



**US Army Corps
of Engineers®**

Pittsburgh District

Planning and Environmental Branch
William S. Moorhead Federal Building
1000 Liberty Avenue
Pittsburgh, Pennsylvania 15222

Public Notice Date: 9 November 2021
Expiration Date: 24 November 2021

NOTICE OF AVAILABILITY

Draft Environmental Assessment

Warrendale-Bayne, Brush Creek, and Mingo Road Water Main Extensions Project in Allegheny County, Pennsylvania

The U.S. Army Corps of Engineers, Pittsburgh District (USACE) is evaluating a Federal funding request for proposed construction of additional water main in Marshall Township, Allegheny County, Pennsylvania.

The USACE invites submission of comments on the environmental impact of the approval of the request. The USACE will consider all submissions received before the expiration date of the public comment period. The nature or scope of the proposal may be changed upon consideration of the comments received.

The draft Environmental Assessment and draft Finding of No Significant Impact are available electronically at:

<http://www.lrp.usace.army.mil/Missions/Planning-Programs-Project-Management/>

Comments can be submitted to the address posted at the top of this notice or to Gabriella.Sykora@usace.army.mil. Comments must be received by 24 November 2021 to ensure consideration.

DRAFT FINDING OF NO SIGNIFICANT IMPACT

**Warrendale-Bayne, Brush Creek, and Mingo Road Water Main Extensions Project
Marshall Township, Allegheny County, Pennsylvania**

The U.S. Army Corps of Engineers, Pittsburgh District (Corps) has prepared an environmental assessment (EA) in accordance with the National Environmental Policy Act of 1969, as amended. The Draft EA, dated 20 August 2021 evaluates potential environmental impacts associated with construction of a new water main extension proposed for federal funding under the Section 219 program for the Warrendale-Bayne, Brush Creek, and Mingo Road Water Main Extensions Project in Allegheny County, Pennsylvania. The Water Resources Development Act (WRDA) of 1999 (Public Law 102-580), Section 219 allows the Corps to consider reimbursement for design and/or construction of environmental infrastructure in Pennsylvania.

The Draft EA, incorporated herein by reference, evaluated alternatives to better serve the Marshall Township community by providing access to clean potable water to previously unserved areas. The preferred alternative, ultimately the Proposed Action is the construction of a water main extension and includes:

- The addition of approximately 13,280 linear feet (LF) of new 16-inch C-900 water main, spread over multiple segments within the roadway right-of-way. The project includes approximately 3,160-feet of water main on Warrendale-Bayne Road; approximately 2,120-feet of water main on Brush Creek Road; and approximately 8,000-feet of water main on Mingo Road.

In addition to the preferred alternative, a “no action” alternative was evaluated. For the preferred alternative, the potential effects to the following resources were evaluated:

Environmental Resource	Minor Effect	No Effect
Aesthetics	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Air quality	<input checked="" type="checkbox"/> (temporary)	<input type="checkbox"/>
Aquatic resources/wetlands	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Invasive species	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Fish and wildlife habitat	<input checked="" type="checkbox"/> (temporary)	<input type="checkbox"/>
Threatened/Endangered species	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Historic properties	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other cultural resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Floodplains	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hazardous, toxic & radioactive waste	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hydrology	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Land use	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Navigation	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Noise levels	<input checked="" type="checkbox"/> (temporary)	<input type="checkbox"/>
Public infrastructure	<input checked="" type="checkbox"/> (beneficial)	<input type="checkbox"/>

Socioeconomics/environmental justice	<input checked="" type="checkbox"/> (beneficial)	<input type="checkbox"/>
Soils	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Tribal trust resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Water quality	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Climate change	<input checked="" type="checkbox"/>	<input type="checkbox"/>

All identified practical means to avoid or minimize adverse environmental effects were analyzed and incorporated into the recommended plan. Best management practices (BMPs) during construction as detailed in the EA will be implemented to minimize impacts. Wetland and stream impacts have been avoided. No compensatory mitigation is required.

Pursuant to section 7 of the Endangered Species Act of 1973, as amended, the U.S. Army Corps of Engineers determined that the recommended plan will have no effect on federally listed species or their designated critical habitat.

Pursuant to section 106 of the National Historic Preservation Act of 1966, as amended, the U.S. Army Corps of Engineers determined that historic properties would not be adversely affected by the recommended plan. The Pennsylvania State Historic Preservation Office concurred with the determination on 3 August 2021.

Pursuant to the Clean Water Act of 1972, as amended, no discharge of dredged or fill material will occur, therefore the recommended plan has been found to be compliant with section 404(b)(1) Guidelines (40 CFR 230). Installation of water main will occur only over existing culverts, avoiding all impacts to waters of the U.S.

A 15-day public comment period will occur from **9 November to 24 November 2021**. The USACE will consider all submissions received before the expiration date of the public comment period. The nature or scope of the proposal may be changed upon consideration of the comments received. If significant effects on the quality of the human environment are identified during public comment which cannot be mitigated, the USACE will initiate an Environmental Impact Statement, and afford all of the appropriate public participation opportunities attendant to an EIS.

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 significantly affect the human environment; therefore, preparation of an Environmental Impact Statement is not required.

Date

ADAM J. CZEKANSKI
COLONEL, Corps of Engineers
District Commander

Environmental Assessment – Warrendale-Bayne, Brush Creek, and Mingo Road Water Main Extensions Project

Project Number 200-315642-20001
August 20, 2021

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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
ASTM	American Society of Testing and Materials
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
EA	Environmental Assessment
EDR	Environmental Data Resources, Inc.
EO	Executive Order
ER	Engineering Regulation
ESA	Phase I Environmental Site Assessment
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Information Rate Map
FPPA	Farmland Policy Protection Act
LF	Linear Foot/Feet
LRP	USACE LRP – (Pittsburgh District)
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
PDCNR	Pennsylvania Department of Conservation and Natural Resources
PL	Public Law
PNDI	Pennsylvania Natural Diversity Inventory
REC	Recognized Environmental Condition
R/W	Right-of-Way
SHPO	State Historic Preservation Office
THPO	Tribal Historic Preservation Office
USFWS	United States Fish and Wildlife Service
USACE	United States Army Corps of Engineers
WRDA	Water Resources and Development Act
WVWA	West View Water Authority

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1.0 INTRODUCTION

1.1 INTRODUCTION

This Environmental Assessment (EA) is intended for the U.S. Army Corps of Engineers, Pittsburgh District (USACE) in accordance with the National Environmental Policy Act (NEPA) of 1969 and in accordance with the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations (CFR), Parts 1500-1508), and with USACE's NEPA implementing regulations, Engineer Regulation (ER) 200-2-2, dated 4-March-1988 (33 CFR 230). The purpose of the EA is to report on potential environmental effects of the proposed water main extensions throughout Marshall Township, PA, as described in the USACE prepared Letter Report dated March 2019 for the Warrendale-Bayne, Brush Creek, and Mingo Road Water Main Extensions Project and depicted in Appendix A, Figure 1.

The West View Water Authority (WVWA) serves 200,000 residents living in 32 municipalities dispersed between Allegheny, Beaver, and Butler Counties. The WVWA runs one 40 million gallons per day (MGD) water treatment plant and operates 10 reservoirs.

The proposed design (proposed action) involves the addition of approximately 13,280 linear feet (LF) of new 16-inch C-900 water main, spread over multiple segments. The design includes no fire hydrants.

The project area for this project consists of the road rights-of-way (R/W) of Warrendale-Bayne, Brush Creek, and Mingo Roads as shown in Appendix A, Figure 1, and described below:

1. Approximately 3,160-feet along Warrendale-Bayne Road from Innovation Drive, under the I-79 overpass and north to Wheatland Road
2. Approximately 2,120-feet along Brush Creek Road extending north from Warrendale-Bayne Road
3. Approximately 8,000-feet along Mingo Road. The Mingo Road water main project area is generally described as:
 - a. Approximately 2,400-feet from Warrendale-Bayne Road south to Rolling Hills Drive.
 - b. Approximately 1,850-feet from Wexford Run Road south to Valley Road.
 - c. Approximately 3,750-feet from Stonegate Drive south, under the I-79 overpass, to Neely School Road.

1.2 PURPOSE AND NEED

The proposed action consists of the installation of a new 16-inch water transmission main network which connects to the existing water transmission and distribution system to better serve customers in Marshall Township, Allegheny County, Pennsylvania, by reducing the age of water within the system and providing access to potable water to previously unserved areas. The proposed water main will provide potable water via a maintained water distribution network to areas which previously relied upon residential water wells. The action is needed to provide clean, treated water to the growing Marshall Township population and keep up with demand.

1.3 AUTHORITY

WVWA entered into a Project Partnership Agreement with the USACE Pittsburgh District (LRP) to complete design and construction of a Section 219 Environmental Infrastructure project for the proposed Warrendale-

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Bayne, Brush Creek, and Mingo Road Water Main Extensions Project. Section 219 of the Water Resources and Development Act (WRDA) of 1992 (PL 102-580) authorizes the USACE to assist non-Federal interests in carrying out water-related environmental infrastructure and resource protection projects. Allegheny County, Commonwealth of Pennsylvania is specifically authorized in Section 219(f) (66).

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2.0 ALTERNATIVES

Under NEPA, alternatives must be considered prior to undertaking an action. Alternatives must include, at a minimum, the proposed action and the “No-Action” alternative, or a baseline in which the proposed action does not proceed, and from which other alternatives can be compared. The alternatives below were used to evaluate the following environmental effects to determine the potential impacts on the human and natural environments to assess the efficacy of the proposed action. As the Proposed Action is part of the WVWA capital improvement plan, no other alternatives were considered besides the Preferred Alternative and the No-Action Alternative.

2.1 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, Marshall Township’s existing water distribution system would remain unchanged. The No-Action Alternative is not desirable because without the water distribution system improvements, clean, treated water to the growing Marshall Township population would not be provided at this point, and WVWA’s capital improvement plan would require reconsideration towards phasing to accommodate population growth and development throughout Allegheny County.

2.2 WATER SYSTEM IMPROVEMENTS (PREFERRED ALTERNATIVE)

The Preferred Alternative (proposed action) involves the addition of 13,280 LF of new C-900 water distribution main, tying into existing segments of the WVWA network. The additional water main is part of the ongoing WVWA capital improvement plan to accommodate population growth and development throughout Allegheny County.

3.0 AFFECTED ENVIRONMENT AND IMPACTS

3.1 INTRODUCTION

This section describes the existing conditions of Marshall Township, and anticipated impacts to environmental resources as a result of the No-Action and Preferred Alternative under consideration.

3.2 RESOURCES AND ANALYSES NOT CONSIDERED IN DETAIL

Based upon the nature of the project and specific resources located within the project area, the No-Action and Preferred Alternative would not be expected to affect the resources identified in the following sections.

3.2.1 Aesthetics

The proposed action consists primarily of subsurface water main installation minimum 4-feet below grade and within existing road R/W. Permanent aesthetic changes above ground would be minor and limited to removal and/or replacement of some roadways and driveways to accommodate water main installation. Replacement of these surface features would not be considered an adverse visual impact. As a result, no permanent adverse aesthetic impacts are anticipated by the proposed action.

Under the No-Action Alternative, the site would remain as-is and impacts to aesthetics would not be expected.

3.3 LAND USE

3.3.1 Affected Environment

Marshall Township is located in the Northwest corner of Allegheny County, and borders Beaver County to the West and Butler County to the North. As of the 2010 Census, the population of Marshall Township was 6,907.

The Township Zoning Map dated 3 January 2008 was found online and is provided as Appendix A, Figure 3. The project area roads are located adjacent to rural and suburban residential zones, with Research and Technology Park zoning bordering the project area west of Brush Creek Road, and Route 19 Boulevard District located north of the terminating point of the proposed water main at Wheatland Road.

Land use in the project area is primarily single-family homes along the Mingo Road section of the project area. Much of Brush Creek Road is wooded, but the proposed water main terminates at the north end at a storage lot and an industrial property. The Warrendale-Bayne Road section of the project area involves crossing under Interstate 79 and the associated on-ramp and off ramp. North of these crossings, the land is wooded to the east until the termination point at the intersection of Wheatland Road, where shopping outlets are located opposite the water main. An electrical substation is located adjacent to the proposed water main where Warrendale-Bayne intersects the Interstate 79 northbound off-ramp.

3.3.2 Environmental Consequences

3.3.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, impacts to land use are not expected.

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3.3.2.2 Preferred Alternative

The Preferred Alternative would not affect land use, nor would any community facilities be affected. The water main is proposed to be installed within the R/W only. The water main would be located underneath roadway shoulders as much as possible, to avoid conflicts with other existing utilities and avoid construction near residential property frontages. There are multiple residential driveways along Mingo Road which will be disrupted by the work, as well as potential conflicts with residential fences. However, the work is limited to the Mingo Road R/W only and affected driveways and fences will be replaced in-kind. There will be no impact to land use.

3.4 HAZARDOUS MATERIALS AND WASTES

3.4.1 Affected Environment

A Phase I Environmental Site Assessment (ESA) was performed by Tetra Tech, Inc. (Tetra Tech) for this project, in accordance with the Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, ASTM International (ASTM) Designation: E 1527-13, to the extent possible (Appendix E). The Phase I ESA was performed for the entire R/W encompassing the proposed water main. Adjacent properties were also observed from within the limits of the roadway to determine whether adverse environmental conditions or hazardous materials were present and could threaten the project area.

