 TABLE

ACID / MINE / QUARRY / FLOW

NATURAL / WETLAND / STAGNANT

PARK / GOLF / LAWN / HOME

ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: ____

Stream & Location: Stream 5B **RM:** _ _ _._ **Date:** 06/ 08 /23

Nick Revetta & Kate Moran **Scorers Full Name & Affiliation:** CDM Smith

River Code: _ _ _-_ _ _-_ _ _ **STORET #:** _ _ _ _ _ _ **Lat./ Long.:** (NAD 83 - decimal °) 39 . 7436 /84 . 5688 **Office verified location** ☐

1] SUBSTRATE

Check ***ONLY* Two** substrate *TYPE BOXES*; estimate % or note every type present

Check ONE (*Or 2 & average*)

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]			☐ ☐ HARDPAN [4]		
☐ ☐ BOULDER [9]			☐ ☐ DETRITUS [3]		
☑ ☑ COBBLE [8]	25		☐ ☐ MUCK [2]		
☐ ☐ GRAVEL [7]	25		☑ ☑ SILT [2]	25	
☐ ☐ SAND [6]	25		☐ ☐ ARTIFICIAL [0]		
☐ ☐ BEDROCK [5]					

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☐ 3 or less [0]

ORIGIN		QUALITY
☐ LIMESTONE [1]	SILT	☐ HEAVY [-2]
☐ TILLS [1]		☐ MODERATE [-1]
☐ WETLANDS [0]		☑ NORMAL [0]
☐ HARDPAN [0]		☐ FREE [1]
☐ SANDSTONE [0]	EMBEDDEDNESS	☐ EXTENSIVE [-2]
☐ RIP/RAP [0]		☐ MODERATE [-1]
☐ LACUSTURINE [0]		☐ NORMAL [0]
☐ SHALE [-1]		☐ NONE [1]
☐ COAL FINES [-2]		

Substrate 10 *Maximum 20*

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.

____ UNDERCUT BANKS [1]	____ POOLS > 70cm [2]	____ OXBOWS, BACKWATERS [1]
2 OVERHANGING VEGETATION [1]	____ ROOTWADS [1]	____ AQUATIC MACROPHYTES [1]
____ SHALLOWS (IN SLOW WATER) [1]	____ BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]
1 ROOTMATS [1]		

AMOUNT

Check ONE (*Or 2 & average*)

☐ EXTENSIVE >75% [11]
☐ MODERATE 25-75% [7]
☑ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Comments

Cover *Maximum 20* 6

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☑ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☐ MODERATE [2]
☑ LOW [2]	☐ FAIR [3]	☑ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel *Maximum 20* 8

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for ***EACH BANK*** (*Or 2 per bank & average*)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	
☑ ☑ NONE / LITTLE [3]	☐ ☐ WIDE > 50m [4]	☐ ☐ FOREST, SWAMP [3]	☐ ☑ CONSERVATION TILLAGE [1]
☐ ☐ MODERATE [2]	☐ ☐ MODERATE 10-50m [3]	☐ ☐ SHRUB OR OLD FIELD [2]	☐ ☐ URBAN OR INDUSTRIAL [0]
☐ ☐ HEAVY / SEVERE [1]	☑ ☐ NARROW 5-10m [2]	☑ ☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐ ☐ MINING / CONSTRUCTION [0]
	☐ ☑ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]	
	☐ ☐ NONE [0]	☐ ☐ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian *Maximum 10* 7

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH (Check **ONE** (*ONLY!*))

☐ > 1m [6]
☐ 0.7-<1m [4]
☐ 0.4-<0.7m [2]
☐ 0.2-<0.4m [1]
☑ < 0.2m [0]

CHANNEL WIDTH (Check ONE (*Or 2 & average*))

☐ POOL WIDTH > RIFFLE WIDTH [2]
☑ POOL WIDTH = RIFFLE WIDTH [1]
☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY (Check ALL that apply)

☐ TORRENTIAL [-1]	☑ SLOW [1]
☐ VERY FAST [1]	☐ INTERSTITIAL [-1]
☐ FAST [1]	☐ INTERMITTENT [-2]
☐ MODERATE [1]	☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current *Maximum 12* 2

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

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

Comments

Riffle / Run *Maximum 8* 2

6] GRADIENT

DRAINAGE AREA (ft/mi) (mi^2)

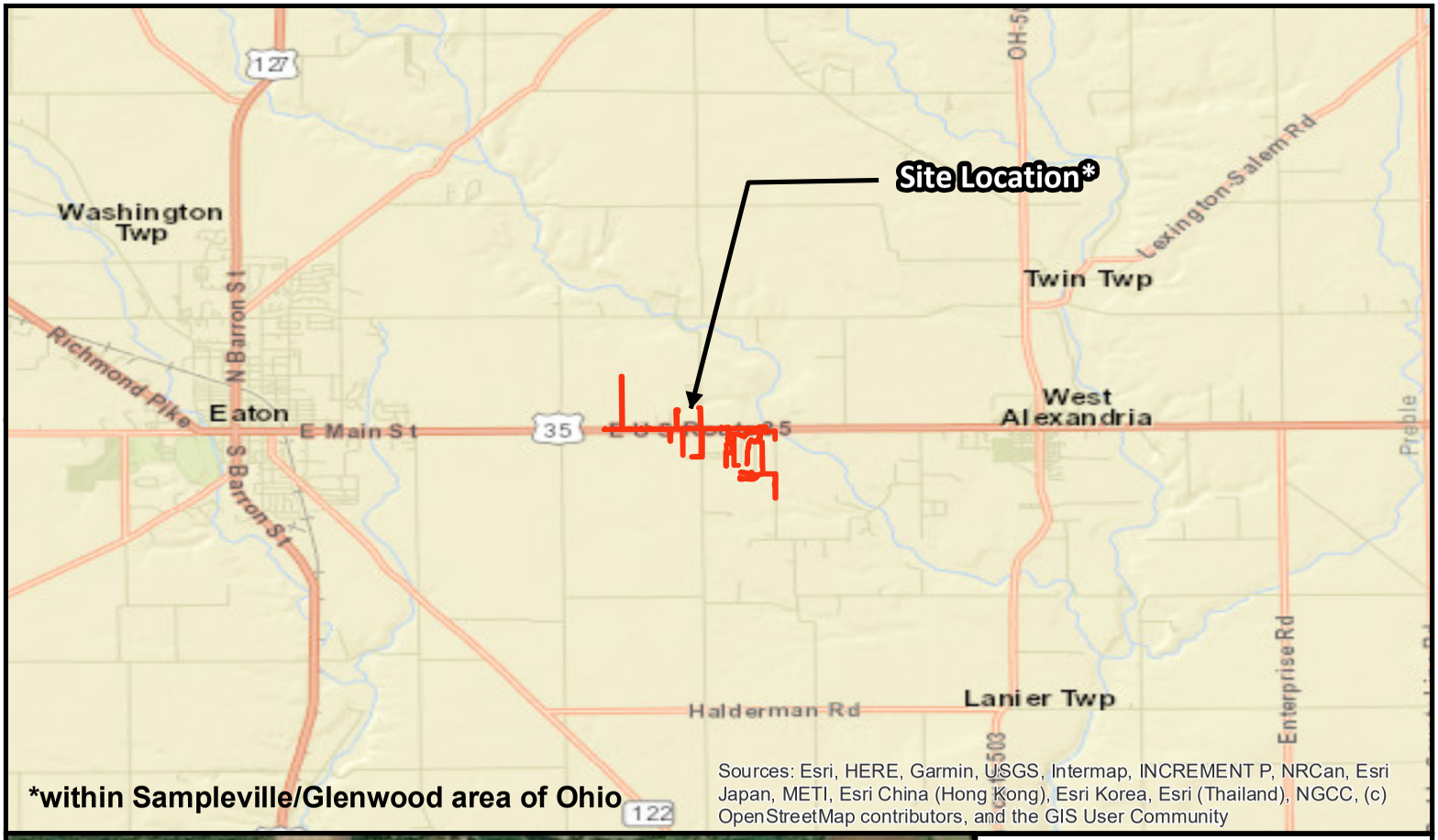
☑ VERY LOW - LOW [2-4]
☐ MODERATE [6-10]
☐ HIGH - VERY HIGH [10-6]

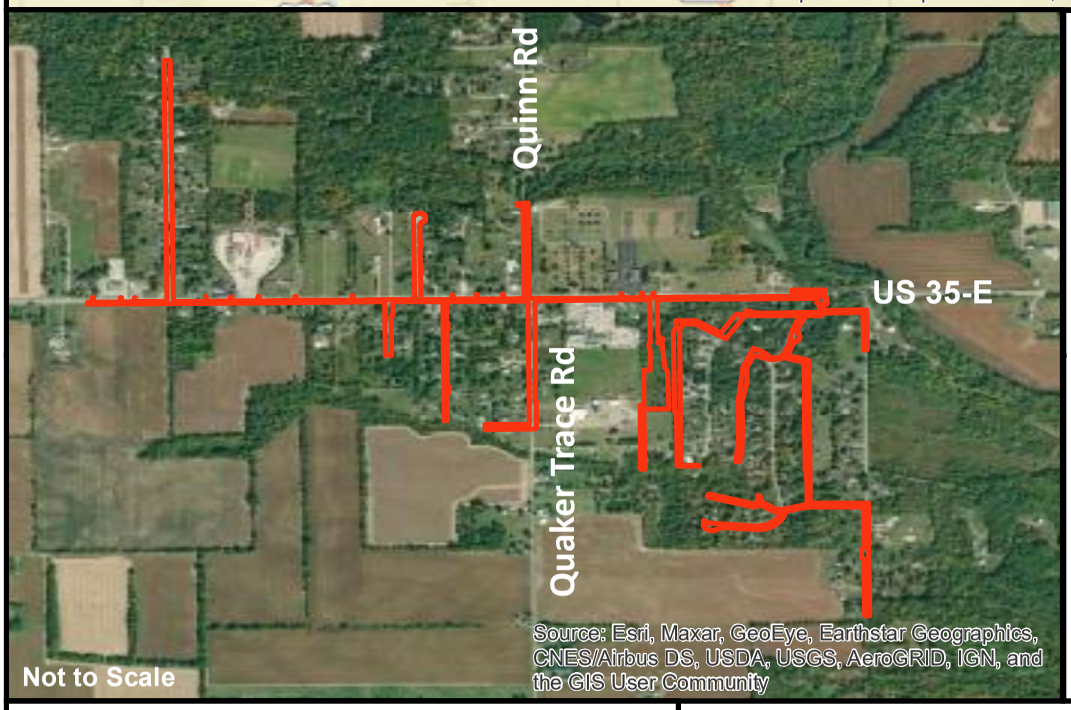
%POOL: 30 **%GLIDE:** ____
%RUN: 60 **%RIFFLE:** 10

Gradient *Maximum 10* 35

Appendix F

Figures - Project Maps





Legend

- Site Location
- Area of Investigation

Figure 1a: Site Location Map

US 35 - Glenwood Area Sanitary Sewer
Waters of the United States Field Investigations

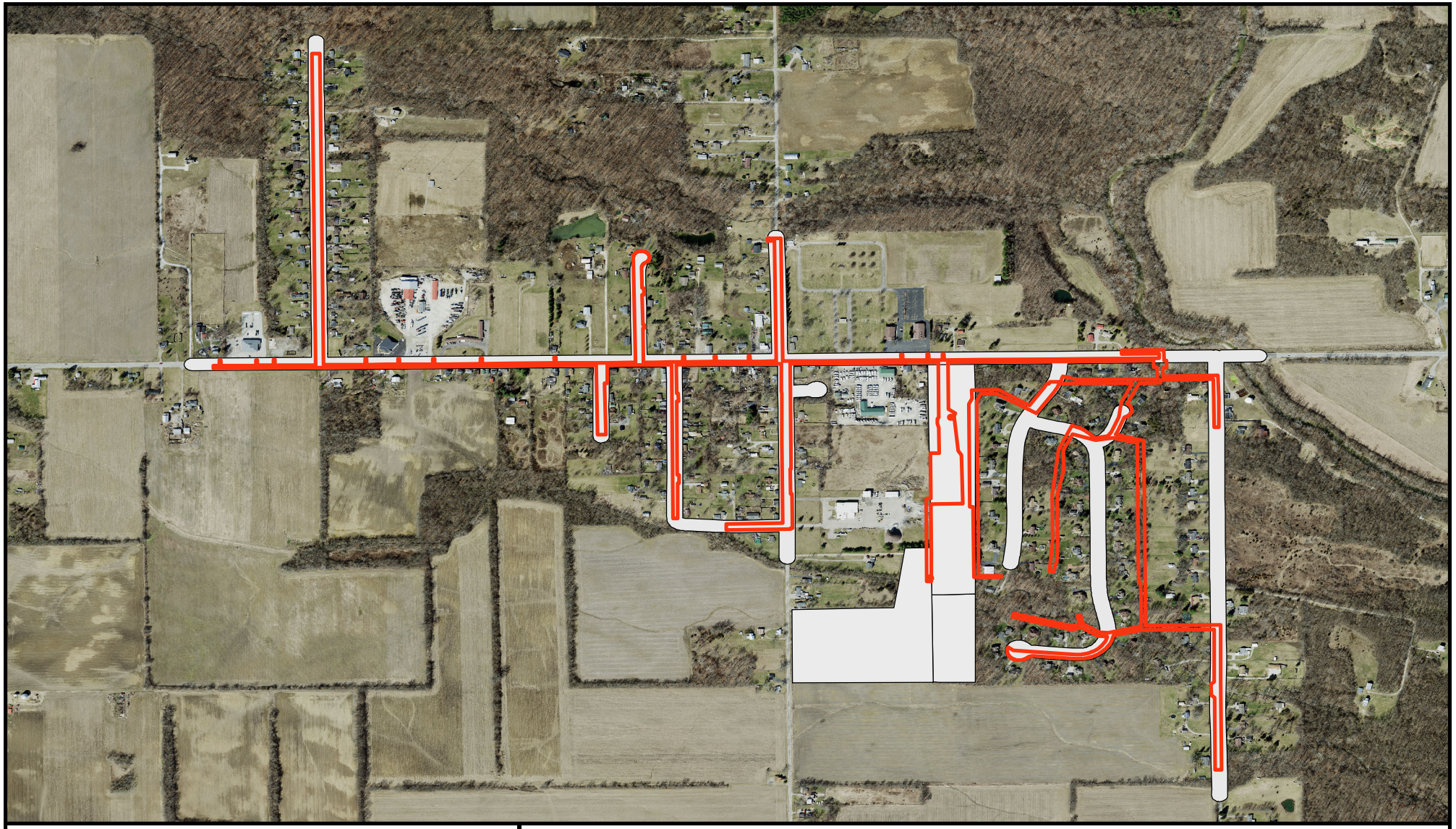
Twin and Lanier Townships, West Alexendria, Preble County, Ohio

N

0 3 Miles

CDM Smith

7/26/2023



Legend

- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 1b: Site Location - 2020 AOI vs. 2023 AOI Map

US 35 - Glenwood Area Sanitary Sewer
Waters of the United States Field Investigations

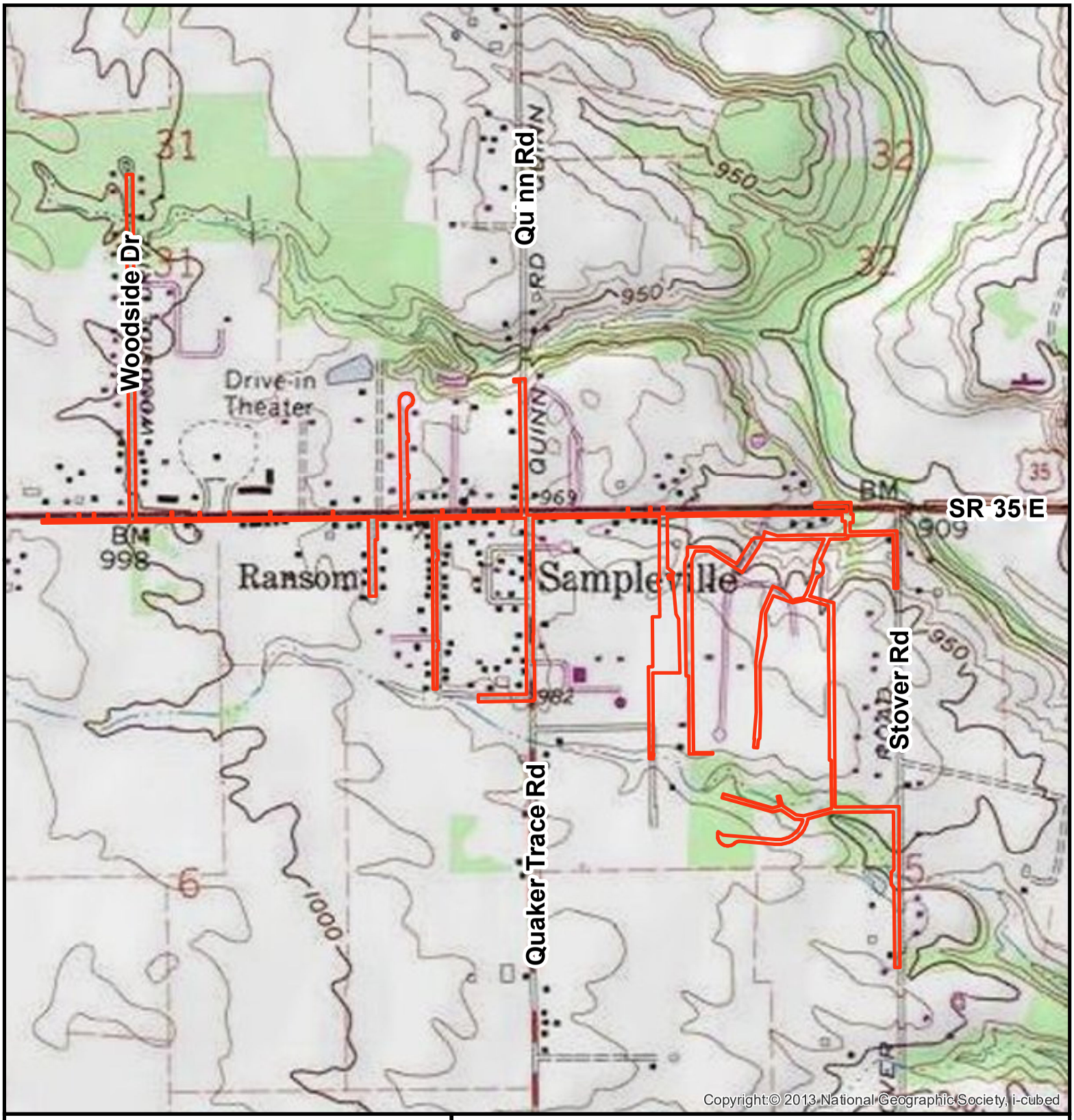
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 1 Miles

CDM Smith

7/26/2023



Legend

Area of Investigation

Figure 2a: Topographic Map

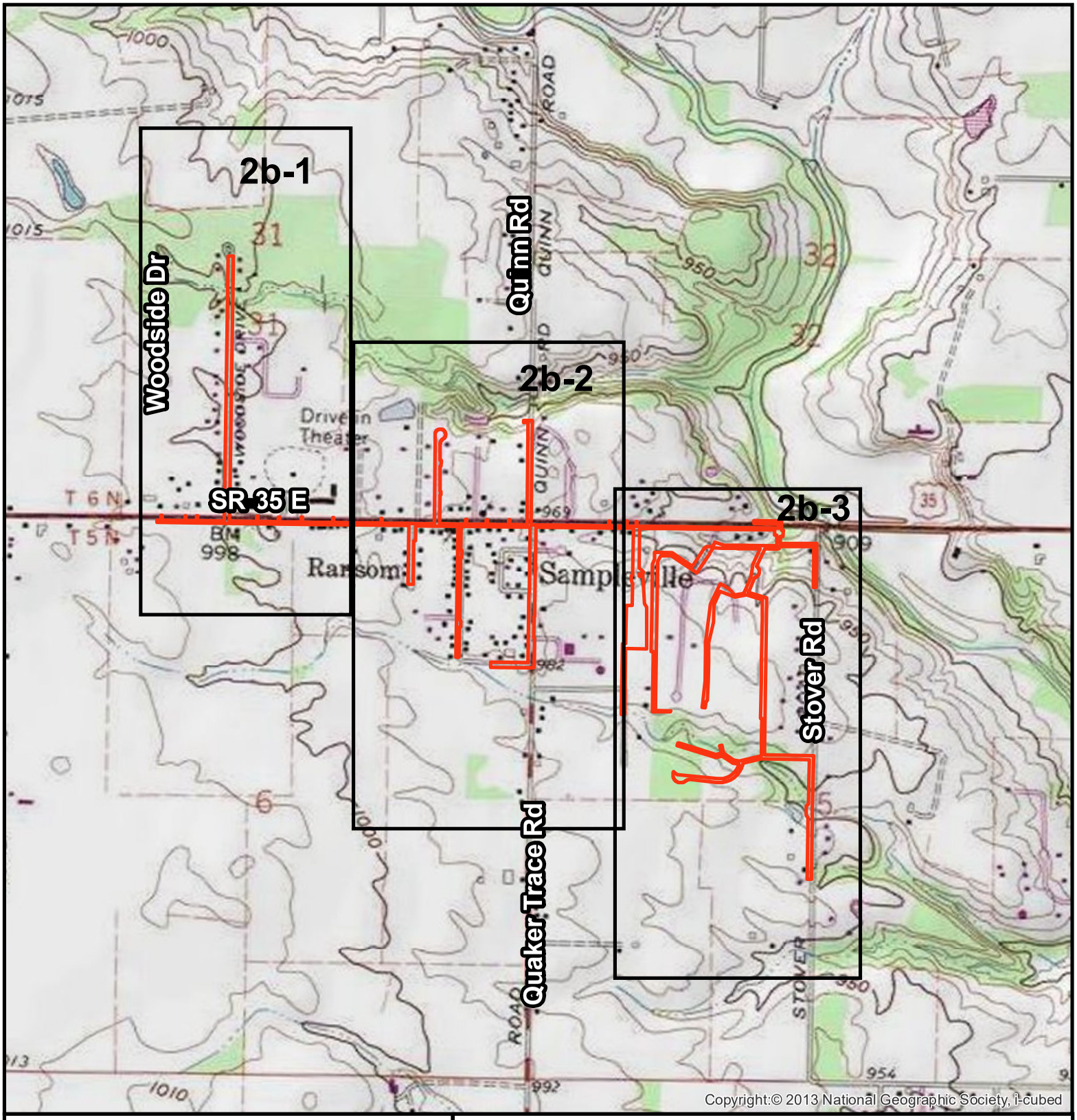
US 35 - Glenwood Area Sanitary Sewer
Waters of the United States Field Investigations
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.6 Miles

CDM Smith

7/26/2023



Legend

Area of Investigation

Figure 2b: Topographic Map Index

US 35- Glenwood Area Sanitary Sewer
Waters of the United States Field Investigations

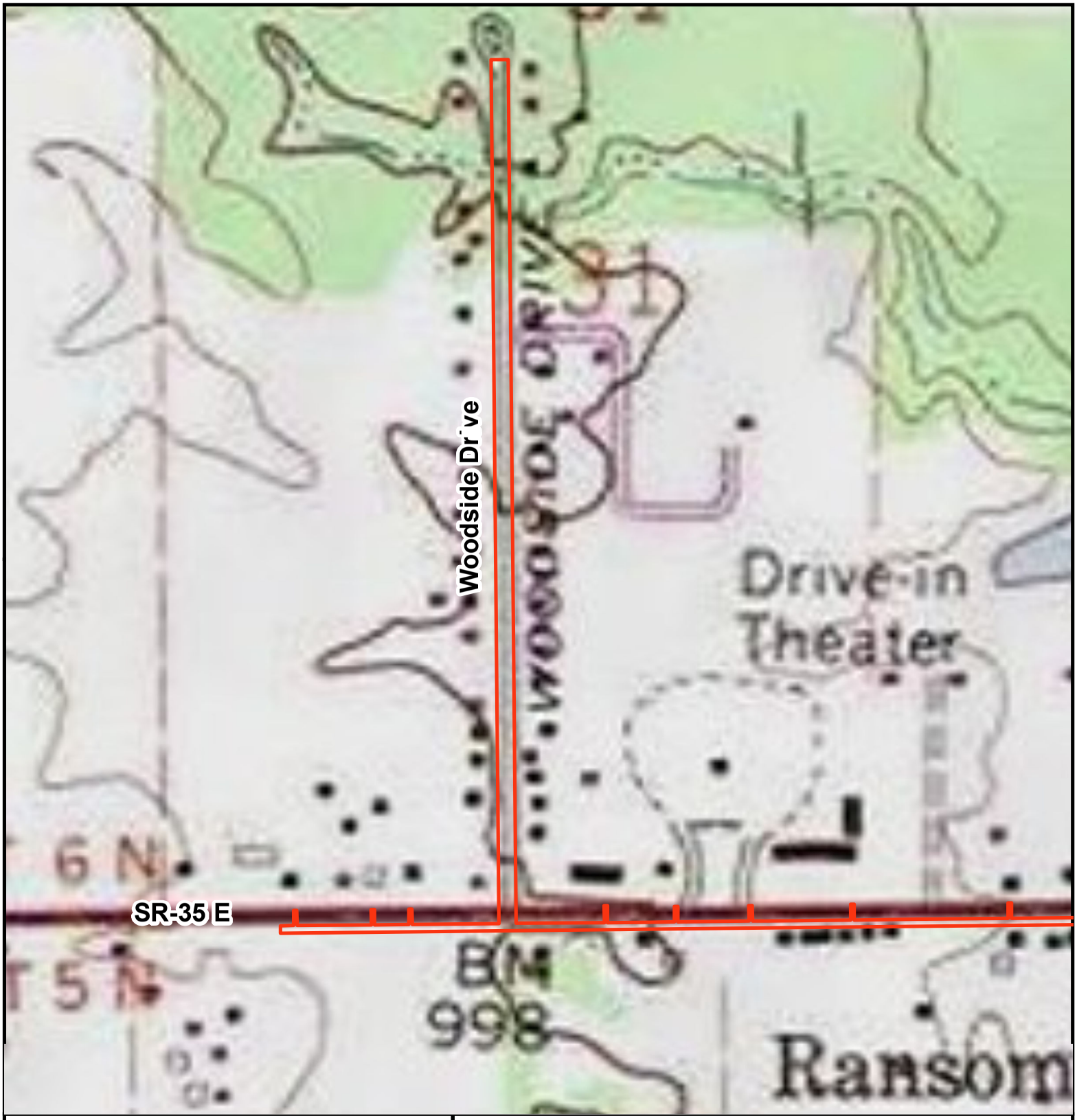
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 Miles 0.6

CDM Smith

7/26/2023



Legend

Area of Investigation

Figure 2b-1: Topographic Map

US 35 - Glenwood Area Sanitary Sewer
Waters of the United States Field Investigations

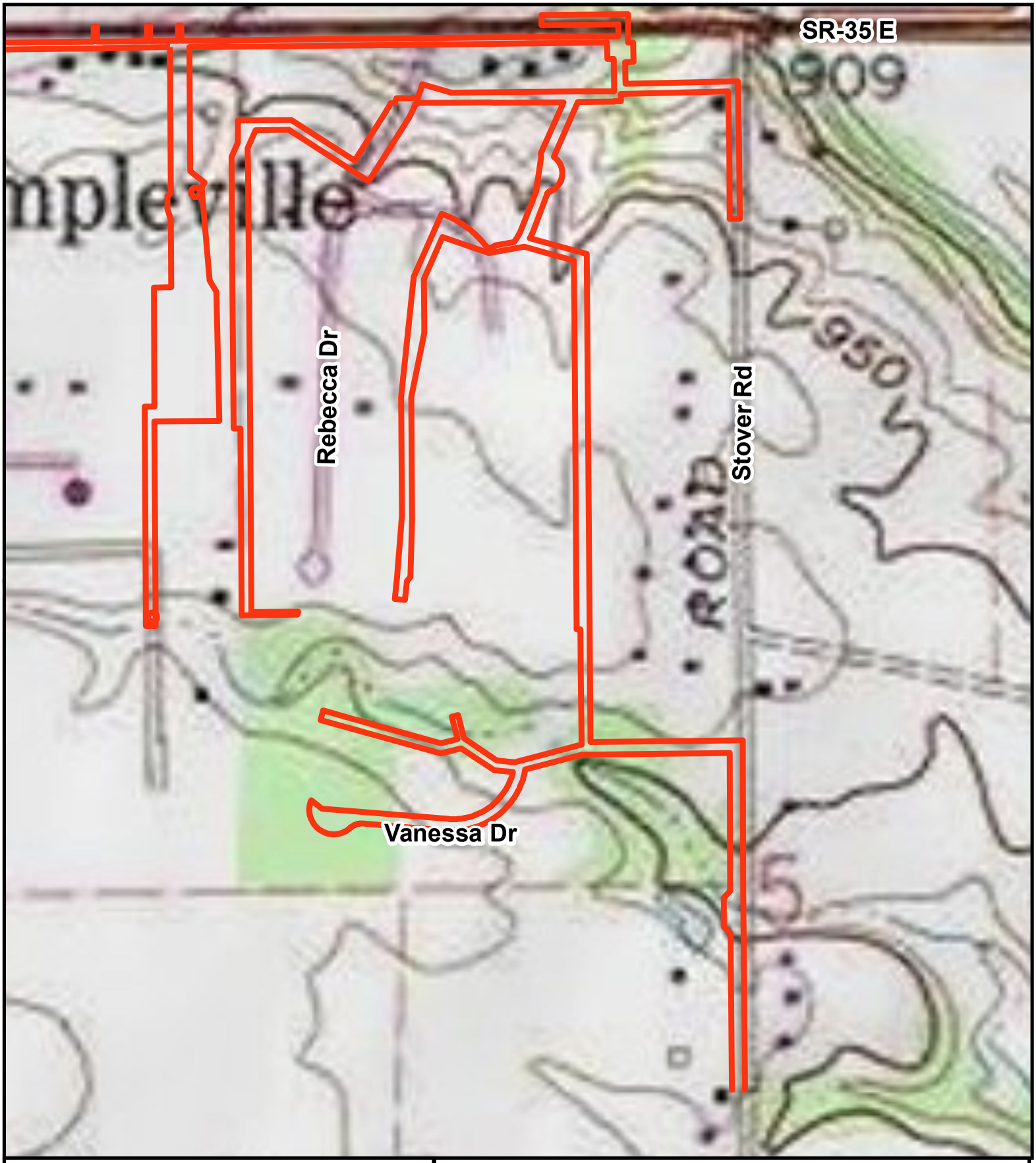
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 Miles 0.2

CDM Smith

7/26/2023



Legend

Area of Investigation

Figure 2b-3: Topographic Map Index

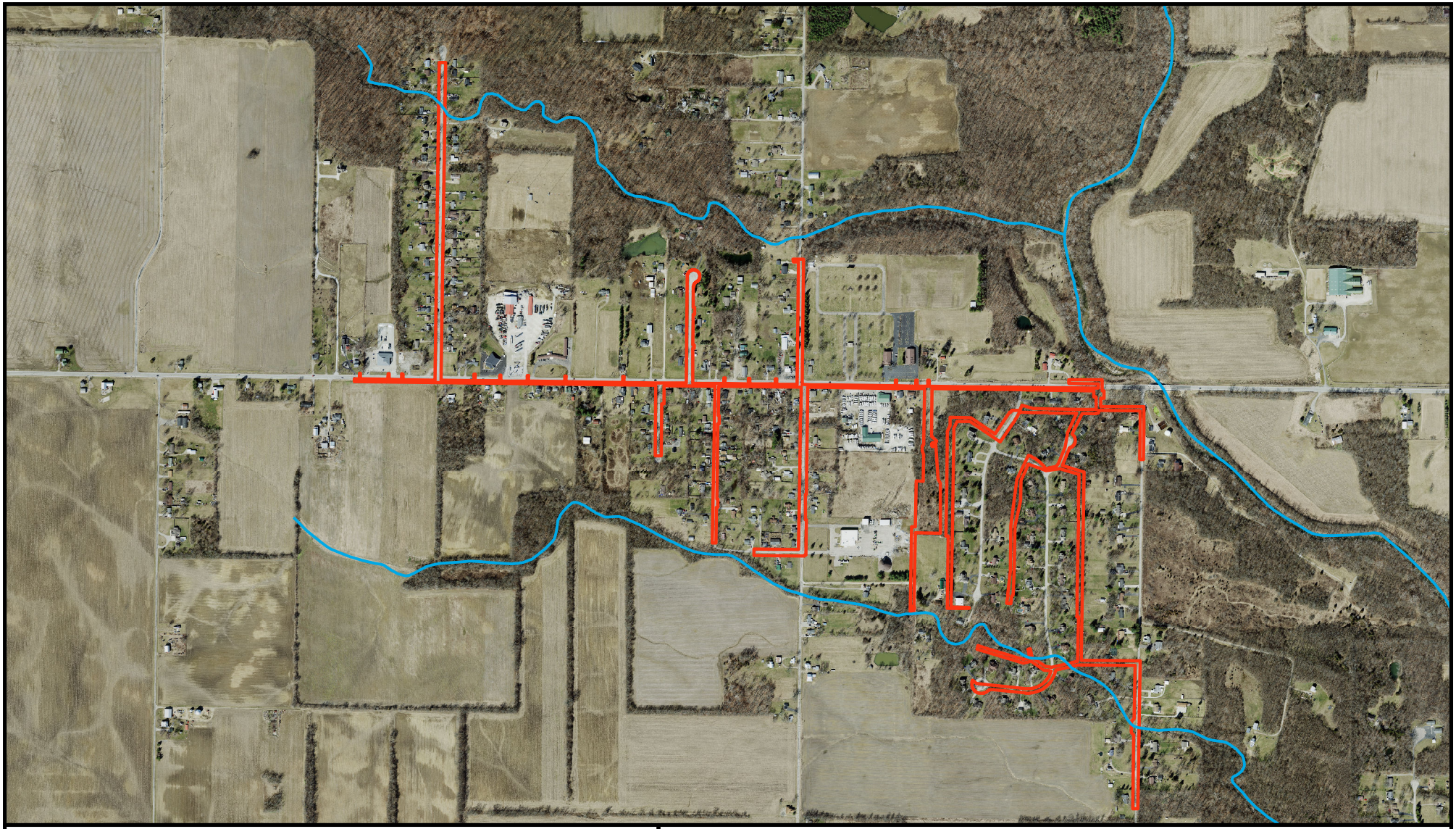
US 35 - Glenwood Area Sanitary Sewer
Waters of the United States Field Investigations
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.1 0.2 Miles

CDM Smith

7/26/2023



Legend

- USGS Stream
- Area of Investigation

Figure 3: National Hydrography Map

US 35 - Glenwood Area Sanitary Sewer
Waters of the United States Field Investigations

Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.5 Miles

CDM Smith

7/26/2023

National Flood Hazard Layer FIRMette

FEMA

84°34'26"W 39°44'53"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

84°33'48"W 39°44'25"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/18/2023 at 9:07 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMette

84°35'30"W 39°45'13"N

84°34'53"W 39°44'46"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

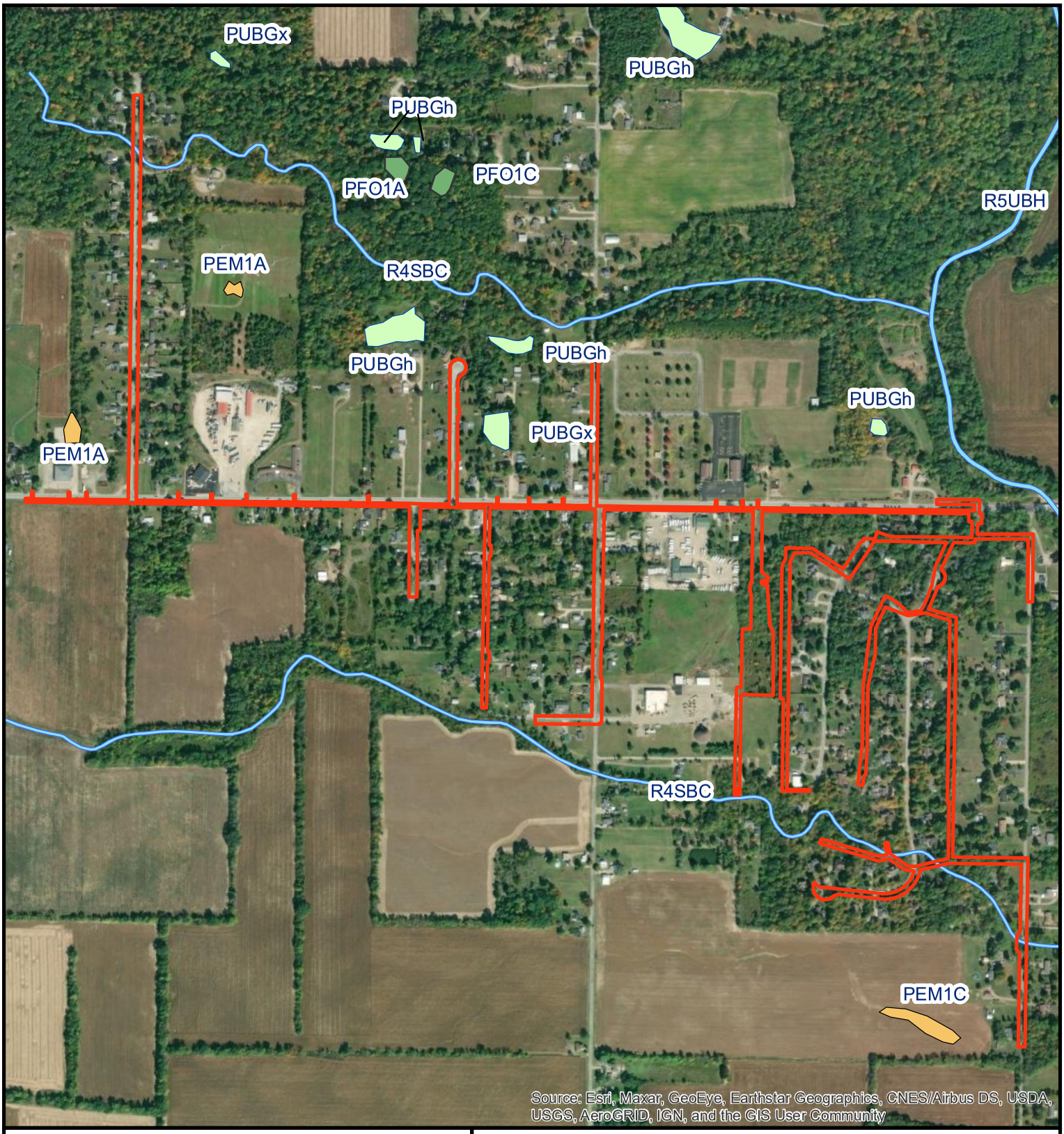
N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/18/2023 at 9:36 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



Legend

- Area of Investigation
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

Figure 5: NWI Wetland Inventory Map

US 35 - Glenwood Area Sanitary Sewer
Waters of the United States Field Investigations

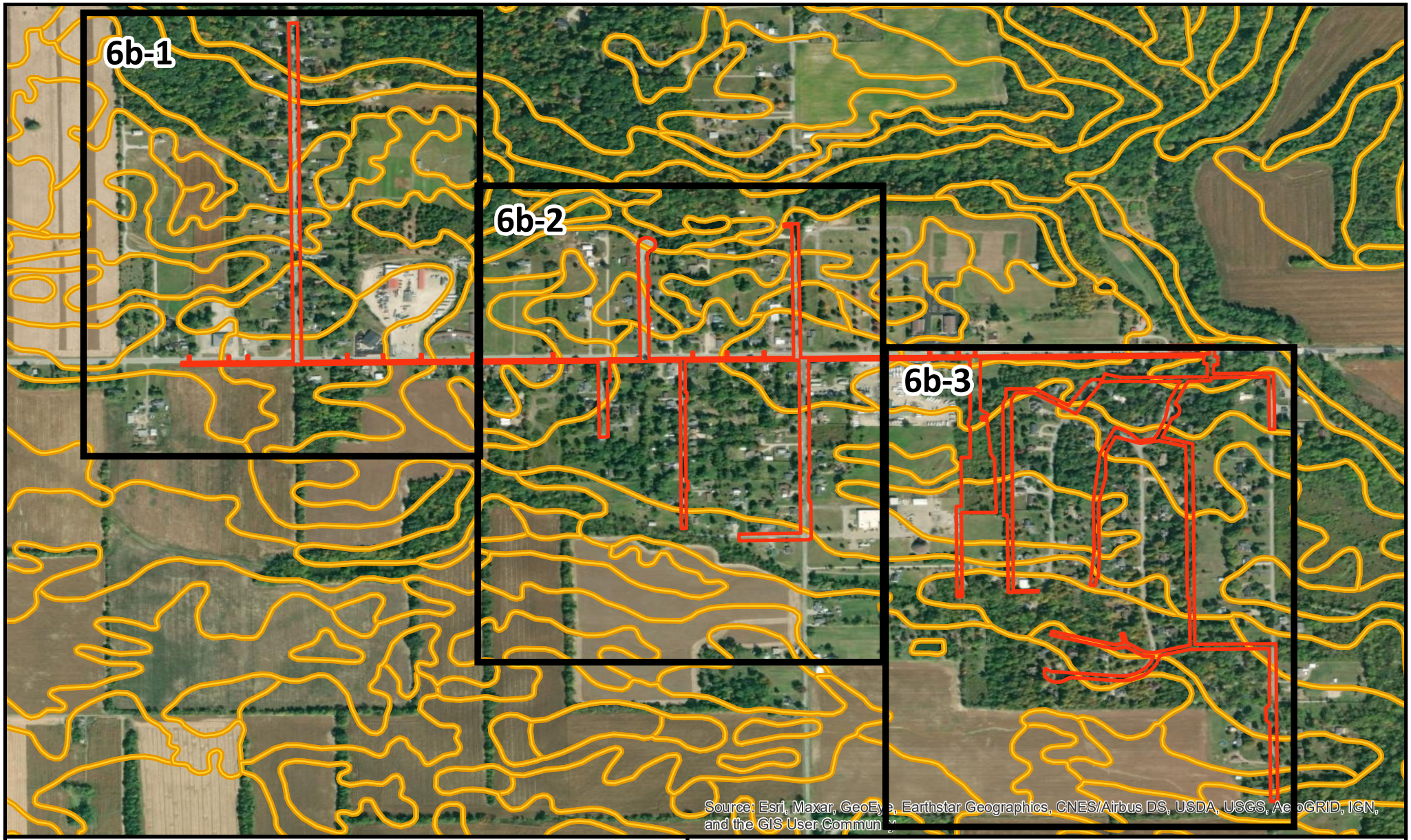
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.4 Miles

CDM Smith

7/26/2023



Legend

- Area of Investigation
- Soil Map Unit

Figure 6a: NRCS Soil Map Index

US 35 - Glenwood Area Sanitary Sewer
Waters of the United States Field Investigations

Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.5 Miles

CDM Smith

7/26/2023

Legend

- Area of Investigation
- Soil Map Unit

Figure 6b-1: NRCS Soil Map

US 35- Glenwood Area Sanitary Sewer
Waters of the United States Field Investigations

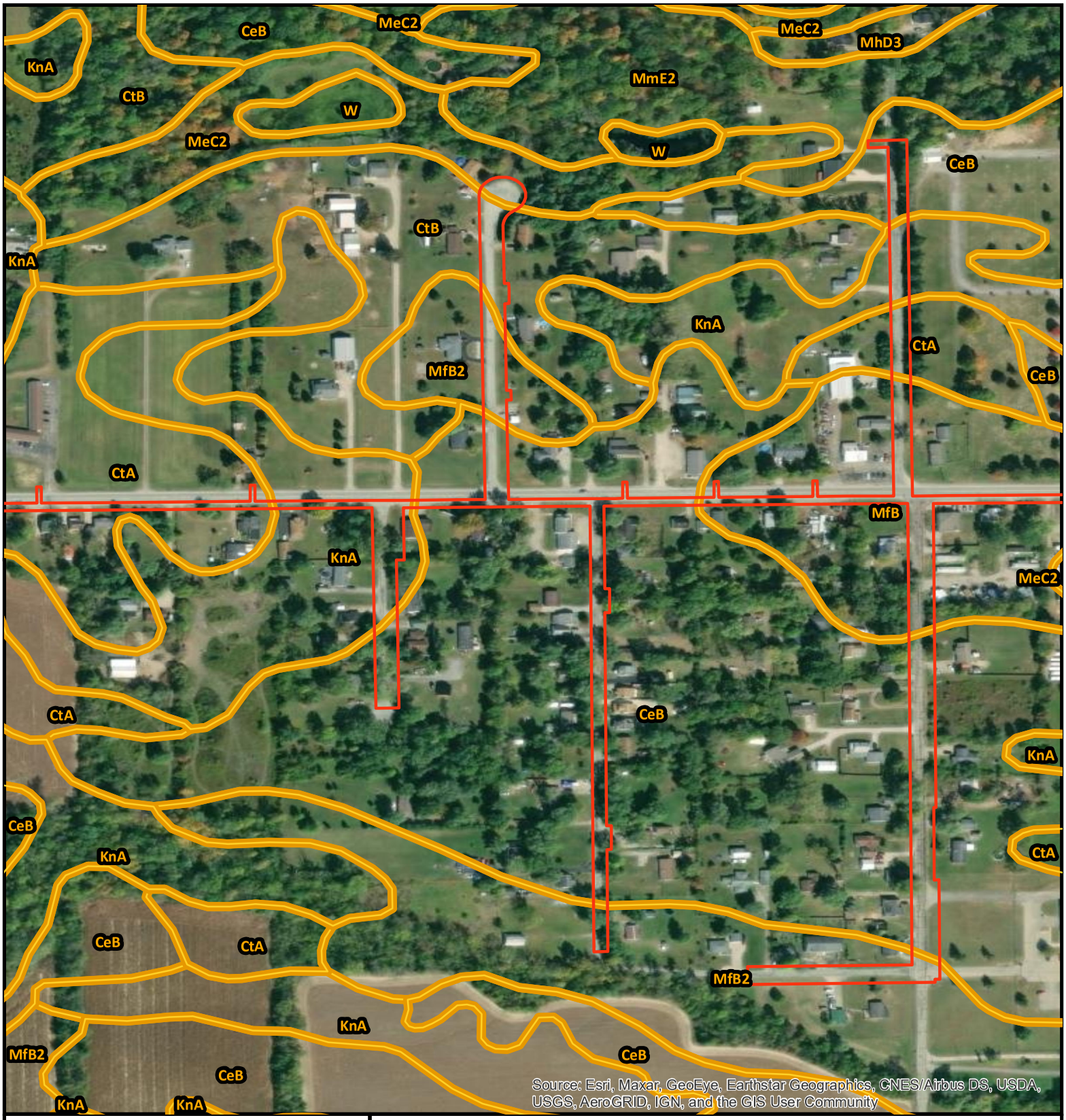
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.2 Miles

CDM Smith

7/26/2023



Legend

- Area of Investigation
- Soil Map Unit

Figure 6b-2: NRCS Soil Map

US 35- Glenwood Area Sanitary Sewer
Waters of the United States Field Investigations

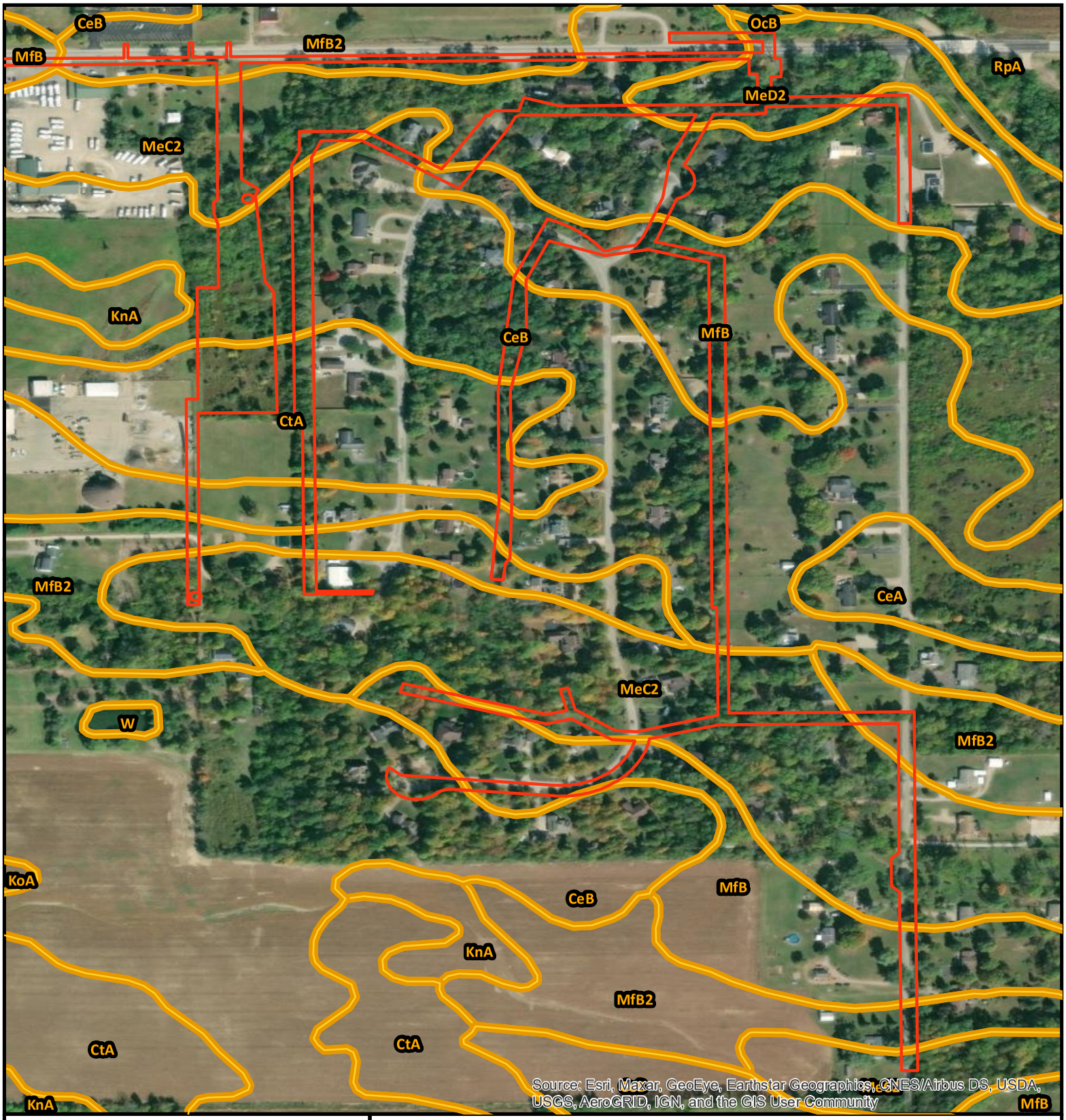
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.2 Miles

CDM Smith

7/26/2023



Legend

- Area of Investigation
- Soil Map Unit

Figure 6b-3: NRCS Soil Map

US 35- Glenwood Area Sanitary Sewer
Waters of the United States Field Investigations

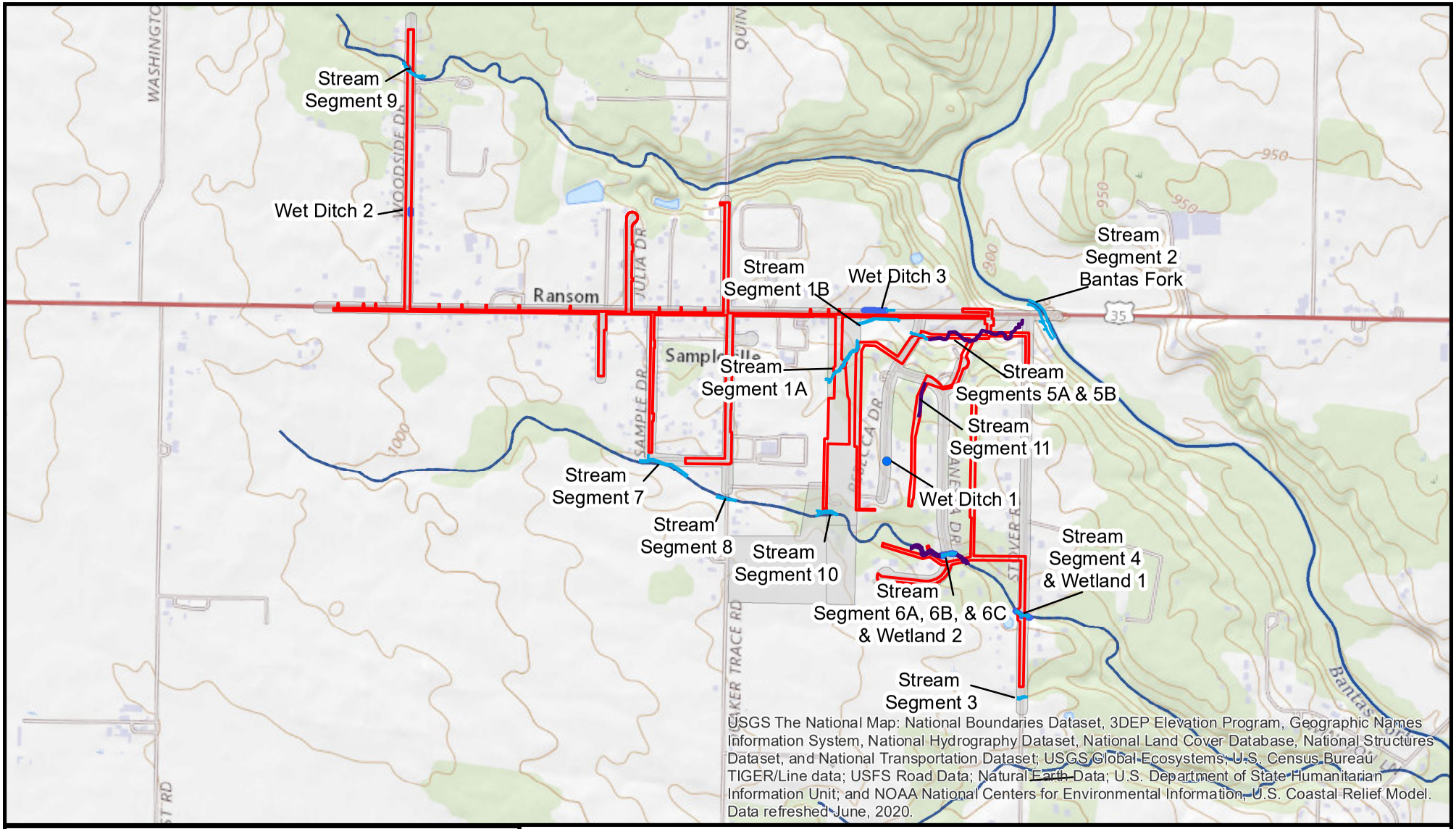
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.2 Miles

CDM Smith

7/26/2023



Legend

- USGS NHD Stream
- 2020 Delineated Streams
- 2023 Delineated Stream
- 2023 Area of Investigation
- 2020 Area of Investigation
- 2020 Delineated Wetlands

Figure 7a: Water Resources

US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations

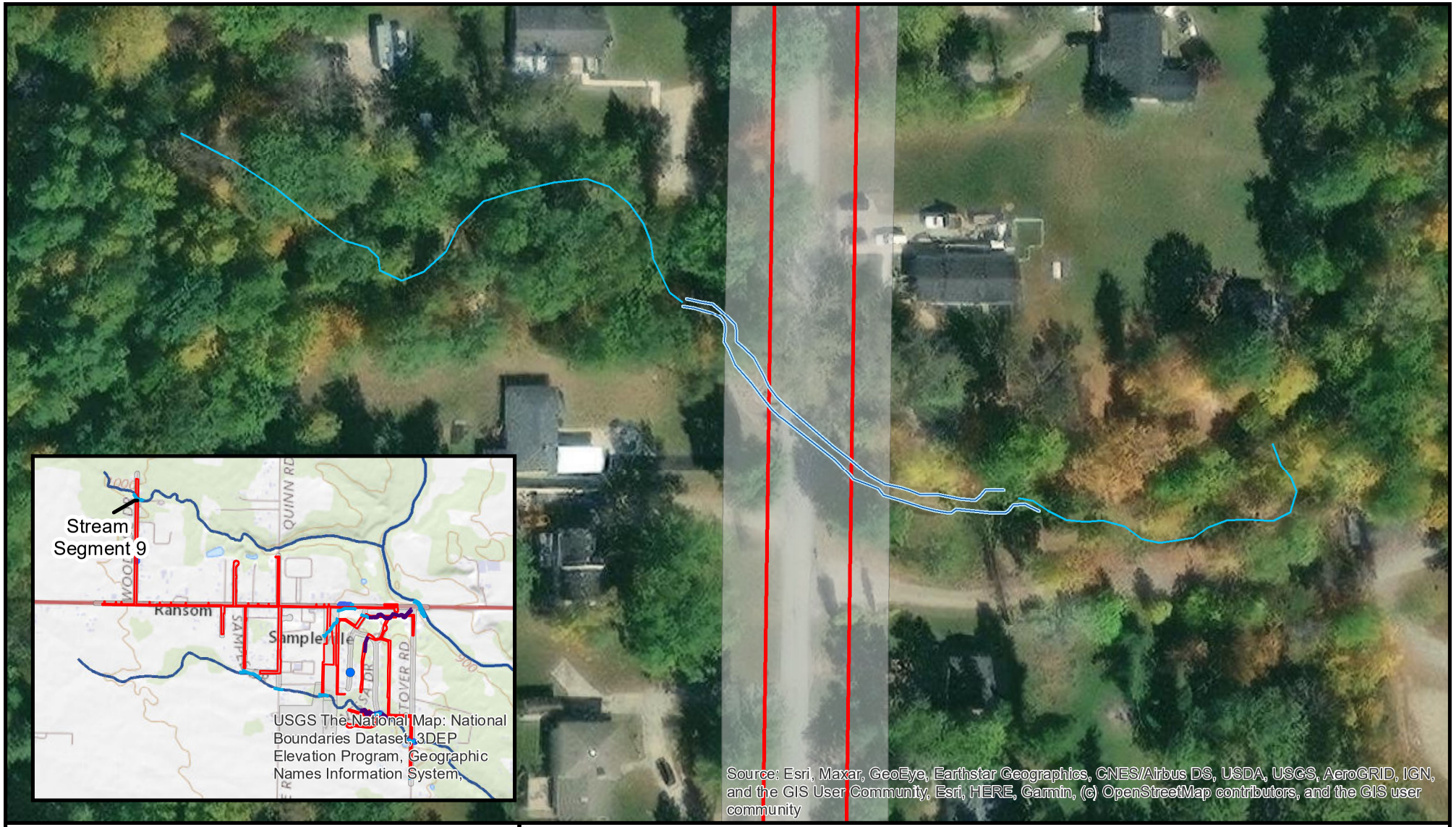
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 1 Miles

CDM Smith

7/26/2023



Legend

- 2020 Delineated Intermittent Stream
- 2020 Suspected Stream Segment
- 2020 Wetlands
- 2020 Area of Investigation
- 2023 Area of Investigation

Figure 7b-1: Water Resources

Stream Segment 9

US - 35 Glenwood Area Sanitary Sewer

2020 & 2023 Waters of the United States Field Investigations

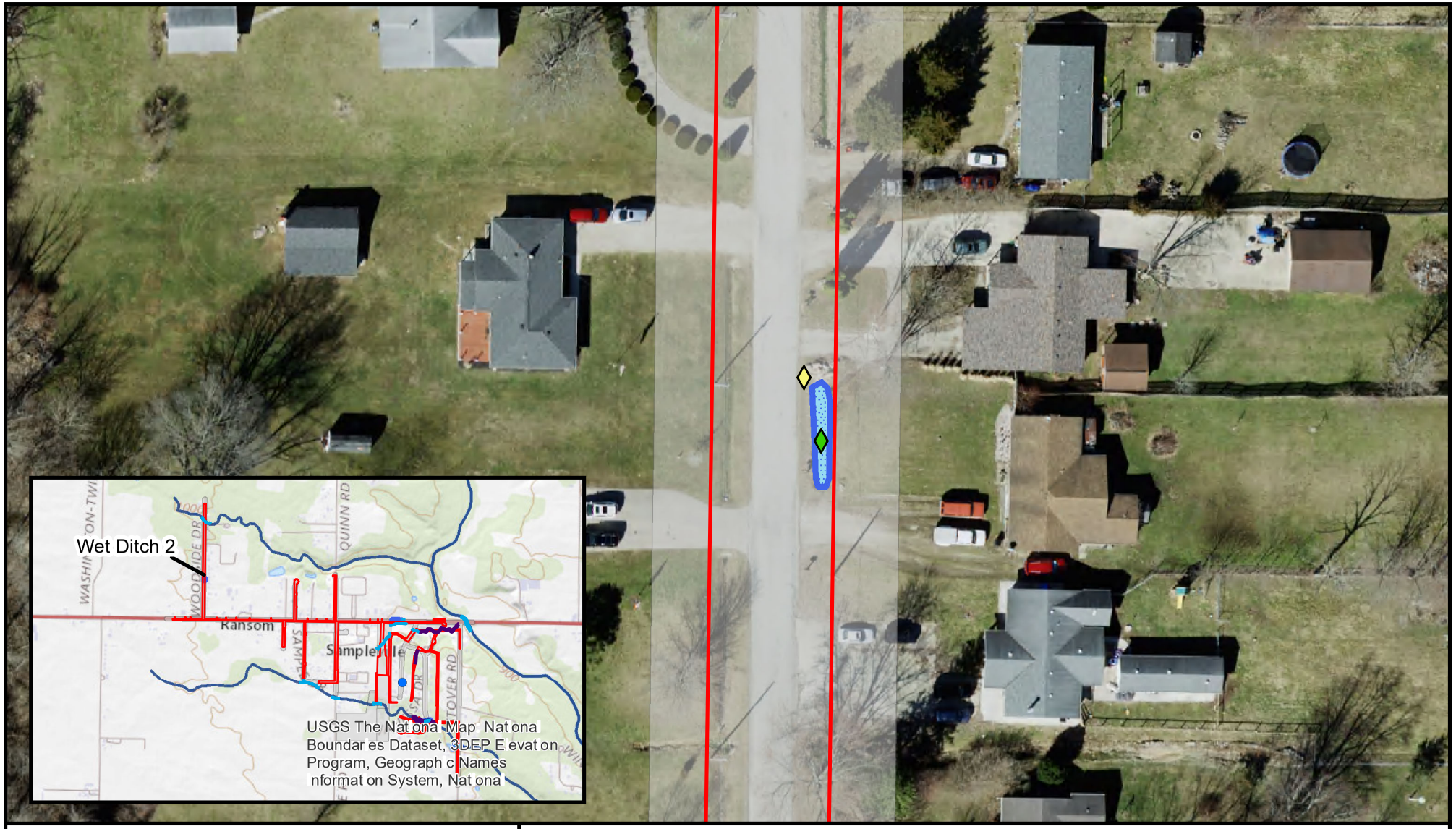
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.05 Miles

CDM Smith

7/26/2023



Legend

- 2020 Upland Plot
- 2020 Wetland Plot
- 2020 Wetlands
- 2020 Area of Investigation
- 2023 Area of Investigation

Figure 7b-2: Water Resources

Wet Ditch 2

US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations

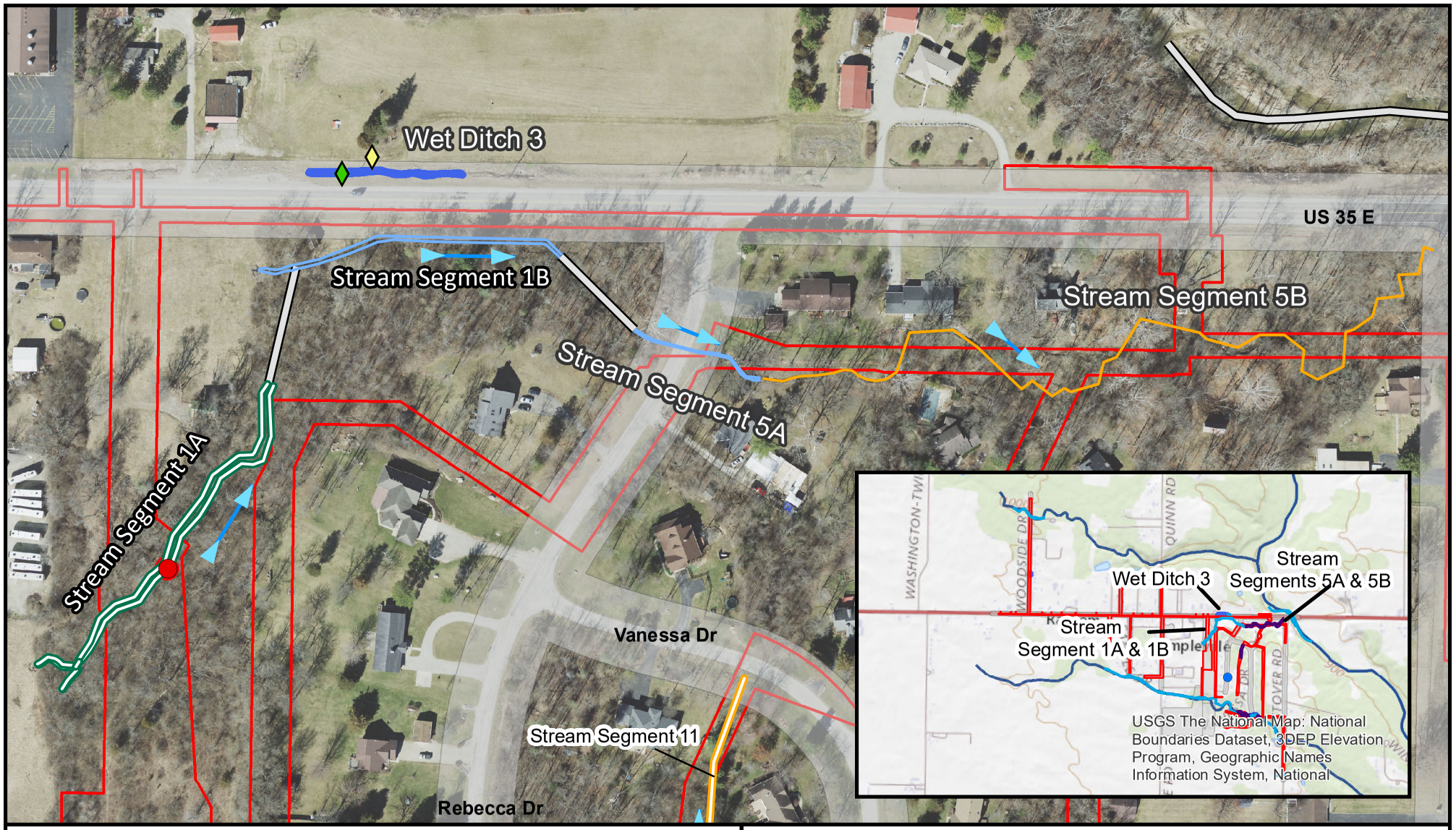
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.04 Miles

CDM Smith

7/26/2023



Legend

- 2020 Upland Plot
- 2020 Wetland Plot
- Outfall location
- Flow Direction
- 2023 Ephemeral Stream
- 2023 Intermittent Stream
- 2020 Ephemeral Stream
- 2020 Intermittent Stream
- 2020 Suspected Stream Segment
- 2023 Area of Investigation
- 2020 Area of Investigation
- 2020 Wetlands

Figure 7b-3: Water Resources

Stream Segments 1A, 1B, 5A, & 5B

US - 35 Glenwood Area Sanitary Sewer

2020 & 2023 Waters of the United States Field Investigations

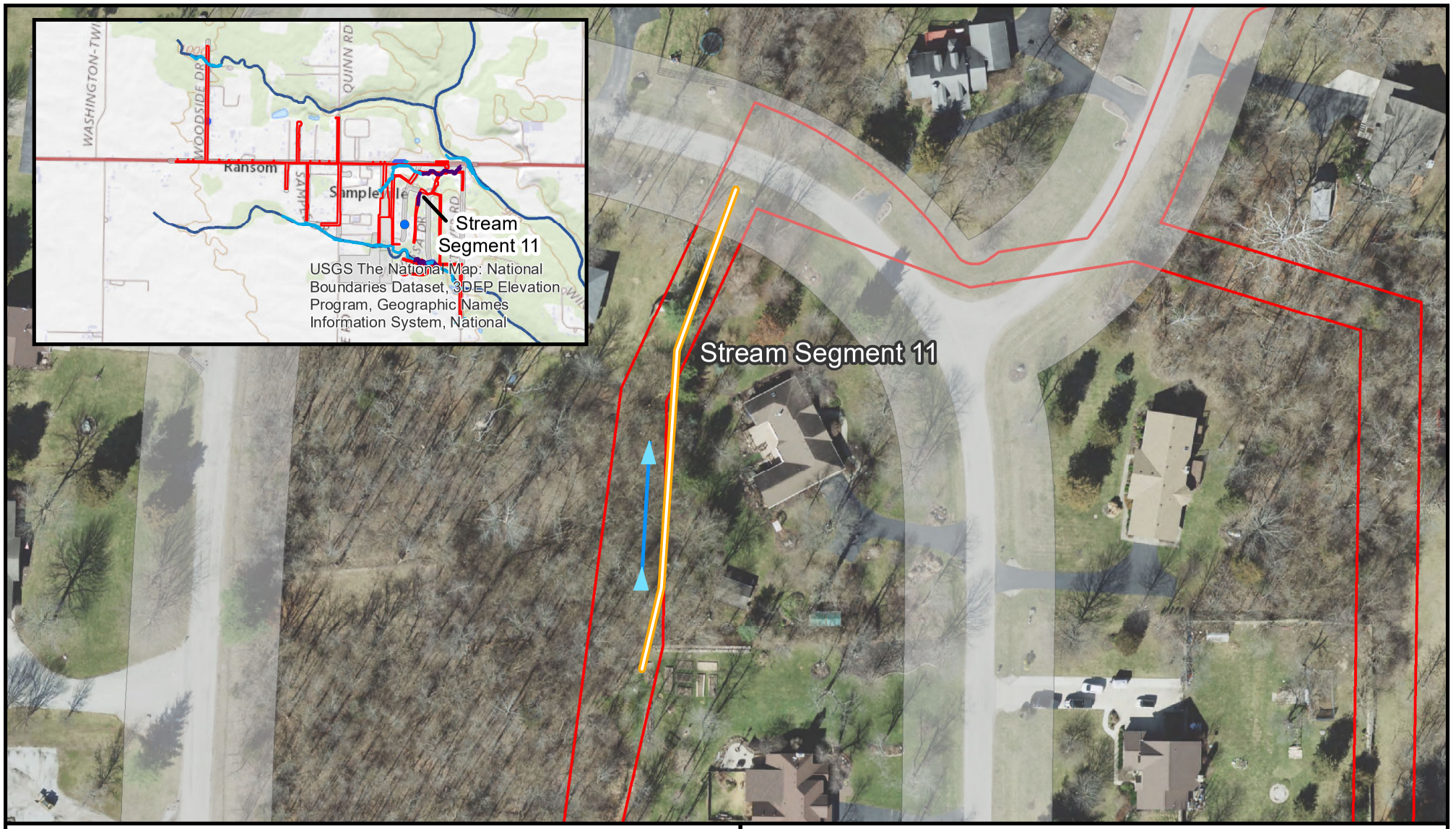
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.05 Miles

CDM Smith

7/26/2023



Legend

- Flow Direction
- 2023 Ephemeral Stream
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 7b-3: Water Resources

Stream Segment 11

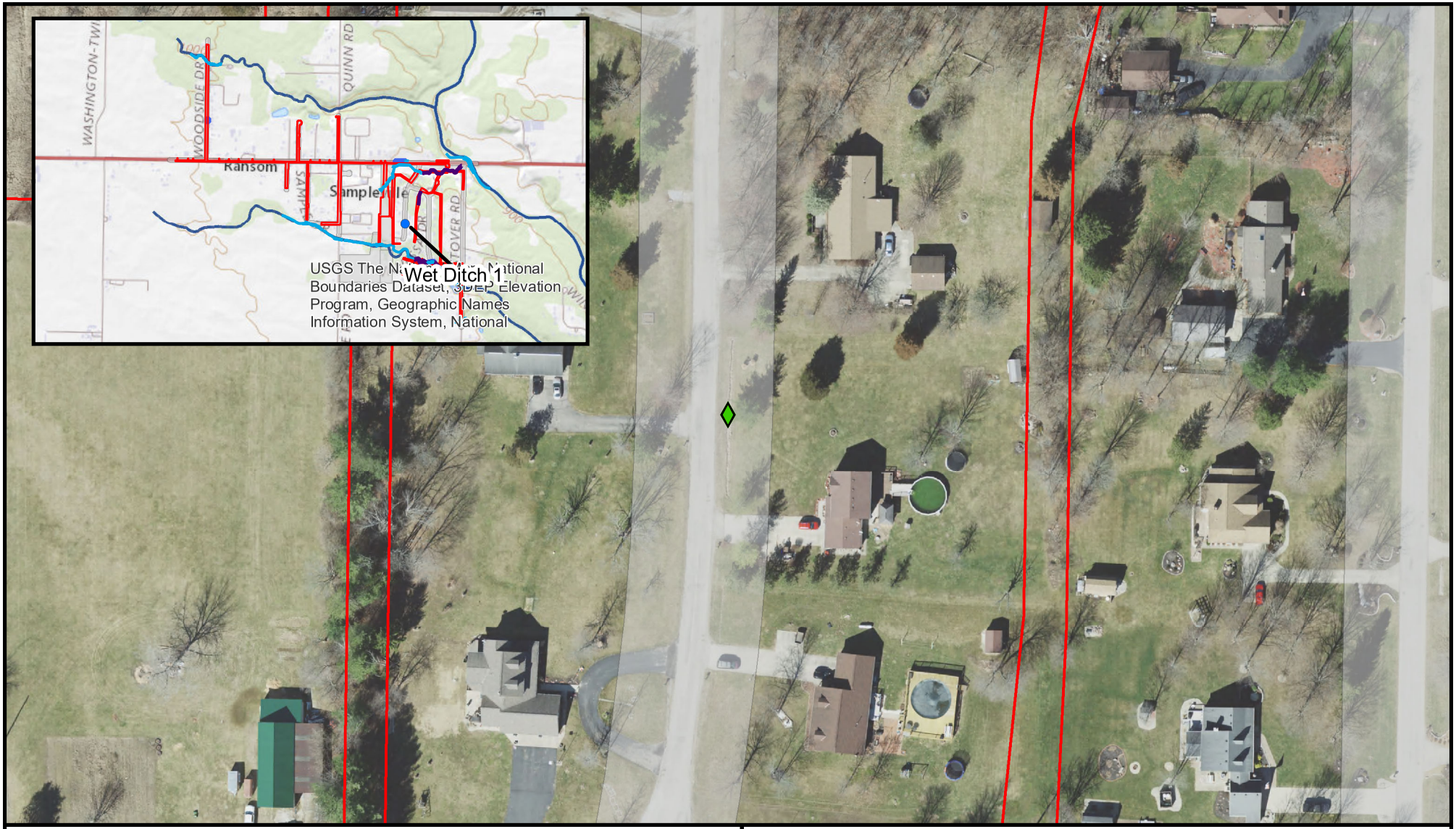
US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.05 Miles

CDM Smith

7/26/2023



Legend

- 2020 Wetland Plot
- 2020 Area of Investigation
- 2023 Area of Investigation

Figure 7b-5: Water Resources

Wet Ditch 1

US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations

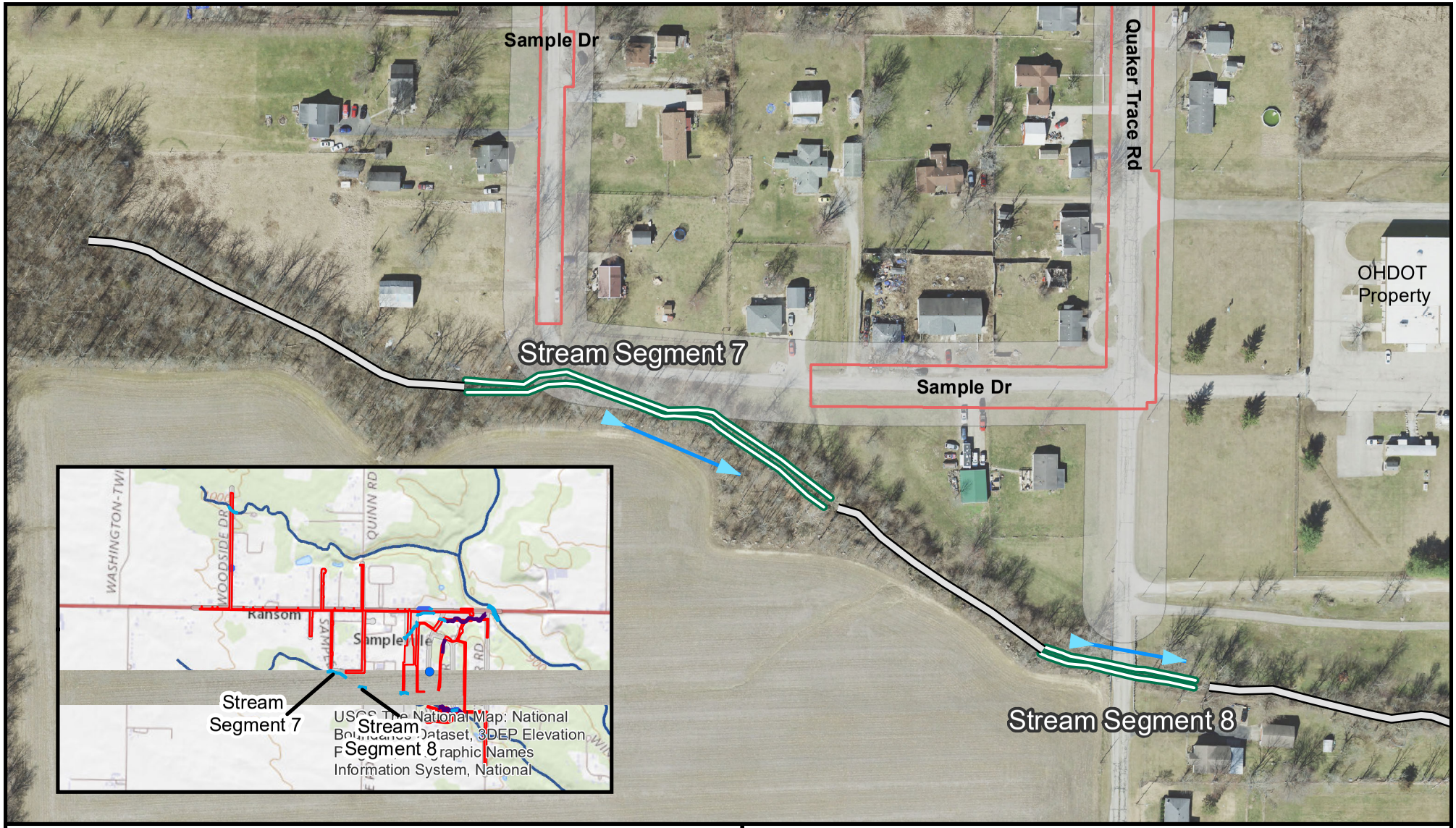
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.05 Miles

CDM Smith

7/26/2023



Legend

- Flow Direction
- 2020 Ephemeral Stream
- 2020 Suspected Stream Segment
- 2020 Area of Investigation
- 2023 Area of Investigation

Figure 7b-6: Water Resources

Stream Segments 7 and 8

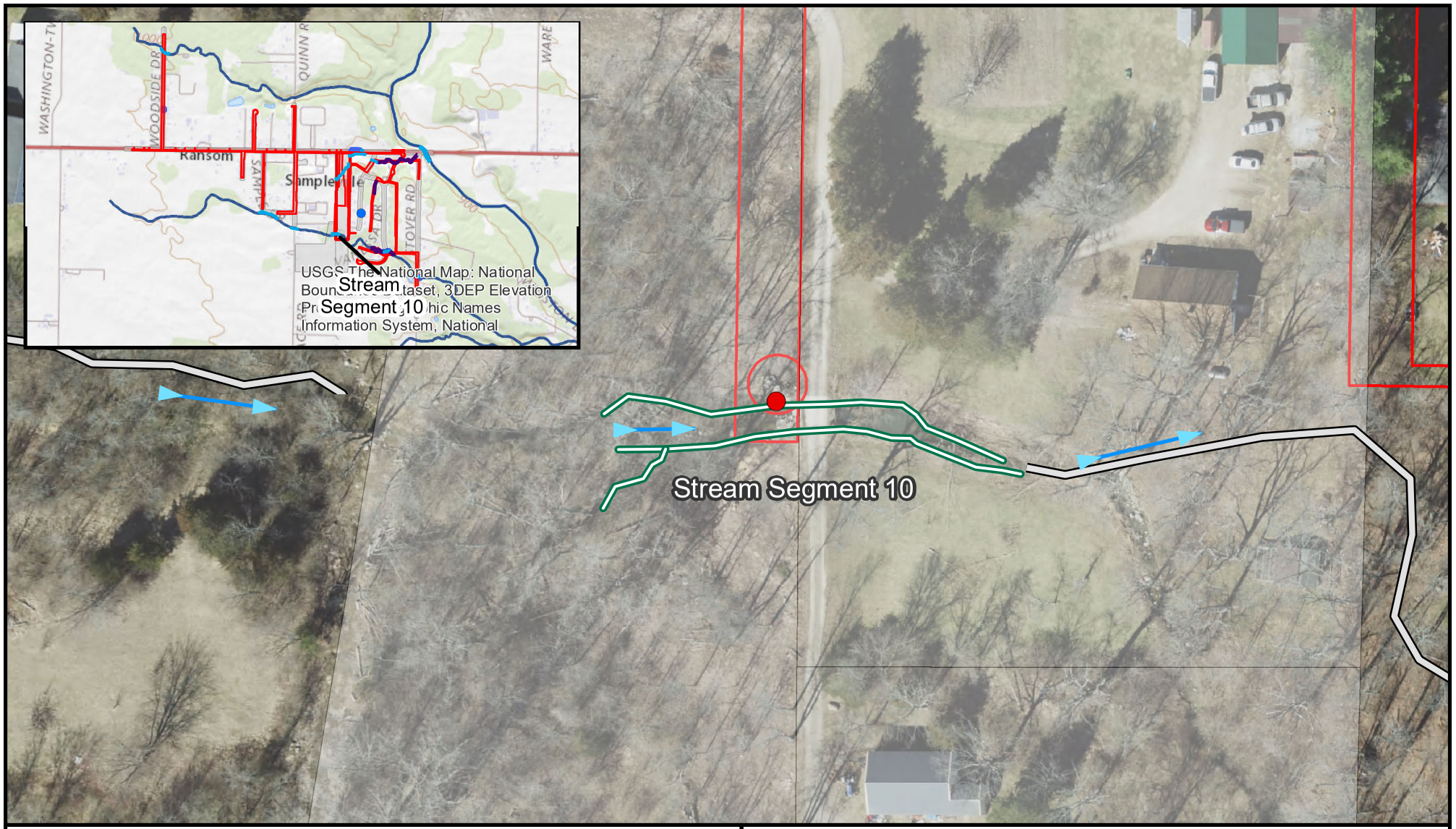
US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.1 Miles

CDM Smith

7/26/2023



Legend

- Outfall location
- Flow Direction
- 2020 Ephemeral Stream
- 2020 Suspected Stream Segment
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 7b-7: Water Resources

Stream Segment 10

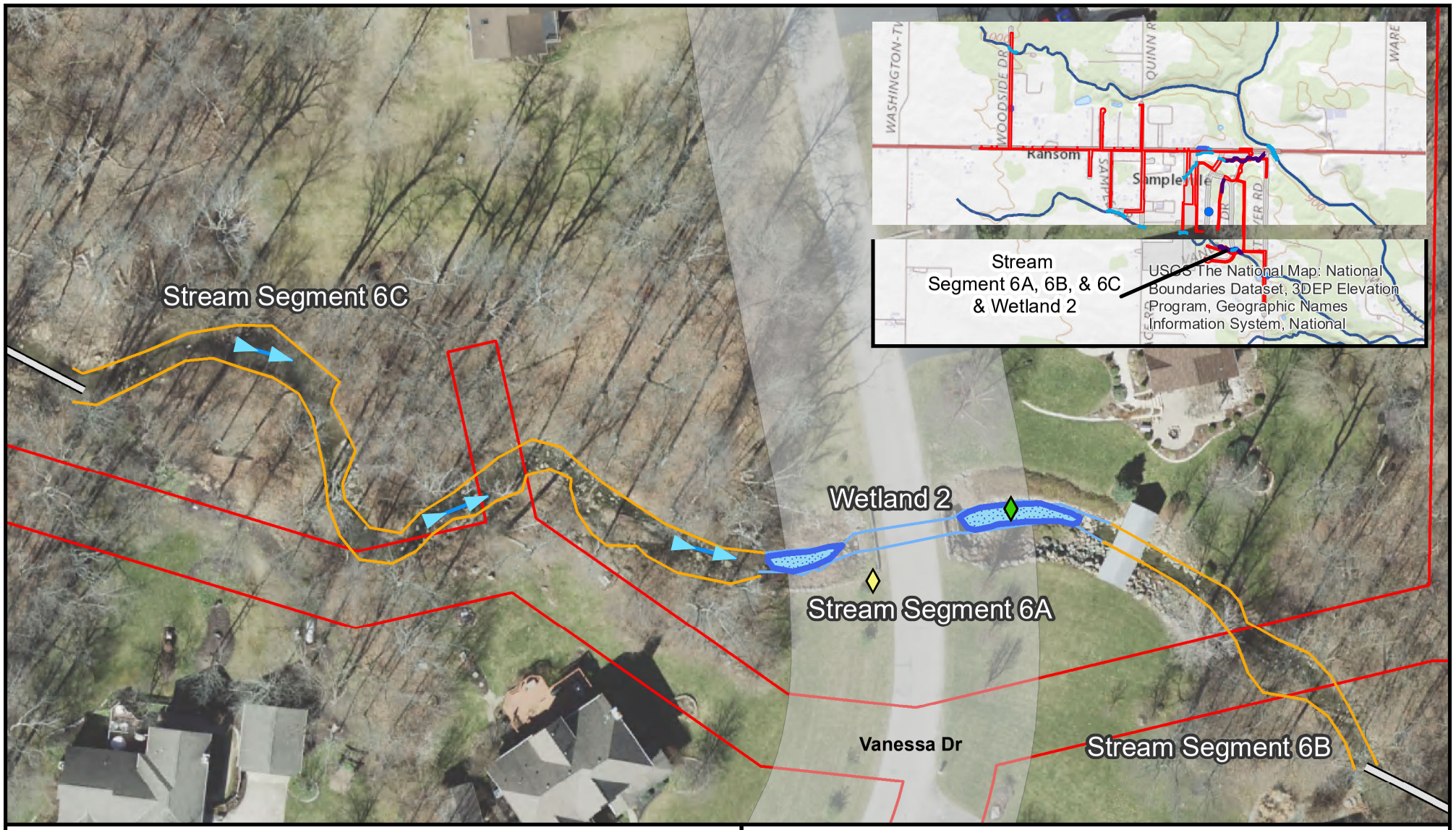
US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.04 Miles

CDM Smith

7/26/2023



Legend

- 2020 Upland Plot
- 2020 Wetland Plot
- Flow Direction
- 2020 Intermittent Stream
- 2020 Suspected Stream Segment
- 2023 Intermittent Stream
- 2023 Area of Investigation
- 2020 Area of Investigation
- 2020 Wetlands

Figure 7b-7: Water Resources

Stream Segments 6A, 6B, 6C, & Wetland 2

US - 35 Glenwood Area Sanitary Sewer

2020 & 2023 Waters of the United States Field Investigations

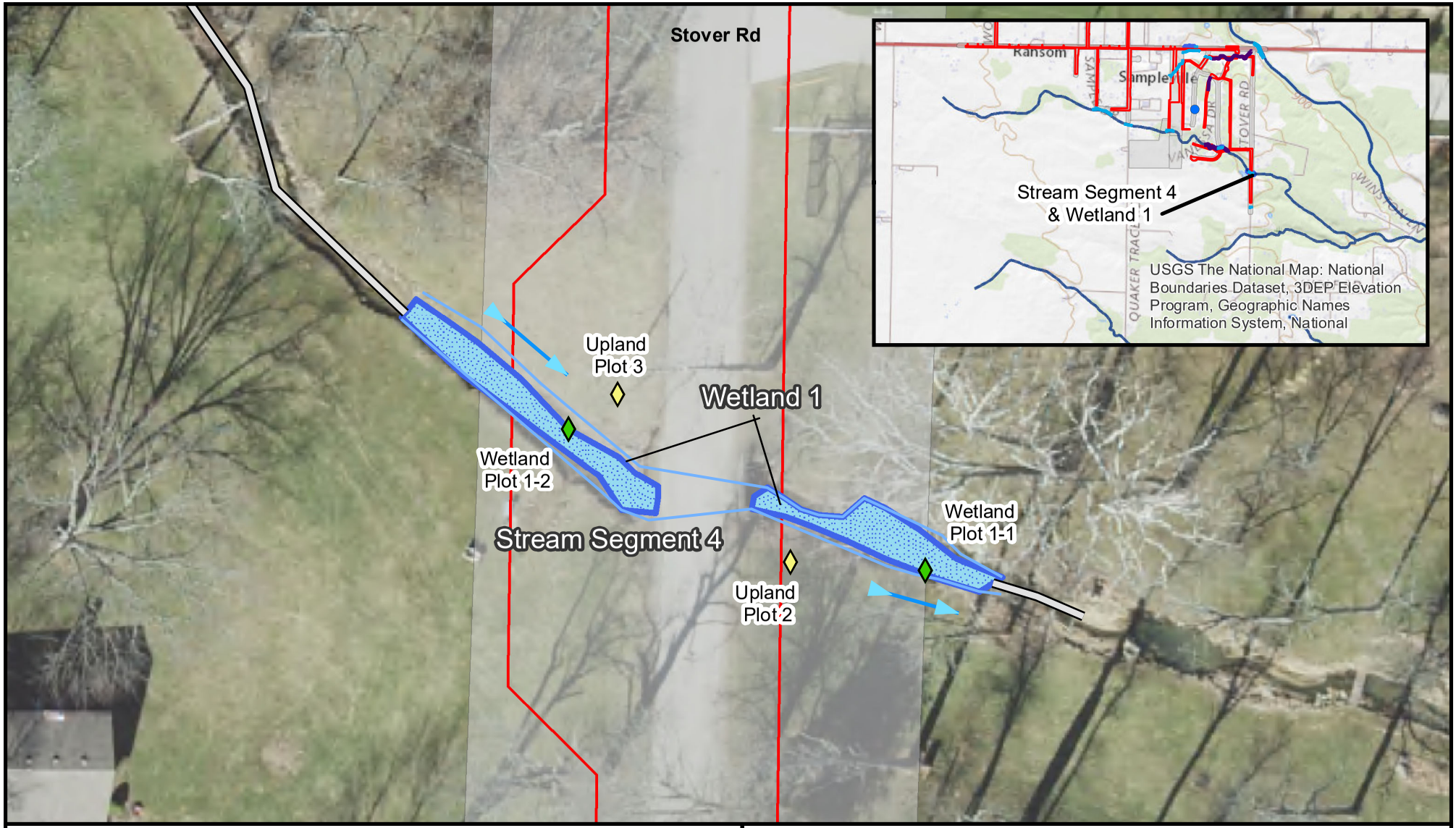
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.02 Miles

CDM Smith

7/26/2023



Legend

- 2020 Upland Plot
- 2020 Wetland Plot
- Flow Direction
- 2020 Intermittent Stream
- 2020 Suspected Stream Segment
- 2020 Wetlands
- 2020 Area of Investigation

Figure 7b-9: Water Resources

Stream Segment 4 & Wetland 1

US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations

Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.018 Miles

CDM Smith

7/26/2023

Legend

- Flow Direction
- 2020 Intermittent Stream
- 2020 Suspected Stream Segment
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 7b-10: Water Resources

Stream Segment 3

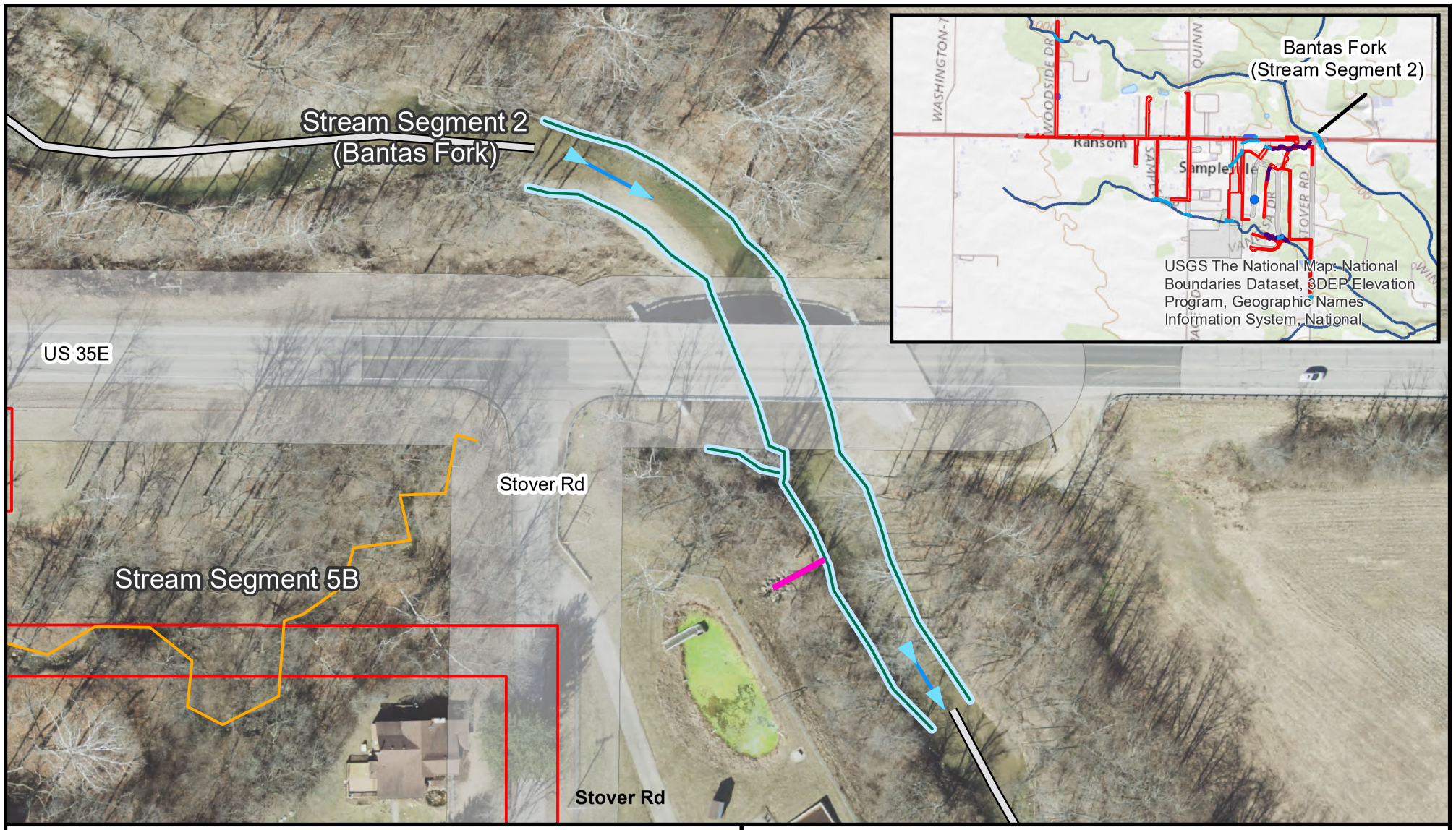
US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.04 Miles

CDM Smith

7/26/2023



Legend

- Flow Direction
- 2020 Drainage
- 2020 Perennial
- 2020 Suspected Stream Segment
- 2023 Intermittent Stream
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 7b-11: Water Resources