No hazardous substances or petroleum products were observed during the site inspection. No storage tanks were observed in the project area during the inspection as well. A solid waste dumpster was noted near the project area during the site walk, but nothing indicated it had been used for hazardous material disposal. The project area consists of overhead power lines throughout much of the proposed water main, many with pole-mounted transformers which were unable to be visually confirmed as to the presence of PCB oils. The electrical substation on Warrendale-Bayne at the intersection of I-79, located approximately 100-feet from the project area was also not verified whether PCB oils were present. No evidence of damage to the equipment or evidence of leaks was noted on any of the pole-mounted transformers or electrical equipment during the Phase I ESA site inspection.

The Phase I ESA also included review of publicly available record flood maps, soil data, and a review of environmental records assembled by Environmental Data Resources, Inc. (EDR), as well as interviews with public officials. One Recognized Environmental Condition (REC) was reported within the radii of the EDR reports (0.5 mile). The REC identification is based upon ongoing cleanup at a leaking underground storage tank (LUST) at a gas station. Historical RECs (HRECs) were also identified at two gas stations near the project area. The gas stations had previous LUSTs and the cleanup activity has been completed at these two sites.

3.4.2 Environmental Consequences

3.4.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no impacts related to potential hazardous contaminants.

3.4.2.2 Preferred Alternative

Based on results of the Phase I ESA, one site with a known REC and two sites with known HRECs are located within a half-mile of the project area. By definition, a HREC is a REC is a site with past contamination which underwent cleanup to the satisfaction of authorities and requires no ongoing controls or monitoring. The site with the REC and ongoing cleanup activities is situated at a lower elevation compared to the project area. As such,

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contaminant migration from this site to the project area is not a concern. Given the location and distance of the REC site and cleanup complete status of the two HREC sites, it is unlikely that these sites have impacted the project area.

The construction of the proposed water main would not involve the use of hazardous substances, nor would the subsequent operation of the water main. The Preferred Alternative will not result in long-term impacts from hazardous materials and wastes. Based on the results of the Phase I ESA, it is unlikely that petroleum, hazardous materials, or waste will be encountered during construction activities.

3.5 TERRESTRIAL RESOURCES, FISH, AND WILDLIFE

3.5.1 Affected Environment

The proposed water main is designed to be located fully within the road R/W. The roadways are asphalt or concrete surfaces with varying R/W widths. The R/W gives way to residential frontage along much of Mingo Road. Many residential properties feature asphalt or concrete access driveways. Near the Mingo Road intersection with Interstate 79, the rural landscape transitions into undulating forested areas. The dominant forest types for this region of Pennsylvania are Oak-Hickory (Red Maples and Hickories) and Great Lakes Beech-Maple (Sugar Maple, Beech, Red Oak, Ohio Buckeye). These forest types also dominate Brush Creek Road, as well as Warrendale Bayne on the east side of Interstate 79. Wildlife broadly consists of ubiquitous mammals, herptiles, and transient birds. The proposed action will not occur near existing water bodies.

3.5.2 Environmental Consequences

3.5.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no impacts to terrestrial resources, fish, or wildlife in the project area.

3.5.2.2 Preferred Alternative

Implementation of the Preferred Alternative may result in temporary minor adverse impacts to terrestrial resources, fish, and wildlife, including construction activity and loud equipment which may result in temporary displacement of wildlife. However, most of the construction will occur on existing roadways or immediately adjacent. Local wildlife is likely accustomed to elevated noise levels near roadways. Animals will likely return to typical activities in the area upon conclusion of construction. Discussed in greater detail in Section 3.8, the proposed action crosses streams as culverts beneath the existing roads. The proposed action has been designed so as to not disturb these streams and associated fish populations, and construction will be performed such that construction-related materials will not erode into nearby water bodies. Construction-related removal and grubbing of plant life will be limited to areas within the existing R/W and will have a minor long-term impact on the habitats in vicinity of the new water mains. The Preferred Alternative presents minor effects to terrestrial resources, fish, and wildlife.

3.6 THREATENED AND ENDANGERED SPECIES

3.6.1 Affected Environment

The Endangered Species Act created a federal program for the protection of threatened and endangered fish, wildlife, and plants and the habitats they inhabit. Section 7(a)(2) of the ESA requires Federal agencies to consult with the United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS), as

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appropriate, to ensure the Federal Agencies' actions avoid undue damage to threatened and endangered species' habitats.

Tetra Tech consulted the Pennsylvania Department of Conservation and Natural Resources (PADCNR) Pennsylvania Natural Diversity Inventory (PNDI) tool online to confirm whether any threatened and endangered species could be impacted by the work in the project area. PADCNR and USFWS indicate no known impacts to any of the species as a result of the proposed action. The agencies' response is contained in Appendix B.

3.6.2 Environmental Consequences

3.6.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no impact to threatened and endangered species in the area.

3.6.2.2 Preferred Alternative

PADCNR and USFWS indicate no known impacts to any listed or proposed threatened or endangered species, or special concern species and resources as a result of the proposed action (refer PNDI in Appendix B). Removal of vegetation will be avoided and, if necessary, will only occur within the R/W. Under the Preferred Alternative, there would be no effect on threatened and endangered species.

3.7 VEGETATION

3.7.1 Affected Environment

The proposed water main alignment is designed to be located fully within the road R/W. The roadways are asphalt or concrete surfaces. The Brush Creek Road alignment begins at the south end with a carpool lot adjacent to Interstate 79, and the northern limit includes an adjacent storage facility and light industrial property. The remaining alignment is surrounded by upland forest. The Warrendale Bayne Road alignment begins west of Innovation Drive, crosses Interstate 79 and connected on and off ramps, and ends at the intersection of Wheatland. The alignment between the electrical substation, east of Interstate 79, and Wheatland Road is flanked to the east by a steep ridge with tree coverage. Mingo Road is primarily single-family residential homes west of Interstate 79, characterized by turf and scattered oak, maple, and hickory trees. East of Interstate 79, the landscape gives way to primarily upland forest with few scattered residences. The dominant forest types for this region of Pennsylvania are Oak-Hickory (Red Maples and Hickories) and Great Lakes Beech-Maple (Sugar Maple, Beech, Red Oak, Ohio Buckeye).

3.7.2 Environmental Consequences

3.7.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no impacts to vegetation in the area.

3.7.2.2 Preferred Alternative

The water main is designed to be installed fully within the existing R/W for Mingo, Brush Creek, and Warrendale Bayne Roads. Removal of vegetation will be avoided and, if necessary, will only occur within the R/W. Impacted turf on various properties will be removed, then re-seeded and mulched during final grading and restoration.

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These removals will have minor impact to wildlife habitats. The Preferred Alternative will have overall a minor impact on vegetation in the project area.

3.8 AQUATIC RESOURCES AND WATER QUALITY

3.8.1 Affected Environment

Tetra Tech prepared an Aquatic Resource Report summarizing the results of a field survey of the project area, for the presence of wetlands and surface water features. The Aquatic Resource Report is included in Appendix C. Tetra Tech applied the methods detailed in the USACE Wetland Delineation Manual (1987 Manual; Environmental Laboratory 1987), as amended by the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0 (Regional Supplement; USACE 2012). Ten streams were identified within the project area. These vary between perennial (flow all year), ephemeral (flow only after rain events), or intermittent (typically flow during wet seasons). Appendix A, Table 1 displays the full list of identified streams with classification data, sizes, and locations.

The project area is entirely located within existing R/W for Mingo, Brush Creek, and Warrendale Bayne Roads. Six of the identified streams/floodways intersect the project area, in the form of culverts crossing beneath the existing roadway. Reference Appendix A, Figure 4. Three of the six streams are tributaries to Brush Creek to the north of the project area. One stream and one floodway are tributaries to the East Branch Big Sewickley Creek. Lastly, East Branch Big Sewickley Creek crosses the project area between Interstate 79 and Neely School Road, near the southern limit of the project area.

3.8.2 Environmental Consequences

3.8.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no impacts to the identified streams in the area.

3.8.2.2 Preferred Alternative

The water main will be constructed fully within existing R/W of the roads in the project area, avoiding identified streams altogether. The six identified stream crossings occur as culverts beneath the roadways. All applicable permits, including a Pennsylvania Department of Environmental Protection (PADEP) Chapter 105 Wetland and Waterway Obstruction and Encroachment permit will be sought for construction activities associated with the water main construction method at each culvert intersection. Depending on the depth of the culvert, the contractor will install the 16-inch water main via open trench a minimum of 3-feet above or below the culvert, assuring that the minimum vertical clearance between the top of the new water main and the roadway surface remains 4-feet.

A PADEP Chapter 102 Erosion and Sediment Control permit will also be obtained under the Preferred Alternative. This permit will approve a plan for the contractor to implement appropriate best management practices to ensure disturbed soils from the open trenches and subsequent restoration, will be prevented from eroding via sheet flow offsite, or flowing directly into the storm drain system which outfall into riparian areas. As a result, the Preferred Alternative will not affect aquatic resources or water quality in the project area.

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3.9 WETLANDS AND FLOODPLAINS

3.9.1 Affected Environment

Tetra Tech prepared an Aquatic Resource Report summarizing the results of a field survey of the project area for the presence of wetlands and surface water features (Appendix C). Tetra Tech researched the USFWS National Wetland Inventory map data, and applied the methods detailed in the USACE Wetland Delineation Manual (1987 Manual; Environmental Laboratory 1987), as amended by the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0 (Regional Supplement; USACE 2012). Thirteen wetlands were identified within the project area. Some connect to streams throughout the project area, but none of them intersect the proposed work alignment. Appendix A, Table 2 displays the full list of identified wetlands with classification data, sizes, and locations.

Federal Emergency Management Agency (FEMA) open-source documents were obtained. The Flood Information Rate Map (FIRM) panels 42003C0038H, 42003C0039H, 42003C0176H, and 42003C0177H characterize the project area's floodplains. The project area is not located in any 100-year floodplains. As shown in Appendix A, Figure 2, Brush Creek lies just to the northeast of the northern limit of the project area. The Brush Creek floodplain extends onto Route 19 near the Warrendale Bayne intersection. It is also fed by a tributary to the south, parallel to Shenot Road. To the project area's south, East Branch Big Sewickley Creek contributes to a floodplain parallel to State Gamelands Road. This floodplain is outside of the project area.

3.9.2 Environmental Consequences

3.9.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no impacts to wetlands or floodplains in the area.

3.9.2.2 Preferred Alternative

The water main will be constructed fully within existing R/W of the roads within the project area. All applicable permits, including PADEP Chapter 102 Erosion and Sediment Control permit will be in place. This permit will approve a plan for the contractor to implement appropriate best management practices to ensure disturbed soils from the open trenches, and subsequent restoration, will be prevented from eroding via sheet flow offsite, or flowing directly into the storm drain system which outfall into riparian areas and wetlands. In addition, a PADEP Chapter 105 Wetland and Waterway Obstruction and Encroachment permit will be obtained. Construction of the water main will not occur within wetland or floodplain areas; the Preferred Alternative will have no effect on wetlands or floodplains.

3.10 SOILS

3.10.1 Affected Environment

The project area is located upon bedrock belonging to the Glanshaw and Casselman formations. Soil layers above bedrock are characterized by alluvial deposits resulting from the nearby rivers and their tributaries. Table 3-1 indicates the NRCS soil classes found within the project area.

Environmental Assessment

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Table 3 - 1. NRCS Soils in the Project Area (Commonwealth Heritage Group, 2020)

Soil Name	Drainage Classification	Acres	Percent
At - Atkins silt loam, 0-3 percent slopes	Poorly Drained	0.447	10.9%
CmB - Clymer silt loam, 3 to 8 percent slopes **	Well Drained	0.558	13.6%
CmC - Clymer silt loam, 8 to 15 percent slopes *	Well Drained	0.570	13.9%
ErB - Ernest silt loam, 3 to 8 percent slopes *	Moderately well drained	0.508	12.4%
ErC - Ernest silt loam, 8 to 15 percent slopes *	Moderately well drained	0.927	22.6%
GpD - Gilpin-Upshur complex, 15 to 25 percent slopes	Well drained	0.262	6.40%
GQF - Gilpin-Upshur complex, very steep	Well drained	0.283	6.90%
GSF - Gilpin, Weikert, Culleoka channery loams, 25 to 80 percent slopes	Well drained	0.131	3.20%
RycC - Rayne silt loam, Conemaugh geology, 8 to 15 percent slopes *	Well drained	0.414	10.1%
		4.10	100%

3.10.2 Environmental Consequences

3.10.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no impacts to soils in the project area.

3.10.2.2 Preferred Alternative

The proposed water main will be laid a minimum of 4-feet below current grade. Excavated fill soils currently beneath the roadways will be re-used as fill for the water main, then re-compacted to specifications before re-surfacing. Native soils encountered will be replaced with engineered fill materials to meet compaction requirements. The Preferred Alternative will have minor impact to soils in the project area.

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3.11 HYDROLOGY

3.11.1 Affected Environment

The project area is characterized by dendritic hydrologic landscapes with rolling hills ending in multiple un-named tributaries or to nearby Brush Creek or East Branch Big Sewickley Creek. Referencing Table 3-1, the soil drainage class varies. Much of the soil is classified as Class C, with slow infiltration rates. Based on soil and groundwater data provided by EDR (Appendix E), the depth to groundwater is typically 6-feet. This will be verified before commencing the proposed action.

3.11.2 Environmental Consequences

3.11.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no impacts to hydrology in the project area.

3.11.2.2 Preferred Alternative

Construction of the proposed water main will not impact surface water features, as erosion and sedimentation controls will be in-place to prevent soil movement into low-lying creeks and/or tributaries. The water main will be placed 4-feet below existing grade, and will not impact the water table, nor will it alter hydrogeologic flow patterns. The Preferred Alternative will have no effect on hydrology.