Stream Segment 2 - Bantas Fork

US - 35 Glenwood Area Sanitary Sewer

2020 & 2023 Waters of the United States Field Investigations

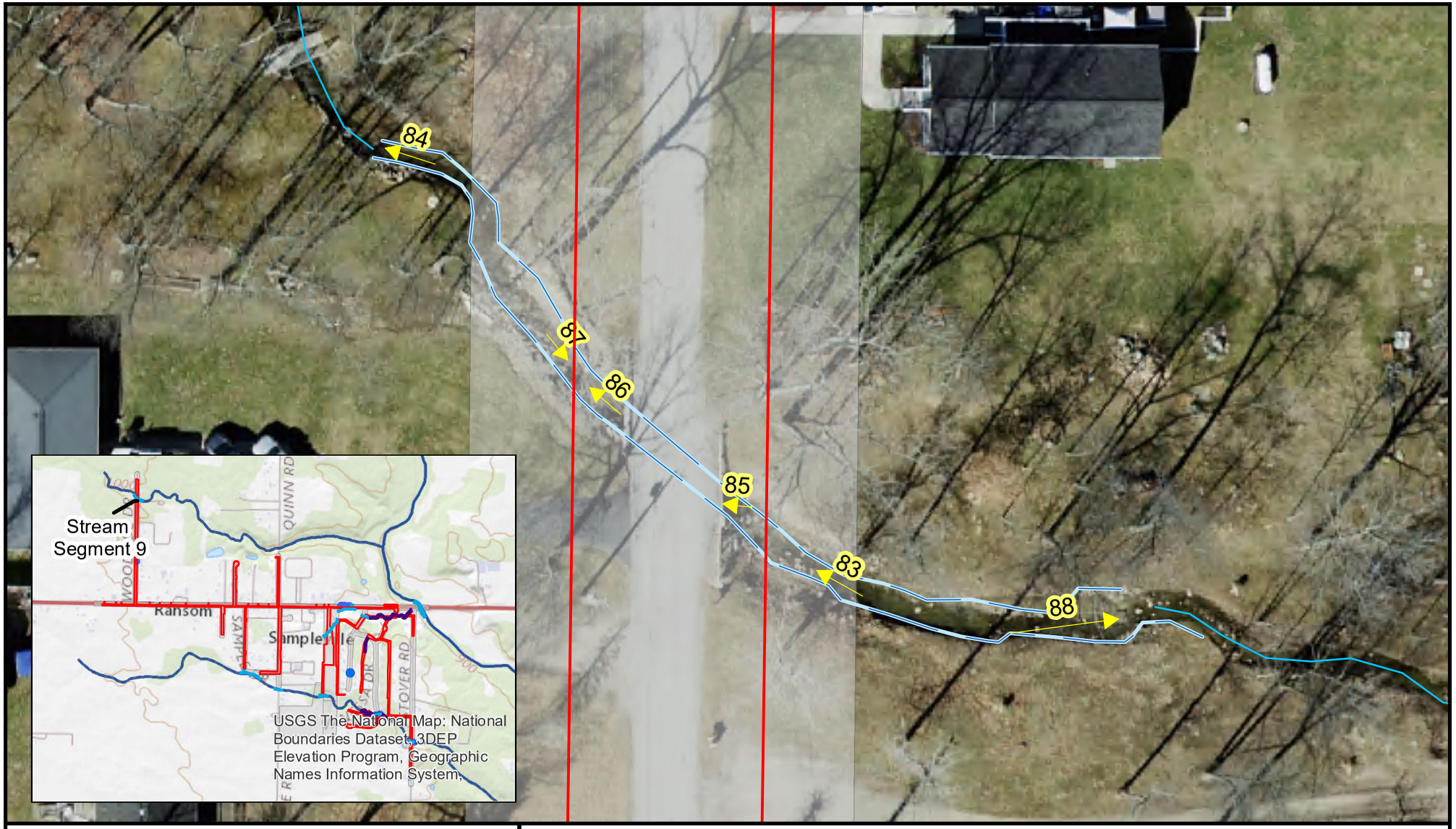
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.04 Miles

CDM Smith

7/26/2023



Legend

- Photo Direction
- 2020 Delineated Intermittent Stream
- 2020 Suspected Stream Segment
- 2023 Area of Investigation
- 2020 Wetlands
- 2020 Area of Investigation

Figure 8-1: Photography Log

Stream Segment 9

US - 35 Glenwood Area Sanitary Sewer

2020 & 2023 Waters of the United States Field Investigations

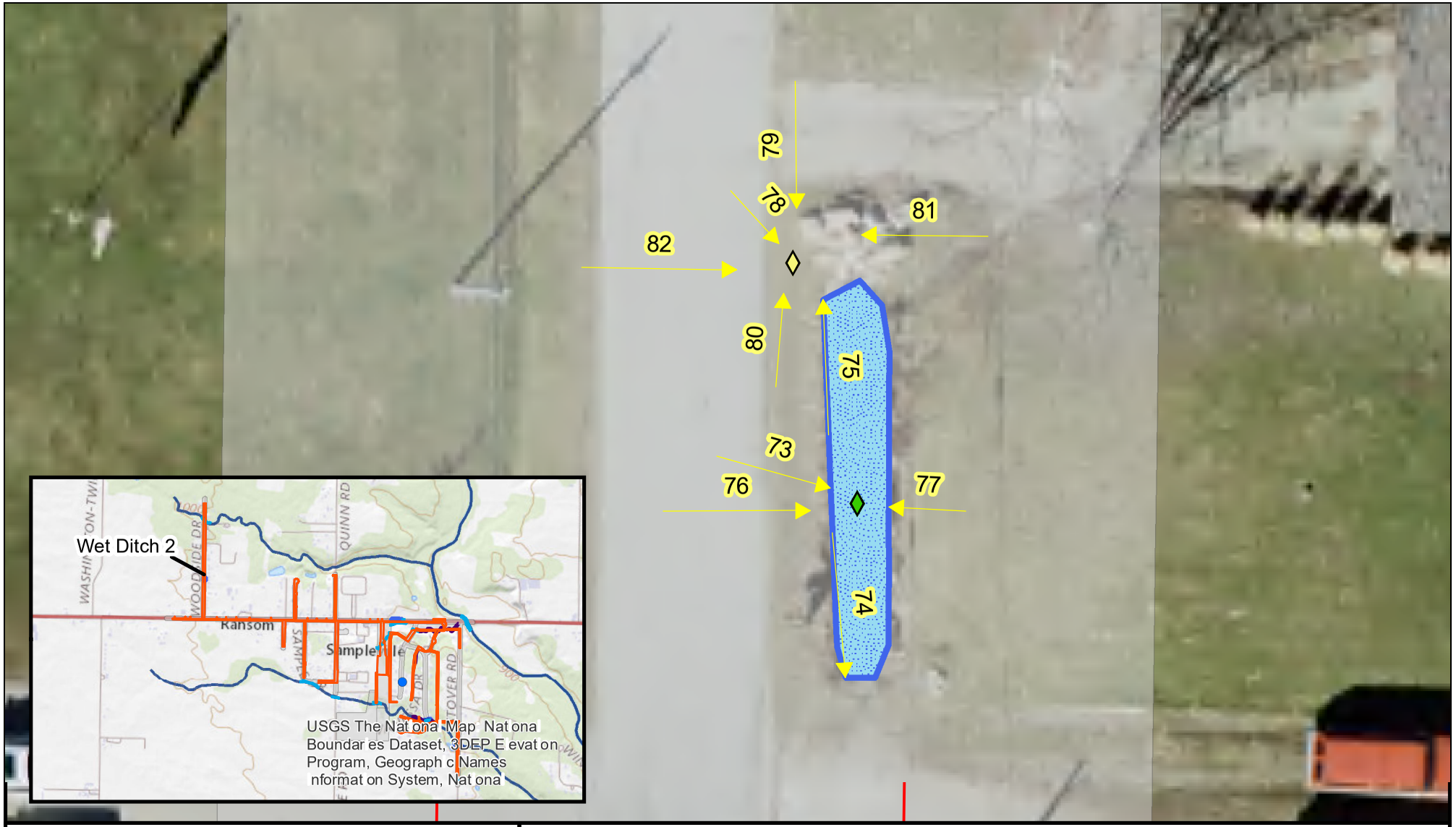
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.02 Miles

CDM Smith

7/26/2023



Legend

- Photo Direction
- 2020 Upland Plot
- 2020 Wetland Plot
- 2020 Wetlands
- 2020 Area of Investigation
- 2023 Area of Investigation

Figure 8-2: Site Photography Log

Wet Ditch 2

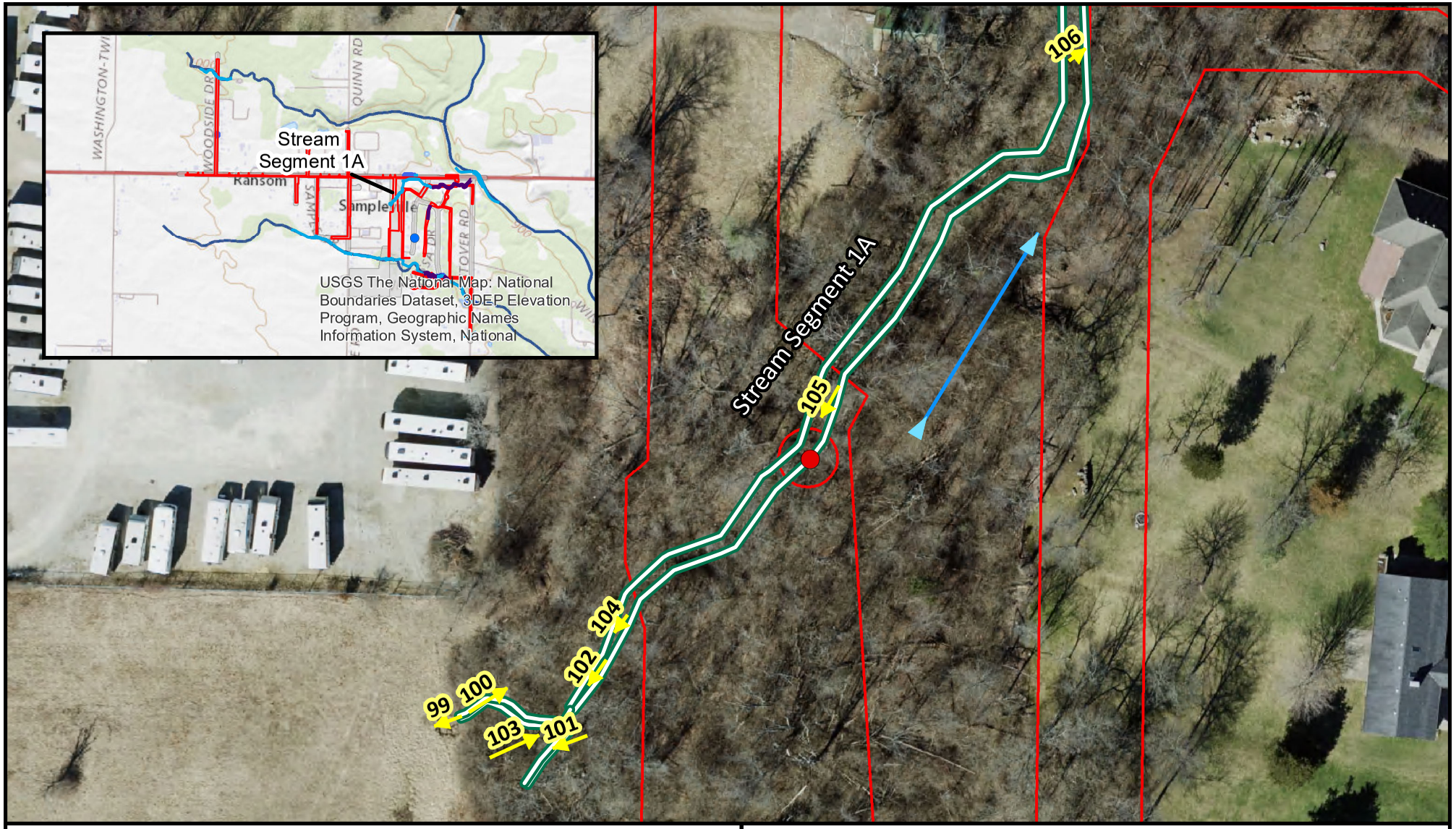
US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 — 0.013 Miles

CDM Smith

7/26/2023



Legend

- Outfall location
- PhotoLog
- Flow Direction
- 2020 Ephemeral Stream
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 8-3: Site Photography Log

Stream Segment 1A

US - 35 Glenwood Area Sanitary Sewer

2020 & 2023 Waters of the United States Field Investigations

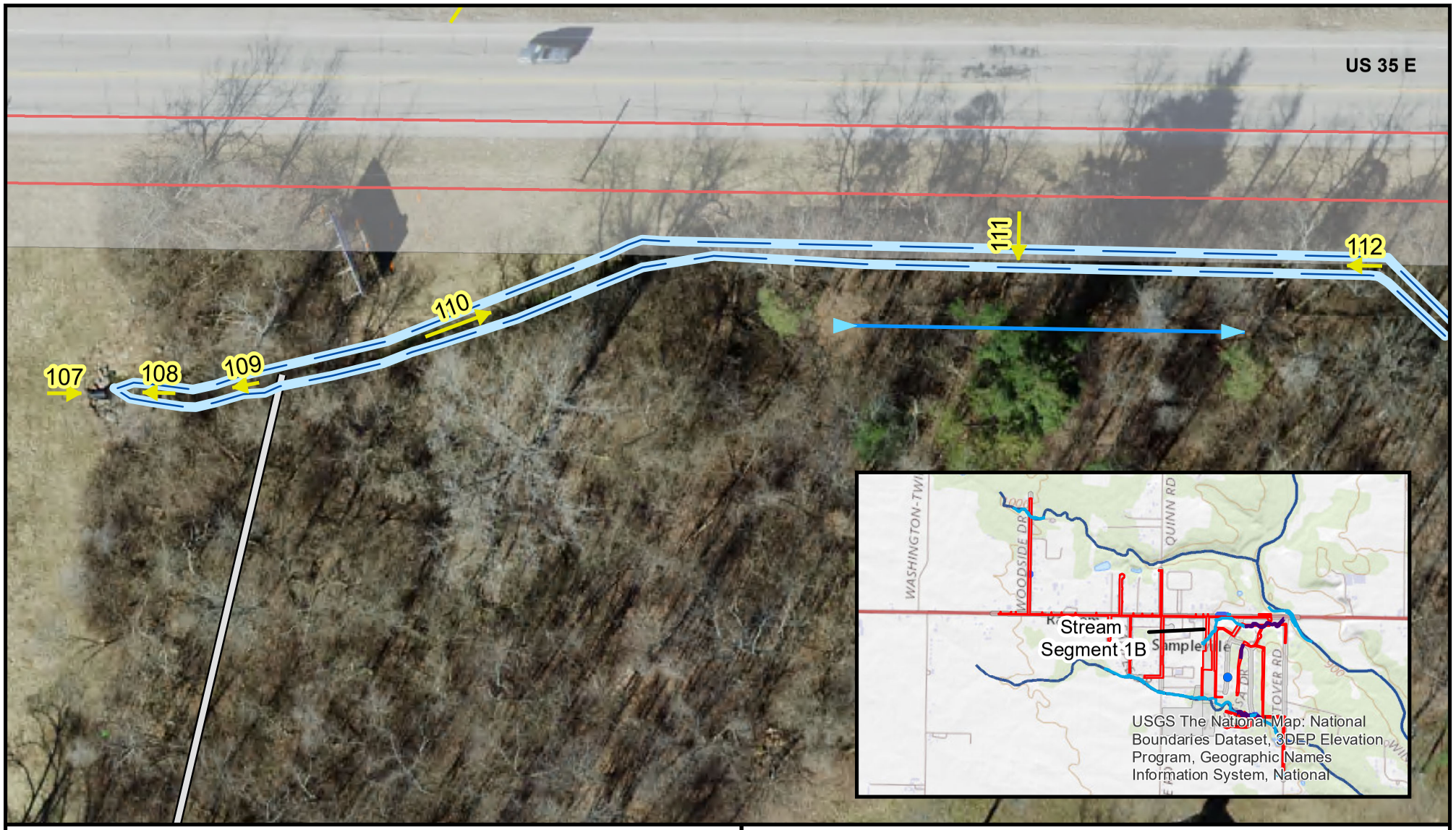
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.02 Miles

CDM Smith

7/27/2023



Legend

- Photo Direction
- Flow Direction
- 2020 Suspected Stream Segment
- 2020 Intermittent
- 2020 Ephemeral Stream
- 2020 Area of Investigation
- 2023 Area of Investigation

Figure 8-4: Site Photography Log

Stream Segment 1B

US - 35 Glenwood Area Sanitary Sewer

2020 & 2023 Waters of the United States Field Investigations

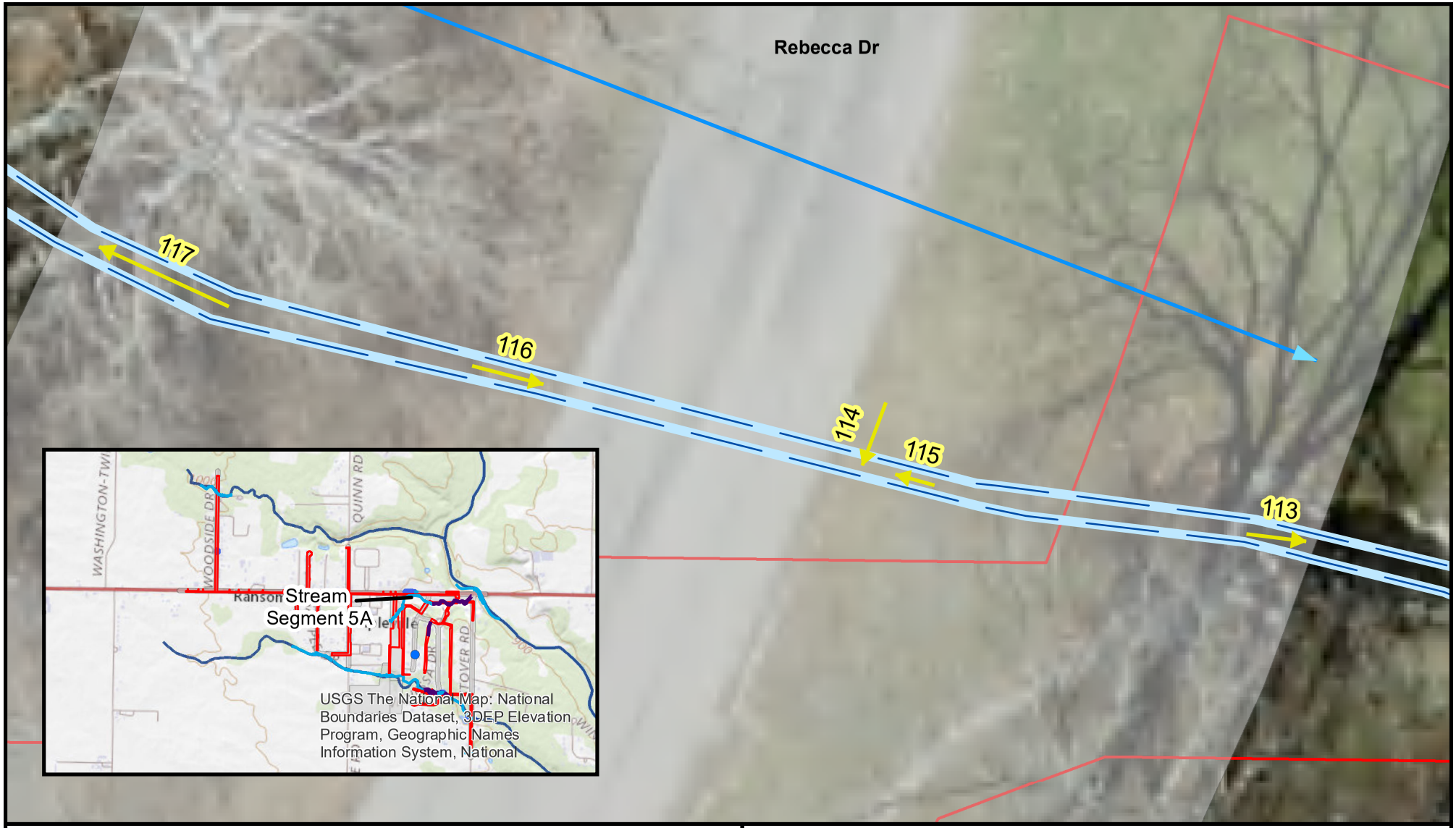
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.013 Miles

CDM Smith

7/26/2023



Legend

- Photo Direction
- Flow Direction
- 2020 Intermittent
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 8-5: Site Photography Log

Stream Segment 5A

US - 35 Glenwood Area Sanitary Sewer

2020 & 2023 Waters of the United States Field Investigations

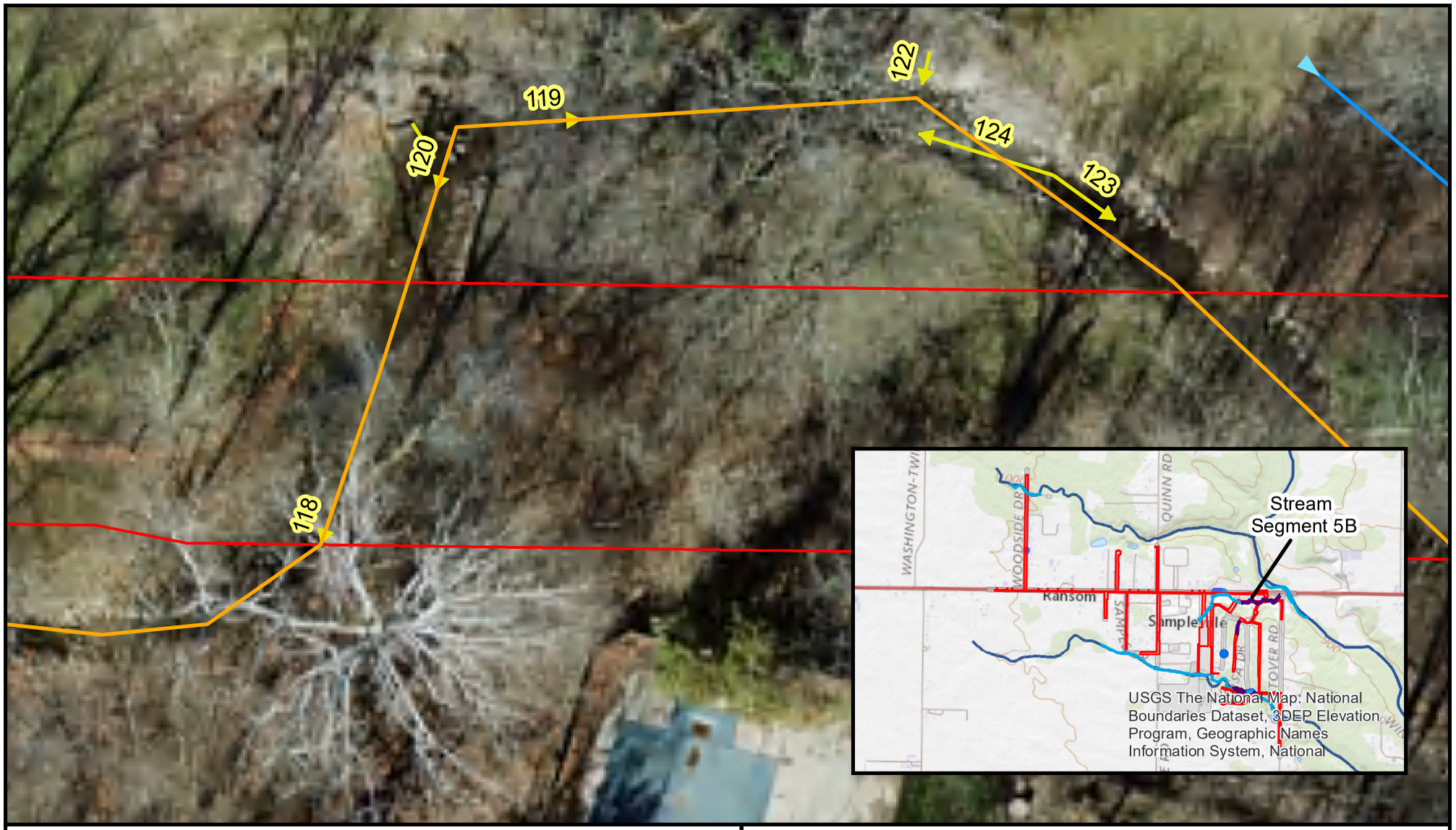
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.003 Miles

CDM Smith

7/26/2023



Legend

- Photo Direction
- Flow Direction
- 2023 Intermittent Stream
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 8-6a: Site Photography Log

Stream Segment 5B

US - 35 Glenwood Area Sanitary Sewer

2020 & 2023 Waters of the United States Field Investigations

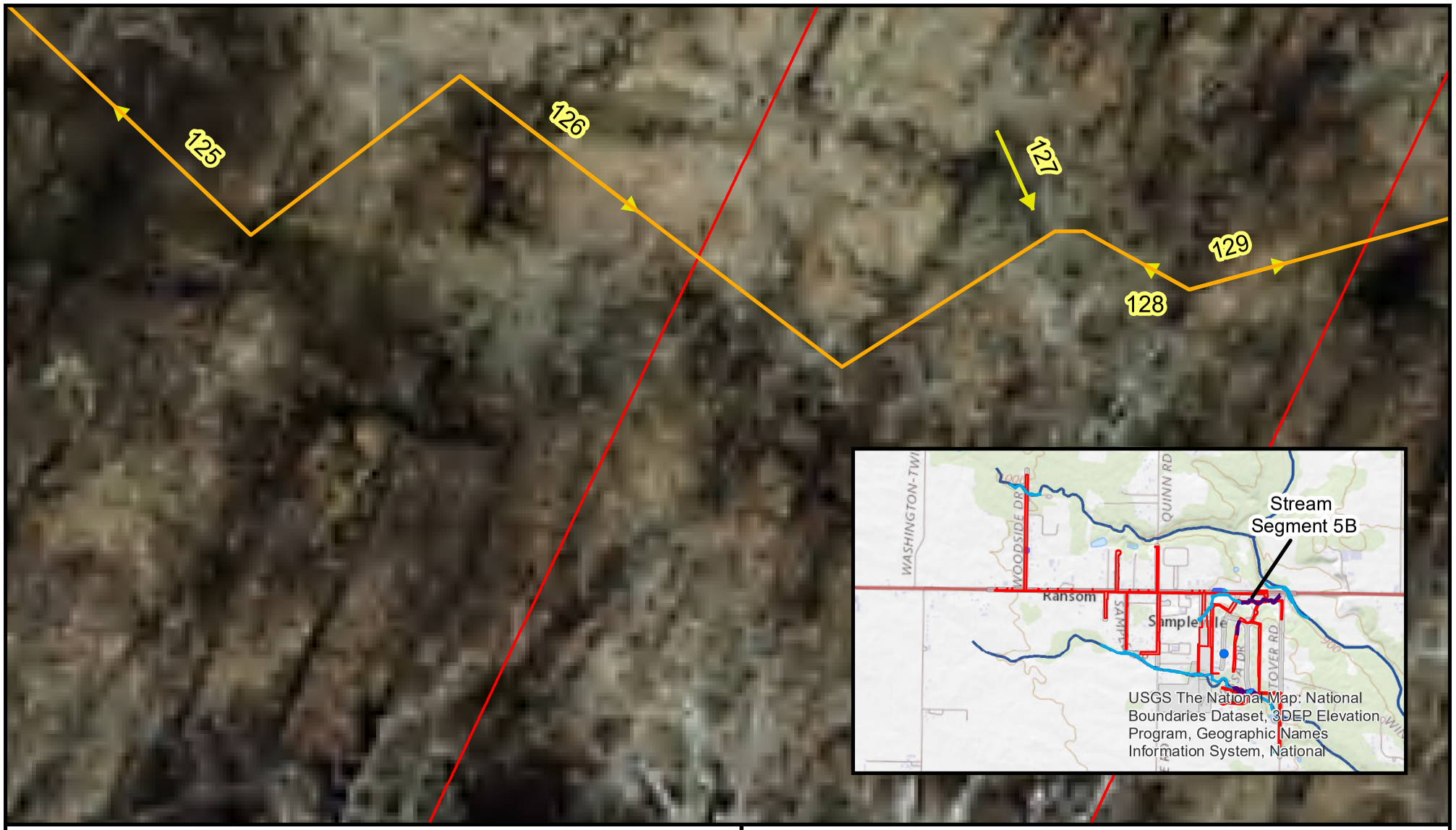
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.005 Miles

CDM Smith

7/26/2023



Legend

- Photo Direction
- Flow Direction
- 2023 Intermittent Stream
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 8-6b: Site Photography Log

Stream Segment 5B

US - 35 Glenwood Area Sanitary Sewer

2020 & 2023 Waters of the United States Field Investigations

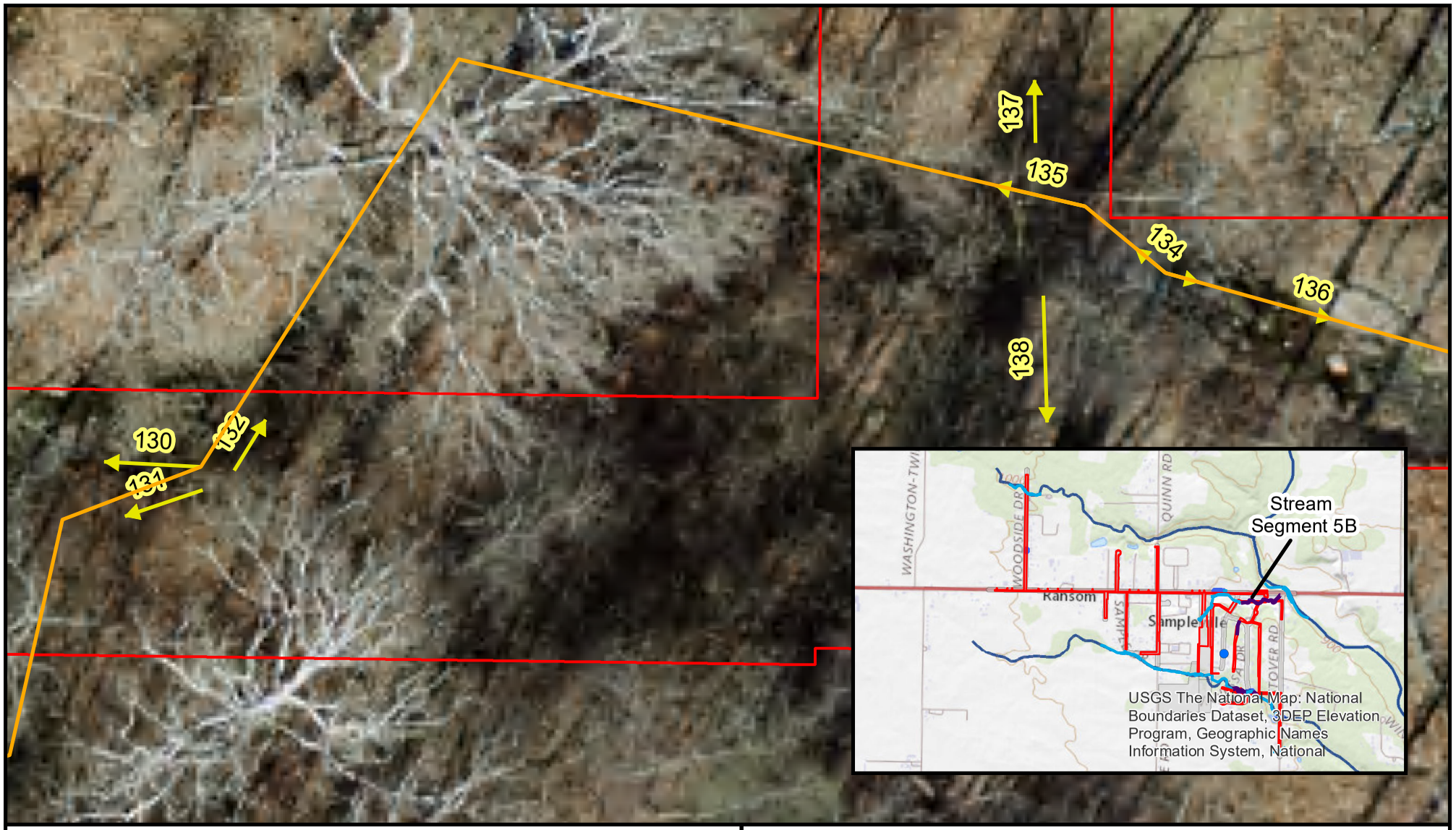
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.003 Miles

CDM Smith

7/26/2023



Legend

- Photo Direction
- Flow Direction
- 2023 Intermittent Stream
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 8-6c: Site Photography Log

Stream Segment 5B

US - 35 Glenwood Area Sanitary Sewer

2020 & 2023 Waters of the United States Field Investigations

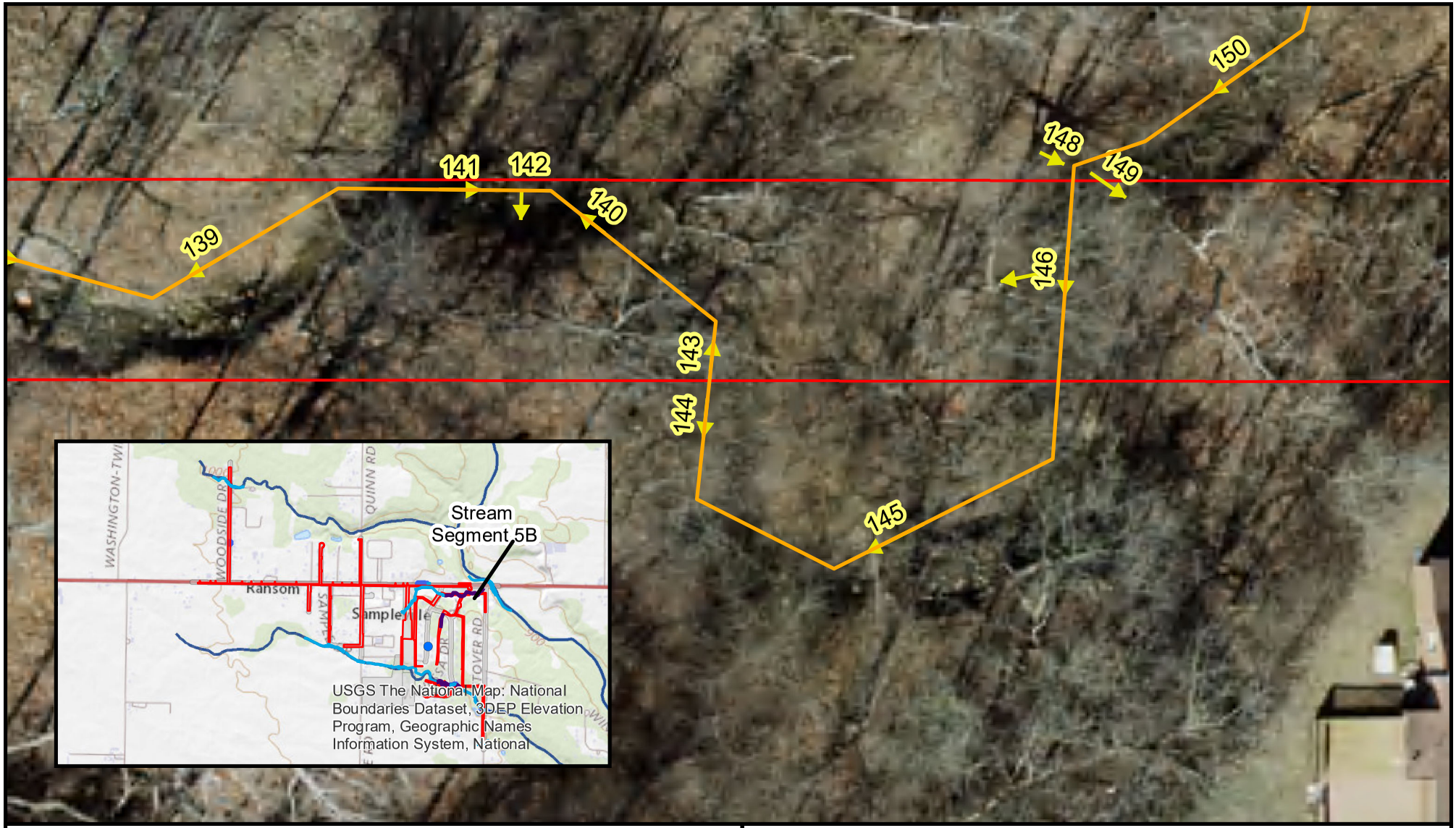
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.005 Miles

CDM Smith

7/26/2023



Legend

- Photo Direction
- 2023 Intermittent Stream
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 8-6d: Site Photography Log

Stream Segment 5B

US - 35 Glenwood Area Sanitary Sewer

2020 & 2023 Waters of the United States Field Investigations

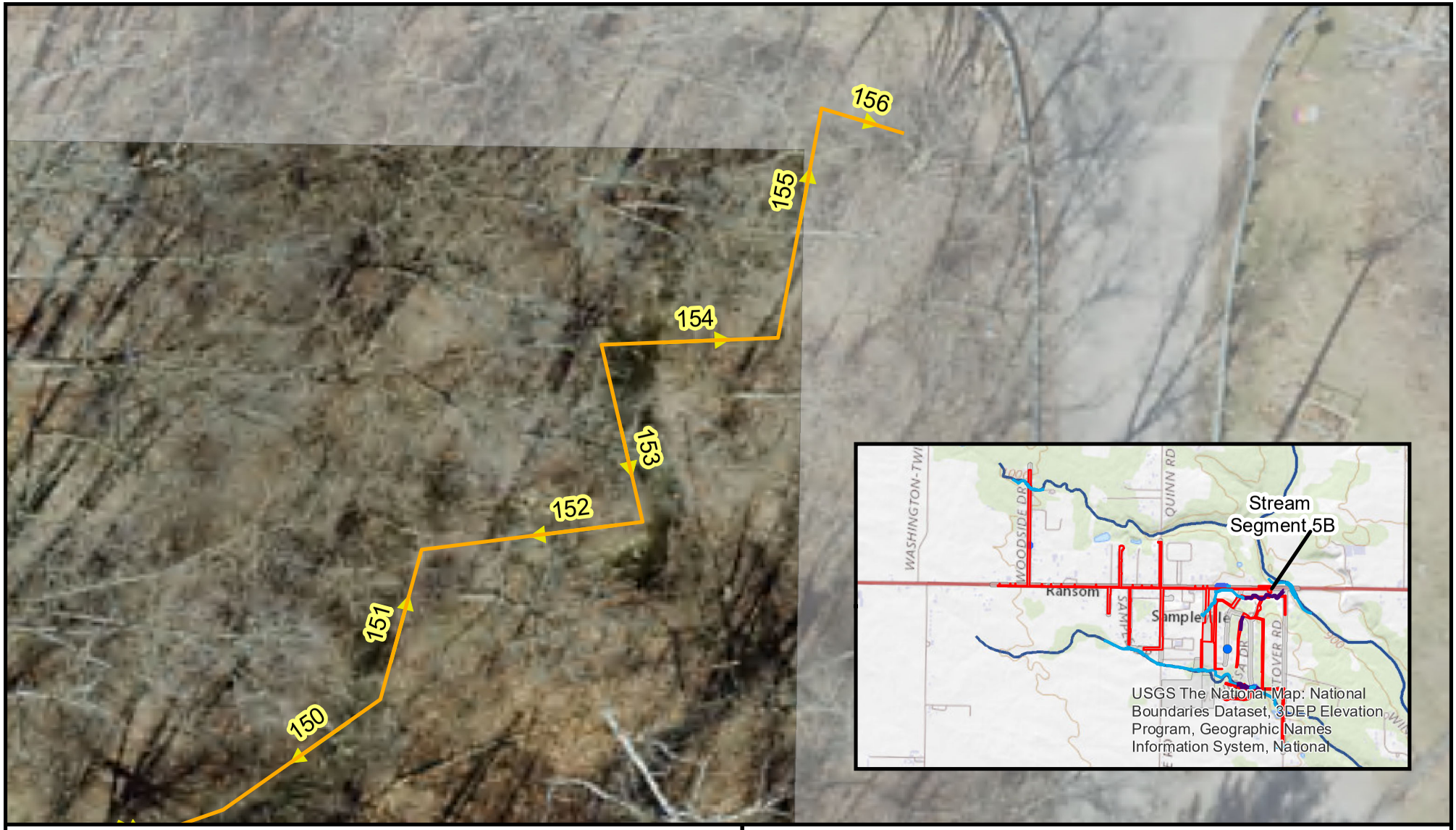
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.006 Miles

CDM Smith

7/26/2023



Legend

- Photo Direction
- Flow Direction
- 2023 Intermittent Stream
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 8-6e: Site Photography Log

Stream Segment 5B

US - 35 Glenwood Area Sanitary Sewer

2020 & 2023 Waters of the United States Field Investigations

Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.006 Miles

CDM Smith

7/26/2023

Legend

- PhotoLog
- Flow Direction
- 2023 Ephemeral Stream
- 2020 Area of Investigation
- 2023 Area of Investigation

Figure 8-7: Site Photography Log

Stream Segment 11

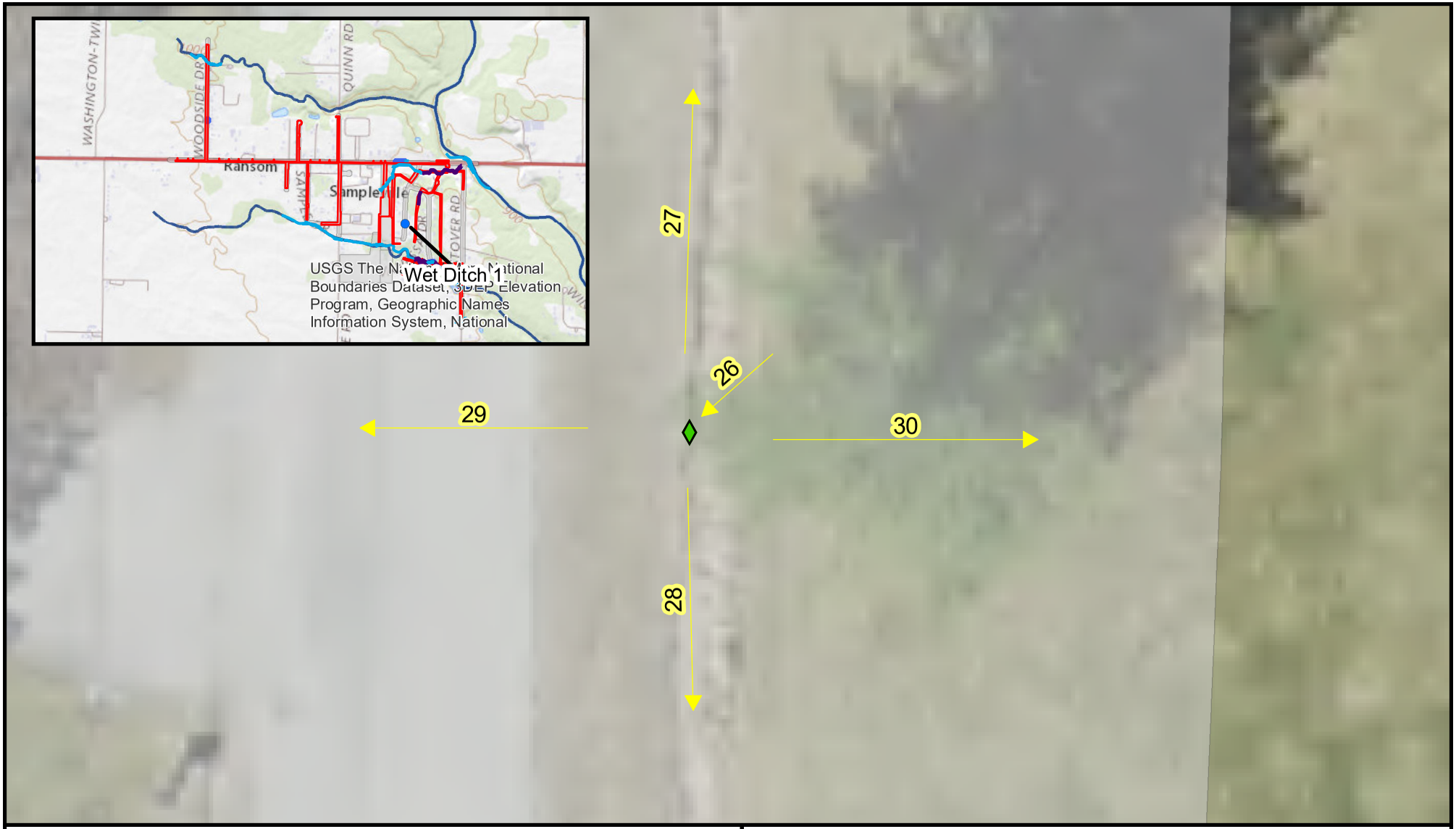
US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.03 Miles

CDM Smith

7/26/2023



Legend

- 2020 Wetland Plot
- Photo Direction
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 8-8: Site Photography Log

Wet Ditch 1

US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations

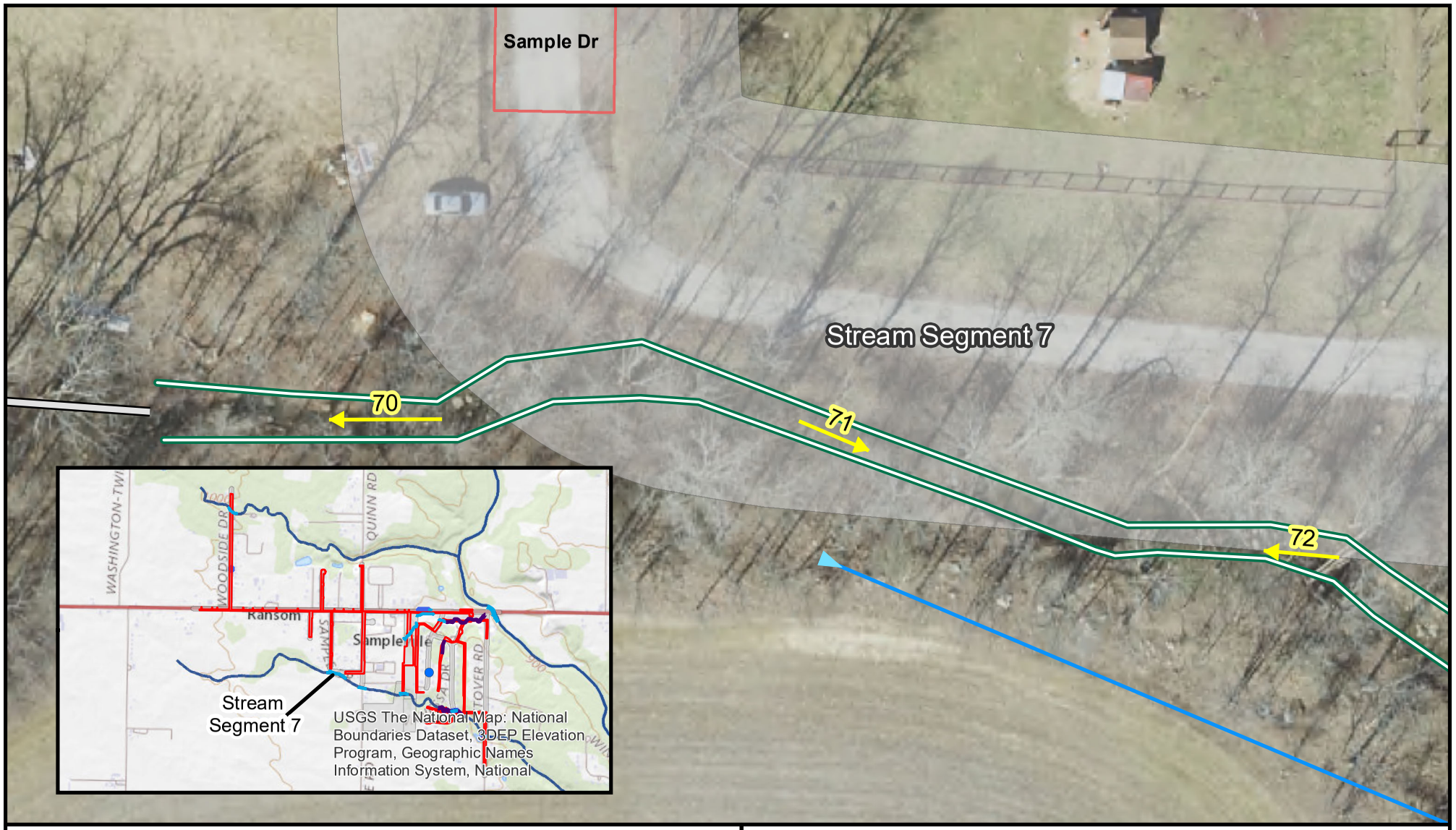
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.004 Miles

CDM Smith

7/26/2023



Legend

- Photo Direction
- Flow Direction
- 2020 Ephemeral Stream
- 2020 Suspected Stream Segment
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 8-9: Site Photogrpahy Log

Stream Segment 7

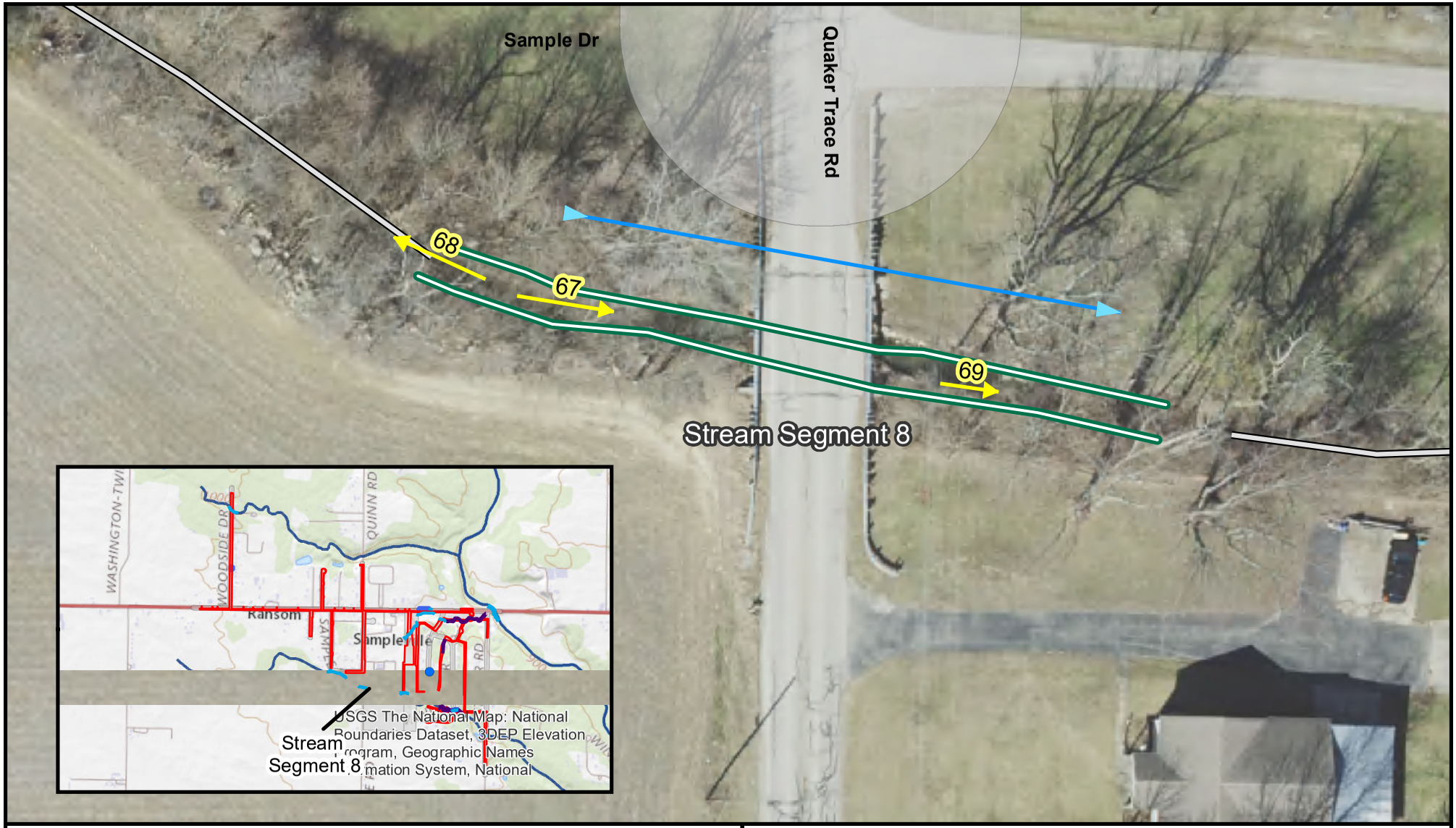
US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.02 Miles

CDM Smith

7/26/2023



Legend

- Photo Direction
- Flow Direction
- 2020 Ephemeral Stream
- 2020 Suspected Stream Segment
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 8-10: Site Photogrpahy Log

Stream Segment 8

US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations

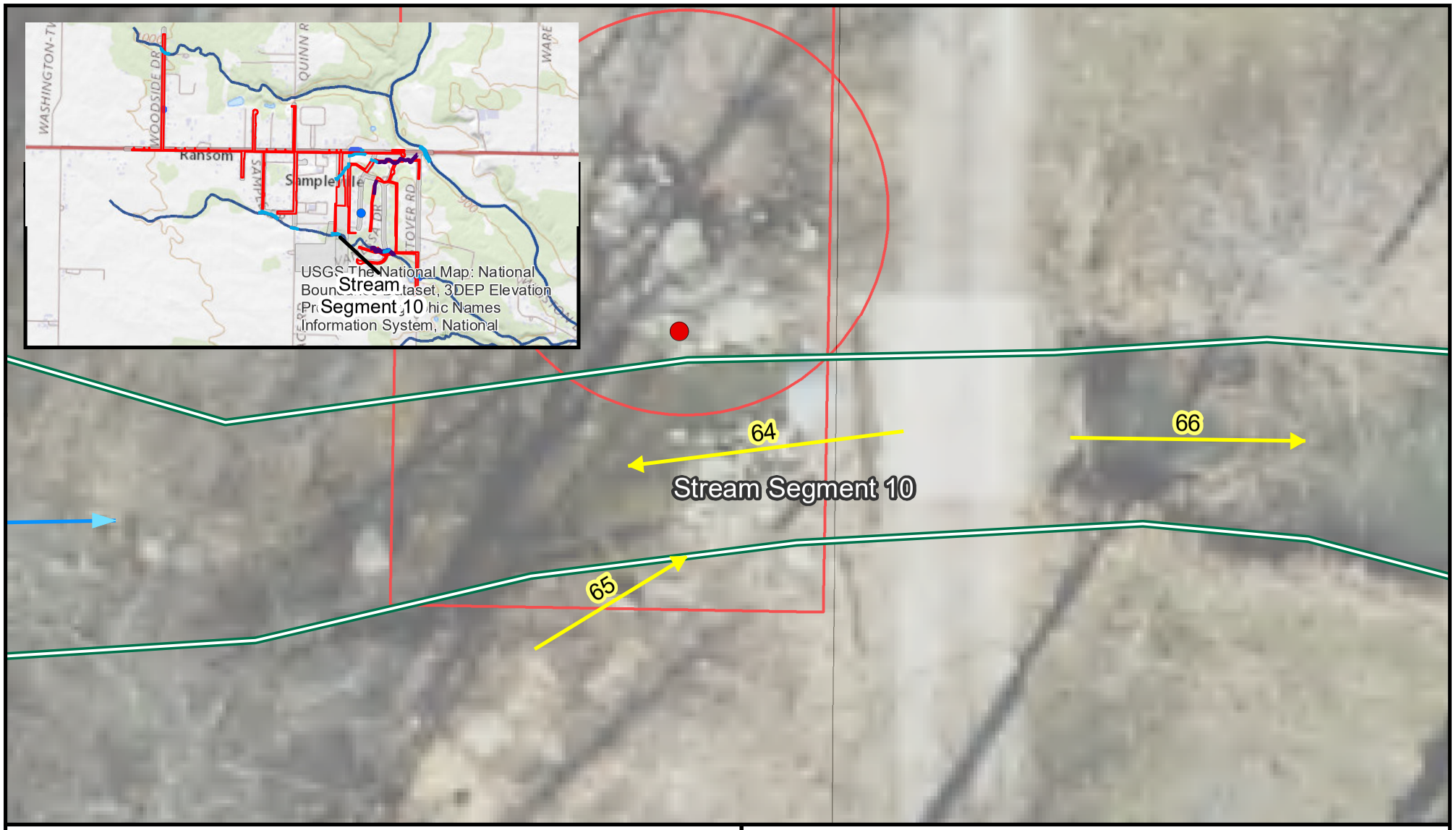
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.02 Miles

CDM Smith

7/26/2023



Legend

- Outfall location
- Photo Direction
- Flow Direction
- 2020 Ephemeral Stream
- 2020 Suspected Stream Segment
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 8-11: Site Photography Log

Stream Segment 10

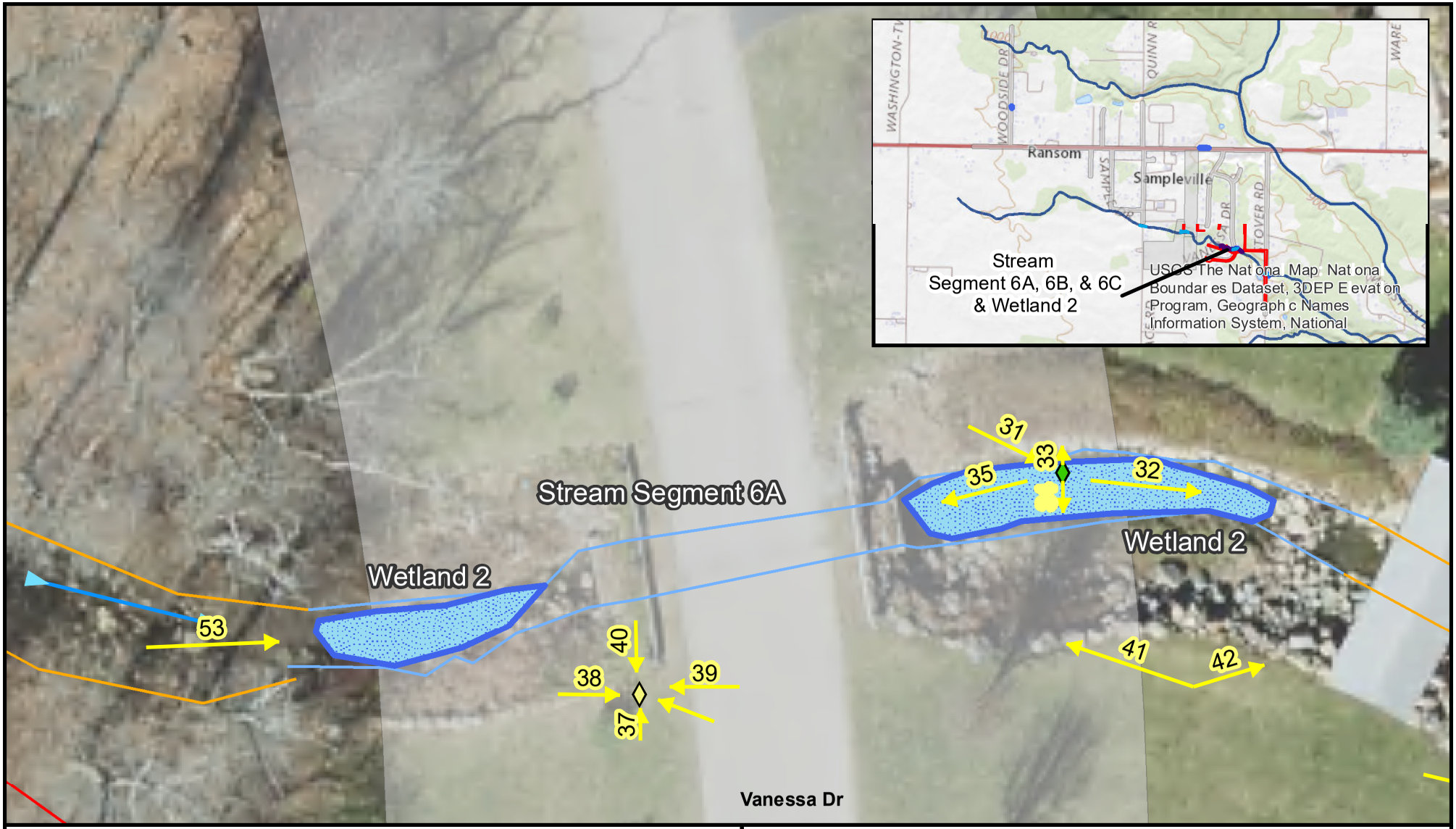
US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.005 Miles

CDM Smith

7/26/2023



Legend

- 2020 Upland Plot
- 2020 Wetland Plot
- Photo Direction
- Flow Direction
- 2020 Intermittent Stream
- 2023 Intermittent Stream
- 2023 Area of Investigation
- 2020 Area of Investigation
- 2020 Wetlands

Figure 8-12a: Site Photography Log

Stream Segment 6A & Wetland 2

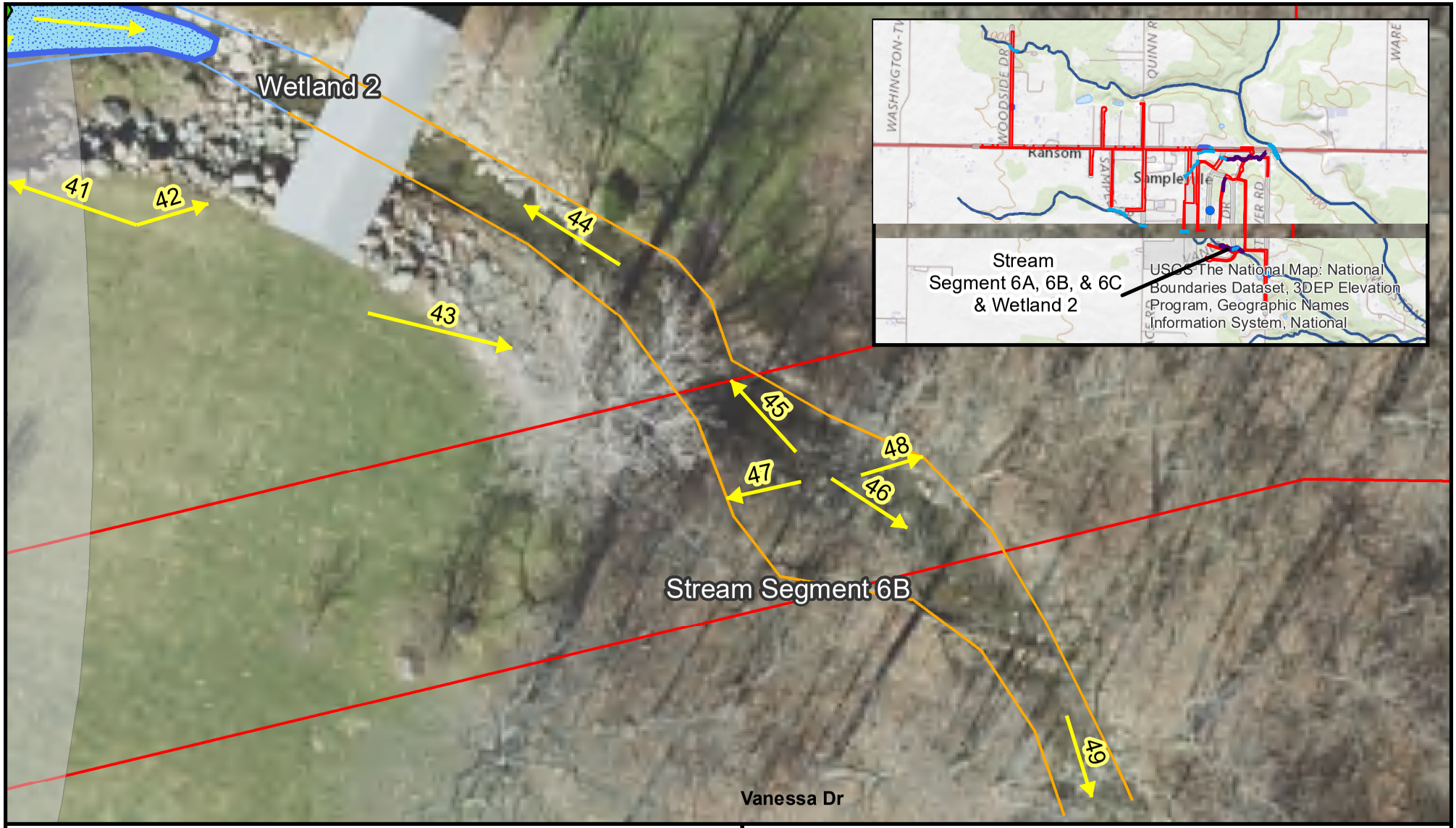
US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.006 Miles

CDM Smith

7/26/2023



Legend

- 2020 Upland Plot
- 2020 Wetland Plot
- Photo Direction
- 2020 Intermittent Stream
- 2023 Intermittent Stream
- 2023 Area of Investigation
- 2020 Wetlands
- 2020 Area of Investigation

Figure 8-12a: Site Photography Log

Stream Segment 6B

US - 35 Glenwood Area Sanitary Sewer

2020 & 2023 Waters of the United States Field Investigations

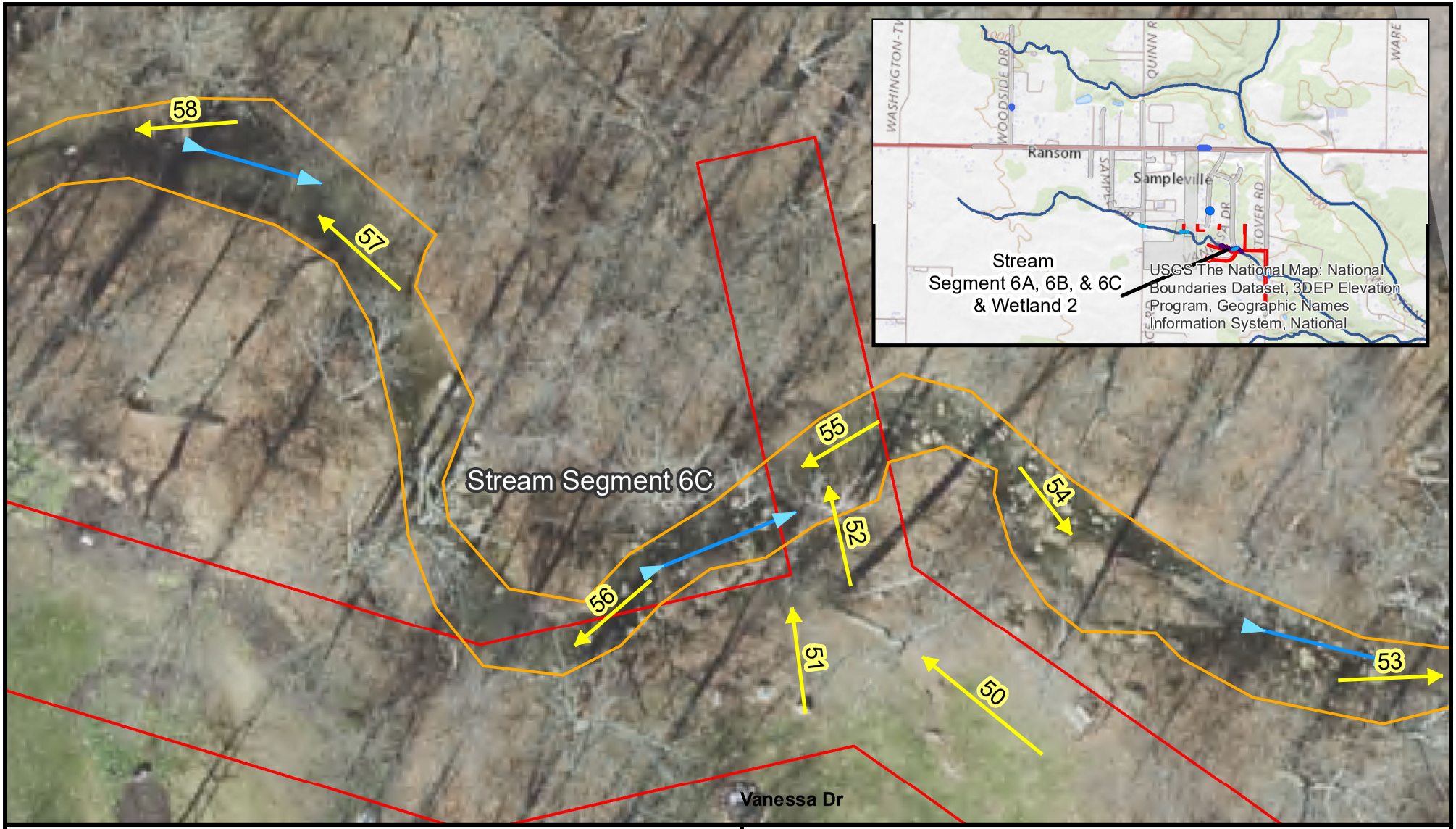
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.006 Miles

CDM Smith

7/26/2023



Legend

- Photo Direction
- Flow Direction
- 2020 Intermittent Stream
- 2023 Intermittent Stream
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 8-12c: Site Photography Log

Stream Segment 6C

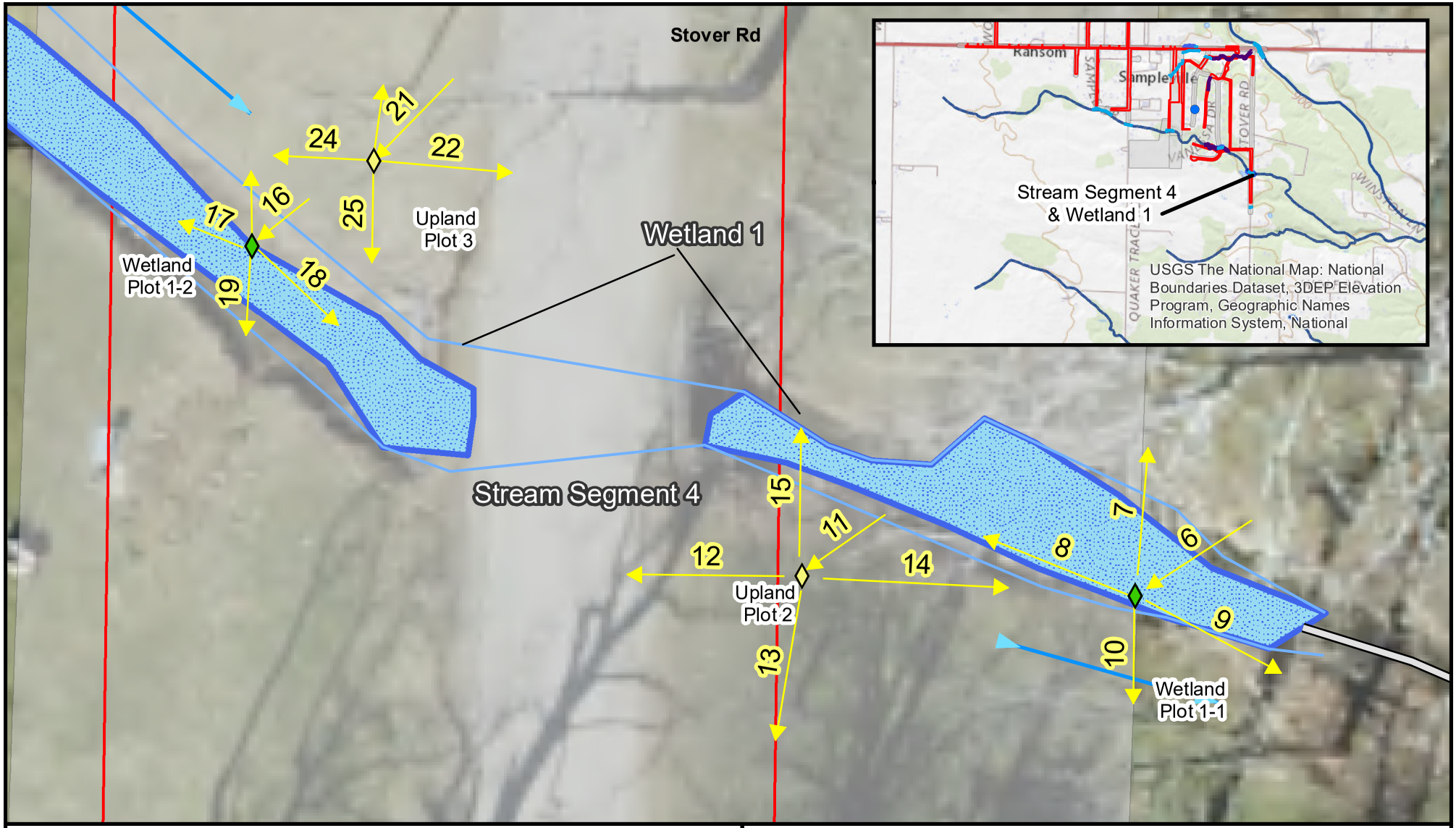
US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.007 Miles

CDM Smith

7/26/2023



Legend

- Photo Direction
- 2020 Upland Plot
- 2020 Wetland Plot
- Flow Direction
- 2020 Intermittent Stream
- 2020 Suspected Stream Segment
- 2023 Area of Investigation
- 2020 Area of Investigation
- 2020 Wetlands

Figure 8-13: Site Photography Log

Stream Segment 4 & Wetland 1

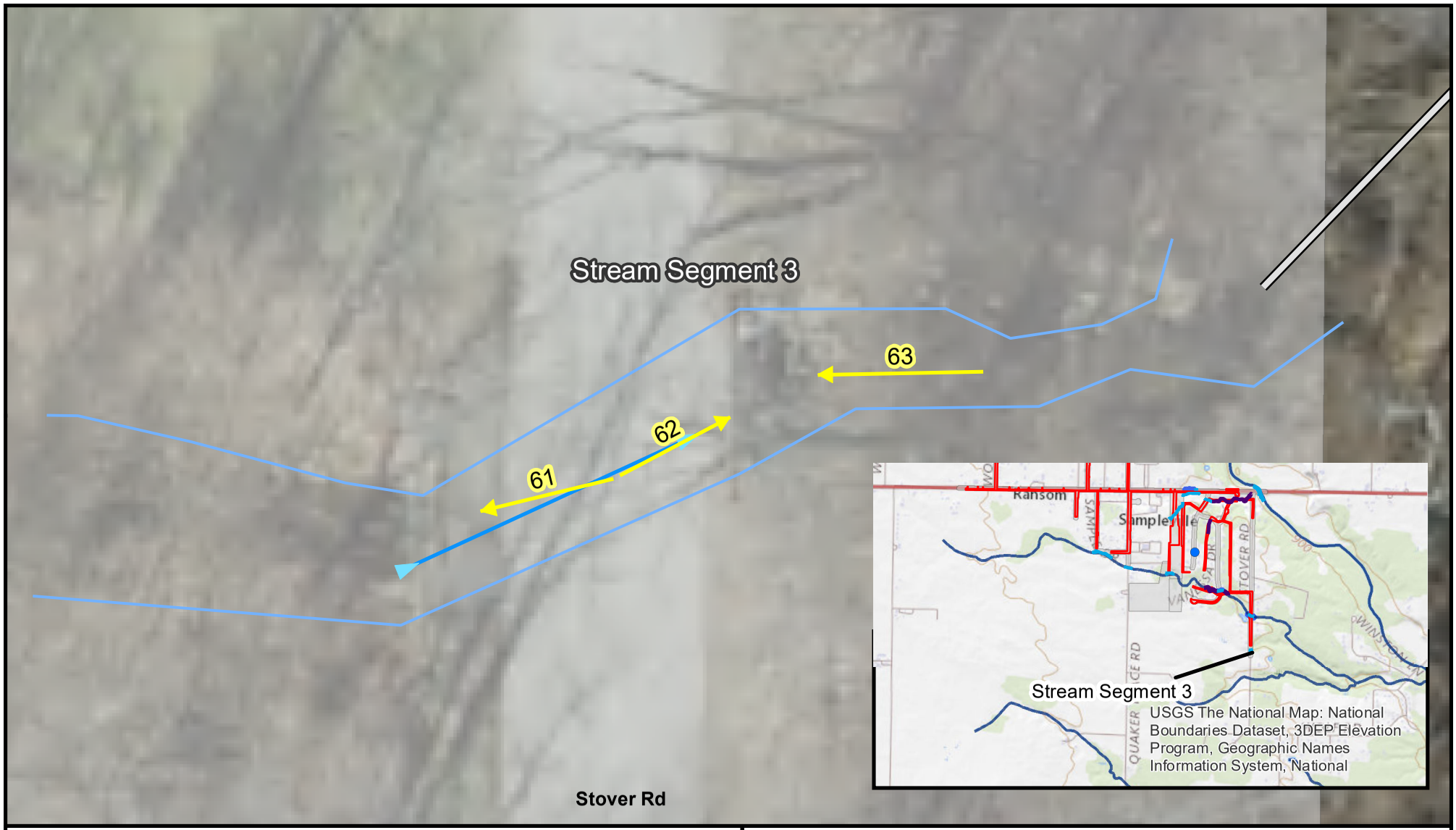
US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.007 Miles

CDM Smith

7/26/2023



Legend

- Photo Direction
- Flow Direction
- 2020 Intermittent Stream
- 2020 Suspected Stream Segment
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 8-14: Site Photography Log

Stream Segment 3

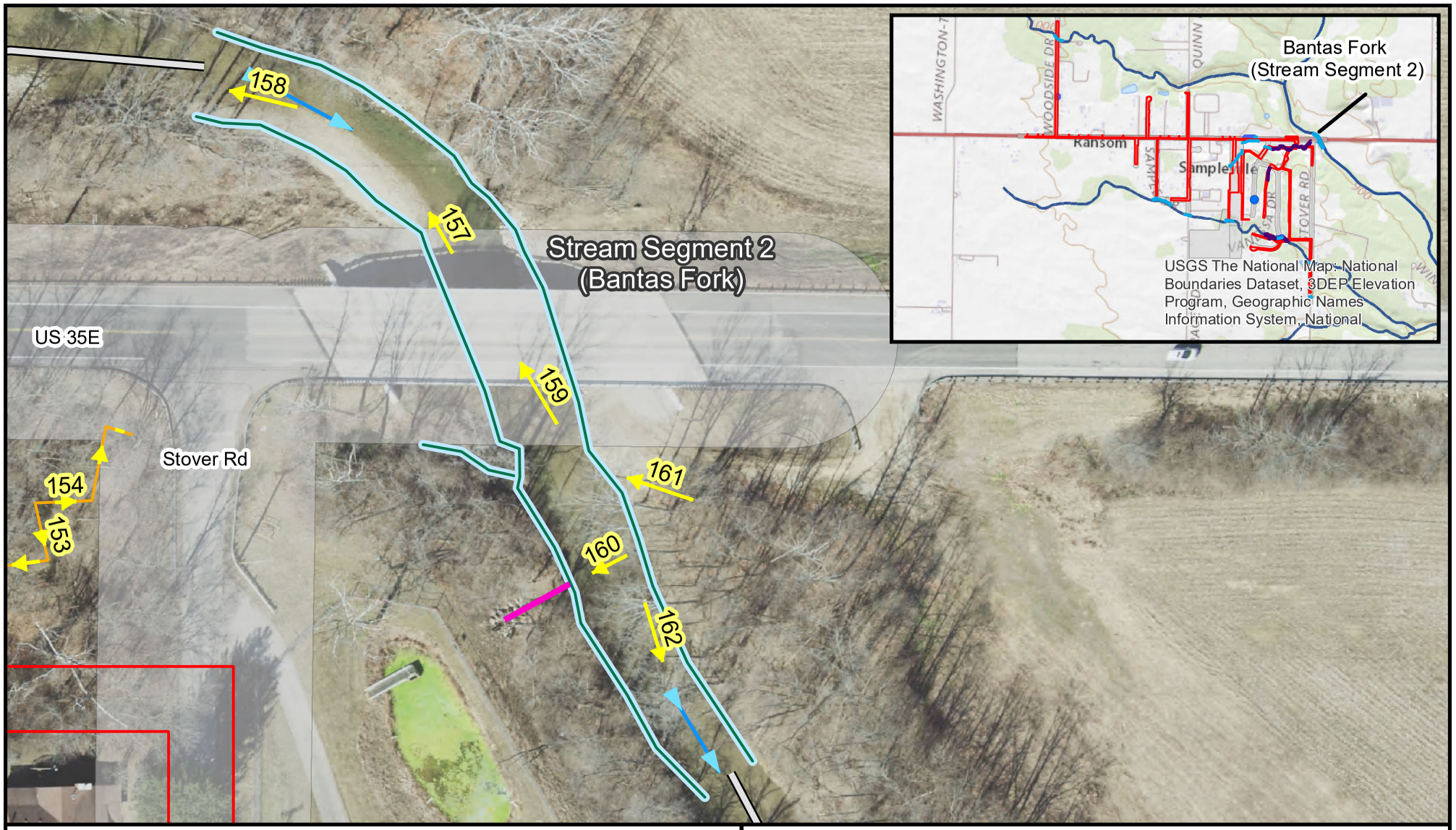
US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.005 Miles

CDM Smith

7/26/2023



Legend

- Photo Direction
- Flow Direction
- 2020 Drainage
- 2020 Perennial
- 2020 Suspected Stream Segment
- 2023 Intermittent Stream
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 8-15: Site Photography Log

Stream Segment 2 - Bantas Fork

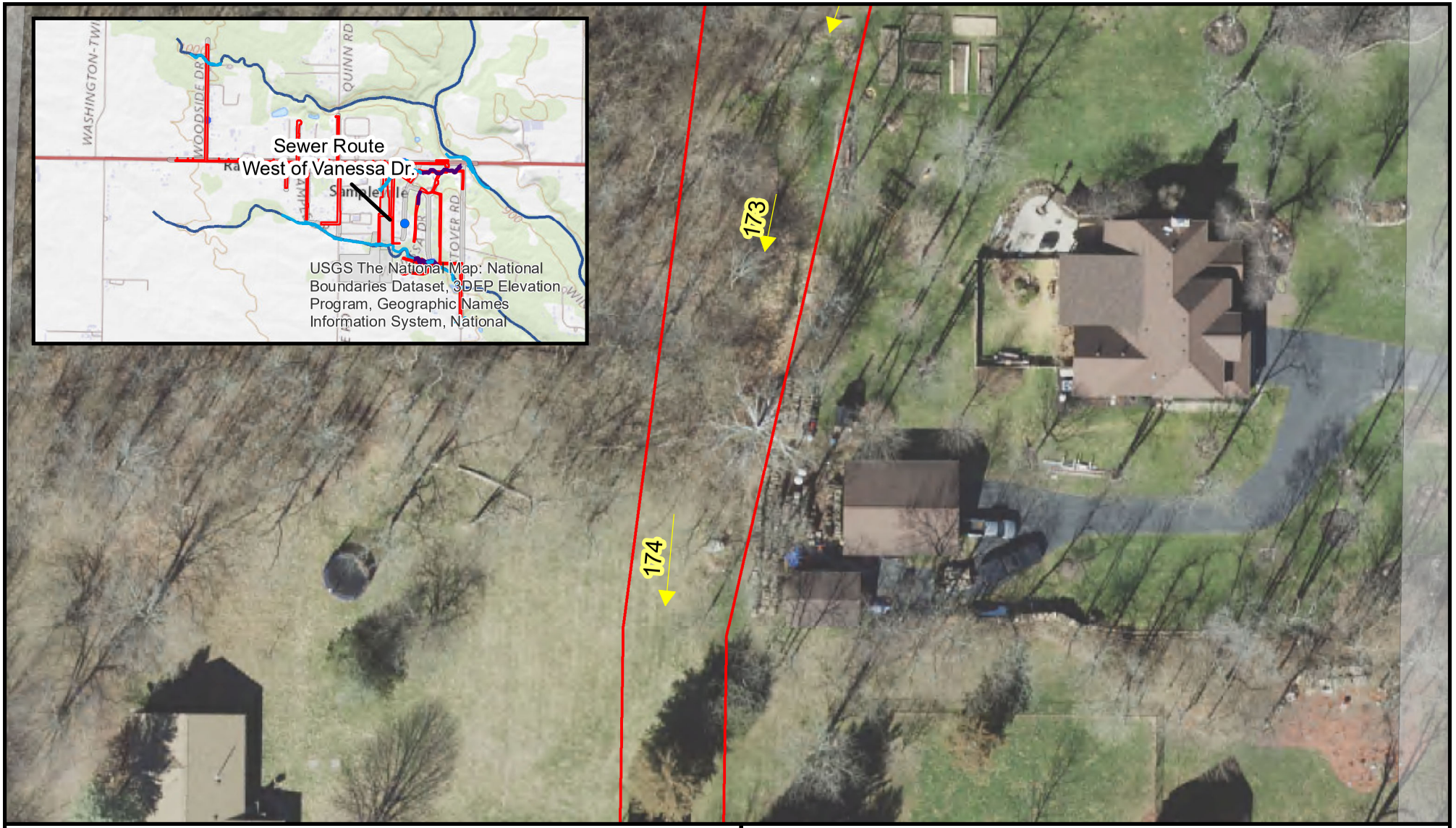
US - 35 Glenwood Area Sanitary Sewer
2020 & 2023 Waters of the United States Field Investigations
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.03 Miles

CDM Smith

7/26/2023



Legend

- Photo Direction
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 8-16a: Site Photography Log

Proposed Sanitary Sewer Route West of Vanessa Dr

US - 35 Glenwood Area Sanitary Sewer

2020 & 2023 Waters of the United States Field Investigations

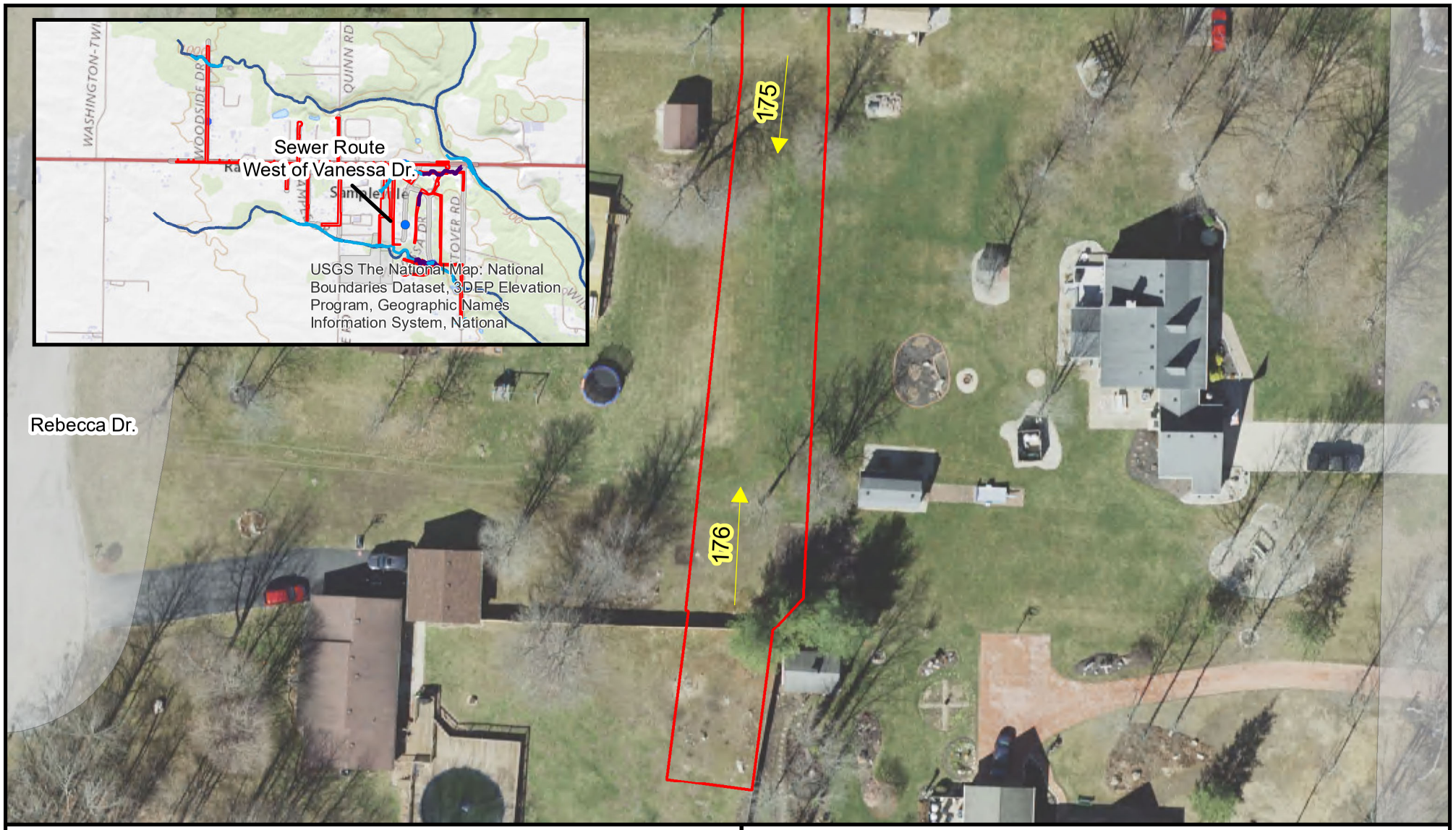
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.02 Miles

CDM Smith

7/26/2023



Legend

- Photo Direction
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 8-16b: Site Photography Log

Proposed Sanitary Sewer Route West of Vanessa Dr

US - 35 Glenwood Area Sanitary Sewer

2020 & 2023 Waters of the United States Field Investigations

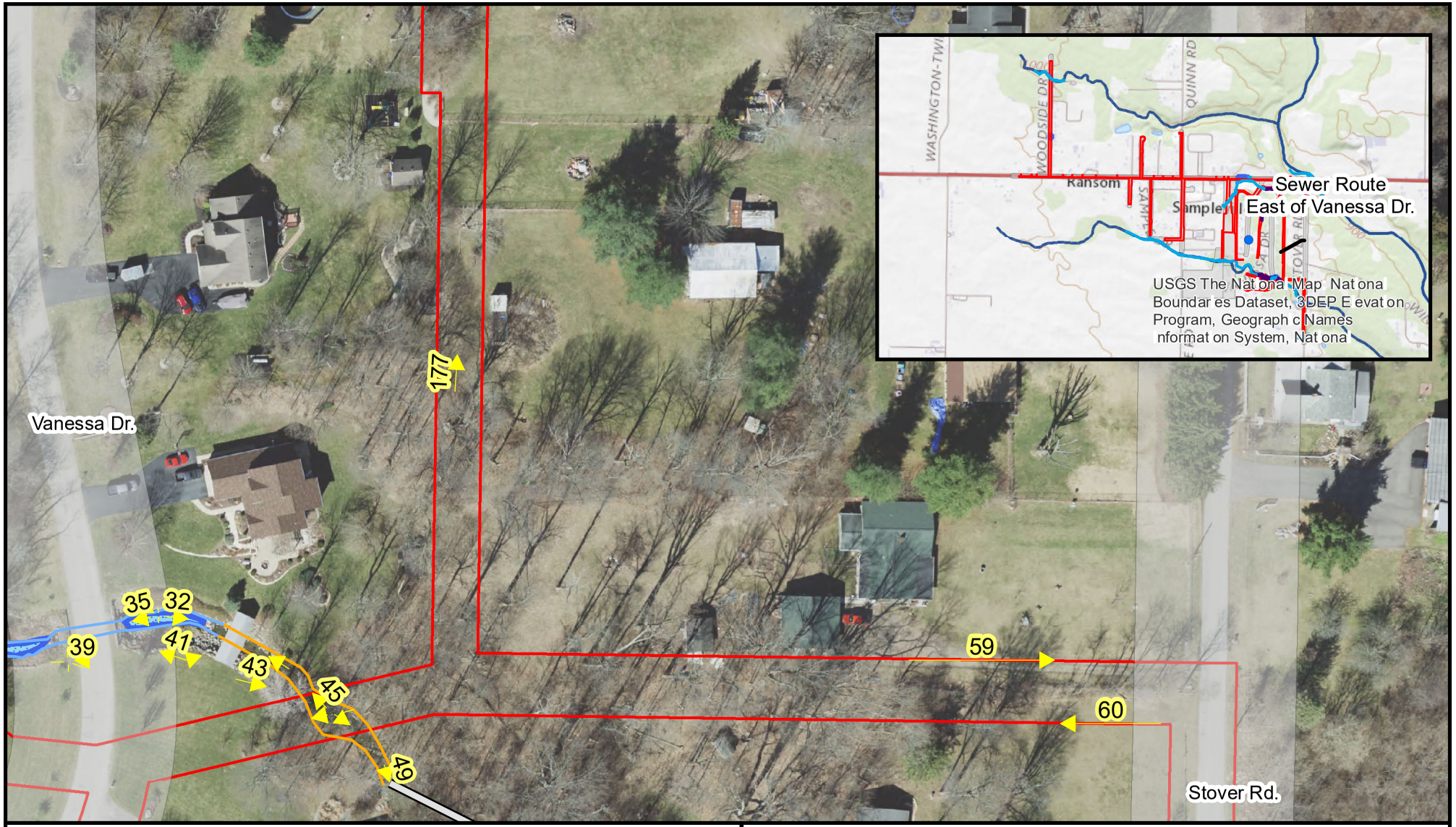
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.02 Miles

CDM Smith

7/26/2023



Legend

- Photo Direction
- 2020 Delineated Intermittent Stream
- 2020 Suspected Stream Segment
- 2023 Intermittent
- 2023 Area of Investigation
- 2020 Wetlands
- 2020 Area of Investigation

Figure 8-17a: Site Photography Log

Proposed Sanitary Sewer Route East of Vanessa Dr

US - 35 Glenwood Area Sanitary Sewer

2020 & 2023 Waters of the United States Field Investigations

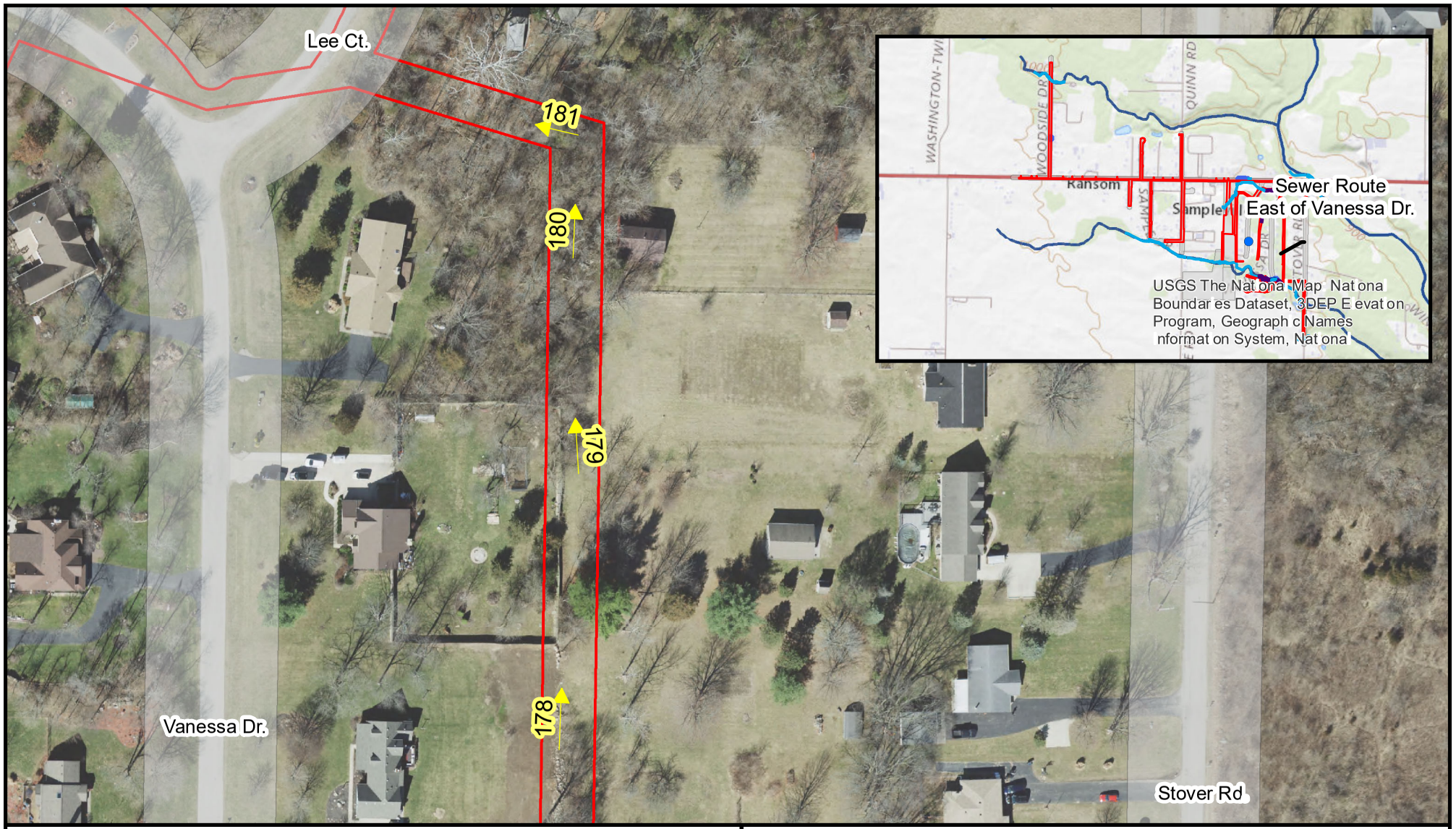
Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