3.12 PRIME AND UNIQUE FARMLAND PROTECTION

3.12.1 Affected Environment

The Farmland Policy Protection Act (FPPA) (7 USC 4201, implementing regulations 7 CFR Part 658, of the Agriculture and Food Act of 1981, as amended) minimizes the impact of federal programs on prime farmland, unique farmland, and land of statewide or local importance.

In Table 3-1, in Section 3.10, *indicates farmland of statewide importance, and **indicates all areas are prime farmland.

3.12.2 Environmental Consequences

3.12.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no impacts to farmland in the area.

3.12.2.2 Preferred Alternative

The water main will be constructed fully within existing R/W of the roads in the project area. The Preferred Alternative will have no effect on farmland.

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3.13 CULTURAL RESOURCES AND HISTORIC PROPERTIES

3.13.1 Affected Environment

The 1966 National Historic Preservation Act (NHPA), as amended (36 CFR Part 800), gives federal agencies statutory obligations to ensure that Section 106 reviews occur in conjunction with the NEPA process to ensure that natural, cultural, and the local historical environment are given consideration in project planning. Section 106 directs federal agencies to consult with the State Historic Preservation Office (SHPO), Tribes, and other interested parties, to ensure federal projects will not affect properties listed within, or having the potential of listing within the National Register of Historic Places (NRHP).

A Phase 1A archaeological and cultural resource overview and assessment was performed in October 2020 (Appendix D). Three previously recorded archaeological sites are directly adjacent to the project area and exist on now-currently private properties. Additionally, one historic property lies directly adjacent to Mingo Road, near the intersection of Warrendale Bayne, a log home constructed circa 1818.

The Pennsylvania State Historic Preservation Office (SHPO) was notified of the project work on 17 May 2021.

3.13.2 Environmental Consequences

3.13.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no impacts to cultural resources and/or historic properties in the area.

3.13.2.2 Preferred Alternative

The water main will be constructed fully within existing R/W of the roads in the project area. This significantly limits the potential for any historic properties or cultural resources to be located within the project area, as much of the project area has been significantly disturbed by the construction of roads and installation of existing utilities.

Based on the Phase IA provided, USACE determined that the Preferred Alternative will have no effect on cultural resources and/or historic properties and requested concurrence from SHPO in a letter dated 17 May 2021. In a letter dated 11 June 2021, the SHPO responded with a request for additional information regarding identification of historic properties in the project area and potential construction vibration impacts to these properties. In a letter dated 3 August 2021, USACE provided a response to SHPO that included details of construction activities and analysis of structures greater than 50 years within the project area. USACE concluded that the method of construction will not produce vibration in excess of what already occurs in the project area from moving vehicles on the roadway and determined that no historic properties will be affected by the proposed action. In a letter dated 6 August 2021, the SHPO concurred.

Upon discovery of any previously undocumented archaeological artifacts or historic properties, construction will immediately cease pending direction from the SHPO, and until the requirements of 36 CFR Section 800.13 have been satisfied. All efforts will be made to consult with federally recognized Native American Tribes that may attach traditional cultural and religious significance to the property or artifact. Communication between USACE, the SHPO, and Native American Tribes will be essential to document and evaluate NRHP eligibility of any properties, as well as the effects on the property resulting from the proposed action. If required, USACE will direct the re-design of the project to avoid the property.

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3.14 TRIBAL TRUST RESOURCES

3.14.1 Affected Environment

According to Census Bureau data, Native Americans do not claim residence in Marshall Township. A list of previously recorded archaeological sites was created as part of the Phase 1a investigation. Two sites were identified near the project area. No Native American cultural sites or lands are located within the Project Area. A copy of the Native American historic sites on the National Register of Historical Places in Pennsylvania is provided in Appendix A, Figure 5.

3.14.2 Environmental Consequences

3.14.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no impacts to tribal trust resources in the project area.

3.14.2.2 Preferred Alternative

Construction of the water main will occur fully within the roadway R/W. Recorded archaeological sites will be identified to the contractor to ensure the work avoids these areas. No Native American cultural sites are located within the project area. Native American Tribes that have historical ties to Allegheny County but reside elsewhere will be notified and afforded the opportunity to comment on the proposed Project within the 15-day public comment period. The Preferred Alternative will have no impact to tribal trust resources.

3.15 SOCIOECONOMIC CONDITIONS AND ENVIRONMENTAL JUSTICE

3.15.1 Affected Environment

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in minority populations and low-income populations, focuses federal attention on human health effects or environmental effects on minority and low-income populations because of federal projects. Its goal is to achieve environmental protection for all communities.

US Census Bureau data labels tract 4110, block groups 1, 2, and 3, as Marshall Township. The population of Marshall Township in 2019 was estimated to be 9,598. The median household income is \$135,208, and 1.8% are considered below the poverty line. An environmental justice screening and mapping report (EJSCREEN), from EPA.gov, was run for the project area. The results indicate that 15% of reporting residents within the project area are people of color, and 10% are considered low income; both statistics are significantly lower than the US national averages, which are 39% and 33%, respectively.

3.15.2 Environmental Consequences

3.15.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no impacts to socioeconomic conditions and environmental justice.

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3.15.2.2 Preferred Alternative

The water main will be constructed fully within existing R/W of the roads in the project area. No community buildings will be impacted. No housing units will need to be displaced during construction or after construction is complete. The proposed water main will provide clean and treated potable water via a maintained water distribution network to currently unserved areas which rely upon residential water wells. As a result, the Preferred Alternative will have a minor beneficial impact to socioeconomic conditions and environmental justice.

3.16 TRANSPORTATION AND TRAFFIC

3.16.1 Affected Environment

The three subject roads, Mingo, Warrendale Bayne, and Brush Creek, are paved roadways supporting residential and commercial traffic within Marshall Township. Brush Creek Road is maintained by Allegheny County, and Mingo and Warrendale Bayne are state roads. WVWA owns and operates existing water mains beneath each roadway.

3.16.2 Environmental Consequences

3.16.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no impacts to transportation or traffic in the project area.

3.16.2.2 Preferred Alternative

The water main will be constructed fully within existing R/W of the roads in the project area. For construction to occur, where the proposed water main will lie beneath the roadway, individual traffic lanes may require temporary closure to facilitate placement of the water main. Upon completion of the water main installation, the roadway and impacted shoulder will be restored to pre-construction conditions. No permanent impacts to roadways are expected. The Preferred Alternative will have minor effect on the transportation and traffic in the project area during construction.

3.17 NOISE

3.17.1 Affected Environment

Due to multiple residences located along the proposed project area, multiple citizens may be exposed to elevated noise levels during construction. Wildlife may also be temporarily impacted during construction.

3.17.2 Environmental Consequences

3.17.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no noise impacts in the project area.

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3.17.2.2 Preferred Alternative

Construction of the water main extensions will temporarily increase noise above normal levels due to operation of construction equipment. No permanent noise impacts are anticipated after completion of construction. The Preferred Alternative will result in minor temporary noise impacts to residents and wildlife during construction.

3.18 AIR QUALITY

3.18.1 Affected Environment

The National Ambient Air Quality Standards (NAAQS) were developed by the EPA to monitor the levels of six criteria pollutants, Sulfur Dioxide, Particulate Matter, Nitrogen Dioxide, Carbon Monoxide, Ozone, and Lead. If the concentration of one or more criteria pollutants in a geographic area is found to exceed the NAAQS regulated levels, the area is classified as nonattainment. Allegheny County is designated as nonattainment for Particulate Matter 2.5 (PM 2.5), or particles 2.5 micrometers and smaller. PM 2.5 occurs from chemical reactions with other criteria pollutants with precursors resulting from heavy automobile traffic among others industrial sources. The project area is not near any industrial centers, but follows I-79, which is a major thoroughfare into the city of Pittsburgh.

3.18.2 Environmental Consequences

3.18.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no air quality impacts in the project area.

3.18.2.2 Preferred Alternative

Construction of the water main will result in temporary increases of emissions from the contractor's vehicles. Construction activities typically create dust from movement of dry soils. Operation of the water main will not result in permanent impacts to air quality. The Preferred Alternative will result in minor temporary impacts to air quality.

3.19 INVASIVE SPECIES

3.19.1 Affected Environment

The Pennsylvania Department of Conservation and Natural Resources and the Pennsylvania Natural Heritage Program both reference the iMapInvasives.org database, found online. Through this tool, two invasive species have been found between half a mile and one mile of the project area. The plant species are commonly known as *Oriental Bittersweet* and *Japanese Knotweed*.

3.19.2 Environmental Consequences

3.19.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no impacts to invasive species in the project area.

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3.19.2.2 Preferred Alternative

The two identified invasive species are located between half a mile and one mile from the project area. The water main installation will not disturb these areas, nor will the contractor's activities track these invasive species into the project area. The Preferred Alternative will have no impact on invasive species in the project area.

3.20 NAVIGATION

3.20.1 Affected Environment

The project area is not located within or near any navigable waters. There are no features in the project area displaying lights required by the Federal Aviation Administration.

3.20.2 Environmental Consequences

3.20.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no navigational impacts in the project area.

3.20.2.2 Preferred Alternative

The project area is not located within or near any navigable waters. The Preferred Alternative will have no impact on navigational features in the project area.

3.21 PUBLIC INFRASTRUCTURE

3.21.1 Affected Environment

WVWA currently owns and operates the water distribution system serving the project area. Due to gaps in the existing pipe network, many customers in the project area own residential water wells to serve their domestic needs. The residents along Mingo Road, and the commercial businesses on Brush Creek Road, are also serviced by other local utilities, including natural gas, sanitary sewer, and power. Warrendale Bayne and Mingo Roads are maintained by PennDOT, and Brush Creek Road is maintained by Allegheny County.

3.21.2 Environmental Consequences

3.21.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no impacts to public infrastructure in the project area.

3.21.2.2 Preferred Alternative

The proposed water main would add 13,280 linear feet of 16-inch water main to previously unserved residents in the project area. Construction of the proposed water main will avoid disrupting other utilities by laying pipe above or below conflicting utilities (those which the water main must cross), or by maintaining a safe distance from parallel utility paths. Construction will result in temporary reconstruction of portions of roadways. Impacted roads will be fully restored when water main installation is completed. The Preferred Alternative will have minor temporary impacts to roadways during construction and minor long-term beneficial impacts to public infrastructure (expanded and improved water distribution network) within the project area.

Environmental Assessment

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3.22 CLIMATE CHANGE

3.22.1 Affected Environment

The local climate of the project area is known as humid subtropical. 46-inches of rainfall and 90-inches of snowfall per year are typical averages. Temperatures can range from 15 to 80 degrees Fahrenheit, on average.

3.22.2 Environmental Consequences

3.22.2.1 No-Action Alternative

No construction would occur under the No-Action Alternative. As such, there would be no impacts to climate change.

3.22.2.2 Preferred Alternative

The proposed water main will have a minor effect on contributors to greenhouse gases by way of heavy construction equipment and light contractor vehicles. As a result, the Preferred Alternative will have minor impact to climate change.

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Warrendale-Bayne, Brush Creek, and Mingo Road Water Main Extensions
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4.0 CONCLUSION

The No-Action alternative would result in no effects to environmental resources. Table 4-1 summarizes the expected impacts to environmental resources within the project area for the Preferred Alternative. Based upon the information presented, the Preferred Alternative would not result in significant adverse impacts.

Implementation of the Preferred Alternative is anticipated to meet the requirements for issuance of a Finding of No Significant Impacts (FONSI) as indicated in 40 CFR 1508.13.

Table 4 - 1. Summary of Impacts

Affected Environment	No Effect	Minor Effect	Significant Effect	Basis of Determination
Aesthetics	X			There will be no change in aesthetics.
Land Use	X			There will be no change in land use.
Hazardous Materials and Waste	X			RECs and HRECs are located within ½ -mile of project area. However, these conditions will not impact the work.
Terrestrial Resources, Fish and Wildlife		X		Construction activity and loud equipment may result in temporary displacement of wildlife. However, it is anticipated that animals will return to typical activities in the area upon conclusion of construction. Construction-related removal and grubbing of plant life will be limited to those located within the existing R/W and will have a little long-term impact on the habitats in vicinity of the new water mains. Fish will not be disturbed as the work will avoid water habitats.
Threatened and Endangered Species	X			PADCNR and USFWS indicate no known threatened and endangered species in the project area. Concurrence from USFWS was not required due to the no effect determination.
Vegetation		X		Some trees and shrubs may be removed and are limited to locations within the R/W. Impacted turf on various properties will be removed, then re-seeded and mulched during final grading and restoration.

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Affected Environment	No Effect	Minor Effect	Significant Effect	Basis of Determination
				The Preferred Alternative will have overall a minor impact on vegetation in the project area.
Aquatic Resources and Water Quality	X			Installation of water main will occur over existing culverts only; no in-water construction will occur. Soil erosion will be minimized.
Wetlands and Floodplains	X			Wetlands and floodplains are outside of the project area and will not be impacted by the work. Construction soil erosion will be minimized.
Soils		X		Excavated fill soils used beneath roadways will be re-used. Native soils encountered will be replaced with engineered fill.
Hydrology	X			Construction will not impact surface water features and will not alter hydrology or hydrogeologic flow patterns.
Prime and Unique Farmland Protection	X			No conversion of farmland will be required to construct the water main in R/W.
Cultural Resources and Historic Properties	X			No cultural or historic resources will be affected by the proposed action. The Pennsylvania SHPO was notified of the project and concurred.
Tribal Trust Resources	X			Recorded archaeological sites will be avoided during construction. No Native American cultural sites in the project area.
Socioeconomic Conditions and Environmental Justice		X (beneficial)		No changes in land use are expected. No residents will be displaced. No impacts to environmental justice. Installation of new water main is a net-benefit for the community by expanding access to potable water via a maintained water distribution network.
Transportation and Traffic		X		Minor construction-related temporary disruptions to transportation and traffic are anticipated. No permanent impacts are expected.
Noise		X		Construction-related elevated noise levels will be temporary. No permanent impacts are expected.