0 0.04 Miles

CDM Smith

7/26/2023



Legend

- Photo Direction
- 2023 Area of Investigation
- 2020 Area of Investigation

Figure 8-17b: Site Photography Log

Proposed Sanitary Sewer Route East of Vanessa Dr

US - 35 Glenwood Area Sanitary Sewer

2020 & 2023 Waters of the United States Field Investigations

Twin and Lanier Townships, West Alexandria, Preble County, Ohio

N

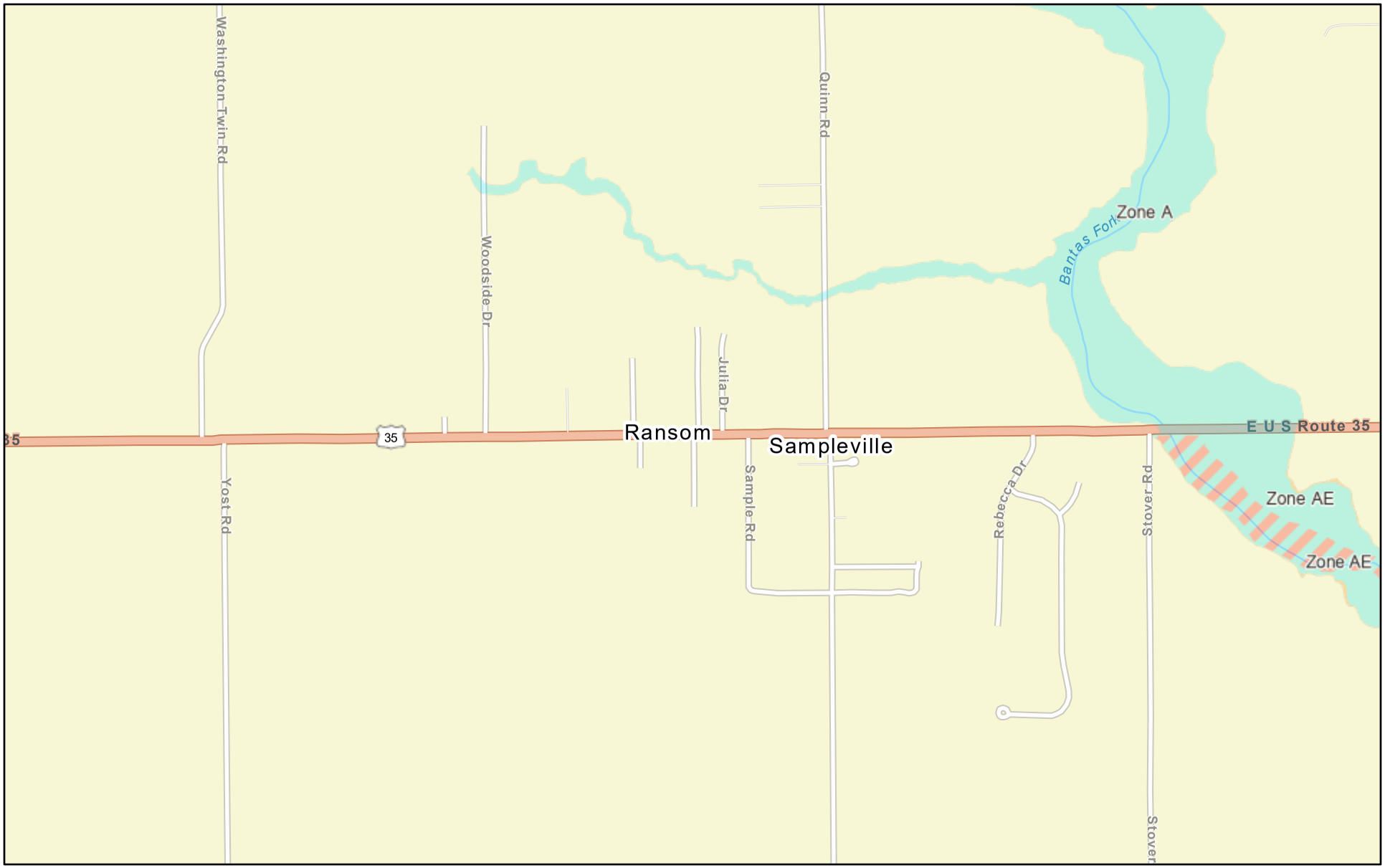
0 0.06 Miles

CDM Smith

7/26/2023

Appendix B. Floodplain Map

Glenwood Sanitary Sewer System Project FEMA Map



November 3, 2023

Flood Hazard Zones

- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- Special Floodway
- Area of Undetermined Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard
- Area with Reduced Risk Due to Levee
- Area with Risk Due to Levee

1:18,056

0 0.1 0.2 0.4 mi

0 0.17 0.35 0.7 km

Esri Community Maps Contributors, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau,

Appendix C. Soils and NCRS Coordination

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*		Date Of Land Evaluation Request 8/24/2023	
Name of Project Glenwood Sanitary Sewer System		Federal Agency Involved USACE	
Proposed Land Use WWTP and Access Road		County and State Preble County, Ohio	
PART II *(To be completed by NRCS)*		Date Request Received By NRCS 8/24/2023	Person Completing Form: Jessica Martin
Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES ☑ NO ☐	Acres Irrigated 50,665	Average Farm Size 179 acres
Major Crop(s) Corn, Beans and Wheat	Farmable Land In Govt. Jurisdiction Acres: 92.94 % 253,679	Amount of Farmland As Defined in FPPA Acres: 79.45 % 216,874	
Name of Land Evaluation System Used OH	Name of State or Local Site Assessment System OH	Date Land Evaluation Returned by NRCS 8/31/2023	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	4.06			
B. Total Acres To Be Converted Indirectly	0			
C. Total Acres In Site	12.5			
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	4.3			
B. Total Acres Statewide Important or Local Important Farmland				
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	0.0019			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	53.76			
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)	77.62			

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	**Maximum Points**	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)	7			
2. Perimeter In Non-urban Use	(10)	0			
3. Percent Of Site Being Farmed	(20)	0			
4. Protection Provided By State and Local Government	(20)	0			
5. Distance From Urban Built-up Area	(15)	0			
6. Distance To Urban Support Services	(15)	0			
7. Size Of Present Farm Unit Compared To Average	(10)	0			
8. Creation Of Non-farmable Farmland	(10)	0			
9. Availability Of Farm Support Services	(5)	3			
10. On-Farm Investments	(20)	0			
11. Effects Of Conversion On Farm Support Services	(10)	0			
12. Compatibility With Existing Agricultural Use	(10)	0			
TOTAL SITE ASSESSMENT POINTS	160	10	0	0	0
PART VII ***(To be completed by Federal Agency)***					
Relative Value Of Farmland *(From Part V)*	100	77.62	0	0	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	10	0	0	0
TOTAL POINTS ***(Total of above 2 lines)***	260	87.62	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☐ NO ☑

Reason For Selection:

Name of Federal agency representative completing this form: Micah Cothren | Date: 9/18/2023

(See Instructions on reverse side)

Form AD-1006 (03-02)

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, http://fppa.nrcs.usda.gov/lesa/.

Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s)of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map, or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)

Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.

Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.

Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.

Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.

Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

(For Federal Agency)

Part I: When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

Part III: When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

Part VI: Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.

2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.
Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \text{ X } 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.

United States Department of Agriculture

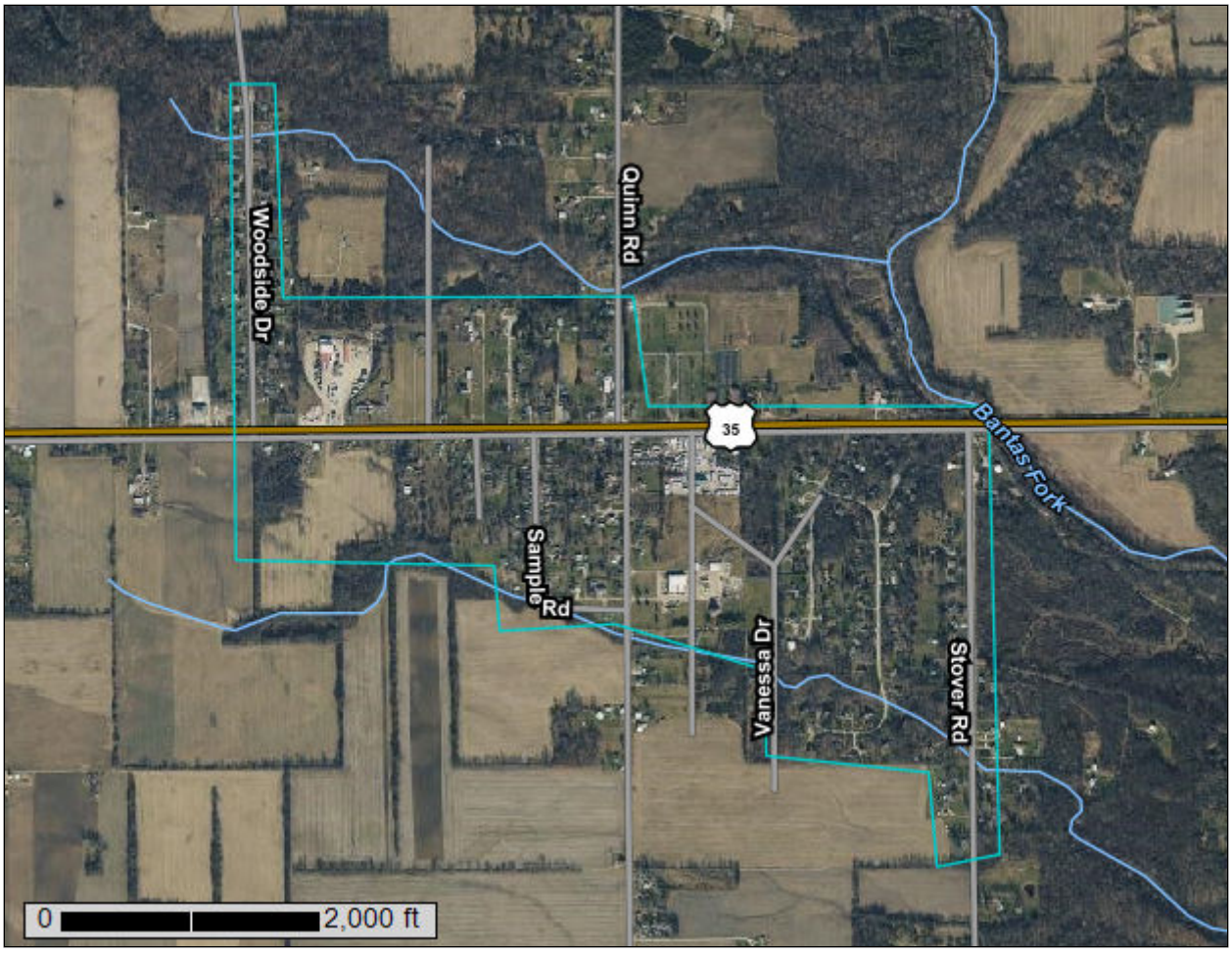
NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Preble County, Ohio

Glenwood Wastewater Collection and Treatment Project



October 31, 2023

Preface

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

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

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

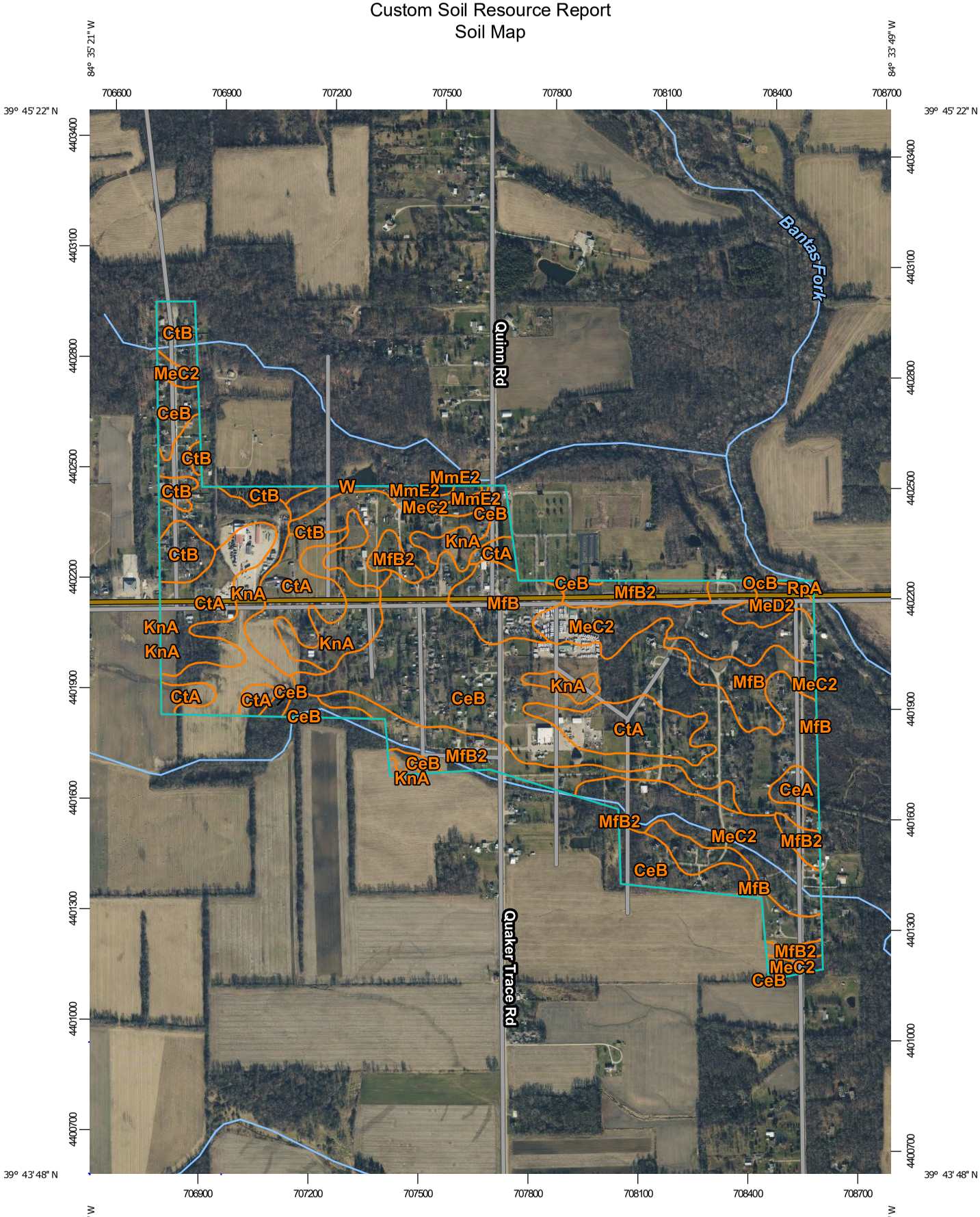
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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

Soil Map

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

Custom Soil Resource Report
Soil Map



Map Scale: 1:14,100 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 200 400 800 1200

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 1:12,000.

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: Preble County, Ohio
Survey Area Data: Version 22, Sep 11, 2023

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

Date(s) aerial images were photographed: Oct 28, 2019—Dec 5, 2019

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CeA	Celina silt loam, 0 to 2 percent slopes	2.7	0.8%
CeB	Celina silt loam, 2 to 6 percent slopes	102.1	30.1%
CtA	Crosby-Celina silt loams, 0 to 2 percent slopes	47.7	14.1%
CtB	Crosby-Celina silt loams, 2 to 4 percent slopes, eroded	27.4	8.1%
KnA	Kokomo silt loam, 0 to 1 percent slopes	44.0	13.0%
MeC2	Miamian silt loam, 6 to 12 percent slopes, eroded	49.7	14.7%
MeD2	Miamian silt loam, 12 to 18 percent slopes, eroded	4.5	1.3%
MfB	Miamian-Celina silt loams, 2 to 6 percent slopes	29.8	8.8%
MfB2	Miamian-Celina silt loams, 2 to 6 percent slopes, eroded	29.2	8.6%
MmE2	Miamian-Hennepin silt loams, 18 to 25 percent slopes, eroded	0.9	0.3%
OcB	Ockley silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	0.1	0.0%
RpA	Rossburg silt loam, moderately wet, sandy substratum, 0 to 1 percent slopes, occasionally flooded	0.5	0.2%
W	Water	0.4	0.1%
Totals for Area of Interest		**339.1**	**100.0%**

Map Unit Descriptions

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

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class.

Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

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

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The

pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

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

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

Preble County, Ohio

CeA—Celina silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2vzc9
Elevation: 660 to 1,410 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Celina and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Celina

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess over loamy till derived from limestone and dolomite

Typical profile

Ap - 0 to 9 inches: silt loam
2Bt - 9 to 25 inches: clay
2BCt - 25 to 30 inches: loam
2Cd - 30 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C/D
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Minor Components

Kokomo

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Crosby

Percent of map unit: 5 percent
Landform: Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

CeB—Celina silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2rwj9
Elevation: 820 to 1,180 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Celina and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Celina

Setting

Landform: Till plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess derived from quartzite over loamy till derived from limestone and dolomite

Typical profile

Ap - 0 to 9 inches: silt loam

2Bt - 9 to 38 inches: clay loam
2Cd - 38 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 24 to 40 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Minor Components

Crosby

Percent of map unit: 5 percent
Landform: Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

Brookston

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Kokomo

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

CtA—Crosby-Celina silt loams, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2w0vy
Elevation: 830 to 1,230 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Crosby and similar soils: 60 percent
Celina and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Crosby

Setting

Landform: Till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess over loamy till

Typical profile

Ap - 0 to 9 inches: silt loam
2Bt - 9 to 28 inches: clay loam
2BCt - 28 to 36 inches: clay loam
2Cd - 36 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 24 to 39 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XD009IN - Wet Till Ridge, F111XA008IN - Wet Till Ridge

Hydric soil rating: No

Description of Celina

Setting

Landform: Till plains
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess over loamy till

Typical profile

Ap - 0 to 9 inches: silt loam
2Bt - 9 to 25 inches: clay
2BCt - 25 to 30 inches: loam
2Cd - 30 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C/D
Ecological site: F111XD010IN - Till Ridge, F111XA009IN - Till Ridge
Hydric soil rating: No

Minor Components

Reesville

Percent of map unit: 5 percent
Landform: Till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XD005IN - Till Depression
Hydric soil rating: No

Kokomo

Percent of map unit: 5 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F111XD008IN - Till Depression Flatwood
Hydric soil rating: Yes

Losantville

Percent of map unit: 5 percent
Landform: Till plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F111XD010IN - Till Ridge
Hydric soil rating: No

CtB—Crosby-Celina silt loams, 2 to 4 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2w0tc
Elevation: 800 to 1,220 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Crosby and similar soils: 60 percent
Celina, eroded, and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Crosby

Setting

Landform: Recessionial moraines, ground moraines, water-lain moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Silty material or loess over loamy till

Typical profile

Ap - 0 to 8 inches: silt loam
BE - 8 to 11 inches: silt loam
Bt1 - 11 to 14 inches: silt loam
2Bt2 - 14 to 28 inches: silty clay loam
2BCt - 28 to 36 inches: loam
2Cd - 36 to 79 inches: loam

Properties and qualities

Slope: 2 to 4 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

Description of Celina, Eroded

Setting

Landform: Ground moraines, recessionial moraines, water-lain moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Nose slope, crest
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Parent material: Silty material or loess over loamy till

Typical profile

Ap - 0 to 9 inches: silt loam
2Bt - 9 to 33 inches: clay loam
2BCt - 33 to 37 inches: loam
2Cd - 37 to 79 inches: loam

Properties and qualities

Slope: 2 to 4 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Minor Components

Kokomo, drained

Percent of map unit: 8 percent

Landform: Water-lain moraines, depressions, swales
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Miamian, eroded

Percent of map unit: 2 percent
Landform: Ground moraines, recessionial moraines, water-lain moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Crest, nose slope
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

KnA—Kokomo silt loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2w57b
Elevation: 600 to 1,000 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kokomo and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kokomo

Setting

Landform: Ground moraines, depressions, flats
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy glaciofluvial deposits over loamy till

Typical profile

Ap - 0 to 10 inches: silt loam
Btg - 10 to 30 inches: silty clay loam
Bt - 30 to 50 inches: clay loam
2BCt - 50 to 68 inches: loam
2C - 68 to 79 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Minor Components

Celina

Percent of map unit: 5 percent
Landform: Till plains
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Crosby

Percent of map unit: 5 percent
Landform: Till plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

MeC2—Miamian silt loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 30stx
Elevation: 650 to 1,530 feet
Mean annual precipitation: 38 to 43 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 150 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Miamian, eroded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miamian, Eroded

Setting

Landform: Moraines, till plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess over loamy till derived from limestone and dolomite

Typical profile

Ap - 0 to 7 inches: silt loam
2Bt - 7 to 24 inches: clay loam
2BCt - 24 to 28 inches: clay loam
2Cd - 28 to 79 inches: loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 26 to 39 inches to densic material
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 30 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Minor Components

Crosby

Percent of map unit: 6 percent
Landform: Recessionial moraines, ground moraines, water-lain moraines
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

Brookston

Percent of map unit: 4 percent

Landform: Depressions, till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

MeD2—Miamian silt loam, 12 to 18 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2t98v
Elevation: 660 to 1,530 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Miamian, eroded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miamian, Eroded

Setting

Landform: Moraines, till plains
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Loess over loamy till

Typical profile

Ap - 0 to 6 inches: silt loam
2Bt - 6 to 22 inches: clay loam
2BC - 22 to 27 inches: clay loam
2Cd - 27 to 79 inches: loam

Properties and qualities

Slope: 12 to 18 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 30 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Minor Components

Crosby

Percent of map unit: 5 percent
Landform: Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

Losantville, severely eroded

Percent of map unit: 3 percent
Landform: Till plains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Hennepin, eroded

Percent of map unit: 2 percent
Landform: Till plains, moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

MfB—Miamian-Celina silt loams, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 72dx
Elevation: 700 to 1,530 feet
Mean annual precipitation: 33 to 45 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 151 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Miamian and similar soils: 60 percent
Celina and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miamian

Setting

Landform: Rises on till plains
Landform position (two-dimensional): Summit
Parent material: A thin layer of loess and the underlying till

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 29 inches: clay loam
H3 - 29 to 35 inches: clay loam
H4 - 35 to 80 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 30 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XA009IN - Till Ridge
Forage suitability group: Unnamed (G111BYA-1OH)
Other vegetative classification: Unnamed (G111BYA-1OH)
Hydric soil rating: No

Description of Celina

Setting

Landform: Rises on till plains
Landform position (two-dimensional): Summit
Parent material: A thin layer of loess and the underlying till

Typical profile

H1 - 0 to 10 inches: silt loam
H2 - 10 to 34 inches: clay loam
H3 - 34 to 80 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Drainage class: Moderately well drained

Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XA009IN - Till Ridge
Forage suitability group: Unnamed (G111AYA-6OH)
Other vegetative classification: Unnamed (G111AYA-6OH)
Hydric soil rating: No

Minor Components

Kokomo
Percent of map unit: 5 percent
Landform: Depressions on till plains
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Crosby
Percent of map unit: 5 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XA008IN - Wet Till Ridge

MfB2—Miamian-Celina silt loams, 2 to 6 percent slopes, eroded

Map Unit Setting
National map unit symbol: 2w57j
Elevation: 520 to 1,530 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Miamian, eroded, and similar soils: 60 percent
Celina, eroded, and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miamian, Eroded

Setting

Landform: Till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess over loamy till

Typical profile

Ap - 0 to 9 inches: silt loam
Bt1 - 9 to 12 inches: silty clay loam
2Bt2 - 12 to 24 inches: clay
2BCt - 24 to 33 inches: loam
2Cd - 33 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 28 to 40 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 30 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Description of Celina, Eroded

Setting

Landform: Till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess over loamy till

Typical profile

Ap - 0 to 9 inches: silt loam
2Bt - 9 to 33 inches: clay loam
2BCt - 33 to 37 inches: loam
2Cd - 37 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 40 inches to densic material

Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Minor Components

Kokomo, frequent ponding

Percent of map unit: 5 percent
Landform: Ground moraines, flats, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear, concave
Across-slope shape: Concave
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Crosby

Percent of map unit: 5 percent
Landform: Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

MmE2—Miamian-Hennepin silt loams, 18 to 25 percent slopes, eroded

Map Unit Setting

National map unit symbol: nwtw
Elevation: 680 to 1,530 feet
Mean annual precipitation: 32 to 42 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 150 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Miamian and similar soils: 70 percent
Hennepin and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miamian

Setting

Landform: Till plains
Landform position (two-dimensional): Backslope
Parent material: A thin layer of loess and the underlying till

Typical profile

H1 - 0 to 3 inches: silt loam
H2 - 3 to 18 inches: clay loam
H3 - 18 to 26 inches: clay loam
H4 - 26 to 80 inches: loam

Properties and qualities

Slope: 18 to 25 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 30 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F111XD010IN - Till Ridge, F111XA009IN - Till Ridge
Hydric soil rating: No

Description of Hennepin

Setting

Landform: Till plains
Landform position (two-dimensional): Backslope
Parent material: Basal till

Typical profile

H1 - 0 to 4 inches: silt loam
H2 - 4 to 19 inches: clay loam
H3 - 19 to 80 inches: loam

Properties and qualities

Slope: 18 to 25 percent
Depth to restrictive feature: 10 to 20 inches to densic material
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Available water supply, 0 to 60 inches: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: F111XD010IN - Till Ridge, F111XA009IN - Till Ridge
Forage suitability group: Unnamed (G111AYA-2OH)
Other vegetative classification: Unnamed (G111AYA-2OH)
Hydric soil rating: No

OcB—Ockley silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2t4ln
Elevation: 400 to 1,300 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 155 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ockley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ockley

Setting

Landform: Outwash terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess over loamy outwash over sandy and gravelly outwash

Typical profile

Ap - 0 to 10 inches: silt loam
2Bt1 - 10 to 41 inches: clay loam
2Bt2 - 41 to 66 inches: gravelly clay loam
3C - 66 to 79 inches: gravelly loamy coarse sand

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 40 to 70 inches to strongly contrasting textural stratification
Drainage class: Well drained

Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F111XD018IN - Dry Outwash Upland, F111XA015IN - Dry Outwash Upland
Hydric soil rating: No

Minor Components

Eldean

Percent of map unit: 5 percent
Landform: Outwash terraces
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA015IN - Dry Outwash Upland
Hydric soil rating: No

Fox

Percent of map unit: 5 percent
Landform: Outwash plains, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F111XA015IN - Dry Outwash Upland
Hydric soil rating: No

Sleeth

Percent of map unit: 5 percent
Landform: Stream terraces, outwash terraces
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA014IN - Outwash Upland
Hydric soil rating: No

RpA—Rossburg silt loam, moderately wet, sandy substratum, 0 to 1 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: 72f6
Elevation: 800 to 1,100 feet
Mean annual precipitation: 32 to 45 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Rossburg and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rossburg

Setting

Landform: Flood plains
Parent material: Loamy alluvium over sandy and gravelly alluvium

Typical profile

H1 - 0 to 18 inches: silt loam
H2 - 18 to 35 inches: loam
H3 - 35 to 52 inches: sandy loam
H4 - 52 to 80 inches: extremely gravelly sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 42 to 72 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F111XA005IN - Dry Alluvium
Hydric soil rating: No

Minor Components

Stonelick

Percent of map unit: 10 percent
Landform: Flood plains
Ecological site: F111XA005IN - Dry Alluvium

Sloan

Percent of map unit: 5 percent
Landform: Flood plains
Ecological site: F111XA004IN - Wet Alluvium
Hydric soil rating: Yes

W—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

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U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request **8/24/23**	4. Sheet 1 of _____
1. Name of Project **Glenwood Sanitary Sewer System**	5. Federal Agency Involved **USACE**	
2. Type of Project	6. County and State **Preble County, Ohio**	

PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS **8/24/23**	2. Person Completing Form **Jessica Martin**
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☐ NO ☑		4. Acres Irrigated **50,665** / Average Farm Size **216,874**
5. Major Crop(s) **Corn, Beans and Wheat**	6. Farmable Land in Government Jurisdiction Acres: **253,679** % **79.**	7. Amount of Farmland As Defined in FPPA Acres: **216,874** % **79.**
8. Name Of Land Evaluation System Used **OH**	9. Name of Local Site Assessment System **OH**	10. Date Land Evaluation Returned by NRCS **8/31/23**

PART III *(To be completed by Federal Agency)*	Alternative Corridor For Segment _____ Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres To Be Converted Directly				
B. Total Acres To Be Converted Indirectly, Or To Receive Services				
C. Total Acres In Corridor	0	0	0	0
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide And Local Important Farmland				
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*				
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))* — Maximum Points				
1. Area in Nonurban Use — 15				
2. Perimeter in Nonurban Use — 10				
3. Percent Of Corridor Being Farmed — 20				
4. Protection Provided By State And Local Government — 20				
5. Size of Present Farm Unit Compared To Average — 10				
6. Creation Of Nonfarmable Farmland — 25				
7. Availablility Of Farm Support Services — 5				
8. On-Farm Investments — 20				
9. Effects Of Conversion On Farm Support Services — 25				
10. Compatibility With Existing Agricultural Use — 10				
TOTAL CORRIDOR ASSESSMENT POINTS — 160	0	0	0	0
PART VII *(To be completed by Federal Agency)*				
Relative Value Of Farmland (From Part V) — 100				
Total Corridor Assessment (From Part VI above or a local site assessment) — 160	0	0	0	0
TOTAL POINTS *(Total of above 2 lines)* — 260	0	0	0	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES ☐ NO ☐

5. Reason For Selection:

NRCS note: All sections are along roads and/or are in rights of way. Not subject to FPPA.

Signature of Person Completing this Part: **Micah Cothren** | DATE **9/18/23**

NOTE: Complete a form for each segment with more than one Alternate Corridor

Clear Form

Appendix D. HTRW Report

From: Brownstein, Susan J.
To: Cothren, Micah V CIV (USA); Kyle Cross
Cc: Markert, Tammy O CIV USARMY CELRL (USA)
Subject: [Non-DoD Source] RE: HTRW Questions
Date: Tuesday, November 28, 2023 3:12:56 PM
Attachments: PrebleCO Project Area July 2023.pdf

Hi Micah,

Thanks very much for the phone call this morning. I reviewed the HTRW report with the staff who prepared it. As you noted below, the 2021 review resulted in three hits within the project area, all of which were reported from the Bureau of Underground Storage Tank Regulations (BUSTR) databases: One unspecified incident at a residence and two confirmed releases from underground storage tanks (USTs) that received NFAs. All three incidents occurred in the 90's so there was not much detail available; however, the residential BUSTR site in question was from 1994, and as stated in the report, "a tank was not involved…However, because release information for this event was not provided, it is unlikely that a release of petroleum to the environment occurred."

Our team agrees that it is unlikely that any of these incidents resulted in contamination to the project area since a release was not confirmed at the residence and the two UST releases received NFAs. Given the HTRW report's 30-year review period, we do not recommend incurring additional project delays to scope, contract, and perform additional environmental review. Such a delay would prolong the service life of aging septic systems and could also potentially jeopardize the multiple funding streams that are enabling this project to finally move forward.

Per your request, I have attached an updated map of the project area.

Please let me know if I can provide any additional information for the NEPA report.

Kind regards,
Susan

Susan Brownstein, PE | CDM Smith | 1360 East 9th Street, Suite 610 | Cleveland, OH 44114 | Phone 216-912-1006 | Fax 216-589-9754 | brownsteinsj@cdmsmith.com | cdmsmith.com

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From: Cothren, Micah V CIV (USA) <Micah.V.Cothren@usace.army.mil>
Sent: Monday, November 27, 2023 4:01 PM
To: Kyle Cross <kcross@prebeng.org>; Brownstein, Susan J. <brownsteinsj@cdmsmith.com>
Cc: Markert, Tammy O CIV USARMY CELRL (USA) <Tammy.Markert@usace.army.mil>
Subject: RE: HTRW Questions

As a follow up, I talked with Susan and am now discussing things internally here at USACE to get this wrinkle ironed out. I'll get back to y'all here in the next day or so once I get a hold of the people I need to talk to.

Thank you for your patience!

From: Cothren, Micah V CIV (USA)
Sent: Monday, November 27, 2023 3:32 PM
To: Kyle Cross <kcross@prebeng.org>; Brownstein, Susan J. <brownsteinsj@cdmsmith.com>
Cc: Markert, Tammy O CIV USARMY CELRL (USA) <Tammy.Markert@usace.army.mil>
Subject: HTRW Questions

Good afternoon. I was wrapping up my environmental assessment document and getting it ready for review when I ran into some issues involving HTRW resources.

The CDM Smith limited HTRW report from 2021 mentioned three BUSTR database sites nearby. Two of which had no further action designations. The third, which was some form of leak at a residence, seemed to have an unknown status. The limited HTRW report mentioned that it recommended a full Phase I be completed given the lack of information on that BUSTR site. Was this action ever taken or was there ever an update to the HTRW report after the update to the project area this year?

Thank you!

Micah V. Cothren
Biologist
Civil Works: Planning, Programs,
and Project Management Branch
USACE – Louisville District
Desk: 502-315-6130

Preble County Wastewater Treatment Plant Hazardous Site Reviews

Background

CDM Smith conducted a review of available environmental records within Preble County, Ohio and ZIP Code 45381 in order to identify if sites reported on the following environmental databases are present within the areas anticipated to be impacted as part of the wastewater treatment plant and associated pipeline construction:

- National Priorities List (NPL)
- Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)
- CERCLIS No Further Remedial Action Planned (NFRAP)
- Toxic Release Inventory (TRI)
- National Pollutant Discharge Elimination System (NPDES) Surface Water Permits
- Assessment, Cleanup and Redevelopment Exchange System (ACRES) / Brownfields
- Resource Conservation and Recovery Act (RCRA) Generators
- Resource Conservation and Recovery Act (RCRA) CORRACTS
- Resource Conservation and Recovery Act (RCRA) non-CORRACTS
- Institutional Controls (ICs)
- Superfund Enterprise Management System (SEMS)
- Bureau of Underground Storage Tank Regulations (BUSTR) for active and inactive USTs
- Voluntary Cleanup Program (VCP)

All databases listed above were reviewed for records reported within Preble County, Ohio with the exception of the BUSTR databases which were reviewed for records reported within the 45381 ZIP Code.

Appendix A lists all sites identified through the database reviews as well as their associated coordinates. Figure 1 depicts the location of the proposed wastewater treatment plant as well as the associated pipeline routes.

Results of Database Reviews

Upon completion of the environmental database reviews, three sites were identified as being located within a 0.25-mile buffer of the project area as depicted in Figure 1. All three sites were reported from the BUSTR databases and are listed below in Table 1.

Site Name	Potential Contamination and Tank Information	Notes
Richard G Fraley Save A Lot Gas	• 2,000, 4,000, and 6,000-gallon steal USTs all containing gasoline • Primary release detected	• All tanks removed 06/01/1992 • No Further Action (NFA) granted
Residence	• Unspecified petroleum incident, not from spill/overfill/release • No tanks reported	• Incident reported 10/18/1994

ODOT Preble County Garage	• 2,000-gallon gasoline Fiberglass Reinforced Plastic UST • 8,000-gallon diesel Fiberglass Reinforced Plastic UST • 1,000-gallon used oil Bare Metal UST • Primary release detected	• All tanks removed 10/23/1998 • NFA granted

Table 1. Sites Identified within 0.25-miles of the proposed pipeline routes

Conclusions and Recommendations

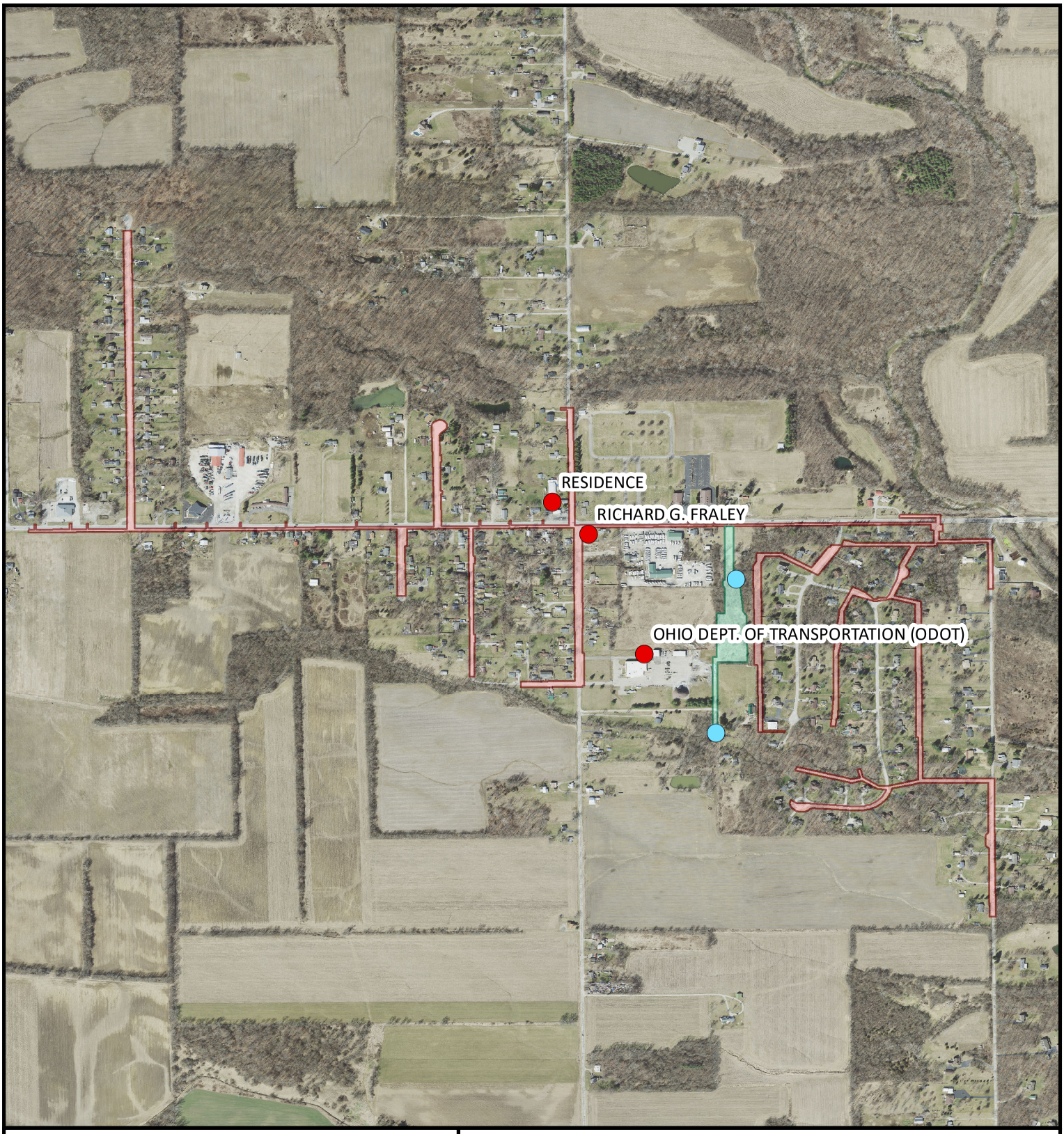
Review of environmental records obtained from federal and state databases identified three sites located within a 0.25-mile buffer of the proposed wastewater treatment plant and associated pipeline route that may require further review.

According to the BUSTR databases which reported these incidents, releases were reported at the Richard G Fraley Save A Lot Gas and ODOT Preble County Garage sites, although no additional information detailing the type or extent of contamination, or any details of cleanup activities were provided. However, both of these sites have had their tanks removed and have received NFAs. As a result, it is unlikely that contamination is currently present at these sites.

The report of the unspecified petroleum incident at the residence not from spill/overfill/release on 10/18/1994 did not provide additional details other than to state that a tank was not involved. As a result, it is unknown what specific chemical constituents were involved in this incident and to what extent. However, because release information for this event was not provided, it is unlikely that a release of petroleum to the environment occurred.

Due to the BUSTR databases reporting those sites detailed above as being located within a 0.125-mile buffer of the proposed wastewater treatment plant and associated pipeline route, the potential for environmental impacts to have impacted the subject property exists; although contamination to the project area is unlikely for those reasons stated above. Completion of a formal Phase I Environmental Site Assessment (ESA) and reviewing detailed records through a Freedom of Information Act (FOIA) request are recommended as this is likely to provide additional details of any environmental impacts to the property of concern including the extent of any contamination resulting from the reported BUSTR sites. The remote desktop investigation performed as part of this report does not constitute the level of due diligence provided by a formal Phase I ESA or preclude the necessity for one.

FIGURE



Legend

- BUSTR
- Outfall
- Outfall and WWTP parcel
- Sewer Line + 30ft

Figure 1: Hazardous Sites Map

Proposed Waste Water Treatment Plant
Preble County, Ohio

N

0 0.5 Miles

CDM Smith

Date: 12/7/2023

APPENDIX A

Appendix A

Hazardous Sites Reported within Preble County and ZIP Code 45381

DATABASE	FACILITY NAME/OWNER	ADDRESS	COORDINATES
TRI	PROVIMI NA INC	6531 STATE RT 503	39.833482, -84.540900
TRI	DDP SPECIALTY ELECTRONIC MATERIALS US 5 LLC	10 S ELECTRIC ST	39.743524, -84.526898
TRI	PARKER HANNIFIN LEWISBURG PLANT	700 W CUMBERLAND ST	39.852849, -84.547598
TRI	SILFEX INC	950 S FRANKLIN ST	39.733132, -84.622958
TRI	NEATON AUTO PRODUCTS MANUFACTURING INC	975 S FRANKLIN ST	39.731755, -84.624999
TRI	PARKER HANNIFIN CORP EATON OHIO PLANT	725 N BEECH ST	39.752011, -84.639094
TRI	LILLY RAM INDUSTRIES	119 E. DAYTON ST	39.745362, -84.525599
TRI	ADM ANIMAL HEALTH & NUTRITION	250 W. CLAY ST	39.844556, -84.542922
CERCLIS NFRAP	LEWISBURG DRUM SITE	UNLISTED	UNLISTED
NPDES	WEST ALEXANDRIA STP	33 DESOTO DR	39.743898, -84.524433
NPDES	VERONA WWTP	100 E MAIN ST	39.744152, -84.636178
NPDES	PREBLE CO SANITARY DIST NO 3 WWTP	STATE RTE 503	39.755079, -84.533858
NPDES	CREEKSIDE VILLAGE MHP	6405 US RTE 35	39.744877, -84.516600
NPDES	NEW PARIS STP	301 WEST CHERRY	39.856145, -84.798163
NPDES	NATIONAL TRAIL HIGH SCHOOL	6940 OXFORD GETTYSBURG RD	39.837636, -84.720742
NPDES	CFG-CONVENIENT FOOD & GAS	9592 US RTE 40 W	39.833287, -84.806757
NPDES	ARROWHEAD CAMPGROUND	1361 THOMAS RD	39.951256, -84.747769
NPDES	ODOT PARK NO 8-39	MILE MARKER 3, I 70 E	39.827167, -84.758806
NPDES	GRATIS WWTP	404 HARRISON ST	39.64468, -84.52926
NPDES	ELDORADO WWTP	ST RT 726	39.89939, -84.67728
NPDES	PREBLE CO BRD OF COMMISSION LAKENGREN WWTP	3800 LONGMAN RD	39.67754, -84.708456
NPDES	PILOT TRAVEL CENTER LLC #286	6141 US ROUTE 127 NORTH	39.83234, -84.63186
NPDES	DAYTON TRAVEL CENTER	6762 STATE ROUTE 127	39.841194, -84.62
NPDES	BLACK WTP	SR 35 & STOVER RD	39.752856, -84.636337
NPDES	CAMDEN STP	300 S MAIN ST	39.62313, -84.64992
NPDES	EATON WWTP	901 S BARRON ST	39.73331, -84.63387
NPDES	LEWISBURG WWTP	TILLMAN LANE	39.847389, -84.539111
NPDES	WEST MANCHESTER WWTP	202 E SCOTT ST	39.90222, -84.625363
Brownfileds	SPARKS FUEL CENTER - LEPAUL GAS STATION	4393 STATE ROUTE 49 WEST	39.822252, -84.791113
RCRA Generators	WEBERS BODY AND FRAME	2017 ST RTE 503 N	39.750097, -84.532664
RCRA Generators	TWIN VALLEY SCHOOL	100 EDUCATION DR	39.74861, -84.53226
RCRA Generators	REXARC INC	35 E THIRD ST	39.74639, -84.53009
RCRA Generators	LILLY RAM INDUSTRIES	119 E. DAYTON ST.	39.74445, -84.52616
RCRA Generators	ALS BODY SHOP	424 WARE ROAD	39.74671, -84.55747
RCRA Generators	HENNRY PENNY CORP	1219 US ROUTE 35 WEST	39.753597, -84.655315
RCRA Generators	OHIO DEPT OF TRANSPORTATION	2 MI W ALEXANDRIA US 35	39.74389, -84.60964
RCRA Generators	UNOCAL CORPORATION SITE AT9864522	6701 NATIONAL ROAD EAST	39.833984, -84.807325
RCRA Generators	NATIONAL TRUCK COMPONENTS	7525 NATIONAL RD E	39.834339, -84.803037
RCRA Generators	NATIONAL TRAIL HIGH SCHOOL	6940 OXFORD GETTYSBURG RD	39.83774, -84.72328
RCRA Generators	ZUMSTEIN INC	524 N WATER ST	39.84839, -84.54332
RCRA Generators	PROVIMI NORTH AMERICA INC	6531 STATE ROUTE 503	39.8328, -84.5397
RCRA Generators	PARKER HANNIFIN LEWISBURG PLANT	700 WEST CUMBERLAND STREET	39.854064, -84.547952
RCRA Generators	LOYS AUTO BODY	217 W CLAY ST	39.84414, -84.54251
RCRA Generators	JIMS BODY SHOP	3801 LEWISBURG WESTERN RD	39.84393, -84.565054
RCRA Generators	L&W COLLISION	3975 STATE ROUTE 40 EAST	39.853686, -84.555467
RCRA Generators	SHERWIN WILLIAMS	MILE MARKER 14 I 70 EAST BOUND	39.834369659424, -84.567481994629
RCRA Generators	POWER TRAIN	9208 US RTE 40 W STE D	39.834863, -84.796161
RCRA Generators	KENS BODY SHOP	4160 PRICE CREEK	39.812171, -84.579142
RCRA Generators	WEYERHAEUSER CO	900 ST RT 35W	39.743857, -84.624266
RCRA Generators	TIMKEN CO ST CLAIR PRECISION TUBING COMPONENTS PLANT	401 INDUSTRIAL DR.	39.74143, -84.61675
RCRA Generators	STARVIN MARVIN 1190	1301 N BARRON	39.75885, -84.63649
RCRA Generators	STANS BODY SHOP	410 N CHERRY ST	39.748002, -84.634787
RCRA Generators	SLEMKER PONTIAC OLDS	909 E MAIN ST	39.74388, -84.62197
RCRA Generators	SHERWIN-WILLIAMS #1437	100 E WASHINGTON JACKSON RD	39.76648, -84.63418
RCRA Generators	MOYSEY BROS DRY CLEANERS	117 E MAIN	39.74391, -84.63537
RCRA Generators	M AND S BODY SHOP	2407 US RTE 127 N	39.779049, -84.6365
RCRA Generators	KROGER STORE 828	1603 N BARRON ST	39.76482, -84.63646
RCRA Generators	EPT NATIONAL DISTRIBUTION CTR	1301 MILLER WILLIAMS RD	39.75836, -84.665582
RCRA Generators	DAYTON POWER & LIGHT CO EATON SRVC CTR	236 W LEXINGTON RD	39.75851, -84.63863
RCRA Generators	DALE CARTER MOTORS	510 SOUTH BARRON STREET	39.73806, -84.63644
RCRA Generators	BULLEN ULTRASONICS INC	1301 MILLER WILLIAMS RD	39.75836, -84.665582
RCRA Generators	GEORGE BROTHERS GARAGE INC	163 E CENTRAL AVE	39.6291, -84.64693
RCRA Generators	KMART # 4815	1705 STATE ROUTE 127 N	39.84087, -84.62903
RCRA Generators	KAISER AGRICULTURAL CHEMICALS	HWY 127 N	40.054668426514, -84.629837036133
RCRA Generators	LEWISBURG CONTAINER INC	243 SINGER RD	39.8433, -84.54292
RCRA Generators	SKILES TRUCK BODY SHOP INC	222 E THIRD ST	39.853656, -84.536401
RCRA Generators	THE IAMS CO	6571 STATE ROUTE 503 NORTH	39.832917, -84.537139
BUSTR	LANIER TOWNSHIP	5190 HALDERMAN RD	39.70777, -84.53761
BUSTR	RICHARD G. FRALEY	3266 US 35	39.743904, -84.575833
BUSTR	RICHARD A. CROUSE	65 E 3RD ST	39.746693, -84.528842
BUSTR	LEONA K. UNGER	24 E DAYTON ST	39.744129, -84.530964
BUSTR	DRAKE PLUMBING & HEATING & AIR	71 N MAIN ST	39.747877, -84.531926
BUSTR	BROWN TRANSPORT INC	6387 SR 122 S	39.669613, -84.556749
BUSTR	RESIDENCE	33 QUINN RD	39.744597, -84.576578
BUSTR	TWIN VALLEY BANK	60-70 SECOND ST	39.7317, -84.5295
BUSTR	BRUBAKER GRAIN & CHEMICAL, INC.	2918 QUAKER TRACE RD	39.702189, -84.574722
BUSTR	JK PROPERTY	85 E DAYTON RD	39.744648, -84.527385
BUSTR	OHIO DEPT. OF TRANSPORTATION (ODOT)	234 QUAKER TRACE RD	39.741207, -84.574265
BUSTR	WILSON CONCRETE PRODUCTS, INC.	RT 503 N	39.7317, -84.5295
BUSTR	KAUSHAL PROPERTY LLC	308 W DAYTON ST.	39.74398, -84.54174

Appendix E. Cultural Resources draft Programmatic Agreement

PROGRAMMATIC AGREEMENT
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS
AND
THE OHIO HISTORY CONNECTION
REGARDING
THE GLENWOOD WASTEWATER COLLECTION AND TREATMENT PROJECT
IN
PREBLE COUNTY, OHIO

WHEREAS, the U.S. Army Corps of Engineers, herein referred to as the "Corps," and Preble County plan to design and construct a sanitary sewage collection and treatment system in Glenwood, Preble County, Ohio (Undertaking), under authority of Section 594 of the Water Resources and Development Act of 1999 (Public Law 106-53, 113 STAT 381), as amended; and

WHEREAS, the Undertaking is composed of the activities for the design and construction of a wastewater treatment plant and system which will include the wastewater treatment plant, an effluent outfall, sewer laterals, a force main, a lift station, a gravity sewer system, manholes, contractor work limits, and temporary storage and laydown areas and access roads; and

WHEREAS, the Corps, in consultation with the Ohio State Historic Preservation Office (OH-SHPO) pursuant to 36 CFR Part 800, the regulations implementing Title 54 of the United States Code, Section 306108 (54 U.S.C. § 306108), has identified an Area of Potential Effects (APE) for the Undertaking that minimally includes the proposed contractor work limits, access roads, and laydown areas and the area of visual effects resulting from the Undertaking's activities, including the alteration of topography and vegetation (see Attachment 1). The APE is based on the Undertaking as proposed at time of execution of this Programmatic Agreement (PA) and may be further refined as a result of additional consultation and as plans for the Undertaking are further developed; and

WHEREAS, a review of existing information on historic properties identified no historic properties either eligible for listing or those listed on the National Register of Historic Places (NRHP) located within a half mile of the APE and no previously recorded archaeological sites are located within the APE. An unevaluated barn older than 50 years of age is located within the proposed contractor work limits of the wastewater treatment facility. The Corps will continue to complete identification and evaluation efforts to include the barn and any other currently unidentified historic properties under the terms of this PA; and

WHEREAS, due to the lack of Rights of Entry (ROE) to access land parcels associated with the APE (see Attachment 2), the Corps will not be able to complete consultation regarding the final identification of historic properties for the Undertaking prior to the completion of the environmental document for compliance with the National Environmental Policy Act (NEPA),

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making execution of this PA for the Undertaking appropriate by mutual understanding of the consulting parties; and

WHEREAS, in accordance with 36 CFR § 800.2(c)(2) the Corps has consulted with the OH-SHPO on the proposed Undertaking and has determined that review and consultation pertaining to additional design development will be carried out during the design phase but before the implementation phase of the Undertaking in order for the Corps to fully assess the effects to historic properties, including those identified through additional survey; and

WHEREAS, in accordance with 36 CFR § 800.2(c)(1) the Corps has initiated consultation with the Miami Tribe of Oklahoma, Shawnee Tribe, Eastern Shawnee Tribe of Oklahoma, Absentee-Shawnee Tribe of Oklahoma, Citizen Potawatomi Nation, Forest County Potawatomi, Hannahville Indian Community, Match-e-be-nash-she-wish Band of Pottawatomi Indians, Nottawaseppi Huron Band of Potawatomi, Pokagon Band of Potawatomi, Saginaw Chippewa Indian Tribe of Michigan, Lac Vieux Desert Band of Lake Superior, Lac du Flambeau Band of Lake Superior, Sault Ste Marie Tribe of Chippewa, Bad River Band of Lake Superior Chippewa, Keweenaw Bay Indian Community, Lac Courte Oreilles Band of Chippewa, Red Cliff Band of Lake Superior Chippewa, Red Lake Chippewa, St. Croix Chippewa Community, Fon du lac Band of Chippewa, Bois Forte Band of Chippewa, Grand Portage Band of Lake Superior Chippewa, Mille Lacs Band of Ojibwe, Grand Traverse Band of Ottawa and Chippewa, Little River Band of Ottawa, Ottawa Tribe of Oklahoma, Little Traverse Bay Band of Odawa, Peoria Tribe of Oklahoma, Sac and Fox Nation of Oklahoma, Oneida Nation of New York, Oneida Nation of Wisconsin, Delaware Nation of Oklahoma, Delaware Tribe of Indians Oklahoma, and Wyandotte Nation of Oklahoma because there may be religious or culturally significant properties within the APE; and

WHEREAS, the Corps has consulted with the Forest County Potawatomi regarding the effects of the Undertaking on historic properties and have invited them to sign this PA as a Concurring Party; and

WHEREAS, the Corps has consulted with the Preble County Government, the Archaeological Society of Ohio, Preble County Historical Society, Lanier Township Government, and Twin Township Government regarding the effects of the Undertaking on historic properties and have invited them as Consulting Parties; and

WHEREAS, in accordance with 36 CFR § 800.2(d), public involvement and an appropriate level of public notification for the Undertaking has been coordinated with the concurrent scoping, public review and comment, public meetings, and technical reviews as required under NEPA and its implementing regulations; and

WHEREAS, in accordance with 36 C.F.R. § 800.6(a)(1), the Corps has notified the Advisory Council on Historic Preservation (ACHP) of its plan to delay the identification of historic properties with specified documentation, and the ACHP has chosen not to participate at this time in the consultation pursuant to 36 C.F.R § 800.6(a)(1)(iii); and

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NOW, THEREFORE, the Corps and the OH-SHPO agree that the Undertaking shall be implemented in accordance with the following stipulations in order to consider the effect of the Undertaking on historic properties.

STIPULATIONS

The Corps shall ensure that the following measures are carried out:

I. CONSULTATION

A. The Corps will continue to consult with OH-SHPO, Indian Tribes, Concurring Parties, and Consulting Parties to identify and assess the Undertaking's effects on historic properties. The Corps shall ensure that 30 calendar days for review and comment is provided to OH-SHPO, Indian Tribes and all Consulting Parties for completion of the steps specified in 36 C.F.R § 800.4-6 before construction plans are finalized. This includes consultation to refine the APE, identify historic properties, evaluate eligibility, assess effects, and resolve any adverse effects.

B. The Corps shall continue to consult with OH-SHPO, Indian Tribes, Concurring Parties, and Consulting Parties during construction of the Undertaking, especially if cultural resources or historic properties are encountered. Other Consulting Parties, in addition to those listed above, may be identified during consultations.

II. REFINE AREAS OF POTENTIAL EFFECTS (APE)

The Corps has established the preliminary APE for the Undertaking minimally includes the proposed contractor work limits, access roads, and laydown areas and the area of visual effects resulting from the Undertaking's activities, including the alteration of topography and vegetation. The Corps will refine the APE during the design phase of the Undertaking and propose what level of effort (LOE) will be needed to identify historic properties within the APE. The Corps will consult with the OH-SHPO, Indian Tribe, Concurring Parties, and Consulting Parties on the revised APE by providing updated maps and project activity descriptions, and reviewers will have 30 calendar days to review and comment.

III. IDENTIFICATION AND TREATMENT OF ABOVE-GROUND AND ARCHAEOLOGICAL RESOURCES ELIGIBLE FOR INCLUSION IN THE NATIONAL REGISTER OF HISTORIC PLACES

After concurrence on the APE and LOE and ROEs have been obtained, the Corps shall carry out investigations to identify and evaluate historic properties within the APE and to assess and, as required, resolve adverse effects.

A. Professional Standards: The Corps shall require that all work be supervised by Preservation Professionals meeting the Professional Qualification Standards as set forth in *Archeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines* (48 FR 44716-44740).

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B. Identification of Historic Properties: Identification of historic properties and assessment of effects shall follow 36 C.F.R. 800.4 and 36 C.F.R. 800.5 and shall be performed in accordance with *Archeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines* (48 FR 44716-44740); and the Ohio History Connection's *Archaeology Guidelines* (Ohio State Historic Preservation Office 2022) and the *Guidelines for Conducting History/Architecture Surveys in Ohio* (State Historic Preservation Office 2014).

C. The Corps will submit for review one electronic copy of any archaeological and above ground structure reports produced during identification efforts to OH-SHPO, Indian Tribes, and Concurring Parties for review and comment. Reports shall include documentation for properties of religious and cultural significance to the Indian tribes, recommendations on the historic significance and integrity of identified cultural resources, NRHP evaluations of identified cultural resources, and a determination of effect, including any conditions imposed, for the specific Undertaking under review. Any archaeological or above ground structure survey reports will follow reporting guidelines outlined in the Ohio History Connection's *Archaeology Guidelines* (Ohio State Historic Preservation Office 2022) and the *Guidelines for Conducting History/Architecture Surveys in Ohio* (State Historic Preservation Office 2014). State site inventory forms for both archaeological sites and above ground structures will also be submitted alongside the reports. The Corps shall provide OH-SHPO, Indian Tribes, and Concurring Parties with 30 days, from receipt of each report, to review and provide comments. Once concurrence has been achieved for both the results of the archaeological and above ground structure reports, digital copies of the final report will be submitted to the OH-SHPO.

D. Information concerning the identification and evaluation of historic properties, including field methods, NRHP evaluations, effects assessments, and overall results from the reports will be provided to Consulting Parties for comment. This information may take the form of the cultural resource reports (described above in Stipulation III.C) if they are determined through consultation with the Signatories of this PA not to contain confidential information as outlined in Stipulation IV. Consulting Parties will have 30 days upon receipt of the information for comment. Based on the responses received from Consulting Parties and Signatories to this PA, the Corps may revise and resubmit reports and/or consultation information revised to include the requested information to the OH-SHPO, Concurring Parties, and Consulting Parties for an additional 30-day review period.

E. Resolution of Adverse Effects: If, through consultation with the OH-SHPO, Indian Tribes, Concurring Parties, and Consulting Parties, it is determined that the Undertaking will have an adverse effect on a historic property, the Corps shall follow the process described in 36 C.F.R. § 800.6 to resolve adverse effects on historic properties. The Corps will consider any views concerning effects provided by OH-SHPO, Indian Tribes, Concurring Parties, and Consulting Parties. The Corps shall continue consultation to resolve adverse effects and may accept additional Consulting Parties into discussions at

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any point during consultation. The Corps shall notify the ACHP, pursuant to 36 C.F.R. § 800.6(a)(1), using its electronic Section 106 notification system.

IV. PROTECTION OF CONFIDENTIAL INFORMATION

To the extent consistent with National Historic Preservation Act Section 304 (Title 54 of the United States Code, Section 300310), the Archaeological Resources Protection Act 9(a), 36 CFR § 800.11(c), and other applicable federal and state laws, cultural resource data from this Undertaking will be treated as confidential by all Signatories of this PA and is not to be released to any person, organization, or agency not a party to this PA. Confidentiality concerns for historic properties that may have traditional religious and cultural significance to the Indian tribes will be respected and will remain confidential to the fullest extent permitted by law. The Corps may require data sharing agreements with any Consulting Party to this PA who is interested in obtaining specific confidential information.

V. DISCOVERY OF HUMAN REMAINS

A. Procedures for addressing the treatment of human remains and grave goods shall be guided by the ACHP's "Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects" (adopted by the ACHP on March 1, 2023), and other applicable Federal, State, and Local laws. If human remains are found during activities in support of the Undertaking, construction activities within 100 feet of the remains shall be halted and the County Coroner, local law enforcement, and the Corps archaeologist shall be notified. The Corps archaeologist shall in turn notify the OH-SHPO, all signatories to the PA, and Indian tribes with ancestral ties to the APE as necessary. If associated burial items, sacred items, or items of cultural patrimony are discovered, work shall cease immediately within a 100 foot radius of the discovery and the Corps archaeologist shall be notified.

B. If the discovery is of prehistoric Native American Origin, the Corps shall provide written notification and documentation to the OH-SHPO, all federally recognized Indian tribes with ancestral ties to the location of the discovery, and other parties deemed appropriate by the Corps who have requested such notifications. The Corps shall consult with these parties to discuss avoidance, minimization of disturbance, or protocols for disinterment.

VI. DURATION

This PA will expire if its terms are not carried out within five (5) years from the date of its execution or after the completion of the Undertaking and the PA's terms, whichever comes first. Prior to such time, the Corps may consult with the Signatories, Concurring Parties, and Consulting Parties to reconsider the terms of the PA and amend it in accordance with Stipulation X below.

VII. POST-REVIEW DISCOVERIES

In accordance with 36 C.F.R § 800.13(a)(1), the following provisions govern the actions to be taken if unanticipated cultural resources are encountered during Undertaking activities that may be historically significant, or unanticipated effects on historic properties occur:

A. All work within the immediate vicinity (100 feet) will cease and reasonable efforts to protect the site will be implemented. Work within this area will not begin until Corps approval.

B. The Corps shall notify the OH-SHPO, Indian Tribes, Concurring Parties, and Consulting Parties within 48 hours of the discovery. Within five (5) business days of notification, the Corps will provide these parties with necessary documentation, the Corps official's assessment of the NRHP eligibility of the cultural resource, and proposed actions to resolve any adverse effects. The OH-SHPO, Indian Tribes, Concurring Parties, and Consulting Parties shall respond within five (5) business days of receiving the Corps assessment and documentation with their comments.

C. The Corps will consult with OH-SHPO, Indian Tribes, and Consulting Parties to seek concurrence on ways to avoid, minimize, or mitigate adverse effects to eligible historic properties. The Corps will ensure that the appropriate actions are carried out and documented with a Memorandum of Agreement (MOA).

D. If concurrence cannot be reached between the Corps and the Signatories of this PA on the appropriate course of action to address adverse effects to a post-review discovery, then the Corps shall initiate the dispute resolution process set forth in Stipulation IX below.

VIII. STATUS REPORTING

Following the execution of this PA and until it expires or is terminated, the Corps shall provide all parties to this PA a status update detailing work undertaken pursuant to its terms at the end of each federal fiscal year. Such yearly updates shall include any scheduling changes proposed, any problems encountered, and a summary of disputes or objections on which the Corps has already consulted, and the Corps' efforts to carry out the terms of this PA. The update shall be distributed to the Signatories and Consulting Parties through electronic mail.

IX. DISPUTE RESOLUTION

A. Should any Signatory or Concurring Party to this PA object at any time to any actions proposed or the manner in which the terms of this PA are implemented, the Corps shall consult with such party to resolve the objection. If the Corps determines that such objection cannot be resolved, the Corps will:

1. Forward all documentation relevant to the dispute, including the Corps' proposed resolution, to the ACHP. The ACHP shall provide the Corps with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the Corps shall prepare a written response that considers any timely advice or comments regarding the dispute from the ACHP, Signatories, and Concurring Parties, and provide them with a copy of this written response. The Corps will then proceed according to its final decision.

2. If the ACHP does not provide its advice regarding the dispute within the thirty (30)

day period, the Corps may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the Corps shall prepare a written response that considers any timely comments regarding the dispute from the Signatories and Concurring Parties to the PA and provide them and the ACHP with a copy of such written response.

3. The Corps' responsibility to carry out all other actions subject to the terms of this PA that are not the subject of the dispute remain unchanged.

B. If the ACHP or OH-SHPO is contacted by a Consulting Party or by a member of the public to discuss a concern or objection about the implementation of this PA, the contacted entity will notify the Corps within seven (7) business days of being contacted. If the Corps is contacted by a Consulting Party or by a member of the public to discuss a concern or objection about the implementation of this PA, the Corps will notify the Consulting Parties within seven (7) business days of being contacted. The Corps and Consulting Parties will discuss the concern or objection in order to develop an appropriate response.

X. AMENDMENTS

This PA may be amended when such an amendment is agreed to in writing by all Signatories. The amendment will be effective on the date a copy signed by all the Signatories is filed with the ACHP.

XI. TERMINATION

If any Signatory to this PA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other Signatories to attempt to develop an amendment per Stipulation X above. If within thirty (30) days (or another time period agreed to by all Signatories) an amendment cannot be reached, any Signatory may terminate the PA upon written notification to the other Signatories.

Once the PA is terminated, and prior to work continuing on the Undertaking, the Corps must either (a) execute a MOA pursuant to 36 C.F.R. § 800.6 or (b) request, take into account, and respond to the comments of the ACHP under 36 C.F.R. § 800.7. The Corps shall notify the Signatories as to the course of action it will pursue.

XII. ANTI-DEFICIENCY PROVISIONS

The Corps' obligations under this PA are subject to the availability of appropriated funds, and the stipulations of this PA are subject to the provisions of the Anti-Deficiency Act. The Corps shall make reasonable and good faith efforts to secure the necessary funds to implement this PA in its entirety. If compliance with the Anti-Deficiency Act alters or impairs the Corps' ability to implement the stipulations of this agreement, the Corps shall consult in accordance with the amendment and termination procedures found at Stipulations X and XI of this agreement.

XIII. EXECUTION

Signatories and all parties named herein have agreed to execute this PA using handwritten signatures or by the use of electronic means. In addition, the Signatories and all parties named

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herein have agreed that the execution of this PA using legally binding counterparts is and shall be considered effective legal execution of same.

Execution of this PA by the Corps and the OH-SHPO and implementation of its terms evidence that the Corps has considered the effects of this Undertaking on historic properties and afforded the ACHP an opportunity to comment and fulfilled its responsibilities under Title 54 of the United States Code, Section 306108.

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PROGRAMMATIC AGREEMENT
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS
AND
THE OHIO HISTORY CONNECTION
REGARDING
THE GLENWOOD WASTEWATER COLLECTION AND TREATMENT PROJECT
IN
PREBLE COUNTY, OHIO

Signed by hand written signature or electronically:

SIGNATORY: UNITED STATES DEPARTMENT OF THE ARMY, UNITED STATES ARMY ENGINEER DISTRICT, LOUISVILLE

BY: _____

L. Reyn Mann
Colonel, U.S. Army
District Commander
United States Army Corps of Engineers, Louisville District
600 Dr. Martin Luther King Jr. Place
Louisville, Kentucky 40202
lisa.r.mann@usace.army.mil
(502) 315-6102

DATE IF SIGNED BY HAND WRITTEN SIGNATURE:
_____ ____, 2023

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PROGRAMMATIC AGREEMENT
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS
AND
THE OHIO HISTORY CONNECTION
REGARDING
THE GLENWOOD WASTEWATER COLLECTION AND TREATMENT PROJECT
IN
PREBLE COUNTY, OHIO

Signed by hand written signature or electronically:

SIGNATORY: OHIO HISTORY CONNECTION

BY: _____

Krista Horrocks
Interim Department Head and Deputy State Historic Preservation Officer
Resource Protection and Review
Ohio's State Historic Preservation Office
Ohio History Connection
800 17th Avenue
Columbus, Ohio 43211
khorrocks@ohiohistory.org
(614) 298-2000

DATE IF SIGNED BY HAND WRITTEN SIGNATURE:
_____ ____, 2023

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PROGRAMMATIC AGREEMENT
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS
AND
THE OHIO HISTORY CONNECTION
REGARDING
THE GLENWOOD WASTEWATER COLLECTION AND TREATMENT PROJECT
IN
PREBLE COUNTY, OHIO

Signed by hand written signature or electronically:

CONCURRING PARTY: FOREST COUNTY POTAWATOMI

BY: _____

James A. Crawford,
Tribal Chairman
Forest County Potawatomi
5416 Everybody's Road
Crandon, Wisconsin 54520
Chairmanoffice@fcp-nsn.gov
(715) 478-7200

DATE IF SIGNED BY HAND WRITTEN SIGNATURE:
_____ ____, 2023

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Attachments

Attachment 1: Undertaking and the Preliminary Area of Potential Effects as Determined by the Corps
Attachment 2: Map Showing Which Land Parcels Have Approved Rights of Entry and Those That Do Not Have Signed Approvals
Attachment 3: Points of Contact for Each Agency

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Attachment 1:
Undertaking and Preliminary Area of Potential Effects as Determined by the Corps

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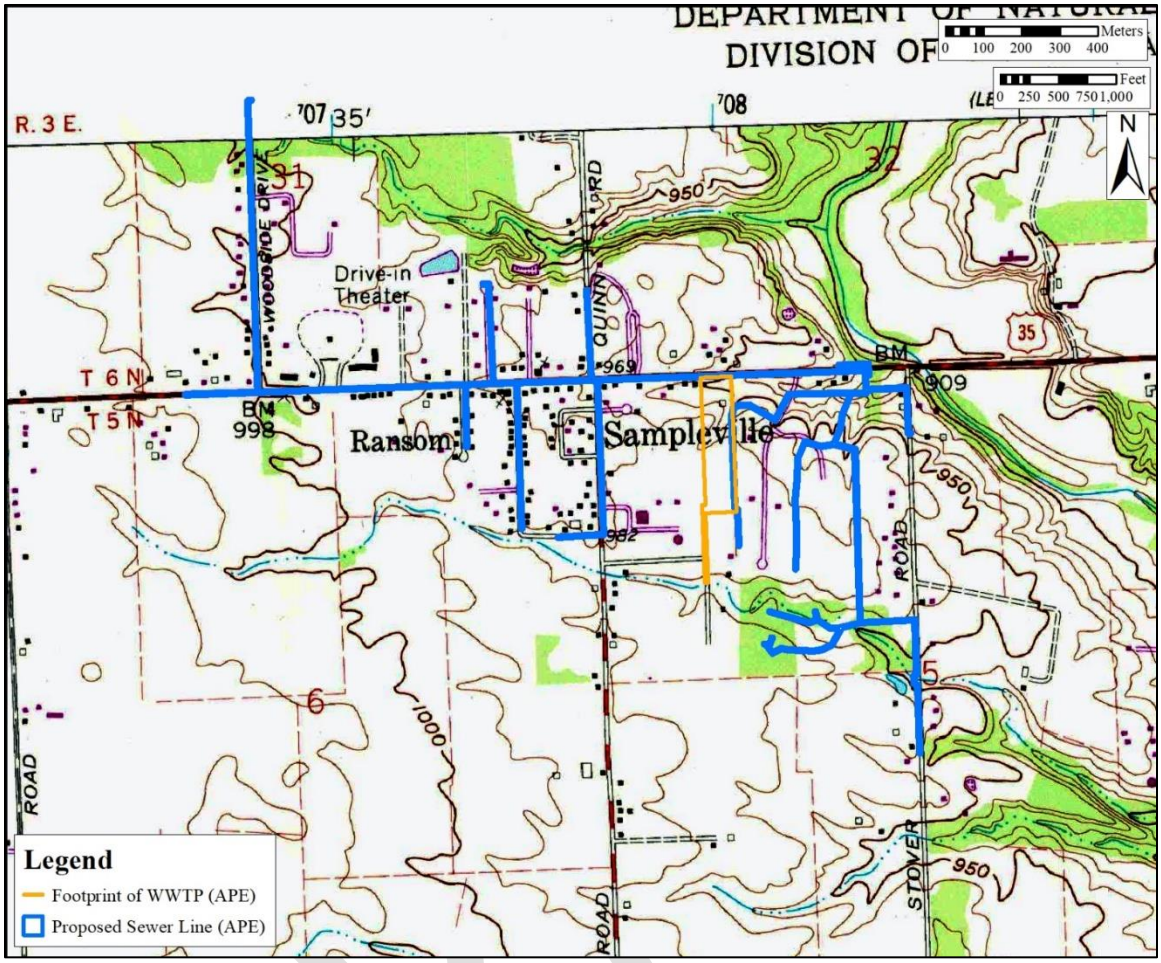

Excerpt of the West Alexandria, Ohio USGS Topographic map (1961; edited 1988) showing the location of the proposed APE.

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Attachment 2:
Map Showing Which Land Parcels Have Approved Rights of Entry and Those That Do Not Have Signed Approvals

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Aerial view showing the location property boundaries within the proposed APE that have an executed right of entry with those in blue that do not (27 blue properties to date). For western part of Undertaking no rights of entry required since it will follow existing rights of ways along roads and utilities.

Attachment 3:

Points of Contact

U.S. Army Corps of Engineers
Ann Howard
Chief, Environmental Resources Section
United States Army Corps of Engineers
Louisville District
600 Dr. Martin Luther King Jr Place
Louisville, KY 40202
Desk: (502) 315-6829
Email: Ann.C.Howard@usace.army.mil

Ohio History Connection
Dawn Walter Gagliano
Project Reviews Manager
Ohio History Connection
800 E. 17th Avenue
Columbus, Ohio 43211
Desk: (614) 298-2049
Email: dgagliano@ohiohistory.org

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Appendix F. Tribal and Agency Correspondence

October 6, 2023

Jared Barrett, MA, PMP
Archaeologist
US Army Corps of Engineers
Louisville District
Environmental Resources Section
600 Dr. Martin Luther King Jr. Place
Louisville, KY 40202

Ref: *Glenwood Wastewater Collection and Treatment Project,*
Glenwood, Preble County, Ohio
ACHP Project Number: 020078

Dear Mr. Barrett:

On September 22, 2023, the Advisory Council on Historic Preservation (ACHP) received your notification and supporting documentation regarding the initiation of Section 106 consultation regarding the referenced undertaking. Based upon the information you provided, we have concluded, pursuant to 36 CFR § 800.2(b)(1), of the regulations, "Protection of Historic Properties" (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act, that our participation may be premature.

The U.S. Army Corps of Engineers, Louisville District should continue consultation with the Ohio State Historic Preservation Officer, Indian tribes, and other consulting parties, as appropriate, to identify and evaluate historic properties and to assess any potential adverse effects on those historic properties. We request that within 180 calendar days of receiving this correspondence, you provide the ACHP with an update as to the progress of the consultation since September 2023. Upon receipt of the additional information, we will notify you within 15 days regarding our decision on participation.

If you have any questions or require our further assistance at this time, please contact Mr. Christopher Daniel at (202) 517-0223 or by e-mail at cdaniel@achp.gov and reference the ACHP Project Number above.

Sincerely,

Christopher Koeppel
Assistant Director
Office of Federal Agency Programs
Federal Property Management Section

Barrett, Jared L CIV USARMY CELRL (USA)

From: Benjamin Rhodd <Benjamin.Rhodd@fcp-nsn.gov>
Sent: Thursday, September 21, 2023 1:43 PM
To: Barrett, Jared L CIV USARMY CELRL (USA)
Subject: [Non-DoD Source] RE: USACE - Section 106 Consultation - Glenwood Wastewater Collection and Treatment Project in Preble County, Ohio

Mr. Barrett,

Pursuant to consultation under Section 106 of the National Historic Preservation Act (1966 as amended) the Forest County Potawatomi Community (FCPC), a Federally Recognized Native American Tribe, reserves the right to comment on Federal undertakings, as defined under the act.

The Tribal Historic Preservation Office (THPO) staff has reviewed the information you provided for this project. Upon review of site data and supplemental cultural history within our Office, the FCPC THPO is pleased to offer a finding of No Historic Properties affected of significance to the FCPC, however, we request to remain as a consulting party for this project. Additionally, the FCPC THPO Office is concerned about the topographic location being near the confluence of two creeks. In numerous instances, occupational and habitation location are found at these confluences. It is suggested that an SOI certified archaeologist be on site during the construction of the sanitary line with stop work authority in the event of an Inadvertent Discovery of human remains or a buried archaeological site that may prove to be significant.

As a standard caveat sent with each proposed project reviewed by the FCPC THPO, the following applies. In the event an Inadvertent Discovery (ID) occurs at any phase of a project or undertaking as defined, and human remains or archaeologically significant materials are exposed as a result of project activities, work should cease immediately. The Tribe(s) must be included with the SHPO in any consultation regarding treatment and disposition of an ID find.

Thank you for protecting cultural and historic properties and if you have any questions or concerns, please contact me at the email or number listed below.

Respectfully,

Ben Rhodd, MS, RPA, Tribal Historic Preservation Officer
Forest County Potawatomi
Historic Preservation Office
8130 Mish ko Swen Drive, P.O. Box 340, Crandon, Wisconsin 54520
P: 715-478-7354 C: 715-889-0202 Main: 715-478-7474
Email: Benjamin.Rhodd@fcp-nsn.gov
www.fcpotawatomi.com

From: Barrett, Jared L CIV USARMY CELRL (USA) <Jared.L.Barrett@usace.army.mil>
Sent: Thursday, September 21, 2023 7:56 AM
To: Joe.Stahlman@sni.org; 106NAGPRA@astribe.com; PBarton@estoo.net; Erin Paden <epaden@shawnee-tribe.com>; Benjamin Rhodd <Benjamin.Rhodd@fcp-nsn.gov>; cpnthpo@potawatomi.org; Hannahville Indian Community, Michigan <earlmeshigaud@hannahville.org>; Pokagon Band of Potwatomi Indians, Michigan and Indiana

<matthew.bussler@pokagonband-nsn.gov>; Raphael Wahwassuck <RaphaelWahwassuck@pbpnation.org>; Gun Lake Tribe - THPO Shared <mbpi_thpo@glt-nsn.gov>; THPO@miamination.com; mlhadden@sagchip.org; 'ldfthpo@ldftribe.com' <ldfthpo@ldftribe.com>; Edith Leoso <thpo@badriver-nsn.gov>; 'gloonsfoot@kbic-nsn.gov' <gloonsfoot@kbic-nsn.gov>; Brian.Bisonette@lco-nsn.gov; marvin.defoe@redcliff-nsn.gov; Michael LaRonge <michael.laronge@scc-nsn.gov>; wandam@stcroixtribalcenter.com; evanschroeder@fdlrez.com; jaylen.strong@boisforte-nsn.gov; maryanng@granportage.com; amyburnette@llojibwe.org; terry.kemper@millelacsband.com; bfletcher@peoriatribe.com; cindy.winslow@gtbindians.com; jsay@lrb-nsn.gov; rhonda.oto@gmail.com; MWiatrolik@LTBBODAWA-NSN.GOV; Buffalo, Jonathan <director.historic@meskwaki-nsn.gov>; mark.junker@sacfoxenviro.org; secondchief@sacandfoxnation-nsn.gov; sbachor@delawaretribe.org; sclemons@wyandotte.org; Frederick.Jacko@nhbp-nsn.gov; 'Corina D. Williams' <cwilliam@oneidanation.org>; Bergevin, Jesse <jbergevin@oneida-nation.org>
Subject: USACE - Section 106 Consultation - Glenwood Wastewater Collection and Treatment Project in Preble County, Ohio

Good morning,
Attached is our consultation letter for the Glenwood Wastewater Collection and Treatment Project in Preble County, Ohio.

Please call or email me if you have any questions regarding this consultation.

Look forward to working with you on this consultation.

Thank you,

Jared Barrett, MA, PMP
Archaeologist
US Army Corps of Engineers, Louisville District
Environmental Resources Section
600 Dr. Martin Luther King Jr. Place
Louisville, KY 40202
Office Phone 502.315.6480
Email: Jared.L.Barrett@usace.army.mil
http://www.lrl.usace.army.mil/

Advisory Council on Historic Preservation
Electronic Section 106 Documentation Submittal System (*e*106) Form
MS Word format

Send to: *e106@achp.gov*

I. Basic information

1. **Name of federal agency** (If multiple agencies, state them all and indicate whether one is the lead agency): United States Army Corps of Engineers, Louisville District (Corps)

2. **Name of undertaking/project** (Include project/permit/application number if applicable):

Glenwood Wastewater Collection and Treatment Project (Project) in Preble County, Ohio (Figure 1)

3. **Location of undertaking** (Indicate city(s), county(s), state(s), land ownership, and whether it would occur on or affect historic properties located on tribal lands):

The Undertaking is located in the unincorporated community of Glenwood located along US 35 between Eaten and West Alexandria in both Lanier and Twin Townships at the center of Preble County, Ohio (Figures 1–3).

The study will not occur on or affect historic properties located on tribal lands.

4. **Name and title of federal agency official and contact person for this undertaking**, including email address and phone number: Jared Barrett, Archaeologist jared.l.barrett@usace.army.mil 502-315-6480

5. **Purpose of notification.** Indicate whether this documentation is to:

- invite the ACHP to participate in a Section 106 consultation, and/or – The Corps will develop a project Programmatic Agreement (PA) due to delayed rights of entry for the project (Figure 4). The Corps will not have time to complete identification of historic properties ahead of a signed Environmental Assessment and Finding of No Significant Impacts (FONSI) for the Undertaking. See attached consulting letters sent to the Ohio History Connection, federally recognized Indian tribes with ancestral ties to the area, and other consulting parties discussing need for a PA for Undertaking due to lack of rights of entry, schedule, and timeframes. Also included is a response received from the Forest County Potawatomi Community.

II. Information on the Undertaking*

6. **Describe the undertaking and nature of federal involvement** (if multiple federal agencies are involved, specify involvement of each):

This Project was authorized under the authority of Section 594 of the Water Resources Development Act (WRDA) of 1999 (Public Law 106-53, 113 STAT 381), as amended. Section 594 authorizes federal design and construction assistance to non-federal interests to carry out water-related environmental infrastructure and resource protection and development projects in Ohio and North Dakota. The Project is a cooperative effort between the Corps and Preble County, Ohio (Non-Federal Sponsor). The Corps, as part of the Project, will provide support for the design and construction of a sanitary sewage collection and treatment system in the area of Glenwood, Ohio (see Figure 1). The Project as described below is considered an Undertaking as defined in 36 CFR 800.3(a) of the National Historic Preservation Act (NHPA).

Based on the cost analysis and environmental conditions, the Preble County Commissioners and the Glenwood community have chosen a plan to construct a gravity sewer system that delivers wastewater to an extended aeration wastewater treatment facility (see Figure 2). The following elements will be part of the proposed Undertaking:

- Wastewater Treatment Plant (WWTP).
- Effluent outfall.
- Sewer Laterals.
- Force Main.
- Lift Station
- Gravity Sewer
- Manholes.
- Contractor Work Limits, Storage and Laydown Areas, and Access Roads

7. Describe the Area of Potential Effects: (also see attached letter sent to Ohio History Connection [SHPO] in Appendix B)

The proposed Area of Potential Effects (APE) consists of the wastewater treatment plant, the effluent outfall channel, the sewer laterals, contractor work limits, and any temporary access roads, contractor storage or laydown areas associated with the Undertaking as shown on Figures 2 and 3. The total area for the proposed APE is approximately 15.98 acres.

8. Describe steps taken to identify historic properties:

A number of steps were taken in an effort to identify cultural resources within the proposed APE. These included a background check of the National Register of Historic Places (NRHP), the Louisville District Geographic Information System, the Ohio History Connection's Ohio Archaeological Inventory and Ohio Historic Inventory (both available online), and previous cultural resource survey reports that have occurred near the vicinity of the APE. The purpose of this records search was to identify and locate any previously recorded cultural resources or historic properties that could be affected by the proposed Undertaking. The online records review of the Ohio Archaeological and Historic Inventories occurred on July 22, 2020. The online search found no known prehistoric or historic archaeological sites or above ground structures within the APE. It also determined that no previously recorded historic properties listed on the NRHP are located within the APE. No archaeological sites were located within a 0.5-mile radius of the proposed APE. No archaeological surveys have been previously conducted with the APE.

During an initial site visit to the site on August 20, 2020, Corps archaeologist Jared Barrett noted the Stover-Sample Cemetery located on Rebecca Drive (Figure 3). The Stover-Sample Cemetery dates to the mid nineteenth century based on the death dates listed on the headstones in the cemetery (1841-1866). Based on the current alignment of the proposed sewer line, it will be located 100 feet west of the Stover-Sample Cemetery property boundary. The Preble Memory Gardens Cemetery is located at 3377 US 35

East West Alexandria, Ohio (Figure 3). The Preble Memory Garden Cemetery was opened in 1969 and is located north of the proposed sewer line alignment along US 35 East. A barn (older than 50 years of age) was noted during the August 20, 2020 site visit and is located within the contractor work limits of the proposed wastewater treatment plant (see Figure 3). Current plans call for the barn to be left on site with no plans to demolish of alter the structure during construction of the Undertaking. The Corps plans on conducting an archaeological survey of the APE according to SHPO standards and will coordinate the results with the SHPO and federally recognized Indian tribes once all rights of entry have been obtained.

Only site visits have been conducted at this time. No formal surveys (for archaeological or above ground structure resources) have yet been conducted of the APE to identify historic properties due to lack of rights of entry.

9. **Describe the historic property** (or properties) and any National Historic Landmarks within the APE (or attach documentation or provide specific link to this information):

None present but identification and evaluation of historic properties (a survey of the APE) is delayed until all rights of entry have been obtained (see Figure 4).

10. Describe the undertaking's effects on historic properties:

Installation and construction of the proposed WWTP, sewer lines, and temporary laydown yards, staging areas, work limits, and access roads. The extent of the effects is unknown at this time since we have not completed a cultural resources investigation to identify historic properties for the Project.

11. Explain how this undertaking would adversely affect historic properties (include information on any conditions or future actions known to date to avoid, minimize, or mitigate adverse effects):

Potentially will adversely affect areas that may contain any unknown historic properties that have not been identified yet within the APE. Additional surveys are needed to complete identification of historic properties within the APE. If historic properties eligible for the NRHP are identified during the survey of the APE, future impacts will be evaluated and could include loss of vegetation in area and construction activities associated with construction of the WWTP and sewer lines.

12. Provide copies or summaries of the views provided to date by any consulting parties, Indian tribes or Native Hawai'ian organizations, or the public, including any correspondence from the SHPO and/or THPO.

See Appendix B for SHPO and THPO correspondence. Also included is a letter sent to potential consulting parties for the PA. We have received a response from the Forest County Potawatomi Community regarding the undertaking (see Appendix B).

* see *Instructions for Completing the ACHP e106 Form*

III. Optional Information

13. Please indicate the status of any consultation that has occurred to date. Are there any consulting parties involved other than the SHPO/THPO? Are there any outstanding or unresolved concerns or issues that the ACHP should know about in deciding whether to participate in consultation?

The Corps is in the process of reaching out to consulting parties and have identified the following potential consulting parties below. At this point in consultation, the only unresolved concern or issue

regarding the Project is the lack of rights of entry where the Undertaking will cross private property. Below is a list of consulting parties we have reached out to as of September 19, 2023.

Consulting Parties List:

Ohio History Connection (SHPO)
Advisory Council on Historic Preservation
Preble County Government
The Archaeological Society of Ohio
Preble County Historical Society
Lanier Township Government
Twin Township Government
Miami Tribe of Oklahoma
Absentee-Shawnee Tribe of Oklahoma
Eastern Shawnee Tribe of Oklahoma
Shawnee Tribe of Oklahoma
Citizen Potawatomi Nation
Forest County Potawatomi
Hannahville Indian Community
Gun Lake Tribe
Nottawaseppi Huron Band of Potawatomi
Pokagon Band of Potawatomi
Saginaw Chippewa Indian Tribe of Michigan
Lac Vieux Desert Band of Lake Superior
Lac du Flambeau Band of Lake Superior
Sault Ste Marie Tribe of Chippewa
Bad River Band of Lake Superior Chippewa
Keweenaw Bay Indian Community
Lac Courte Oreilles Band of Chippewa
Red Cliff Band of Lake Superior Chippewa
Red Lake Chippewa
St. Croix Chippewa Community
Fon du lac Band of Chippewa
Bois Forte Band of Chippewa
Grand Portage Band of Lake Superior Chippewa
Leech Lake Band of Ojibwe
Mille Lacs Band of Ojibwe
Grand Traverse Band of Ottawa and Chippewa
Little River Band of Ottawa
Ottawa Tribe of Oklahoma
Little Traverse Bay Band of Odawa
Peoria Tribe of Oklahoma
Sac and Fox Tribe of Mississippi in Iowa
Sac and Fox Nation of Oklahoma
Oneida Nation of New York
Oneida Nation of Wisconsin
Delaware Nation of Oklahoma
Delaware Tribe of Indians Oklahoma
Wyandotte Nation of Oklahoma

14. Does your agency have a website or website link where the interested public can find out about this project and/or provide comments? Please provide relevant links: No

15. Is this undertaking considered a "major" or "covered" project listed on the Federal Infrastructure Projects Permitting Dashboard or other federal interagency project tracking system? If so, please provide the link or reference number: No

The following are attached to this form (check all that apply):

_X__ Section 106 consultation correspondence

_X__ Maps, photographs, drawings, and/or plans

___ Additional historic property information

___ Other:

Appendix A: Maps of the study areas (APE)

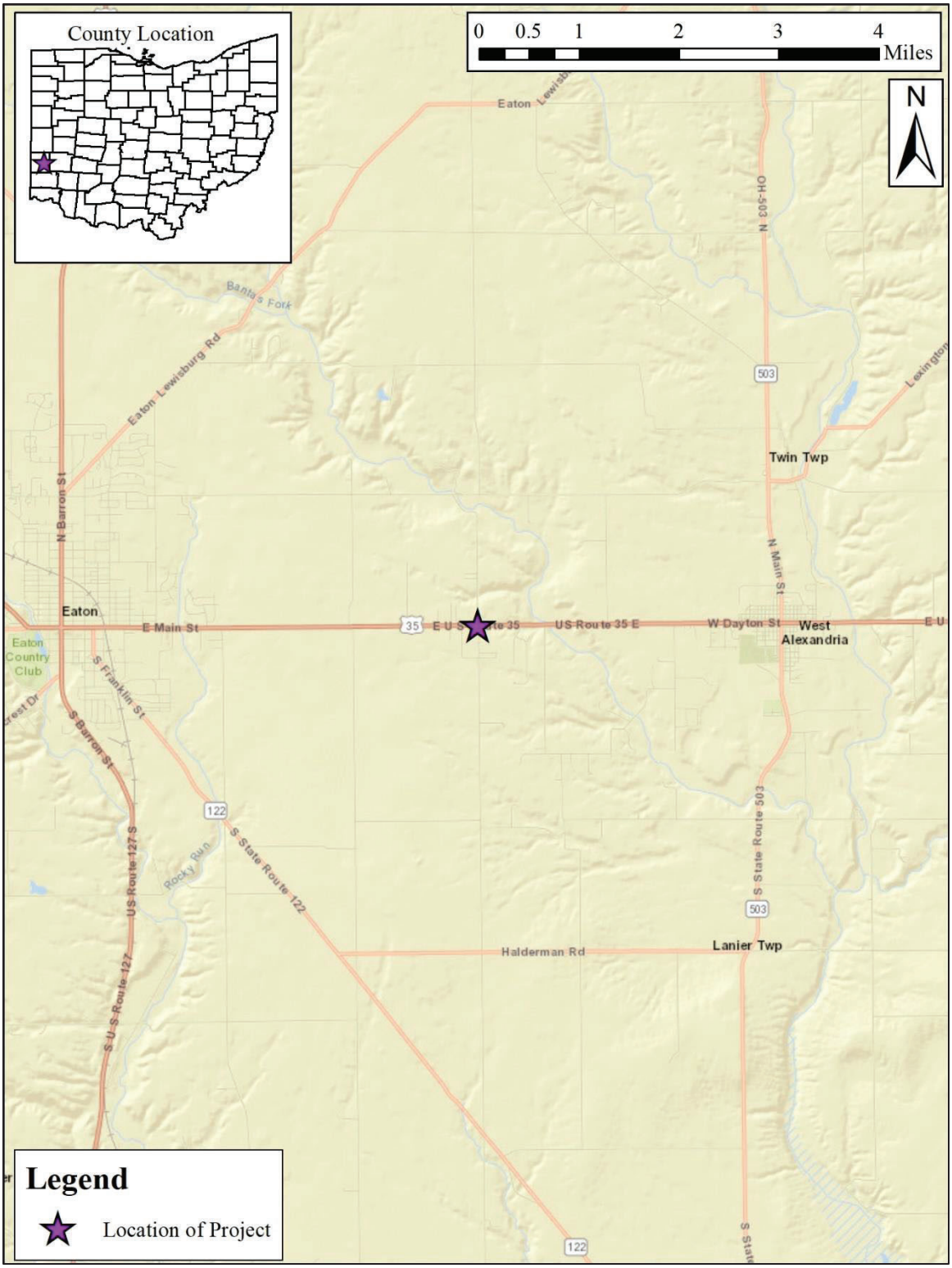

Figure 1. Map showing the general location of the Glenwood Wastewater Collection and Treatment Project (Undertaking).

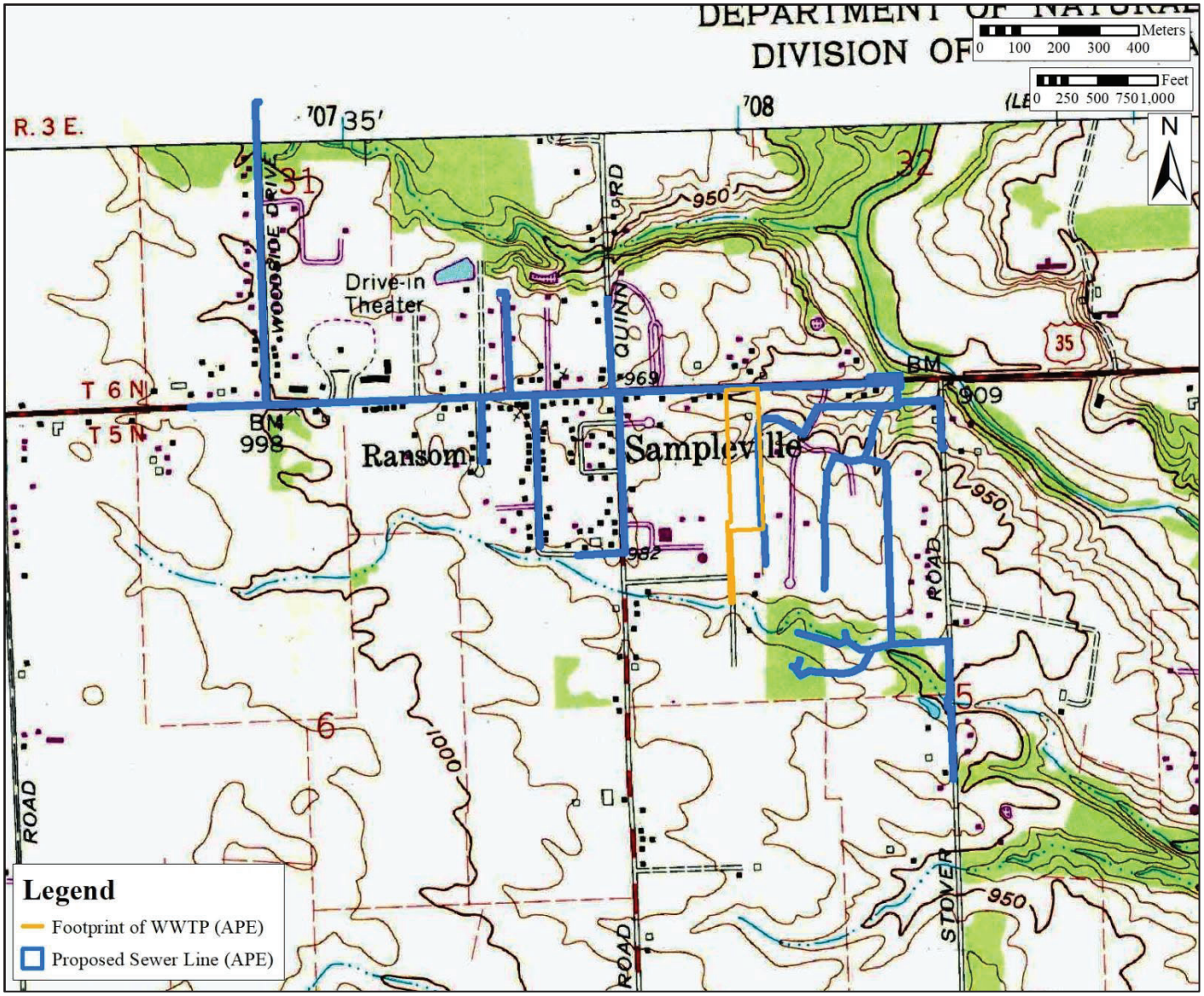

Figure 2. Excerpt of the West Alexandria, Ohio USGS Topographic map showing the location of the proposed APE.