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Affected Environment	No Effect	Minor Effect	Significant Effect	Basis of Determination
Air Quality		X		Temporary construction-related emissions and dust.
Invasive Species	X			No invasive species in project area.
Navigation	X			No navigable waters exist in the project area.
Public Infrastructure		X (beneficial)		Temporary road closures during construction. Water main will avoid conflicts with existing utilities. Preferred Alternative will result in long-term beneficial impacts to public infrastructure (expanded and improved water distribution network) within the project area.
Climate Change		X		Construction vehicles onsite create additional emissions and subsequent greenhouse gases.

Environmental Assessment

Warrendale-Bayne, Brush Creek, and Mingo Road Water Main Extensions
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APPENDIX A

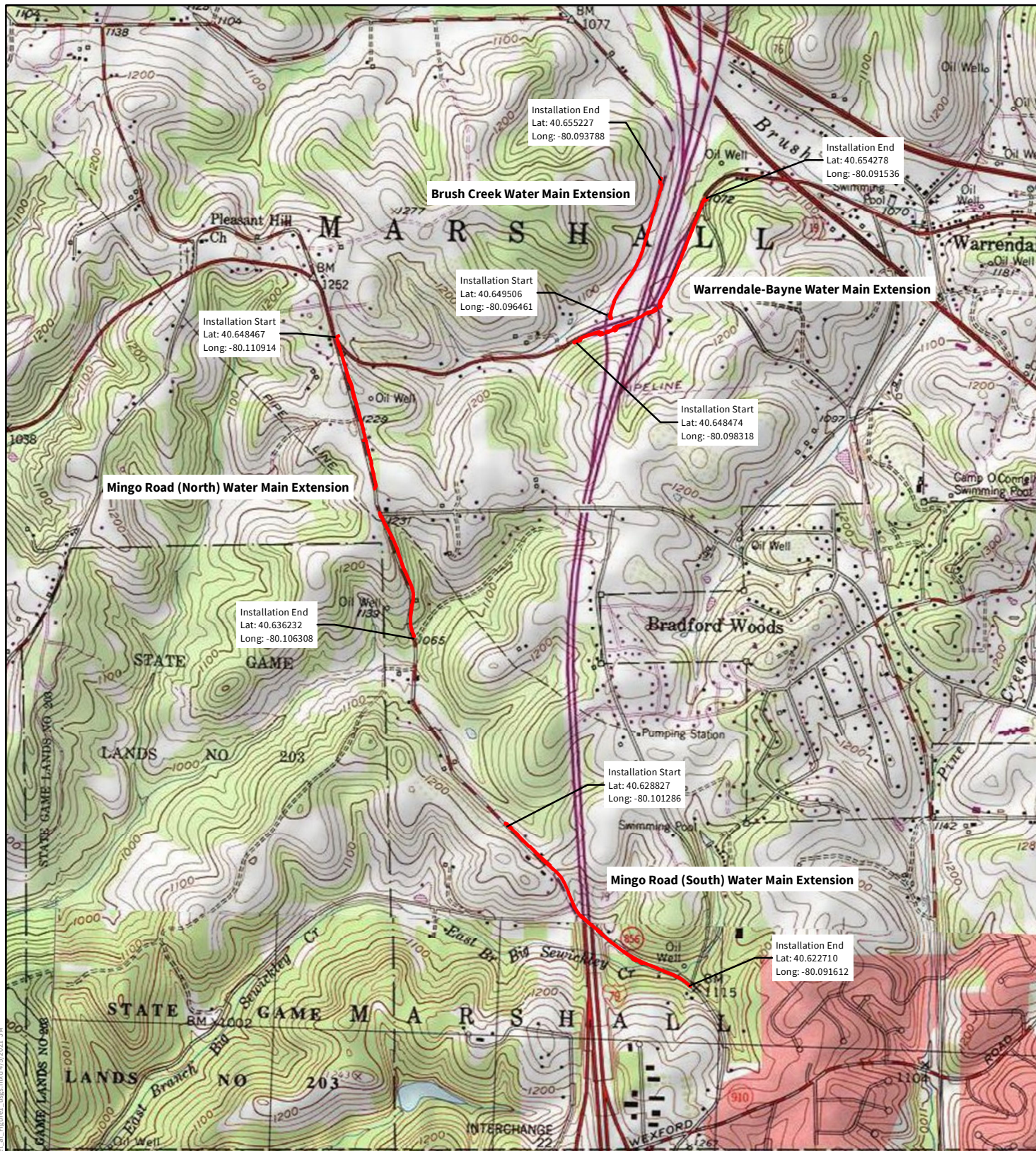
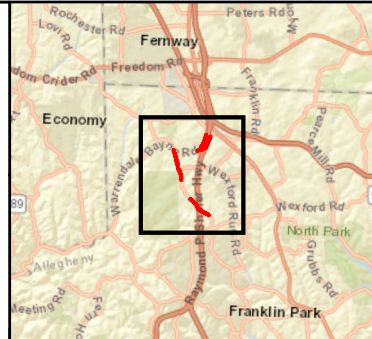


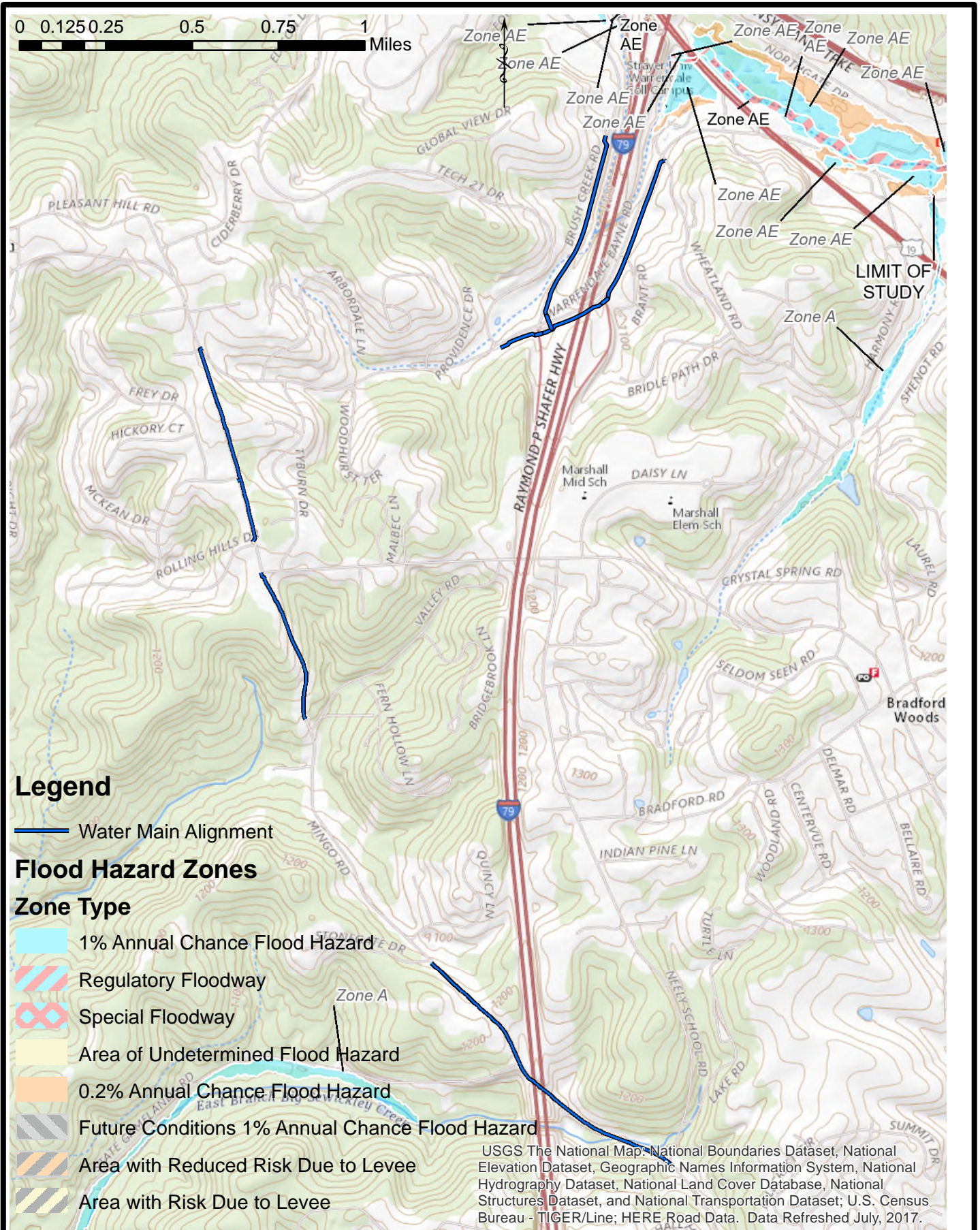
FIGURE 1
PROJECT LOCATION MAP
WARRENDALE-BAYNE, BRUSH CREEK, AND MINGO
ROAD WATER MAIN EXTENSIONS
WEST VIEW WATER AUTHORITY
MARSHALL TOWNSHIP
ALLEGHENY COUNTY,
PENNSYLVANIA

Legend
 Project Area












Notes:
 1) Topographic map provided by ESRI's ArcGIS Online USA Topo Maps map service (© 2013 National Geographic Society, i-cubed)
 2) Quadrangles displayed are Ambridge, Baden, Emsworth, and Mars

Document Path: C:\Local_GIS\WestView_Water_Authority\GIS\MapDocs\WVMA_Warrendale_et_al_Figures_1.mxd, 4/5/2021, JM



Legend

-  Water Main Alignment
- Flood Hazard Zones**
- Zone Type**
-  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

USGS The National Map: National Boundaries Dataset, National Elevation Dataset, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data. Data Refreshed July, 2017.



TETRA TECH

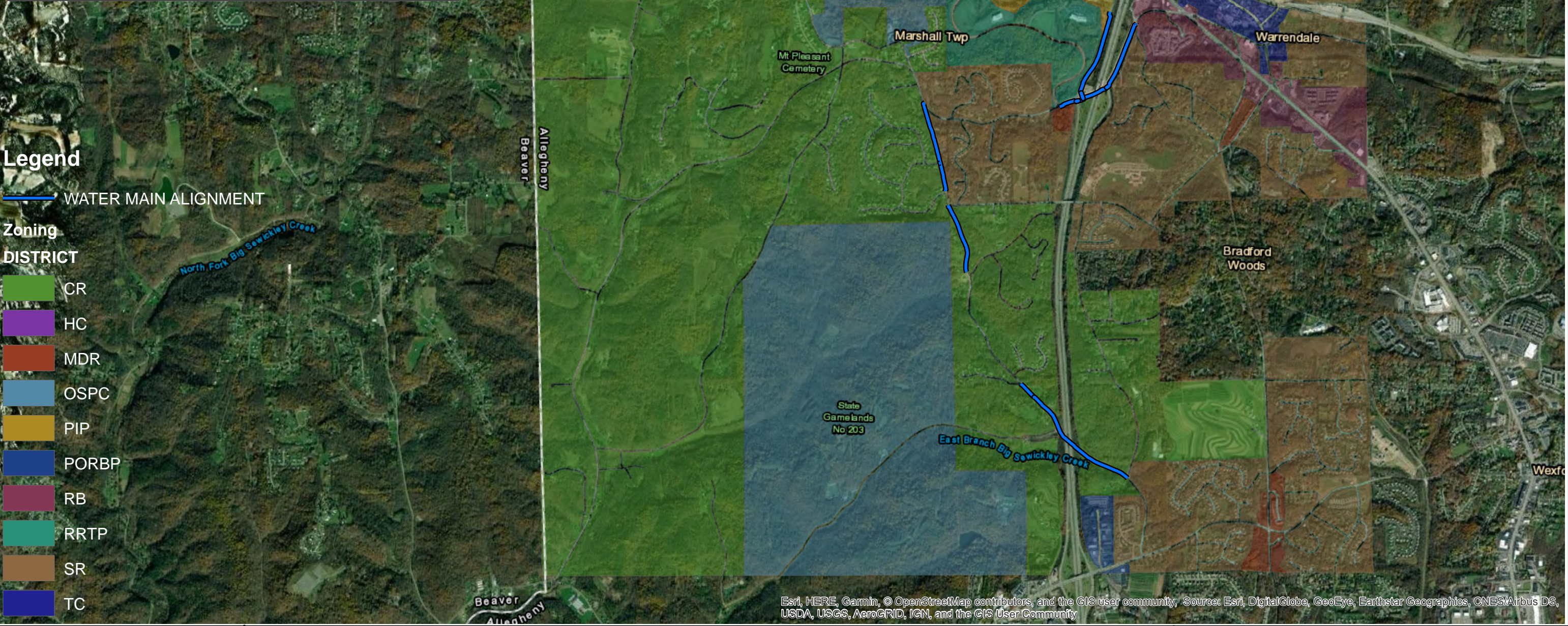
DESIGNED: K. KOSITZ DATE: 7/21/21

Warrendale-Bayne, Brush Creek and Mingo Road
Water Main Extensions, Marshall Township, PA