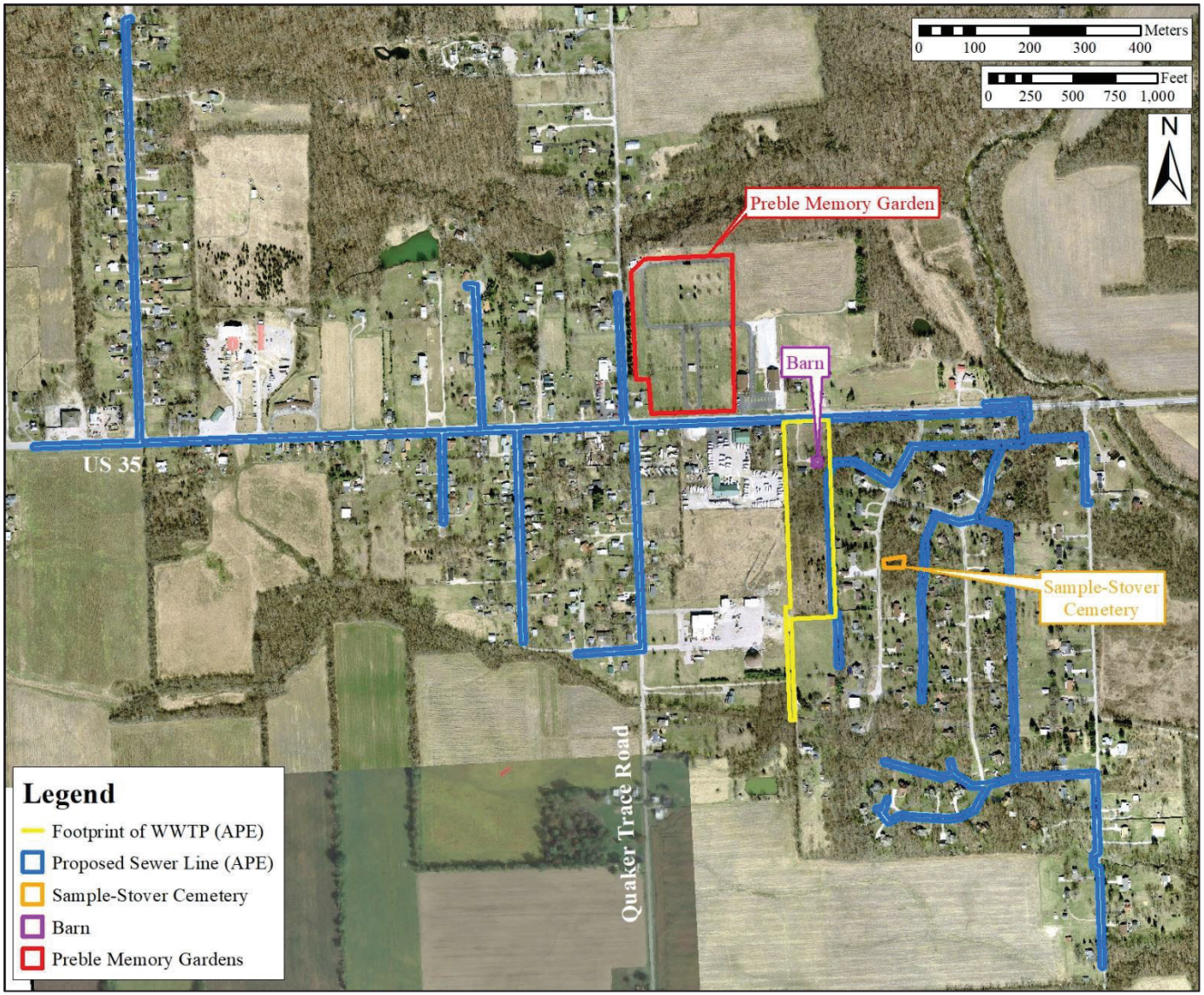

Figure 3. Aerial view showing the location of the proposed APE and locations of previously recorded above ground cultural resources located either within or near the APE.

Figure 4. Aerial view showing the location property boundaries within the APE that require an executed right of entry with those in blue that do not have an executed right of entry (27 properties to date). For western part of Undertaking no rights of entry required since it will follow existing rights of ways along roads and utilities.

Appendix B: Agency and THPO Correspondence

ADVISORY COUNCIL ON HISTORIC PRESERVATION

401 F Street NW, Suite 308 □ Washington, DC 20001-2637
Phone: 202-517-0200 □ Fax: 202-517-6381 □ achp@achp.gov □ www.achp.gov

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING JR PL
LOUISVILLE, KY 40202

September 21, 2023

Planning, Programs and
Project Management Division

Ms. Megan Wood
Ohio State Historic Preservation Officer
Ohio History Connection
800 E 17th Avenue
Columbus, Ohio 43211

Dear Ms. Wood:

The U.S. Army Corps of Engineers, Louisville District (Corps) is initiating consultation under Section 106 of the National Historic Preservation Act (NHPA) regarding the proposed Glenwood Wastewater Collection and Treatment Project (Project) in Preble County, Ohio (Figure 1). This project was authorized under the authority of Section 594 of the Water Resources Development Act (WRDA) of 1999 (Public Law 106-53, 113 STAT 381), as amended. Section 594 authorizes federal design and construction assistance to non-federal interests to carry out water-related environmental infrastructure and resource protection and development projects in Ohio and North Dakota. The Project is a cooperative effort between the Corps and Preble County, Ohio (Non-Federal Sponsor). The Corps as part of the Project will provide support for the design and construction of a sanitary sewage collection and treatment system in the area of Glenwood, Ohio (see Figure 1). The Project as described below is considered an Undertaking as defined in 36 CFR 800.3(a) of the NHPA.

The Undertaking is located in the unincorporated community of Glenwood located along US 35 between Eaten and West Alexandria at the center of Preble County, Ohio. Based on the cost analysis and environmental conditions, the Preble County Commissioners and the Glenwood community have chosen a plan to construct a gravity sewer system that delivers wastewater to an extended aeration wastewater treatment facility (Figure 2). The following elements will be part of the proposed Undertaking:

- wastewater treatment plant (WWTP),
- effluent outfall,
- sewer laterals,
- force main,
- lift station,
- gravity sewer,
- manholes, and
- contractor work limits, storage and laydown areas, and access roads.

The proposed Area of Potential Effects (APE) consists of the wastewater treatment plant, the effluent outfall channel, the sewer laterals, contractor work limits, and any temporary access roads, contractor storage or laydown areas associated with the Undertaking as shown on Figure 2. The total area for the proposed APE is approximately 15.98 acres.

A number of steps were taken in an effort to identify cultural resources within the proposed APE. These included a background check of the National Register of Historic Places (NRHP), the Louisville District Geographic Information System, the Ohio History Connection's Ohio Archaeological Inventory and Ohio Historic Inventory (both available online), and previous cultural resource survey reports that have occurred near the vicinity of the APE. The purpose of this records search was to identify and locate any previously recorded cultural resources or historic properties that could be affected by the proposed Undertaking. The online records review of the Ohio Archaeological and Historic Inventories occurred on July 22, 2020. The online search found no known prehistoric or historic archaeological sites or above ground structures within the APE. It also determined that no previously recorded historic properties listed on the NRHP are located within the APE. No archaeological sites were located within a 0.5-mile radius of the proposed APE. No archaeological surveys have been previously conducted with the APE.

During an initial site visit to the site on August 20, 2020, Corps archaeologist Jared Barrett noted the Stover-Sample Cemetery located on Rebecca Drive (Figure 3). The Stover-Sample Cemetery dates to the mid-nineteenth century based on the death dates listed on the headstones in the cemetery (1841-1866). Based on the current alignment of the proposed sewer line, it will be located 100 feet west of the Stover-Sample Cemetery property boundary. The Preble Memory Gardens Cemetery is located at 3377 US 35 East West Alexandria, Ohio (Figure 3). The Preble Memory Garden Cemetery was opened in 1969 and is located north of the proposed sewer line alignment along US 35 East. A barn (older than 50 years of age) was noted during the August 20, 2020 site visit and is located within the contractor work limits of the proposed wastewater treatment plant (see Figure 3). Current plans call for the barn to be left on site with no plans to demolish of alter the structure during construction of the Undertaking. The Corps plans on conducting an archaeological survey of the APE according to Ohio State Historic Preservation Office (OSHPO) standards and will coordinate the results with the OSHPO and federally recognized Indian tribes once all rights of entry have been obtained.

Due to the lack of rights of entry to access landowner properties within the proposed APE (27 as of this letter; see Figure 4), the Corps will not be able to complete an archaeological survey of the proposed APE prior to the completion of the environmental document for compliance with the National Environmental Policy Act (NEPA). The Corps is proposing to delay the identification of historic properties to the design phase but prior to its implementation (construction) of the Undertaking. The delay of identification of historic properties will require the development of a Programmatic Agreement (PA) for the Undertaking.

We are also developing a consulting party's list for the Undertaking to begin consultation and development of the PA. Listed below in Table 1 is the list of consulting parties we plan on consulting for the Undertaking and for the development of the PA. If you know of any consulting parties who wish to participate in this process, please let us know. Please provide a response no later than 30 days upon receipt of this letter. If you have any questions or comments, please contact Mr. Jared Barrett, archaeologist by telephone at 502-315-6480, or by email at Jared.L.Barrett@usace.army.mil.

Sincerely,

Ann Howard
Chief, Environmental Resources Section

Enclosures:
1. Figures 1-4
2. Table 1

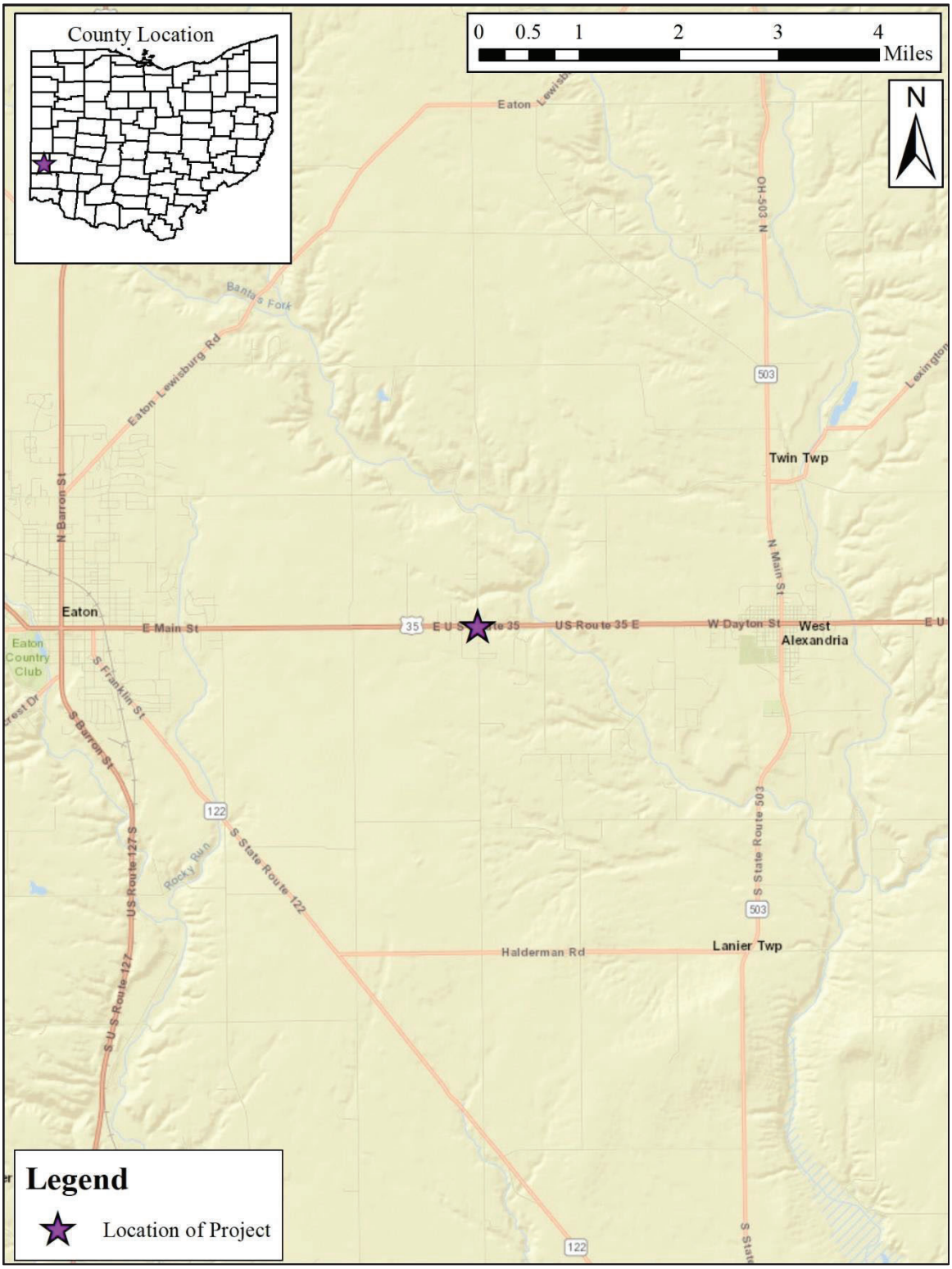

Figure 1. Map showing the general location of the Glenwood Wastewater Collection and Treatment Project (Undertaking).

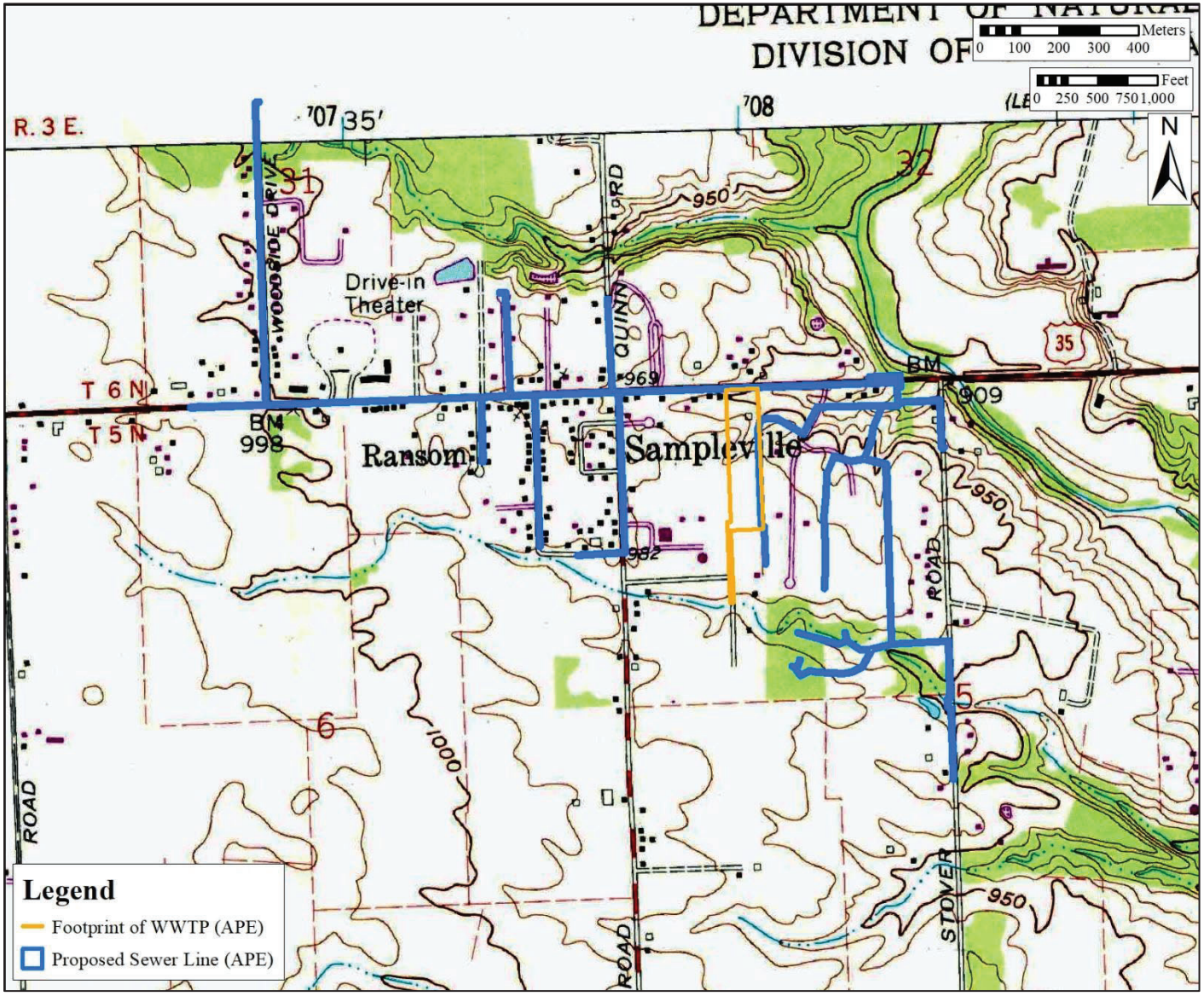

Figure 2. Excerpt of the West Alexandria, Ohio USGS Topographic map showing the location of the proposed APE.

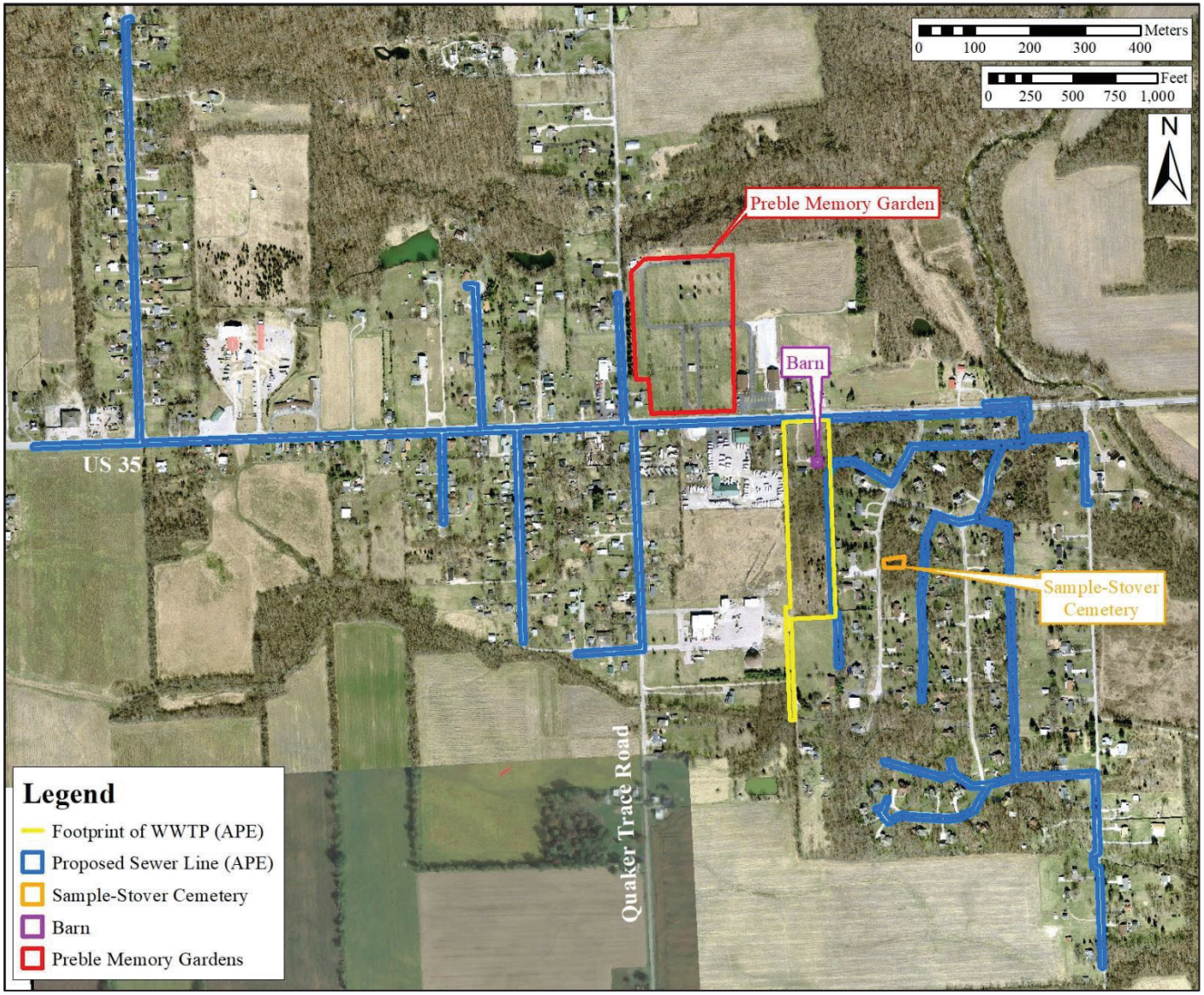

Figure 3. Aerial view showing the location of the proposed APE and locations of previously recorded above ground cultural resources located either within or near the APE.

Figure 4. Aerial view showing the location property boundaries within the APE that require an executed right of entry with those in blue that do not have an executed right of entry (27 properties to date). For western part of Undertaking no rights of entry required since it will follow existing rights of ways along roads and utilities.

Table 1. List of Consulting Parties for Undertaking:

Ohio History Connection
Advisory Council on Historic Preservation
Preble County Government
The Archaeological Society of Ohio
Preble County Historical Society
Lanier Township Government
Twin Township Government
Miami Tribe of Oklahoma
Absentee-Shawnee Tribe of Oklahoma
Eastern Shawnee Tribe of Oklahoma
Shawnee Tribe of Oklahoma
Citizen Potawatomi Nation
Forest County Potawatomi
Hannahville Indian Community
Gun Lake Tribe
Nottawaseppi Huron Band of Potawatomi
Pokagon Band of Potawatomi
Saginaw Chippewa Indian Tribe of Michigan
Lac Vieux Desert Band of Lake Superior
Lac du Flambeau Band of Lake Superior
Sault Ste Marie Tribe of Chippewa
Bad River Band of Lake Superior Chippewa
Keweenaw Bay Indian Community
Lac Courte Oreilles Band of Chippewa
Red Cliff Band of Lake Superior Chippewa
Red Lake Chippewa
St. Croix Chippewa Community
Fon du lac Band of Chippewa
Bois Forte Band of Chippewa
Grand Portage Band of Lake Superior Chippewa
Leech Lake Band of Ojibwe
Mille Lacs Band of Ojibwe
Grand Traverse Band of Ottawa and Chippewa
Little River Band of Ottawa
Ottawa Tribe of Oklahoma
Little Traverse Bay Band of Odawa
Peoria Tribe of Oklahoma
Sac and Fox Tribe of Mississippi in Iowa
Sac and Fox Nation of Oklahoma
Oneida Nation of New York
Oneida Nation of Wisconsin
Delaware Nation of Oklahoma
Delaware Tribe of Indians Oklahoma
Wyandotte Nation of Oklahoma

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING JR PL
LOUISVILLE, KY 40202

September 21, 2023

Planning, Programs and
Project Management Division

Initiation of Section 106 Consultation of the National Historic Preservation Act for the Proposed Glenwood Wastewater Collection and Treatment Project in Preble County, Ohio

The U.S. Army Corps of Engineers, Louisville District (Corps) is initiating consultation under Section 106 of the National Historic Preservation Act (NHPA) regarding the proposed Glenwood Wastewater Collection and Treatment Project (Project) in Preble County, Ohio (Figure 1). This project was authorized under the authority of Section 594 of the Water Resources Development Act (WRDA) of 1999 (Public Law 106-53, 113 STAT 381), as amended. Section 594 authorizes federal design and construction assistance to non-federal interests to carry out water-related environmental infrastructure and resource protection and development projects in Ohio and North Dakota. The Project is a cooperative effort between the Corps and Preble County, Ohio (Non-Federal Sponsor). The Corps as part of the Project will provide support for the design and construction of a sanitary sewage collection and treatment system in the area of Glenwood, Ohio (see Figure 1). The Project as described below is considered an Undertaking as defined in 36 CFR 800.3(a) of the NHPA.

The Undertaking is located in the unincorporated community of Glenwood, located along US 35 between Eaten and West Alexandria at the center of Preble County, Ohio. Based on the cost analysis and environmental conditions, the Preble County Commissioners and the Glenwood community have chosen a plan to construct a gravity sewer system that delivers wastewater to an extended aeration wastewater treatment facility (Figure 2). The following elements will be part of the proposed Undertaking:

- wastewater Treatment Plant (WWTP),
- effluent outfall,
- sewer laterals,
- force main,
- lift station,
- gravity sewer,
- manholes, and
- contractor work limits, storage and laydown areas, and access roads.

The proposed Area of Potential Effects (APE) consists of the wastewater treatment plant, the effluent outfall channel, the sewer laterals, contractor work limits, and any temporary access roads, contractor storage or laydown areas associated with the Undertaking as shown on Figure 2. The total area for the proposed APE is approximately 15.98 acres.

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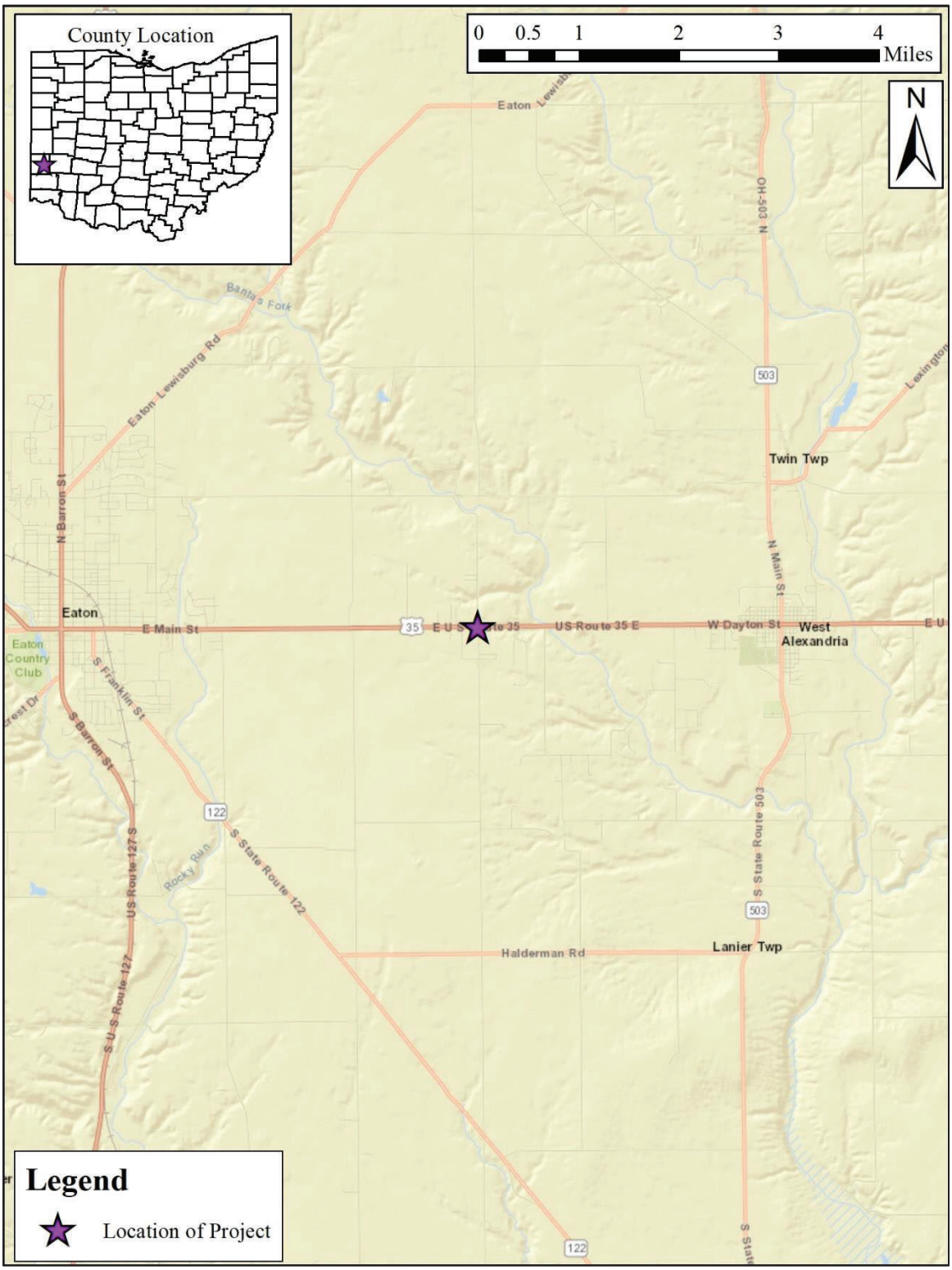
Sincerely,

Ann Howard
Chief, Environmental Resources Section

Enclosures:
Figures 1 through 4



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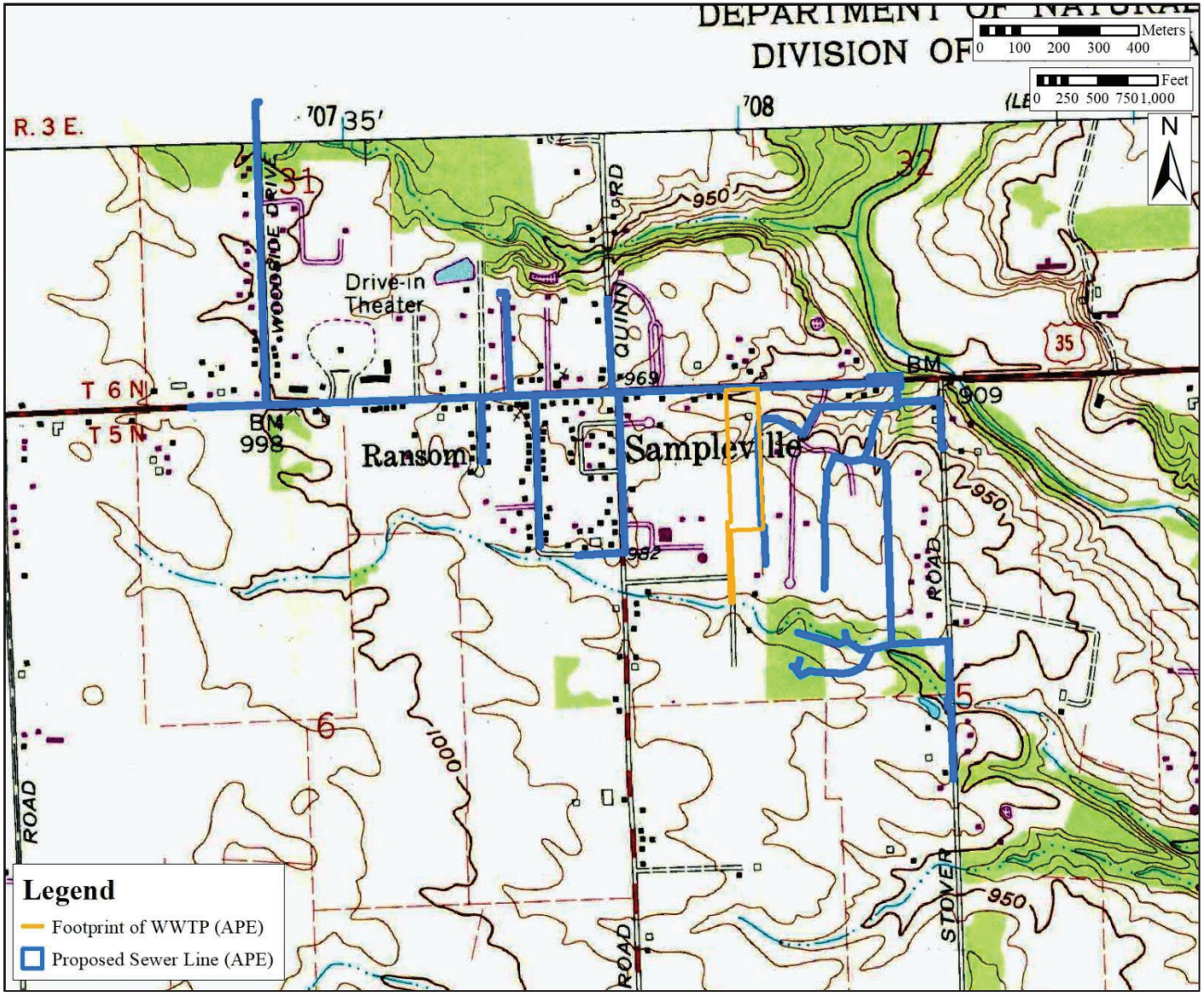

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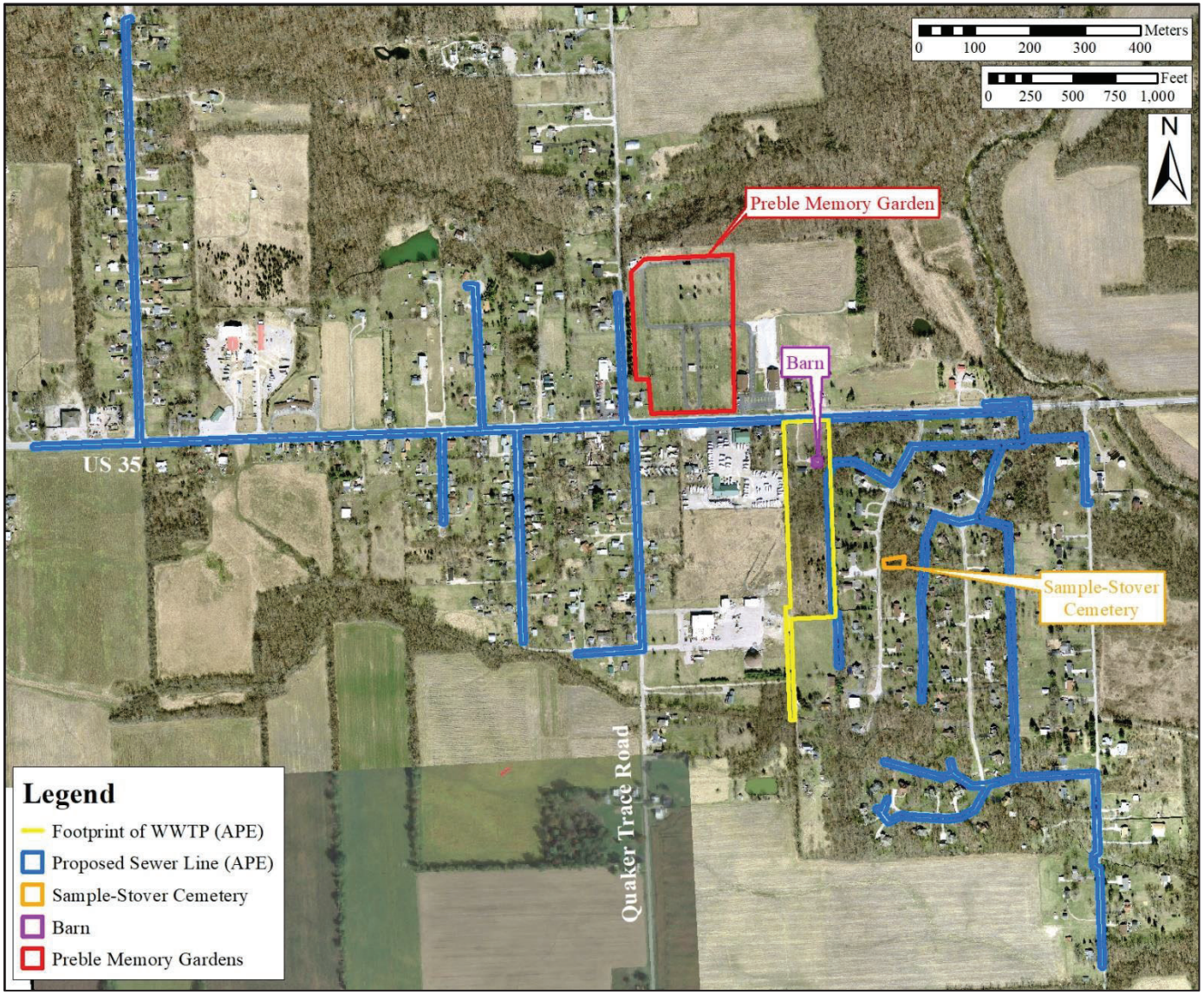

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Ottawa Tribe of Oklahoma
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Oneida Nation of New York
Oneida Nation of Wisconsin
Delaware Nation of Oklahoma
Delaware Tribe of Indians Oklahoma
Wyandotte Nation of Oklahoma

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING JR PL
LOUISVILLE, KY 40202

September 21, 2023

Planning, Programs and
Project Management Division

Invitation to be a Consulting Party for a Programmatic Agreement under Section 106 of the National Historic Preservation Act for the Proposed Glenwood Wastewater Collection and Treatment Project in Preble County, Ohio

The U.S. Army Corps of Engineers, Louisville District (Corps) is initiating consultation under Section 106 of the National Historic Preservation Act (NHPA) regarding the proposed Glenwood Wastewater Collection and Treatment Project (Project) in Preble County, Ohio (Figure 1). This project was authorized under the authority of Section 594 of the Water Resources Development Act (WRDA) of 1999 (Public Law 106-53, 113 STAT 381), as amended. Section 594 authorizes federal design and construction assistance to non-federal interests to carry out water-related environmental infrastructure and resource protection and development projects in Ohio and North Dakota. The Project is a cooperative effort between the Corps and Preble County, Ohio (Non-Federal Sponsor). The Corps as part of the Project will provide support for the design and construction of a sanitary sewage collection and treatment system in the area of Glenwood, Ohio (see Figure 1). The Project as described below is considered an Undertaking as defined in 36 CFR 800.3(a) of the NHPA.

The Undertaking is located in the unincorporated community of Glenwood located along US 35 between Eaten and West Alexandria at the center of Preble County, Ohio. Based on the cost analysis and environmental conditions, the Preble County Commissioners and the Glenwood community have chosen a plan to construct a gravity sewer system that delivers wastewater to an extended aeration wastewater treatment facility (Figure 2). The following elements will be part of the proposed Undertaking:

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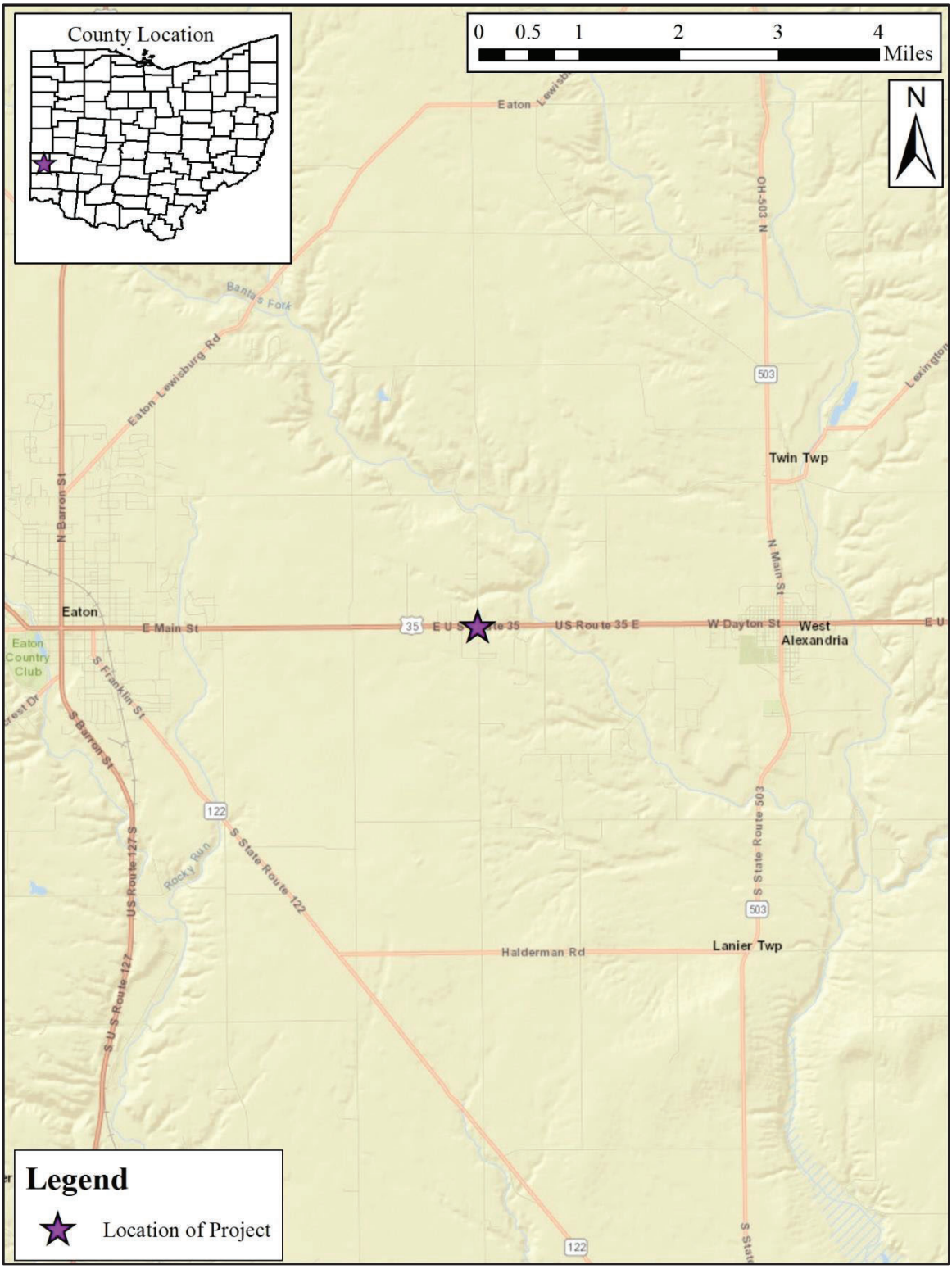

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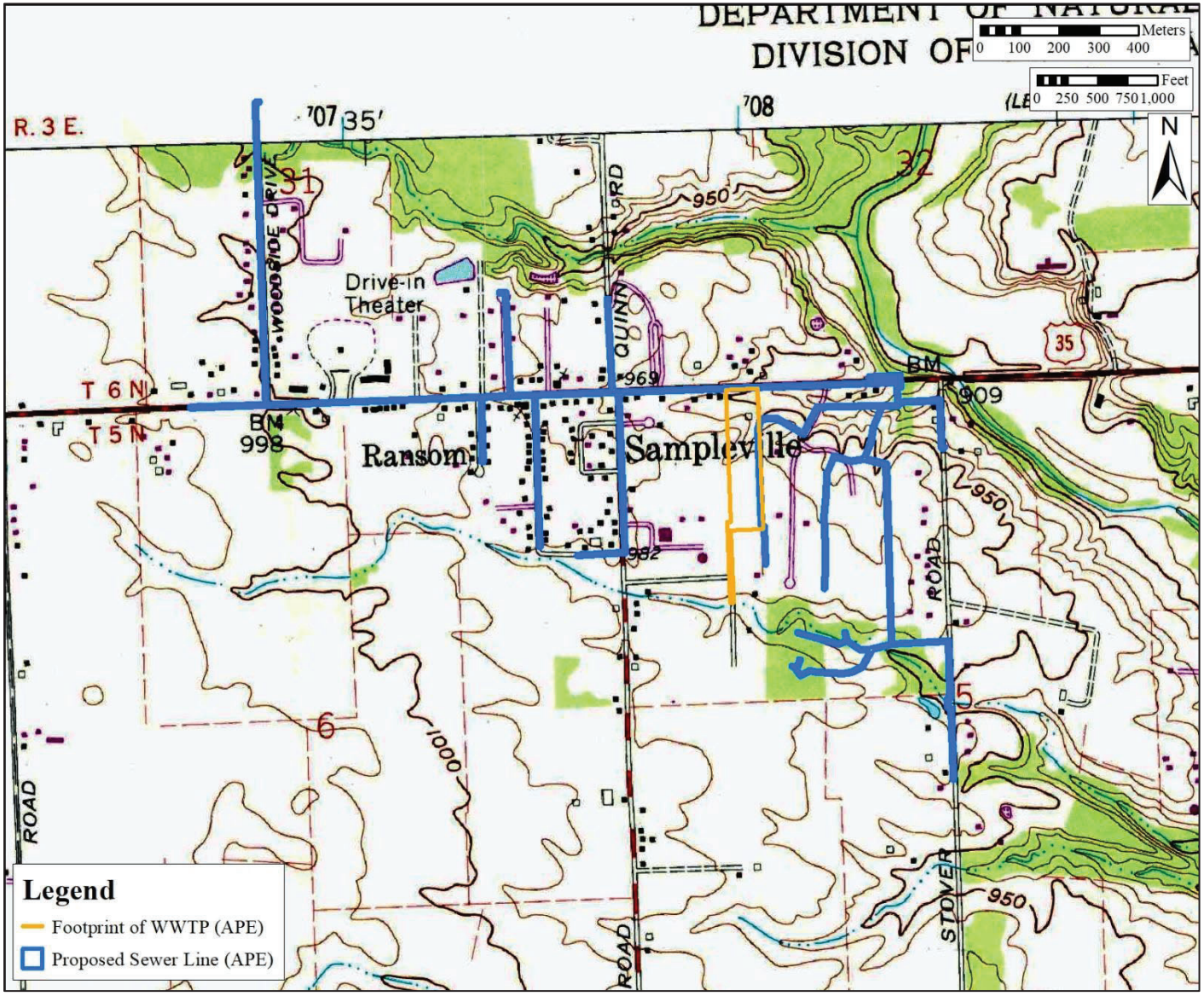

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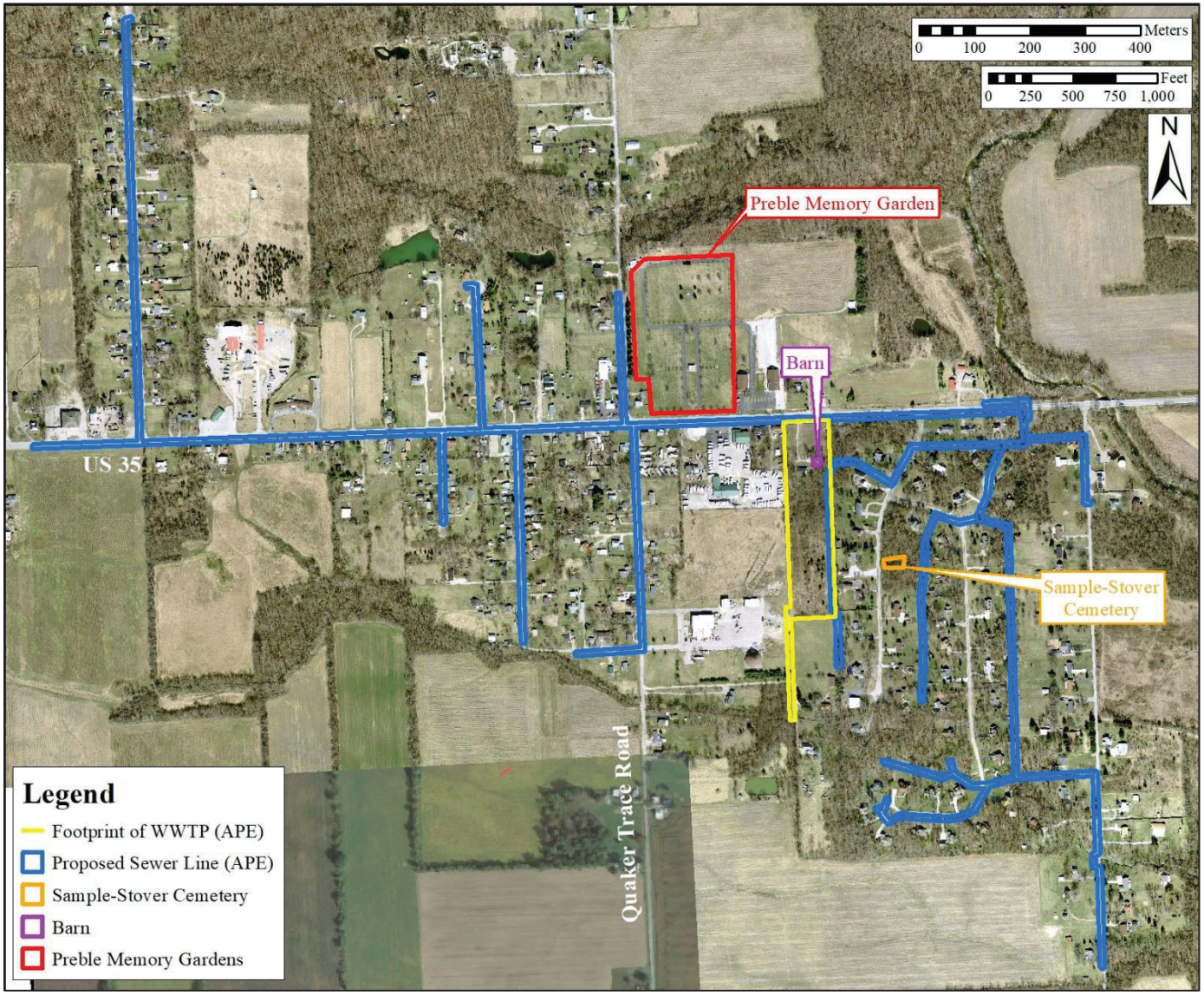

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Grand Portage Band of Lake Superior Chippewa
Leech Lake Band of Ojibwe
Mille Lacs Band of Ojibwe
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Sac and Fox Nation of Oklahoma
Oneida Nation of New York
Oneida Nation of Wisconsin
Delaware Nation of Oklahoma
Delaware Tribe of Indians Oklahoma
Wyandotte Nation of Oklahoma

Barrett, Jared L CIV USARMY CELRL (USA)

From: Benjamin Rhodd <Benjamin.Rhodd@fcp-nsn.gov>
Sent: Thursday, September 21, 2023 1:43 PM
To: Barrett, Jared L CIV USARMY CELRL (USA)
Subject: [Non-DoD Source] RE: USACE - Section 106 Consultation - Glenwood Wastewater Collection and Treatment Project in Preble County, Ohio

Mr. Barrett,

Pursuant to consultation under Section 106 of the National Historic Preservation Act (1966 as amended) the Forest County Potawatomi Community (FCPC), a Federally Recognized Native American Tribe, reserves the right to comment on Federal undertakings, as defined under the act.