FEMA Flood Hazard Map

FIGURE

2



FILE NAME: MPS/C/FORM/11X17/REPORT2



DESIGNED: K. KOSITZ DATE: 7/21/21

Warrendale Bayne, Brush Creek, and Mingo Road Water Main Extensions

Zoning Map

FIGURE 3



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERWAYS ENGINEERING AND WETLANDS

Applicant's Name / Client: West View Water Authority

AQUATIC RESOURCES IMPACT TABLE

FOR PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION CHAPTER 105 WATER OBSTRUCTION AND ENCROACHMENT APPLICATION / REGISTRATION

Project / Site Name: Warrendale-Bayne, Brush Creek, and Mingo Road Water Main Extensions Project (Allegheny County)										Date: March 2021				
PADEP USE ONLY			PROJECT INFORMATION								PADEP / 105			
PADEP Permit Number	Single Complete Crossing Number	Crossing Number	Fee	Structure / Activity Unique Identifier	Aquatic Resource Type	Latitude dd NAD83	Longitude dd NAD83	Waters Name	PA Code Chapter 93 Designation	Work Proposed	PADEP Impact Type	Watercourse Impact Top-of-Bank to Top-of-Bank	Floodway Impact Top-of-Bank Landward	Wetland Impact Dimension
												Length and Width (feet)	Length and Width (feet)	Length and Width (feet)
			NA	S-KZ02	Stream	40.653012°	-80.094485°	UNT to Brush Creek	WWF	Utility Line Crossing	Permanent	3.0 - 1.3	100 - 1.3	0
											Temporary	3.0 - 7.7	100 - 7.59	0
			NA	S-KZ01-UP	Stream	40.651538°	-80.095146°	UNT to Brush Creek	WWF	Utility Line Crossing	Permanent	8.5 - 1.3	238 - 1.3	0
											Temporary	8.5 - 10.5	238 - 17.6	0
			NA	S-KZ04	Stream	40.652867°	-80.092271°	UNT to Brush Creek	WWF	Utility Line Crossing	Permanent	3.0 - 1.3	100 - 1.3	0
											Temporary	3.0 - 10.9	100 - 11	0
			NA	S-KZ05	Stream	40.637598°	-80.106511°	UNT to East Branch Big Sewickley Creek	TSF	Utility Line Crossing	Permanent	5.0 - 1.3	225 - 1.3	0
											Temporary	5.0 - 22.8	225 - 14	0
			NA	S-KZ08	Stream	40.623396°	-80.093637°	East Branch Big Sewickley Creek	TSF	Utility Line Crossing	Permanent	8.0 - 1.3	259 - 1.3	0
											Temporary	8.0 - 14	259 - 15	0
			NA	S-KZ10 (Floodway)	Floodway	40.622532°	-80.091335°	UNT to East Branch Big Sewickley Creek	TSF	Utility Line Crossing	Permanent	0	12 - 1.3	0
											Temporary	0	12 - 51.9	0

PADEP Impact Types (Permanent and Temporary):

Permanent Impacts are those areas affected by a water obstruction or encroachment that consist of both direct and indirect impacts that result from the placement or construction of a water obstruction or encroachment, and include areas necessary for the operation and maintenance of the water obstruction or encroachment located in, along, or across, or projecting into a watercourse, floodway, or body of water.

Temporary Impacts are those areas affected during the construction of a water obstruction or encroachment that consists of both direct and indirect impacts located in, along, or across, or projecting into a watercourse, floodway, or body of water that are restored upon completion of construction. This does not include areas that will be maintained as a result of the operation and maintenance of the water obstruction or encroachment located in, along, or across, or projecting into a watercourse, floodway, or body of water (these are considered permanent impacts).

⁽¹⁾Resource crossing qualifies under Chapter 105.12a Waiver (2) - A water obstruction in a stream or floodway with a drainage area of 100 acres or less.

dd = Decimal Degrees

CWF = Cold Water Fishes

HQ-CWF = High Quality Cold Water Fishes

WWF = Warm Water Fishes

NAD83 = North American Datum 1983

PADEP = Pennsylvania Department of Environmental Protection

UNT = Unnamed Tributary

**Table 1.
Identified Streams**

Stream Number ¹	Stream Reach ID	PA Chapter 93 Stream Name ²	County	Latitude ³	Longitude ³	Flow Regime	Water Type ⁴	Cowardin Class ⁵	Flow Direction	PA Stream Designated Use ⁶	Top of Bank Width (feet)	Figure(s)
1	S-KZ01-DN	UNT to Brush Creek	Allegheny	40.653921	-80.093913	Perennial	RPW	R3UB1	N	WWF	5.50	4-1
	S-KZ01-UP	UNT to Brush Creek	Allegheny	40.651472	-80.095425	Perennial	RPW	R3UB3	N	WWF	8.50	4-1, 4-2, 4-3
2	S-KZ02	UNT to Brush Creek	Allegheny	40.653018	-80.094622	Intermittent	RPW	R4SB3	E	WWF	3.00	4-1
3	S-KZ03	UNT to Brush Creek	Allegheny	40.650881	-80.095334	Perennial	RPW	R3UB3	N	WWF	3.00	4-2, 4-3
4	S-KZ04	UNT to Brush Creek	Allegheny	40.652721	-80.092034	Ephemeral	NRPW	R6	W	WWF	3.00	4-2
5	S-KZ05	UNT to East Branch Big Sewickley Creek	Allegheny	40.637207	-80.106415	Ephemeral	NRPW	R6	SE	TSF	5.00	4-8
6	S-KZ06	UNT to East Branch Big Sewickley Creek	Allegheny	40.624039	-80.095600	Perennial	RPW	R3UB1	S	TSF	12.00	4-10, 4-11
7	S-KZ07	UNT to East Branch Big Sewickley Creek	Allegheny	40.623881	-80.095365	Intermittent	RPW	R4SB3	S	TSF	6.00	4-10, 4-11
8	S-KZ08	East Branch Big Sewickley Creek	Allegheny	40.623387	-80.093156	Perennial	RPW	R3UB1	WNW	TSF	8.00	4-10, 4-11
9	S-KZ09	UNT to East Branch Big Sewickley Creek	Allegheny	40.623023	-80.092983	Intermittent	RPW	R4SB3	NE	TSF	4.00	4-11
10	S-KZ10	UNT to East Branch Big Sewickley Creek	Allegheny	40.622768	-80.091064	Intermittent	RPW	R4SB2	N	TSF	6.50	4-11

Notes:

- 1 - Streams with braided channels, streams that have different flow regimes (e.g. ephemeral and intermittent) within the surveyed reach, and Chapter 93 named streams with different field stream reach identification names are counted as single streams.
 - 2 - From PADEP (2018); see References. For identified streams without a PA Chapter 93 name, the identified stream was given the name, "Unnamed Tributary (UNT)", of the first named receiving waterbody.
 - 3 - In decimal degrees.
 - 4 - RPW = Relatively Permanent Waters
- NRPW = Non-Relatively Permanent Waters
- TNW = Traditional Navigable Waters
 - 5 - From Cowardin et al. 1979; see References.
 - 6 - Stream Designated Use Under Chapter 93 of Title 25 of the PA Code.
- Aquatic Life
- CWF = Cold Water Fishes
 - MF = Migratory Fishes
 - TSF = Trout Stocking
 - WWF = Warm Water Fishes
- Special Protection
- EV = Exceptional Value Waters
 - HQ = High Quality Waters

**Table 2.
Identified Wetlands**

Wetland Number ¹	Wetland ID	Latitude ²	Longitude ²	Cowardin Class ³	HGM ⁴	Water Type ⁵	Associated Waterbodies	Size (square feet) ⁶	Open/Closed Boundary	Figure(s)
1	W-KZ01-PEM	40.653888	-80.093911	PEM	Riverine	RPWWD	S-KZ01-DN	2,464	Closed	4-1
	W-KZ01-PFO	40.653543	-80.094071	PFO	Riverine	RPWWD	S-KZ01-DN, S-KZ01-UP, S-KZ02	9,686	Closed	4-1, 4-2
	W-KZ01-PSS	40.654176	-80.093804	PSS	Riverine	RPWWD	S-KZ01-DN	4,650	Open	4-1
2	W-KZ02-PEM	40.651213	-80.095160	PEM	Riverine	RPWWD	S-KZ01-UP, S-KZ03	23,346	Closed	4-2, 4-3
	W-KZ02-PSS	40.651120	-80.095054	PSS	Riverine	RPWWD	S-KZ03	7,909	Closed	4-2, 4-3
3	W-KZ03	40.651365	-80.095601	PEM	Riverine	RPWWD	S-KZ01-UP	436	Closed	4-2
4	W-KZ04	40.650113	-80.096697	PSS	Riverine	RPWWD	S-KZ01-UP	22,937	Open	4-3
5	W-KZ05	40.649183	-80.095489	PEM	Depressional	ISOLATE	N/A	1,074	Closed	4-3, 4-4
6	W-KZ06	40.652454	-80.092304	PSS	Slope	NRPWW	S-KZ04	5,858	Open	4-2
7	W-KZ07	40.637756	-80.106574	PEM	Slope	NRPWW	S-KZ05	2,068	Closed	4-8
8	W-KZ08	40.625789	-80.097288	PEM	Depressional	NRPWW	UNT to East Branch Big Sewickley Creek	8,628	Open	4-10
9	W-KZ09	40.624426	-80.095334	PEM	Slope	RPWWD	S-KZ06	6,580	Open	4-10, 4-11
10	W-KZ10	40.623907	-80.095428	PEM	Riverine	RPWWD	S-KZ06, S-KZ07, S-KZ08	3,695	Open	4-10, 4-11
11	W-KZ11	40.623267	-80.093932	PFO	Riverine	RPWWD	S-KZ08	9,774	Open	4-11
12	W-KZ12-PFO	40.623272	-80.092666	PFO	Riverine	RPWWD	S-KZ08	14,432	Open	4-11
	W-KZ12-PEM	40.622998	-80.091815	PEM	Riverine	RPWWD	S-KZ08	16,072	Open	4-11
13	W-KZ13	40.622432	-80.091266	PEM	Riverine	RPWWN	S-KZ10	1,262	Closed	4-11

Notes:

- 1 - Wetlands with multiple contiguous Cowardin types (e.g. PEM and PSS) are considered a single wetland system and are counted as one wetland.
- 2 - In decimal degrees. Coordinates show wetland test pit locations.
- 3 - PEM = Palustrine Emergent
 - PFO = Palustrine Forested
 - PSS = Palustrine Scrub-Shrub
 - PUB = Palustrine Unconsolidated Bottom
- 4 - HGM = Hydrogeomorphic
- 5 - RPWWD = Wetlands directly abutting Relatively Permanent Waters (RPWs) that flow directly or indirectly into Traditional Navigable Waterways (TNWs)
 - RPWWN = Wetlands adjacent but not directly abutting RPWs that flow directly or indirectly into TNWs
 - NRPWW = Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - Isolate = Isolated (interstate or intrastate) waters, including isolated wetlands
- 6 - Size of wetlands with open boundaries may be larger than shown in this table. Wetland size shown is the size of the wetland delineated and illustrated on Aquatic Resource Location Map.

APPENDIX B

1. PROJECT INFORMATION

Project Name: **Warrendale-Bayne, Brush Creek, and Mingo Road Water Main Extensions**

Date of Review: **2/25/2021 04:31:59 PM**

Project Category: **Water extraction/transfer, Water line construction**

Project Area: **1.56 acres**

County(s): **Allegheny**

Township/Municipality(s): **MARSHALL TOWNSHIP**

ZIP Code:

Quadrangle Name(s): **EMSWORTH; MARS**

Watersheds HUC 8: **Connoquenessing; Upper Ohio**

Watersheds HUC 12: **Big Sewickley Creek; Brush Creek**

Decimal Degrees: **40.651052, -80.093148**

Degrees Minutes Seconds: **40° 39' 3.7874" N, 80° 5' 35.3322" W**

2. SEARCH RESULTS

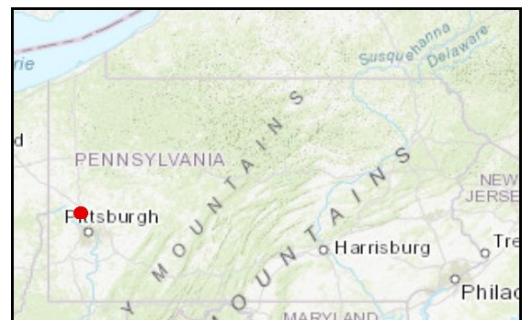
Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. Therefore, based on the information you provided, no further coordination is required with the jurisdictional agencies. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

Warrendale-Bayne, Brush Creek, and Mingo Road Water Main Extensions

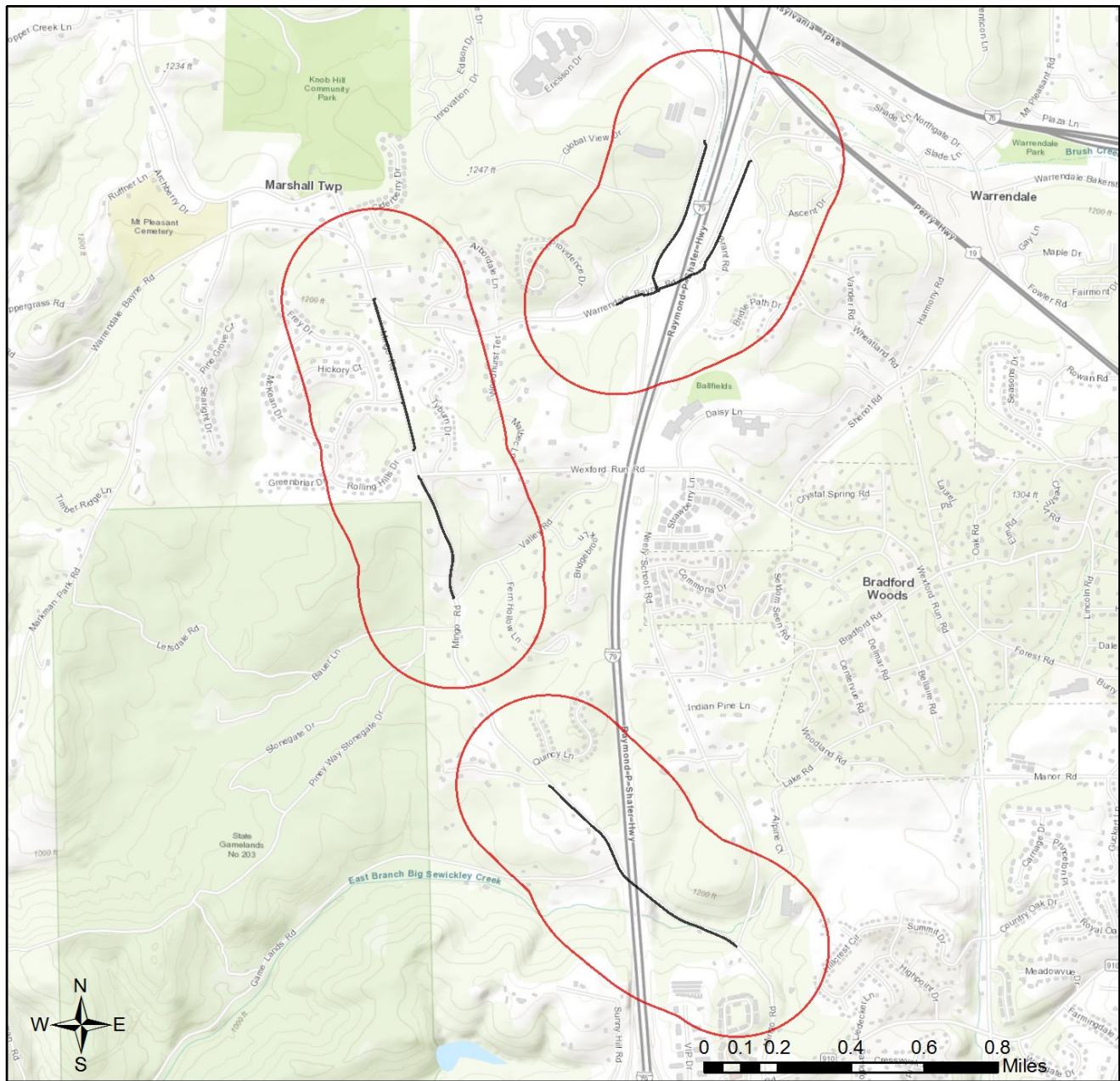


- Project Boundary
- Buffered Project Boundary



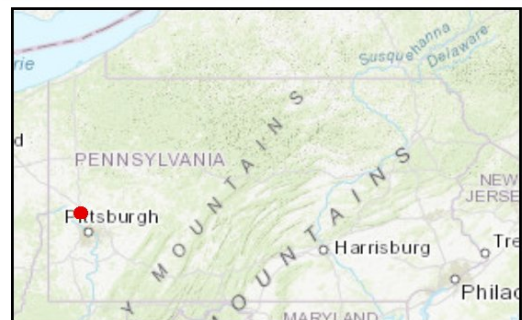
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Warrendale-Bayne, Brush Creek, and Mingo Road Water Main Extensions



- Project Boundary
- Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, Garmin, Intemap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jurisdictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

U.S. Fish and Wildlife Service

RESPONSE:

No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq. is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at <https://conservationexplorer.dcnr.pa.gov/content/resources>.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources

Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov

PA Fish and Boat Commission

Division of Environmental Services
595 E. Rolling Ridge Dr., Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

U.S. Fish and Wildlife Service

Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
Email: IR1_ESPenn@fws.gov
NO Faxes Please

PA Game Commission

Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: Emily Zapinski
Company/Business Name: Tetra Tech, Inc.
Address: 661 Andersen Dr., Suite #200
City, State, Zip: Pittsburgh, PA 15220
Phone: (412) 377-0355 Fax: ()
Email: emily.zapinski@tetrattech.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

Emily J. Zapinski
applicant/project proponent signature

02/25/2021
date

APPENDIX C

Aquatic Resource Report for the USACE LRP Water Main Extension Project

USACE LRP (Pittsburgh District)

Allegheny County, Pennsylvania

November 2020

Prepared for:

USACE LRP (Pittsburgh District)

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Appendix A: Stream Data Forms

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Appendix D: Resumes

ACRONYMS AND ABBREVIATIONS

Acronyms/Abbreviations	Definition
1987 Manual	Corps of Engineers Wetland Delineation Manual
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
GIS	Geographic Information Systems
GPS	Global Positioning System
HGM	Hydrogeomorphic
HUC	Hydrologic Unit Code
NJD	Non-Jurisdictional
NRCS	Natural Resources Conservation Service
NRPW	Non-Relatively Permanent Waters
NRPWW	Wetlands adjacent to Non-Relatively Permanent Waters that flow directly or indirectly into Traditionally Navigable Waters
NWI	National Wetlands Inventory
OBL	Obligate
OHWM	Ordinary High-Water Mark
PA	Pennsylvania
PADEP	Pennsylvania Department of Environmental Protection
PEM	Palustrine Emergent
PFO	Palustrine Forested
Project	USACE LRP Water Main Extension Project
PSS	Palustrine Scrub-Shrub
PUB	Palustrine Unconsolidated Bottom
Regional Supplement	Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0
RPW	Relatively Permanent Waters
RPWWD	Wetlands directly abutting Relatively Permanent Waters that flow directly or indirectly into Traditionally Navigable Waters
RPWWN	Wetlands adjacent to but not directly abutting Relatively Permanent Waters that flow directly or indirectly into Traditionally Navigable Waters
Tetra Tech	Tetra Tech, Inc.
TNW	Traditionally Navigable Water
TNWW	Wetlands Adjacent to Traditionally Navigable Waters
UNT	Unnamed Tributary

Acronyms/Abbreviations	Definition
UPL	Upland
USACE	United States Army Corps of Engineers
USACE LRP	USACE LRP (Pittsburgh District)
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1.0 INTRODUCTION

USACE LRP - Pittsburgh District (USACE LRP) proposes the design and installation of the USACE LRP Water Main Extension Project (Project), a new 16-inch water distribution main network, totaling 13,700 linear feet, which connects at multiple points to the existing water distribution system to better serve customers in the Marshall Township, Allegheny County, Pennsylvania (PA). The Project is in Allegheny County, PA, as shown on the United States Geological Survey (USGS) Project Location Map (Figure 1). The Project is in the Connoquenessing (Hydrologic Unit Code [HUC] 05030105) and Upper Ohio (HUC 05030101) Watersheds (USGS 2019). The Project study area and surrounding landscape is primarily dominated by commercial and residential land, with occasional upland forests bisected by Interstate 79. The Project study area consists of gentle to moderately sloped topography as primarily follows existing paved roadways.

Tetra Tech, Inc. (Tetra Tech), on behalf of USACE LRP, prepared this Aquatic Resource Report summarizing the results of a field survey of the Project study area for the presence of wetlands and surface water features. Tetra Tech applied the methods detailed in the United States Army Corps of Engineers' (USACE) *Wetland Delineation Manual (1987 Manual; Environmental Laboratory 1987)*, as amended by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0 (Regional Supplement; USACE 2012)*.

2.0 METHODS

The primary objective of the aquatic resource field survey is to identify and map potentially jurisdictional streams and wetlands for Project permitting; however, the survey also includes the identification and mapping of likely non-jurisdictional (NJD) aquatic features (see Section 2.4)

2.1 FIELD SURVEY

Prior to the start of field surveys, an initial desktop analysis of the Project study area is conducted through a review of available Geographic Information Systems (GIS) resources. Information reviewed includes the following:

- USGS topographic mapping (Figure 1; National Geographic Society, i-cubed 2013).
- Natural Resources Conservation Service (NRCS) Web Soil Survey (Figure 2; NRCS 2017) mapping and data.
- United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping (Figure 3; USFWS 2018).
- Pennsylvania Department of Environmental Protection (PADEP) Chapter 93 Designated Use Streams mapping (Figure 3; PADEP 2018).

All features identified in the field, including stream reaches, wetlands, and wetland upland points, are given unique identification names (i.e. S-ID, W-ID, and W-ID-UPL, respectively). In addition, the PADEP Chapter 93 stream name (PADEP 2018) for field identified streams is recorded on the stream data form (Appendix A) and listed in Table 1. Identified streams without a PADEP Chapter 93 name are named, “Unnamed Tributary (UNT)” of the first named receiving waterbody.

Identified stream reaches are mapped along their entire course within the study area by use of a Global Positioning System (GPS) receiver with sub-meter accuracy or better. The identified streams are shown on the Aquatic Resource Location Map (Figures 4-1 to 4-11). Stream data forms detailing stream characteristics are provided in Appendix A. Photographs and photograph location maps of each identified stream reach are included immediately following each features’ respective stream data form.

Wetland delineation involves the establishment of the wetland/upland boundary based on the identification of hydrophytic vegetation, hydric soils, and wetland hydrology indicators. This delineated wetland boundary is mapped in the field by use of a GPS receiver. Delineated wetlands are shown as closed or open boundary systems on the Aquatic Resource Location Map (Figures 4-1 to 4-11). Wetlands that continue beyond the delineated boundary shown on the Aquatic Resource Location Map are identified as open boundary wetland systems. Wetlands that do not continue beyond the delineated boundary shown on the Aquatic Resource Location Map are identified as closed boundary wetland systems. Data collected on vegetation, soils, and hydrology for identified wetlands and their associated upland points are recorded on USACE Wetland Determination Data Forms (Appendix B). Photographs and photograph location maps of each identified wetland are included immediately following each features’ respective USACE Wetland Determination Data Form.

NJD aquatic features identified within the Project study area are assessed, documented, mapped in the field by use of a GPS receiver, and are shown on the Aquatic Resource Location Map (Figures 4-1 to 4-11). Photographs and photograph location maps of each identified non-jurisdictional aquatic feature are provided in Appendix C.

2.2 STREAM IDENTIFICATION

Potentially jurisdictional streams are identified in the field by the presence of a continuous channel that exhibits evidence of frequent or reoccurring water flow such as a defined bed, bank, and an ordinary high-water mark (OHWM; USACE and United States Environmental Protection Agency [USEPA] 2007).

The designated use of identified streams is identified in 25 Pa. Code §93. Physical and biological characteristics of the identified streams are evaluated to determine Flow Regime (82 FR 1860, January 6, 2017), USACE Waters Type (USACE and USEPA 2007), and Cowardin classifications (Cowardin et al. 1979). Physical characteristics evaluated include but are not limited to channel morphology, substrate size and type, and base flow conditions. Biological characteristics evaluated include but are not limited to the presence of fish, aquatic macroinvertebrates, and vegetation rooted within the OHWM. USACE Water Types (USACE and USEPA 2007) include:

- *Traditional Navigable Water (TNW)* – All “navigable waters of the U.S.,” defined in 33 CFR Part 329 and by numerous decisions of the federal courts, plus all other waters that are navigable-in-fact.
- *Relatively Permanent Waters (RPW)* – Streams that flow directly or indirectly into TNWs and where the flow of water is continuous year-round or at least seasonally.
- *Non-RPW (NRPW)* – Streams that flow directly or indirectly into TNWs where the flow of water is not continuous at least seasonally.

Flow Regimes (82 FR 1860, January 6, 2017) include:

- *Perennial* – Streams that typically have flow year-round. Most of the hydrology for perennial streams is derived from smaller upstream waters and/or groundwater sources with precipitation as a supplemental hydrologic contributor. Perennial streams are classified as RPW or TNW USACE Waters Types (USACE and USEPA 2007).
- *Intermittent* – Streams with seasonal flow, typically during the wet season (winter through spring). At least a portion of the hydrology for intermittent streams is derived from groundwater sources with precipitation as a supplemental hydrologic contributor. Intermittent streams are classified as an RPW USACE Waters Type (USACE and USEPA 2007).
- *Ephemeral* – Rain-dependent streams flowing only after precipitation event. Precipitation driven run-off from the localized surrounding landscape is the primary source of hydrology. Ephemeral streams are different from non-jurisdictional ditches and drainages due to the presence of an observable OHWM. Ephemeral streams are classified as an NRPW USACE Waters Type (USACE and USEPA 2007).

2.3 WETLAND DELINEATION

Wetland delineations are conducted in accordance with the procedures specified in the *1987 Manual* (Environmental Laboratory 1987) and the *Regional Supplement* (USACE 2012). According to the *1987 Manual* (Environmental Laboratory 1987), an area is defined as a wetland if, under normal circumstances, it meets all three of the following criteria: predominance of hydrophytic vegetation (plants adapted for life in saturated soil conditions); hydric soils (soils formed under water, or in saturated conditions); and wetland hydrology (current or recent inundation or saturated soils at some time during the growing season).