The Tribal Historic Preservation Office (THPO) staff has reviewed the information you provided for this project. Upon review of site data and supplemental cultural history within our Office, the FCPC THPO is pleased to offer a finding of No Historic Properties affected of significance to the FCPC, however, we request to remain as a consulting party for this project. Additionally, the FCPC THPO Office is concerned about the topographic location being near the confluence of two creeks. In numerous instances, occupational and habitation location are found at these confluences. It is suggested that an SOI certified archaeologist be on site during the construction of the sanitary line with stop work authority in the event of an Inadvertent Discovery of human remains or a buried archaeological site that may prove to be significant.

As a standard caveat sent with each proposed project reviewed by the FCPC THPO, the following applies. In the event an Inadvertent Discovery (ID) occurs at any phase of a project or undertaking as defined, and human remains or archaeologically significant materials are exposed as a result of project activities, work should cease immediately. The Tribe(s) must be included with the SHPO in any consultation regarding treatment and disposition of an ID find.

Thank you for protecting cultural and historic properties and if you have any questions or concerns, please contact me at the email or number listed below.

Respectfully,

Ben Rhodd, MS, RPA, Tribal Historic Preservation Officer
Forest County Potawatomi
Historic Preservation Office
8130 Mish ko Swen Drive, P.O. Box 340, Crandon, Wisconsin 54520
P: 715-478-7354 C: 715-889-0202 Main: 715-478-7474
Email: Benjamin.Rhodd@fcp-nsn.gov
www.fcpotawatomi.com

From: Barrett, Jared L CIV USARMY CELRL (USA) <Jared.L.Barrett@usace.army.mil>
Sent: Thursday, September 21, 2023 7:56 AM
To: Joe.Stahlman@sni.org; 106NAGPRA@astribe.com; PBarton@estoo.net; Erin Paden <epaden@shawnee-tribe.com>; Benjamin Rhodd <Benjamin.Rhodd@fcp-nsn.gov>; cpnthpo@potawatomi.org; Hannahville Indian Community, Michigan <earlmeshigaud@hannahville.org>; Pokagon Band of Potwatomi Indians, Michigan and Indiana

<matthew.bussler@pokagonband-nsn.gov>; Raphael Wahwassuck <RaphaelWahwassuck@pbpnation.org>; Gun Lake Tribe - THPO Shared <mbpi_thpo@glt-nsn.gov>; THPO@miamination.com; mlhadden@sagchip.org; 'ldfthpo@ldftribe.com' <ldfthpo@ldftribe.com>; Edith Leoso <thpo@badriver-nsn.gov>; 'gloonsfoot@kbic-nsn.gov' <gloonsfoot@kbic-nsn.gov>; Brian.Bisonette@lco-nsn.gov; marvin.defoe@redcliff-nsn.gov; Michael LaRonge <michael.laronge@scc-nsn.gov>; wandam@stcroixtribalcenter.com; evanschroeder@fdlrez.com; jaylen.strong@boisforte-nsn.gov; maryanng@granportage.com; amyburnette@llojibwe.org; terry.kemper@millelacsband.com; bfletcher@peoriatribe.com; cindy.winslow@gtbindians.com; jsay@lrb-nsn.gov; rhonda.oto@gmail.com; MWiatrolik@LTBBODAWA-NSN.GOV; Buffalo, Jonathan <director.historic@meskwaki-nsn.gov>; mark.junker@sacfoxenviro.org; secondchief@sacandfoxnation-nsn.gov; sbachor@delawaretribe.org; sclemons@wyandotte.org; Frederick.Jacko@nhbp-nsn.gov; 'Corina D. Williams' <cwilliam@oneidanation.org>; Bergevin, Jesse <jbergevin@oneida-nation.org>
Subject: USACE - Section 106 Consultation - Glenwood Wastewater Collection and Treatment Project in Preble County, Ohio

Good morning,
Attached is our consultation letter for the Glenwood Wastewater Collection and Treatment Project in Preble County, Ohio.

Please call or email me if you have any questions regarding this consultation.

Look forward to working with you on this consultation.

Thank you,

Jared Barrett, MA, PMP
Archaeologist
US Army Corps of Engineers, Louisville District
Environmental Resources Section
600 Dr. Martin Luther King Jr. Place
Louisville, KY 40202
Office Phone 502.315.6480
Email: Jared.L.Barrett@usace.army.mil
http://www.lrl.usace.army.mil/

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING JR PL
LOUISVILLE, KY 40202

September 21, 2023

Planning, Programs and
Project Management Division

Initiation of Section 106 Consultation of the National Historic Preservation Act for the Proposed Glenwood Wastewater Collection and Treatment Project in Preble County, Ohio

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Sincerely,

Ann Howard

Digitally signed by Ann Howard
Date: 2023.09.21 07:50:36 -04'00'

Ann Howard
Chief, Environmental Resources Section

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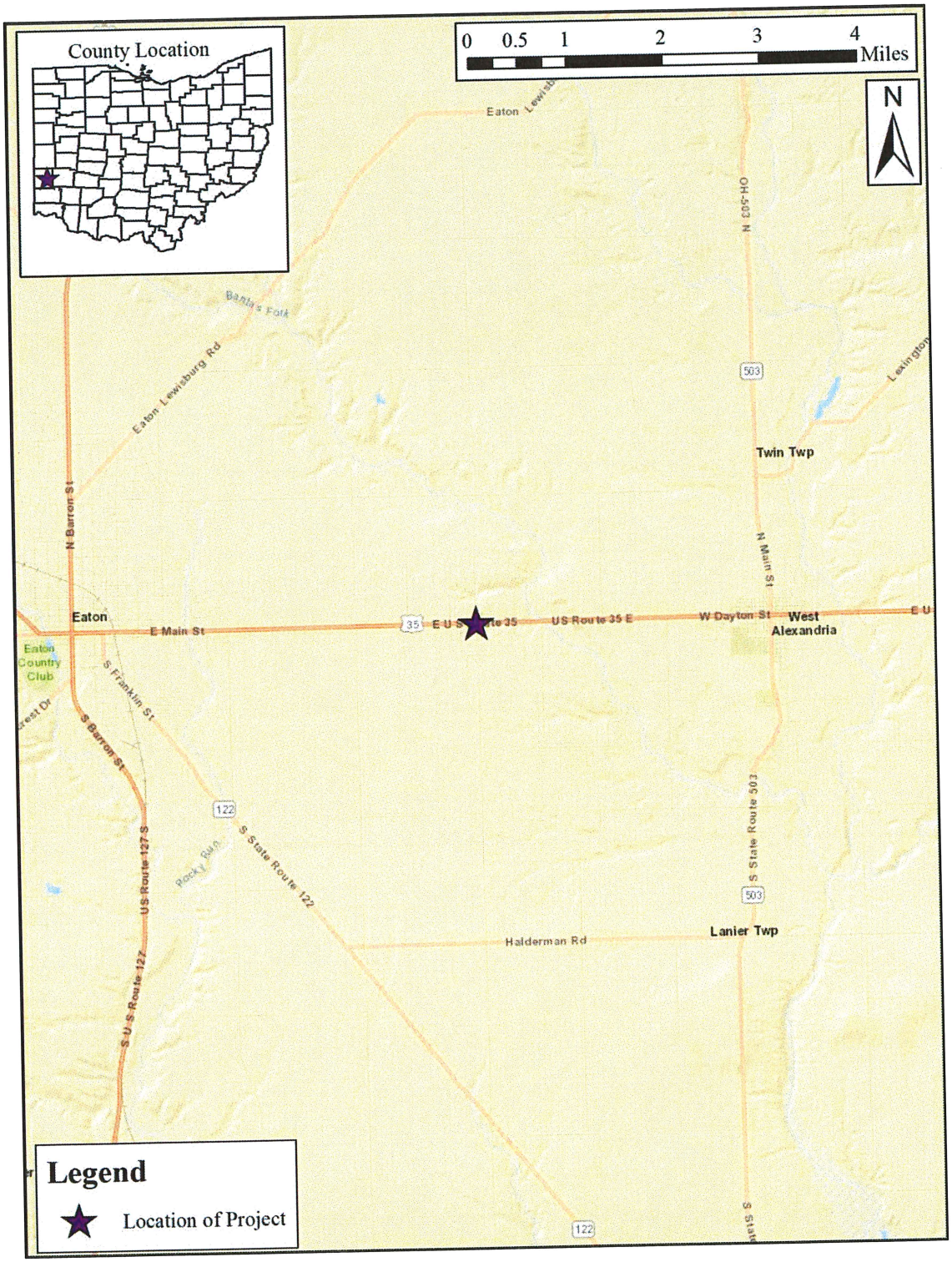

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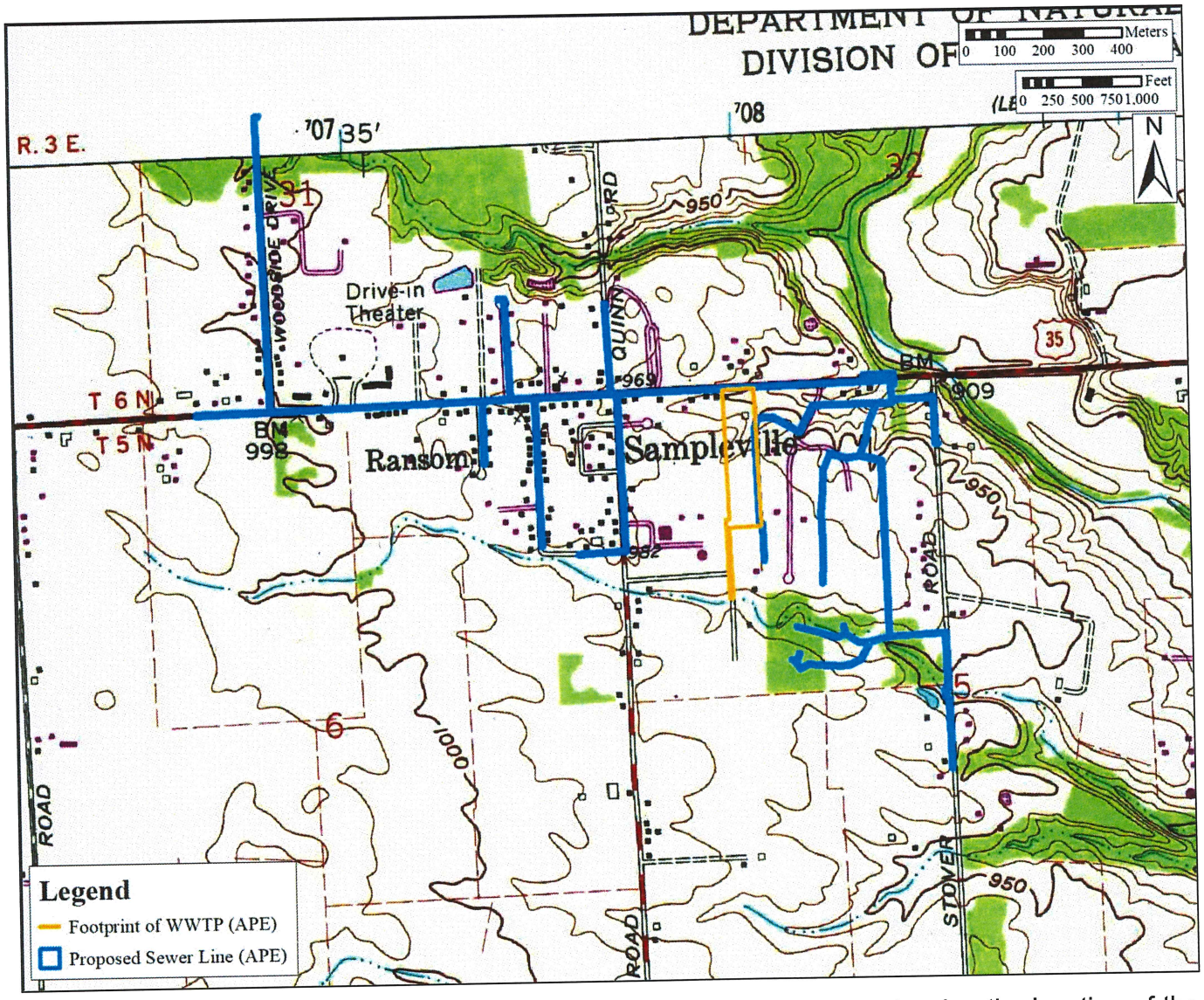

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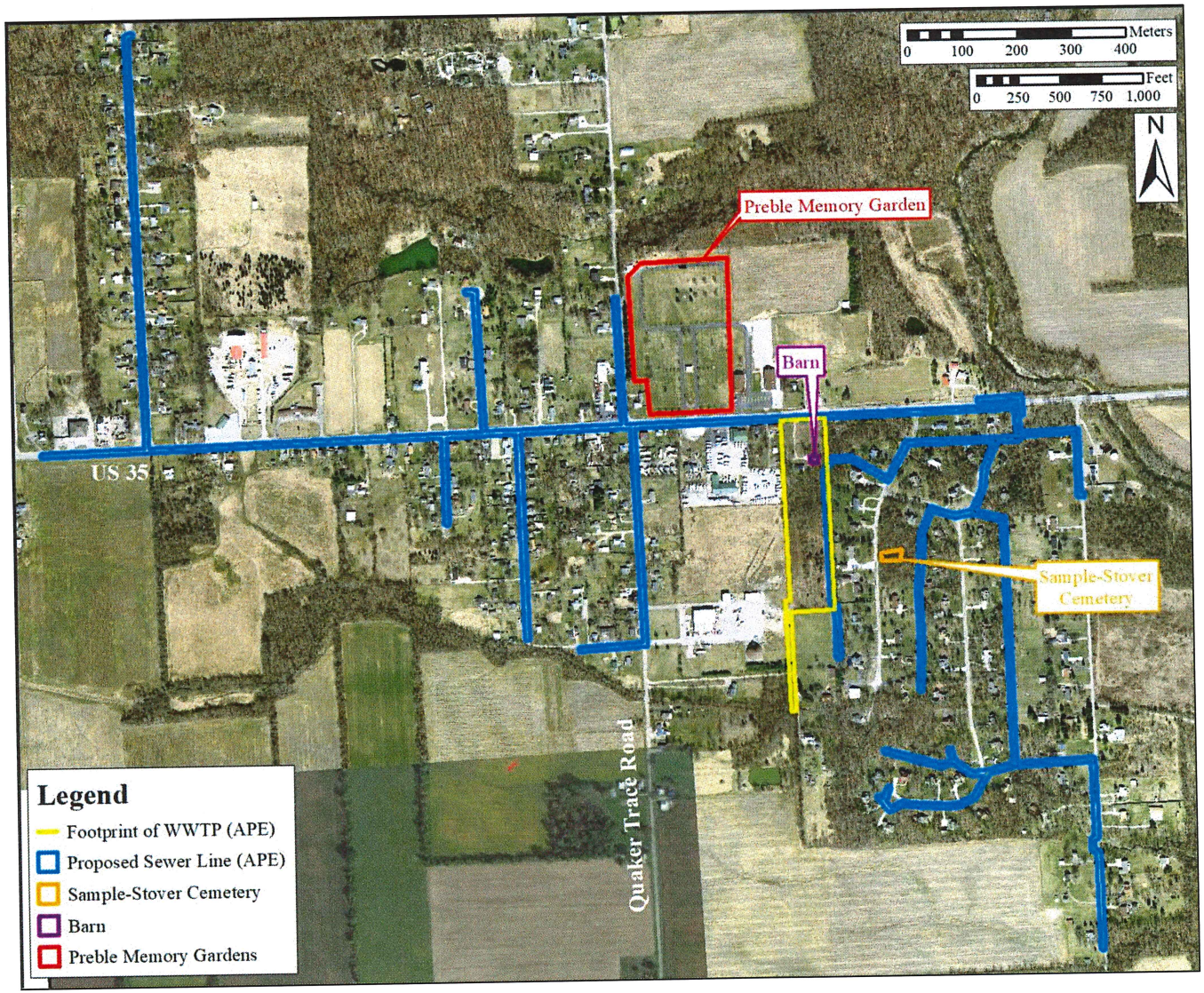

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, LOUISVILLE DISTRICT
600 DR. MARTIN LUTHER KING JR PL
LOUISVILLE, KY 40202

September 21, 2023

Planning, Programs and
Project Management Division

Ms. Megan Wood
Ohio State Historic Preservation Officer
Ohio History Connection
800 E 17th Avenue
Columbus, Ohio 43211

Dear Ms. Wood:

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The proposed Area of Potential Effects (APE) consists of the wastewater treatment plant, the effluent outfall channel, the sewer laterals, contractor work limits, and any temporary access roads, contractor storage or laydown areas associated with the Undertaking as shown on Figure 2. The total area for the proposed APE is approximately 15.98 acres.

A number of steps were taken in an effort to identify cultural resources within the proposed APE. These included a background check of the National Register of Historic Places (NRHP), the Louisville District Geographic Information System, the Ohio History Connection's Ohio Archaeological Inventory and Ohio Historic Inventory (both available online), and previous cultural resource survey reports that have occurred near the vicinity of the APE. The purpose of this records search was to identify and locate any previously recorded cultural resources or historic properties that could be affected by the proposed Undertaking. The online records review of the Ohio Archaeological and Historic Inventories occurred on July 22, 2020. The online search found no known prehistoric or historic archaeological sites or above ground structures within the APE. It also determined that no previously recorded historic properties listed on the NRHP are located within the APE. No archaeological sites were located within a 0.5-mile radius of the proposed APE. No archaeological surveys have been previously conducted with the APE.

During an initial site visit to the site on August 20, 2020, Corps archaeologist Jared Barrett noted the Stover-Sample Cemetery located on Rebecca Drive (Figure 3). The Stover-Sample Cemetery dates to the mid-nineteenth century based on the death dates listed on the headstones in the cemetery (1841-1866). Based on the current alignment of the proposed sewer line, it will be located 100 feet west of the Stover-Sample Cemetery property boundary. The Preble Memory Gardens Cemetery is located at 3377 US 35 East West Alexandria, Ohio (Figure 3). The Preble Memory Garden Cemetery was opened in 1969 and is located north of the proposed sewer line alignment along US 35 East. A barn (older than 50 years of age) was noted during the August 20, 2020 site visit and is located within the contractor work limits of the proposed wastewater treatment plant (see Figure 3). Current plans call for the barn to be left on site with no plans to demolish of alter the structure during construction of the Undertaking. The Corps plans on conducting an archaeological survey of the APE according to Ohio State Historic Preservation Office (OSHPO) standards and will coordinate the results with the OSHPO and federally recognized Indian tribes once all rights of entry have been obtained.

Due to the lack of rights of entry to access landowner properties within the proposed APE (27 as of this letter; see Figure 4), the Corps will not be able to complete an archaeological survey of the proposed APE prior to the completion of the environmental document for compliance with the National Environmental Policy Act (NEPA). The Corps is proposing to delay the identification of historic properties to the design phase but prior to its implementation (construction) of the Undertaking. The delay of identification of historic properties will require the development of a Programmatic Agreement (PA) for the Undertaking.

We are also developing a consulting party's list for the Undertaking to begin consultation and development of the PA. Listed below in Table 1 is the list of consulting parties we plan on consulting for the Undertaking and for the development of the PA. If you know of any consulting parties who wish to participate in this process, please let us know. Please provide a response no later than 30 days upon receipt of this letter. If you have any questions or comments, please contact Mr. Jared Barrett, archaeologist by telephone at 502-315-6480, or by email at Jared.L.Barrett@usace.army.mil.

Sincerely,

Ann Howard Digitally signed by Ann Howard Date: 2023.09.21 07:56:53 -04'00'

Ann Howard
Chief, Environmental Resources Section

Enclosures:
1. Figures 1-4
2. Table 1

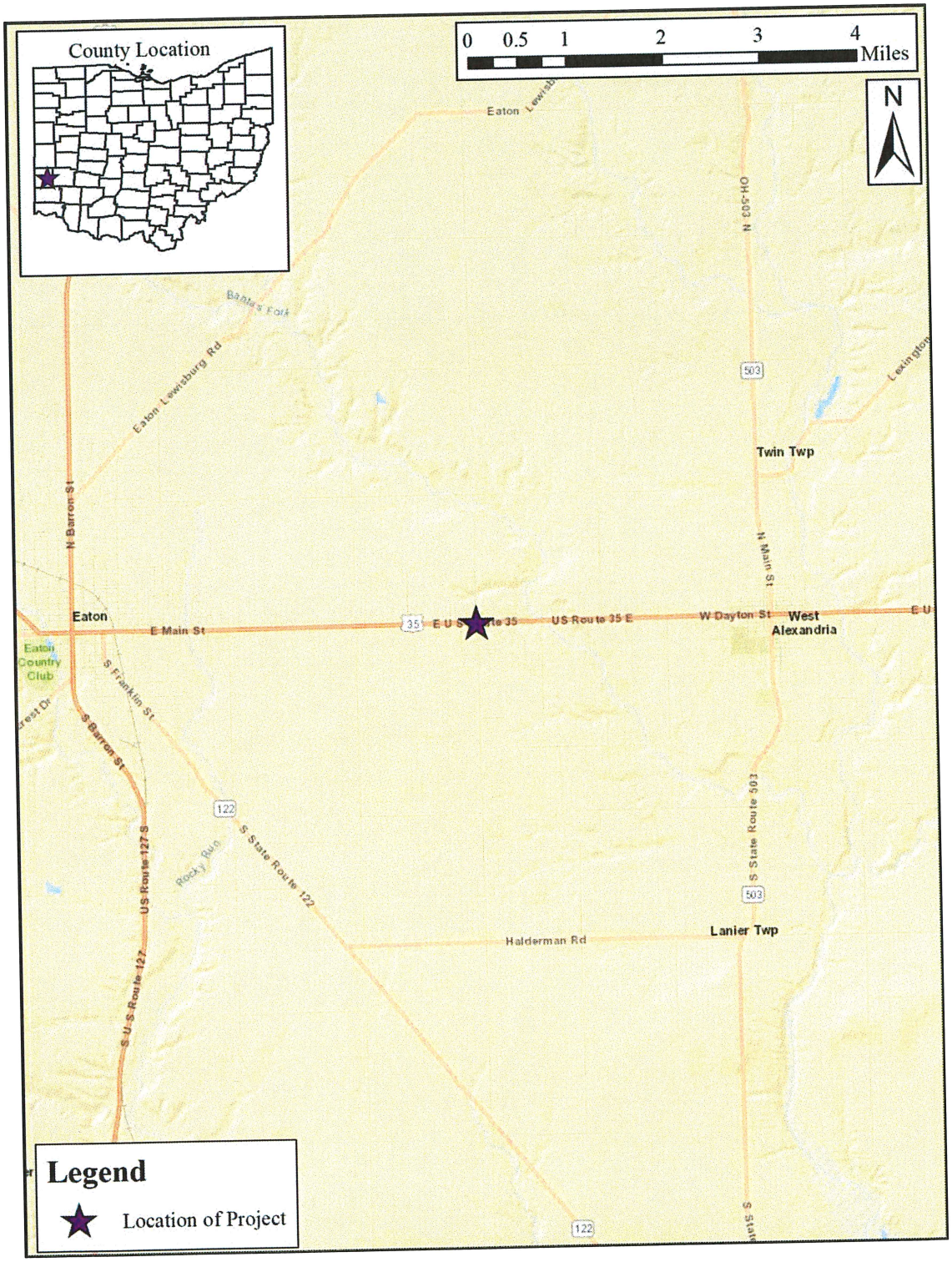


Figure 1. Map showing the general location of the Glenwood Wastewater Collection and Treatment Project (Undertaking).

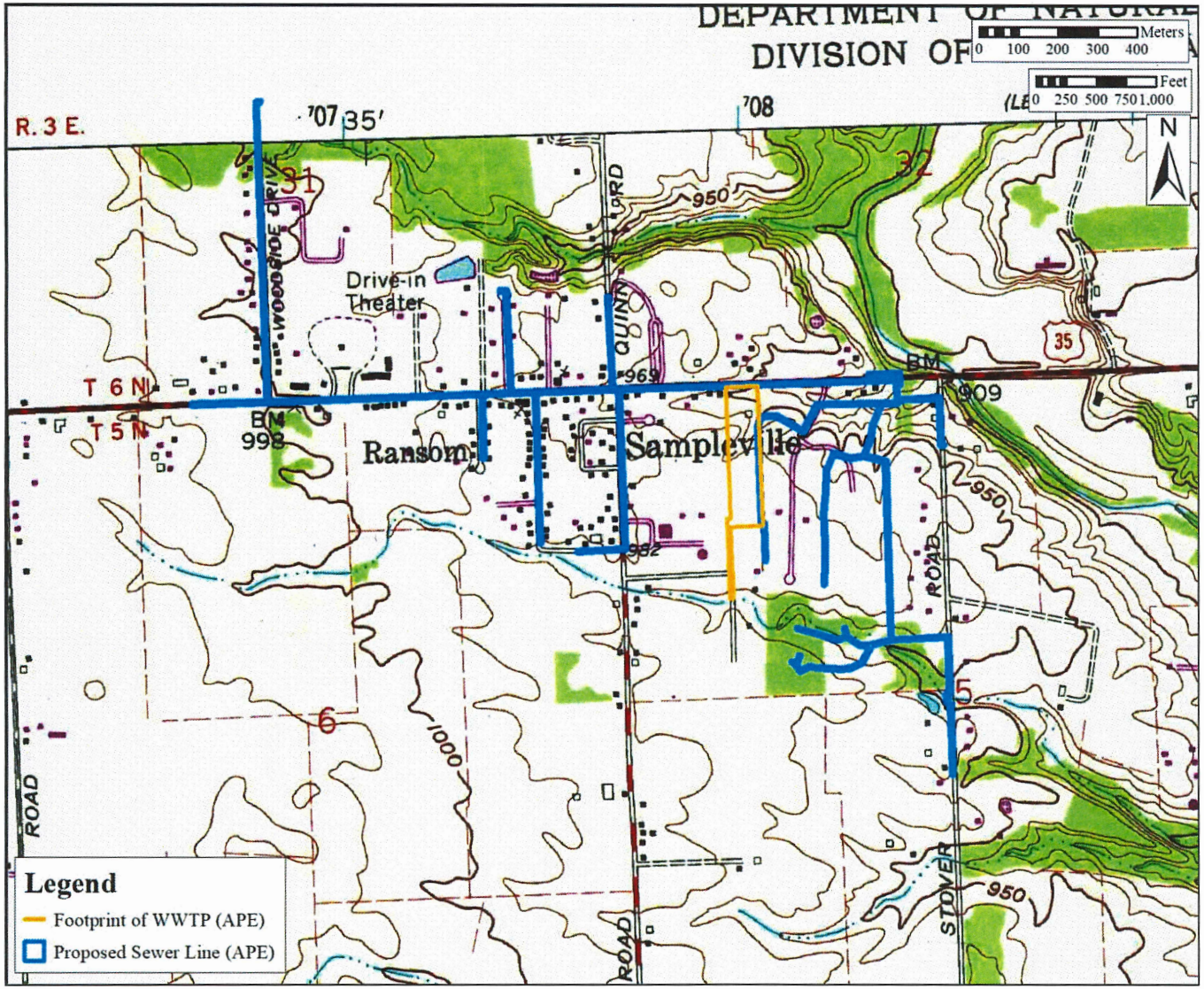


Figure 2. Excerpt of the West Alexandria, Ohio USGS Topographic map showing the location of the proposed APE.

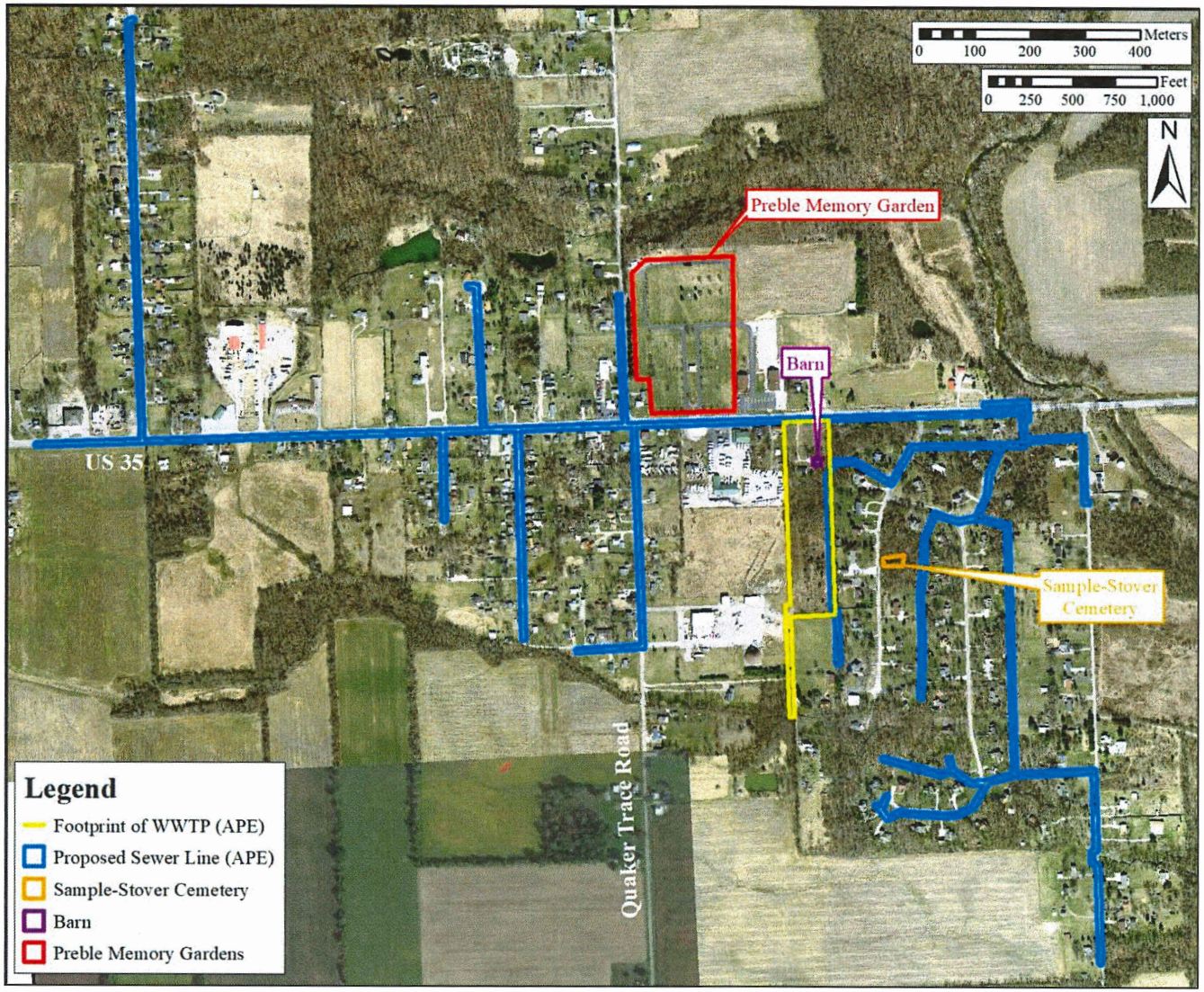


Figure 3. Aerial view showing the location of the proposed APE and locations of previously recorded above ground cultural resources located either within or near the APE.

Figure 4. Aerial view showing the location property boundaries within the APE that require an executed right of entry with those in blue that do not have an executed right of entry (27 properties to date). For western part of Undertaking no rights of entry required since it will follow existing rights of ways along roads and utilities.

Table 1. List of Consulting Parties for Undertaking:

Ohio History Connection
Advisory Council on Historic Preservation
Preble County Government
The Archaeological Society of Ohio
Preble County Historical Society
Lanier Township Government
Twin Township Government
Miami Tribe of Oklahoma
Absentee-Shawnee Tribe of Oklahoma
Eastern Shawnee Tribe of Oklahoma
Shawnee Tribe of Oklahoma
Citizen Potawatomi Nation
Forest County Potawatomi
Hannahville Indian Community
Gun Lake Tribe
Nottawaseppi Huron Band of Potawatomi
Pokagon Band of Potawatomi
Saginaw Chippewa Indian Tribe of Michigan
Lac Vieux Desert Band of Lake Superior
Lac du Flambeau Band of Lake Superior
Sault Ste Marie Tribe of Chippewa
Bad River Band of Lake Superior Chippewa
Keweenaw Bay Indian Community
Lac Courte Oreilles Band of Chippewa
Red Cliff Band of Lake Superior Chippewa
Red Lake Chippewa
St. Croix Chippewa Community
Fon du lac Band of Chippewa
Bois Forte Band of Chippewa
Grand Portage Band of Lake Superior Chippewa
Leech Lake Band of Ojibwe
Mille Lacs Band of Ojibwe
Grand Traverse Band of Ottawa and Chippewa
Little River Band of Ottawa
Ottawa Tribe of Oklahoma
Little Traverse Bay Band of Odawa
Peoria Tribe of Oklahoma
Sac and Fox Tribe of Mississippi in Iowa
Sac and Fox Nation of Oklahoma
Oneida Nation of New York
Oneida Nation of Wisconsin
Delaware Nation of Oklahoma
Delaware Tribe of Indians Oklahoma
Wyandotte Nation of Oklahoma

Appendix G. IPAC Report

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:
Project Code: 2023-0085075
Project Name: Glenwood Wastewater Collection and Treatment Project

January 19, 2024

Subject: List of threatened and endangered species that may occur in your proposed project location 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 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 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:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.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 https://www.fws.gov/program/migratory-bird-permit/what-we-do.

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 https://www.fws.gov/library/collections/threats-birds.

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 https://www.fws.gov/partner/council-conservation-migratory-birds.

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:

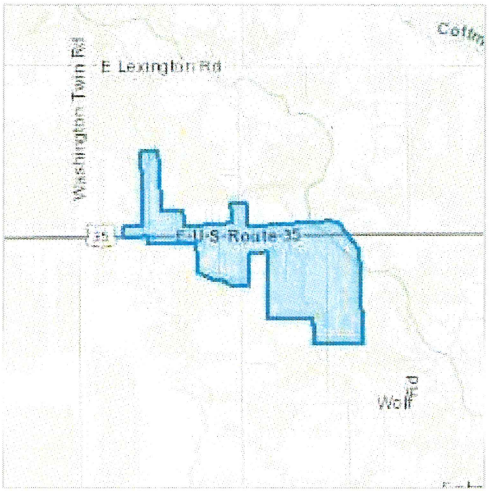
Ohio Ecological Services Field Office
4625 Morse Road, Suite 104
Columbus, OH 43230-8355
(614) 416-8993

PROJECT SUMMARY

Project Code: 2023-0085075
Project Name: Glenwood Wastewater Collection and Treatment Project
Project Type: Wastewater Facility - New Construction
Project Description: Installation of a gravity sewer system and extended aeration water treatment plant. Construction of a private access road to treatment plant. Construction of a lift station, and construction of an outfall pipe.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@39.7432303,-84.57203902923867,14z



Counties: Preble County, Ohio

ENDANGERED SPECIES ACT SPECIES

There is a total of 6 threatened, endangered, or candidate species on this species list.

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], 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.

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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 *Myotis sodalis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Whooping Crane *Grus americana* Population: U.S.A. (AL, AR, CO, FL, GA, ID, IL, IN, IA, KY, LA, MI, MN, MS, MO, NC, NM, OH, SC, TN, UT, VA, WI, WV, western half of WY) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/758	Experimental Population, Non-Essential

REPTILES

NAME	STATUS
Eastern Massasauga (=rattlesnake) *Sistrurus catenatus*	Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/2202

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus*	Candidate

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9743

CRITICAL HABITATS

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

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Micah Cothren
Address: 600 Martin Luther King Jr. Place, USACE 708
City: Louisville
State: KY
Zip: 40202
Email micah.v.cothren@usace.army.mil
Phone: 5023156130

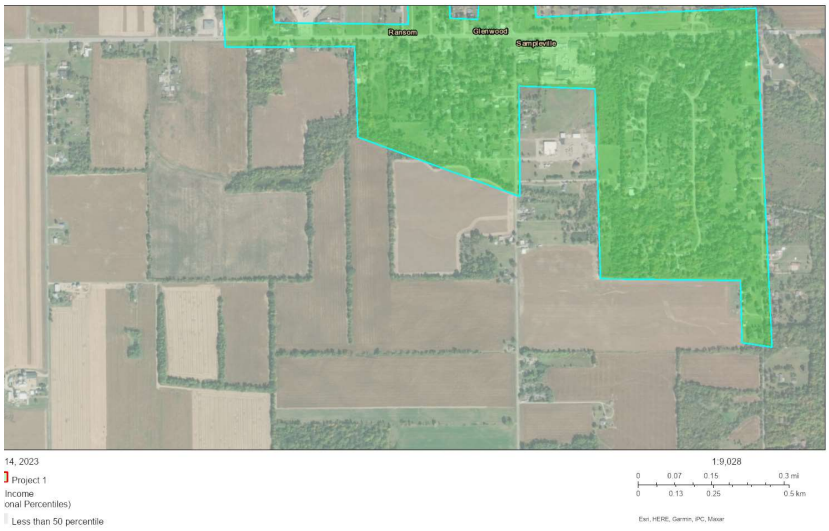
Appendix H. USEPA, Environmental Justice Report

EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Preble County, OH

the User Specified Area
Population: 300
Area in square miles: 0.42



LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
No language data available.	

COMMUNITY INFORMATION

- Low income: 18 percent
- People of color: 10 percent
- Less than high school education: 8 percent
- Limited English households: 0 percent
- Unemployment: 6 percent
- Persons with disabilities: 11 percent
- Male: 46 percent
- Female: 54 percent
- 78 years — Average life expectancy
- $30,366 — Per capita income
- Number of households: 117
- Owner occupied: 86 percent

BREAKDOWN BY RACE

- White: 90%
- Black: 8%
- Asian: 0%
- Hispanic: 1%
- American Indian: 0%
- Hawaiian/Pacific Islander: 0%
- Other race: 1%
- Two or more races: 0%

BREAKDOWN BY AGE

From Ages 1 to 4	4%
From Ages 1 to 18	24%
From Ages 18 and up	76%
From Ages 65 and up	19%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	100%
Speak Asian-Pacific Island Languages	0%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic popultion can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

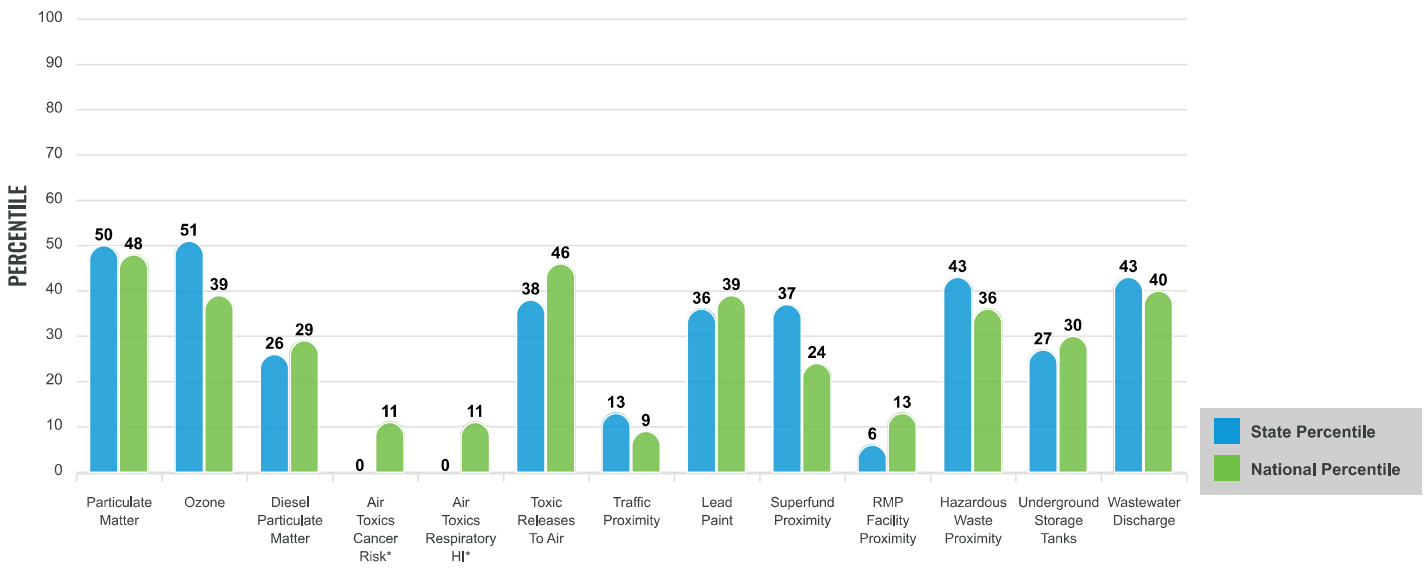
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

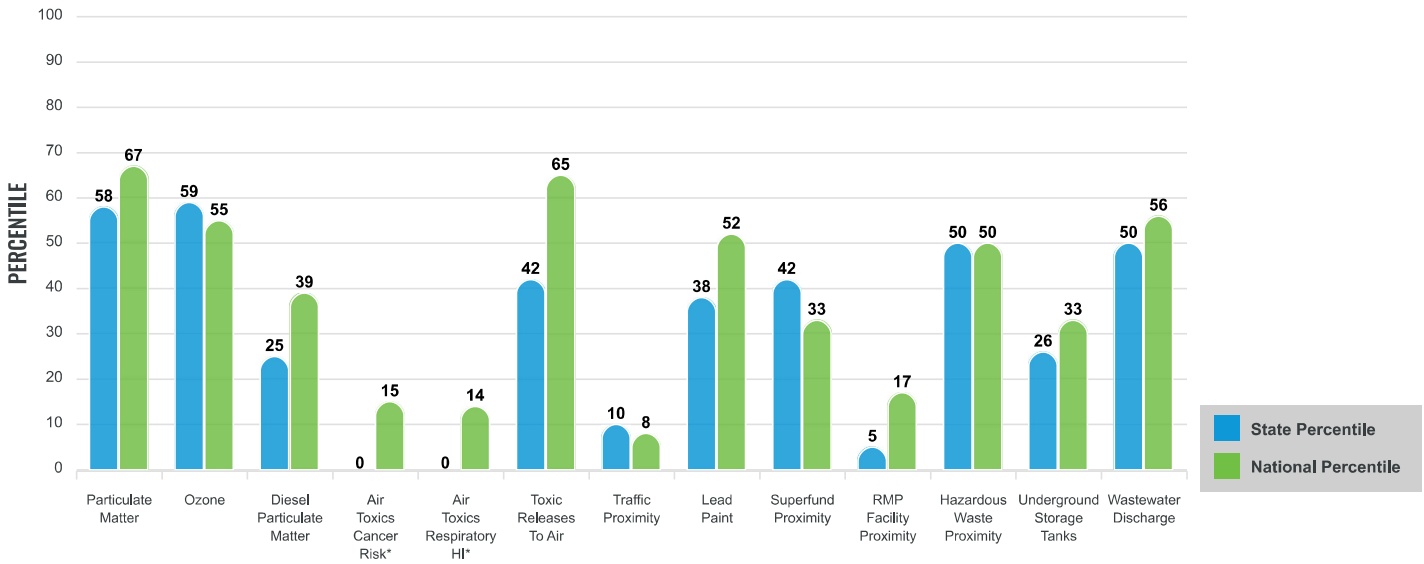
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for the User Specified Area

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter (µg/m^3)	9.39	9.18	60	8.08	81
Ozone (ppb)	62.4	61.4	66	61.6	59
Diesel Particulate Matter (µg/m^3)	0.174	0.261	23	0.261	38
Air Toxics Cancer Risk* (lifetime risk per million)	20	24	0	28	3
Air Toxics Respiratory HI*	0.2	0.25	0	0.31	4
Toxic Releases to Air	2,800	10,000	42	4,600	78
Traffic Proximity (daily traffic count/distance to road)	3.3	110	11	210	9
Lead Paint (% Pre-1960 Housing)	0.32	0.44	40	0.3	60
Superfund Proximity (site count/km distance)	0.036	0.094	45	0.13	33
RMP Facility Proximity (facility count/km distance)	0.064	0.49	6	0.43	15
Hazardous Waste Proximity (facility count/km distance)	0.55	1.3	53	1.9	51
Underground Storage Tanks (count/km^2)	0.19	2.9	24	3.9	31
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.0085	0.47	59	22	66
SOCIOECONOMIC INDICATORS					
Demographic Index	14%	28%	28	35%	18
Supplemental Demographic Index	10%	14%	34	14%	35
People of Color	10%	24%	42	39%	22
Low Income	18%	33%	30	31%	34
Unemployment Rate	6%	6%	64	6%	63
Limited English Speaking Households	0%	1%	0	5%	0
Less Than High School Education	8%	10%	54	12%	50
Under Age 5	4%	6%	36	6%	37
Over Age 64	19%	18%	59	17%	62
Low Life Expectancy	19%	21%	28	20%	42

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 0
Water Dischargers 0
Air Pollution 0
Brownfields 0
Toxic Release Inventory 0

Other community features within defined area:

Schools 0
Hospitals 0
Places of Worship 0

Other environmental data:

Air Non-attainment ..... No
Impaired Waters ..... Yes

Selected location contains American Indian Reservation Lands* ..... No
Selected location contains a "Justice40 (CEJST)" disadvantaged community ..... No
Selected location contains an EPA IRA disadvantaged community ..... No

Report for the User Specified Area

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	19%	21%	28	20%	42
Heart Disease	7.1	7.2	41	6.1	69
Asthma	9.8	10.7	29	10	49
Cancer	7	6.6	58	6.1	69
Persons with Disabilities	9.7%	14.8%	20	13.4%	30

CLIMATE INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	8%	7%	71	12%	57
Wildfire Risk	0%	0%	0	14%	0

CRITICAL SERVICE GAPS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	15%	15%	58	14%	61
Lack of Health Insurance	6%	7%	55	9%	45
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Footnotes

Report for the User Specified Area