2.3.1 Hydrophytic Vegetation

Hydrophytic vegetation is identified in the field based on protocol outlined in the *Regional Supplement* (USACE 2012). Plant species representative of the habitats within the Project study area are identified to the species

taxonomic level and the indicator status for each plant species is identified using the *National Wetland Plant List, version 3.4*. (USACE 2018). Wetland indicator statuses are described below (Reed 1988):

- *Obligate (OBL)* – almost always occurs in wetlands; estimated probability of occurrence in a wetland is greater than 99 percent.
- *Facultative Wetland (FACW)* – usually occurs in wetlands but may occur in non-wetlands; estimated probability of occurrence in a wetland is 67 to 99 percent.
- *Facultative (FAC)* – equally likely to occur in wetlands and non-wetlands; estimated probability of occurrence in a wetland is 34 to 66 percent.
- *Facultative Upland (FACU)* – usually occurs in non-wetlands but may occur in wetlands; estimated probability of occurrence in a wetland is 1 to 33 percent.
- *Upland (UPL)* – rarely occurs in wetlands; estimated probability of occurrence in a wetland is less than 1 percent.

Hydrophytic vegetation includes species with an indicator status of OBL, FACW, or FAC. Hydrophytic vegetation decisions are based on the plant community typically present during the wet portion of the growing season during a normal rainfall year. In areas where human practices or natural events have influenced vegetation, procedures for difficult or problematic situations outlined in the *Regional Supplement* (USACE 2012) are followed.

Wetlands habitat types are based on vegetation strata composition and are classified in accordance with the USFWS *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979):

- *Palustrine emergent (PEM)* – contain emergent, herbaceous (non-woody) plants which are the tallest life form with at least 30 percent aerial coverage.
- *Palustrine scrub-shrub (PSS)* – contain woody plants less than six meters (20 feet) in height which are the tallest life form with at least 30 percent aerial coverage, or, when trees or shrubs alone cover less than 30 percent of an area but in combination cover 30 percent or more. Trees are defined as woody plants at least six meters (20 feet) in height, and shrubs are defined as woody plants less than six meters (20 feet) in height.
- *Palustrine forested (PFO)* – contain woody plants at least six meters (20 feet) in height which are the tallest life form with at least 30 percent aerial coverage.
- *Palustrine unconsolidated bottom (PUB)* – contain all wetland and deepwater habitats with at least 25 percent cover of particles smaller than stones, and a vegetative cover of less than 30 percent.

2.3.2 Hydric Soils

Hydric soils are identified in the field based on protocol outlined in the *1987 Manual* (Environmental Laboratory 1987), *Regional Supplement* (USACE 2012), and *Field Indicators of Hydric Soils in the United States* (United States Department of Agriculture [USDA] 2010). Based on prior experience, the presence of field-identified hydric soils does not always align with NRCS mapped hydric soils units. The NRCS soil units represent a large geographic area and are based on broad geologic and historic conditions. The methods used in the *Field Indicators of Hydric Soils in the United States* (USDA 2010) are used to determine hydric soil conditions on a localized scale. A review of the NRCS mapped hydric soils units is used to initially identify areas that have the potential to contain wetlands (See Section 3.2); however, the wetland delineation boundaries are based on the presence of field identified hydric soils. In cases where soils are found to be disturbed or problematic, determinations may rely on the NRCS mapped hydric soil units (USACE 2012).

2.3.3 Wetland Hydrology

Wetland hydrology indicators are identified in the field based on protocol outlined in the *1987 Manual* (Environmental Laboratory 1987) and *Regional Supplement* (USACE 2012). Hydrogeomorphic (HGM) and Water Type classifications are assigned to wetlands based on their hydrologic source and connectivity to streams. HGM classifications are based on *A Hydrogeomorphic Classification for Wetlands* (Brinson 1993); a summary of HGM classifications commonly used in the Project region is described below:

- *Riverine* – Wetlands occur in floodplains and riparian corridors in association with stream channels.
- *Depressional* – Wetlands occur in topographic depressions. Dominant water sources are precipitation ground water discharge, and both interflow and overland flow from adjacent uplands.
- *Slope* – Wetlands normally are found where there is a discharge of ground water to the land surface. They normally occur on sloping land; elevation gradients may range from steep hillsides to slight slopes.

Wetland USACE Water Types (USACE and USEPA 2007) include:

- *TNWW* – Wetlands adjacent to TNWs.
- *RPWWD* – Wetlands directly abutting RPWs that flow directly or indirectly into TNWs.
- *RPWWN* – Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs.
- *NRPWW* – Wetlands adjacent to NRPWs that flow directly or indirectly into TNWs.
- *Isolate* – Isolated (interstate or intrastate) waters, including isolated wetlands.

Current wetland hydrology indicators, inundation/saturation visible on aerial imagery, and estimates of the effects of ditches and subsurface drainage systems are all considered when making decisions regarding wetland hydrology in areas where human practices or natural events may have altered wetland hydrology.

2.4 NON-JURISDICTIONAL AQUATIC FEATURE IDENTIFICATION

Wetland delineations are conducted in accordance with the procedures specified in the *1987 Manual* (Environmental Laboratory 1987) and the *Regional Supplement* (USACE 2012). Potentially jurisdictional streams are identified in the field by the presence of a continuous channel that exhibits evidence of frequent or reoccurring water flow such as a defined bed, bank, and an OHWM (USACE and USEPA 2007). Aquatic features that are identified and evaluated utilizing these methodologies but lack the necessary criteria to be considered a wetland, waterbody, or water of the U.S. are considered non-jurisdictional. NJD aquatic features may include but are not limited to stormwater management features (e.g. stormwater retention ponds, ditches excavated wholly in and draining only uplands that do not carry a relatively permanent flow), drainage features, groundwater wells, wet areas that are not tributaries or open waters and do not meet the regulatory definition of "wetlands", water-filled depressions created incidental to construction activity, and farm ponds.

The Aquatic Resource Location Map (Figures 4-1 to 4-11) illustrates the NJD aquatic feature locations in relation to the Project study area. Photographs and photograph location maps of each identified non-jurisdictional aquatic feature are provided in Appendix C.

3.0 RESULTS

Tetra Tech performed field surveys for USACE LRP Water Main Extension Project on September 27th and 28th, 2020. Field surveys were performed by qualified wetland scientists that are experienced in the region. Resumes of all personnel that performed the field surveys are provided in Appendix D. Surveys were limited to the Project study area illustrated on Figures 1 through 4. The field surveys identified 10 stream reaches, 13 wetlands, and five non-jurisdictional aquatic features within the Project study area. The Aquatic Resource Location Map (Figures 4-1 to 4-11) illustrate the wetland, stream, and non-jurisdictional aquatic feature locations in relation to the Project study area. Tables 1 and 2 summarize stream and wetland information for all identified stream reaches and wetlands. Stream data forms are included in Appendix A and Wetland Determination Data Forms for wetlands and their associated upland points are included in Appendix B. Non-jurisdictional aquatic feature photographs are provided in Appendix C.

This Aquatic Resource Report represents our best professional judgment and is based on site conditions at the time of the field survey. However, final authority over determinations made during these surveys rests with the PADEP and USACE.

3.1 STREAM IDENTIFICATION

Ten stream reaches were identified in the Project study area based on our review of available GIS mapping data, evidence collected during field surveys, and best professional judgment. A summary of the data for each identified stream reach is provided in Table 1. Table 1 shows the stream reach field identification name, the PADEP Chapter 93 stream name, stream location, Flow Regime classification, Water Type classification, Cowardin classification, flow direction, PA Stream Designated Use, top of bank width, and Figure 4 sheet location. Stream data forms are provided for each stream reach in Appendix A. Photographs and photograph location maps of each identified stream reach are included immediately following each features' respective stream data form.

3.2 WETLAND DELINEATION

NRCS and USFWS NWI mapping were reviewed for the initial desktop analysis of the Project study area to identify areas that may have the potential to contain wetlands. Table 3 summarizes the NRCS hydric soils list for Allegheny County. The NRCS soil survey mapping units are shown on Figure 2. A review of the USFWS NWI mapping indicates that there are no NWI wetlands mapped in the Project study area (Figure 3).

Thirteen wetlands are located within the Project study area based on our review of available GIS mapping data, evidence collected during field surveys, and best professional judgment.

A summary of each wetland identified and delineated within the Project study area is provided in Table 2. Table 2 shows the wetland identification name, location, Cowardin classification, HGM classification, Waters Type classification, the identity of any associated (i.e. abutting or adjacent) waterbodies, wetland size within the Project study area (in acres and square feet), whether the wetland boundary is open or closed (see Section 2.1), and Figure 4 sheet location. Wetlands with multiple Cowardin types (e.g. PEM and PSS) are considered a single wetland system and are counted as one wetland. The wetland size provided in Table 2 represents the size of the delineated wetland boundary shown on Figures 4-1 to 4-11. Open boundary wetlands continue beyond the delineated wetland boundary shown on Figures 4-1 to 4-11; therefore, the total wetland size of open boundary wetlands may be larger than the size provided in Table 2.

USACE Wetland Determination Data Forms detailing the existing vegetation, soil characteristics, and hydrology for each wetland and its associated upland point are provided in Appendix B. Photographs and photograph location maps of each identified wetland are included immediately following each features' respective USACE Wetland Determination Data Form.

3.3 NON-JURISDICTIONAL AQUATIC FEATURES

Five non-jurisdictional aquatic features were identified in the Project study area based on our review of available GIS mapping data, evidence collected during field surveys, and best professional judgment. The NJD aquatic features (NJD-KZ01, NJD-KZ02, NJD-KZ03, NJD-KZ04, and NJD-KZ05) are maintained roadside drainage ditches, swales, or concrete sloughs conveying upland runoff along existing paved roads or highways. These stormwater management ditches, swales, or concrete sloughs are excavated wholly in uplands, lack of contiguous and well-defined bed and bank characteristics, lack a contiguous and well-defined OHWM, and some have upland vegetation growing within the substrate; therefore, these stormwater management features are not jurisdictional streams or waterbodies. The Aquatic Resource Location Map (Figures 4-1 to 4-11) illustrate the NJD aquatic feature locations in relation to the Project study area. Photographs and photograph location maps of each identified non-jurisdictional aquatic feature are provided in Appendix C.

4.0 CONCLUSION

During the field survey of the USACE LRP Water Main Extension Project, 10 stream reaches, and 13 wetlands, and five non-jurisdictional aquatic features were identified within the Project study area. A summary of the identified stream reach and wetland data is provided in Tables 1 and 2 and locations of all streams, wetlands, and NJD aquatic features are shown on the Aquatic Resource Location Map (Figures 4-1 to 4-11).

This Aquatic Resource Report represents our best professional judgment and is based on site conditions at the time of the field survey. However, final authority over the determinations made during this survey rests with the PADEP and the USACE.

5.0 REFERENCES

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FIGURES

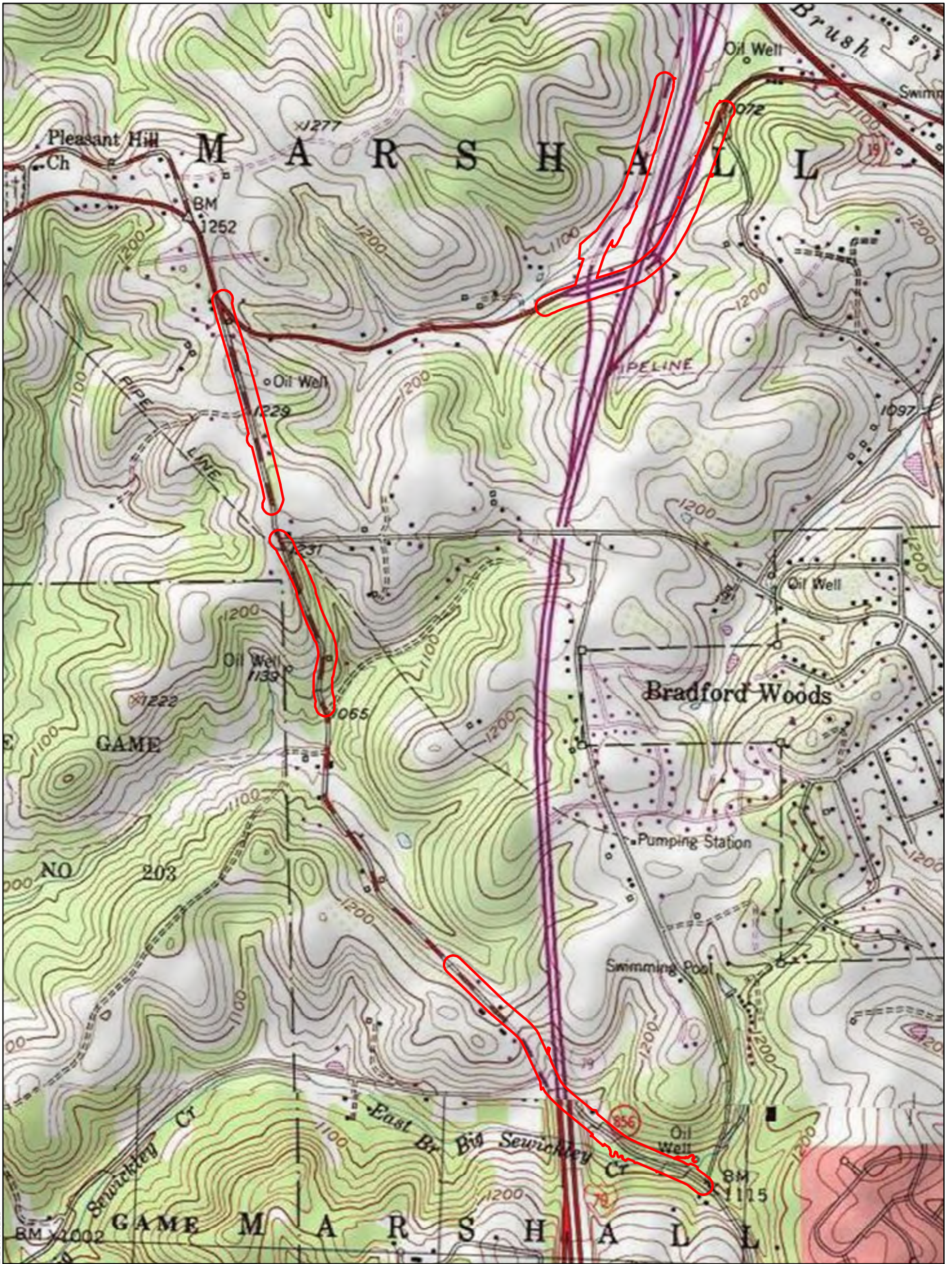
Figure 1: USGS Project Location Map

Figure 2: NRCS Soils Map

Figure 3: NWI Wetlands and PADEP Chapter 93 Streams Map

Figure 4-INDEX: USGS Project Index Map

Figures 4-1 to 4-11: Aquatic Resource Location Map




TETRATECH



1 inch = 1,000 feet

1,000 0 1,000 Feet

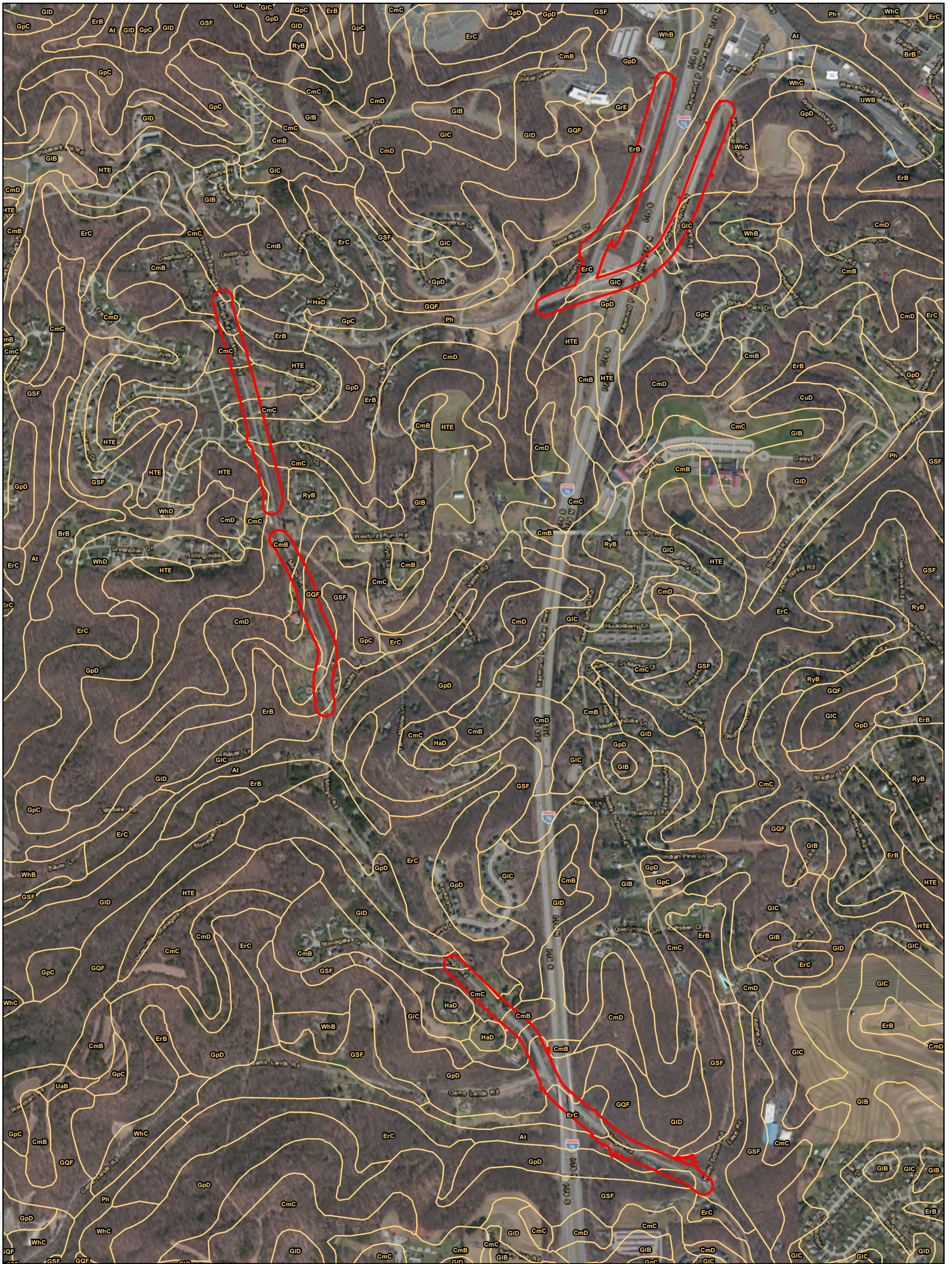
**FIGURE 1
USGS PROJECT LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT**

Legend
 Study Area

**USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA**

Notes:
 1) Topographic map provided by ESRI's ArcGIS Online USA Topo Maps map service (© 2013 National Geographic Society, i-cubed).
 2) Quadrangle(s) displayed: Mars, Emsworth.





1 inch = 1,000 feet

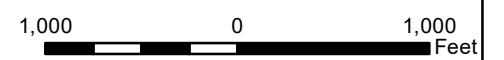
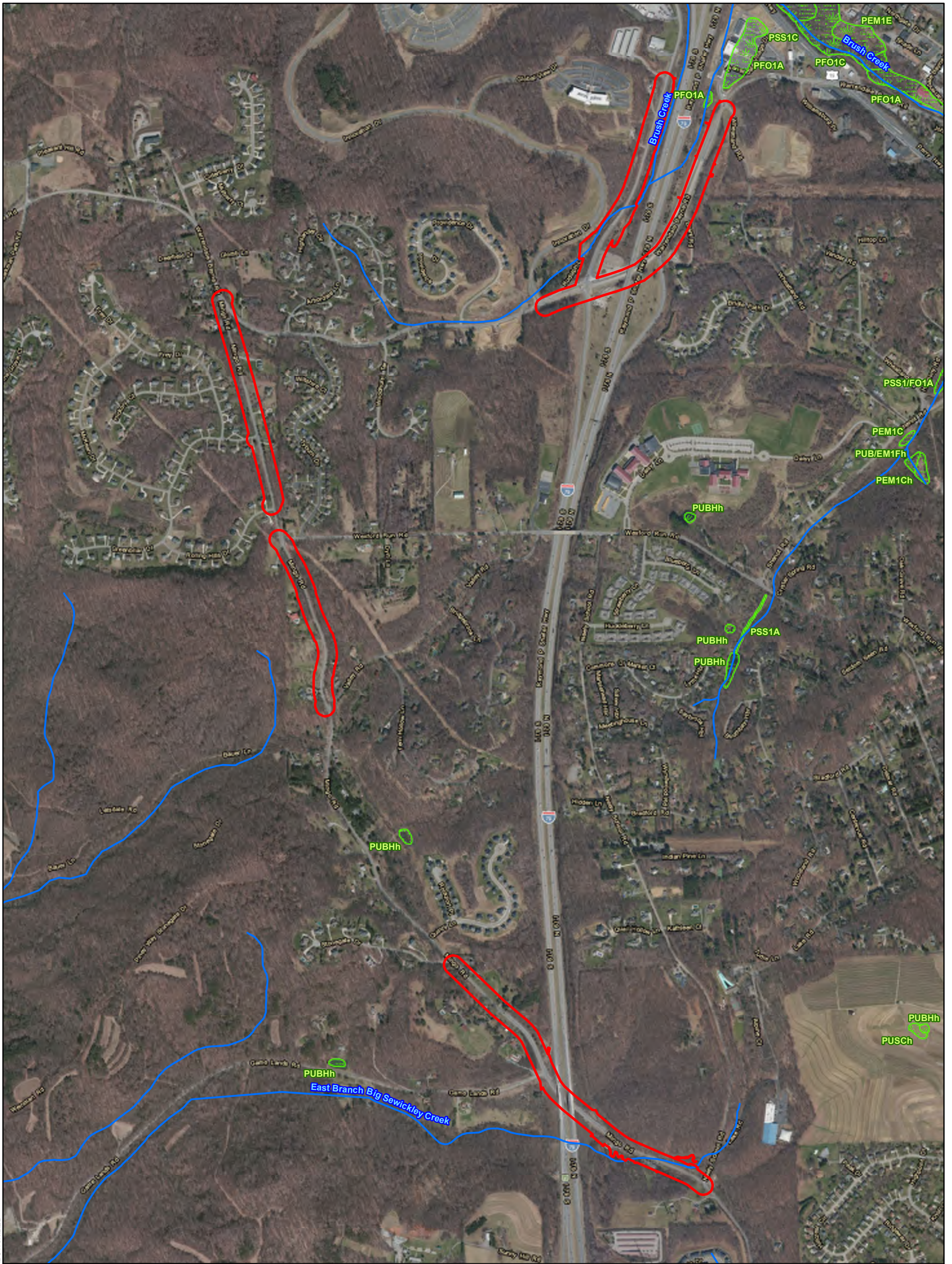


FIGURE 2
NRCS SOILS MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

- Legend**
- Study Area
 - Natural Resources Conservation Service (NRCS) Soils & Code

Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).
 2) NRCS Soils data provided by the NRCS, United States Department of Agriculture, Web Soil Survey (2017).





1 inch = 1,000 feet

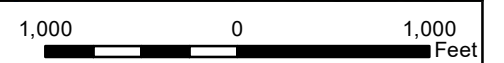


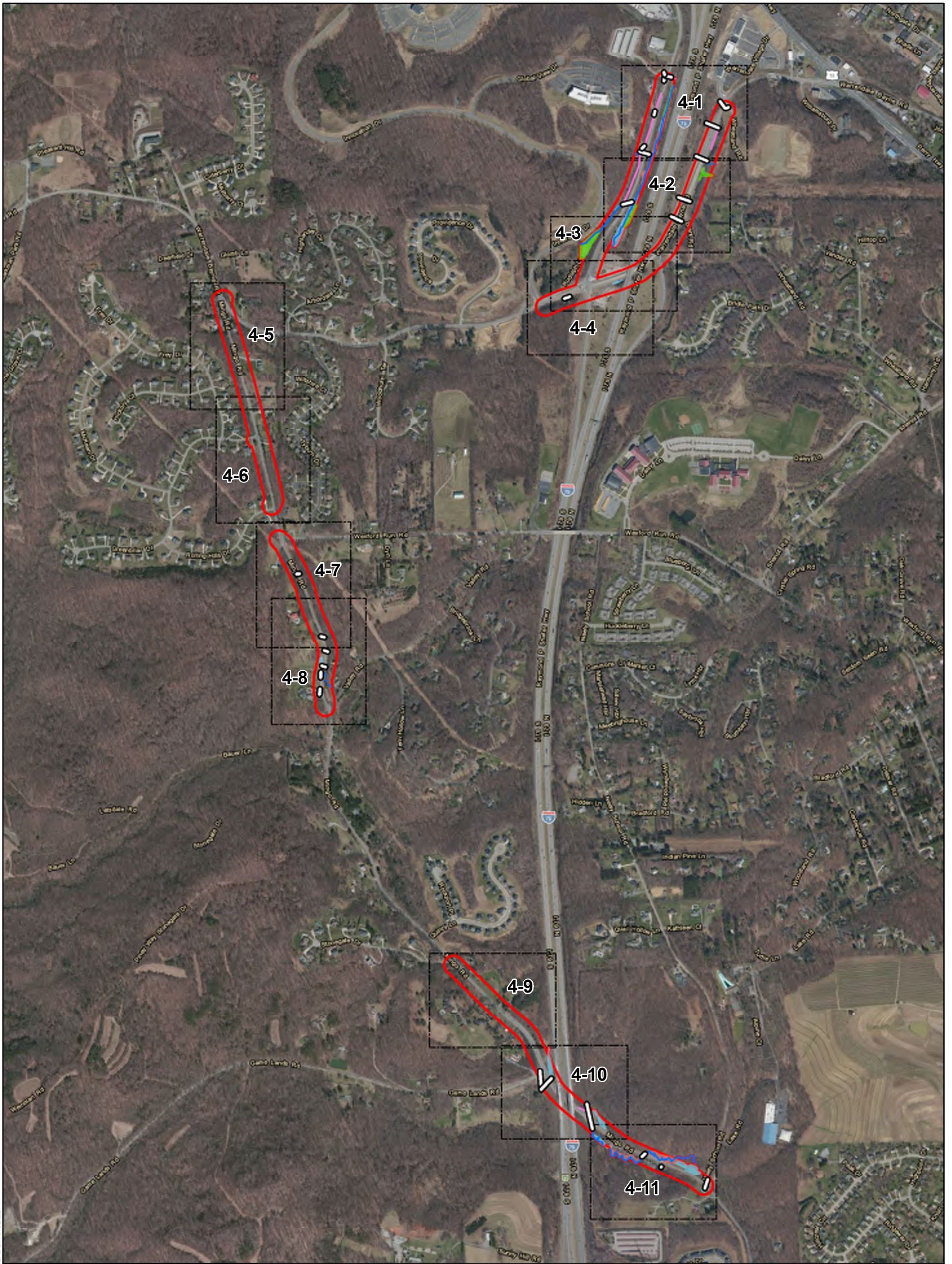
FIGURE 3
NWI WETLANDS AND PADEP
CHAPTER 93 STREAMS MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Legend

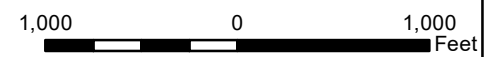
- Study Area
- Pennsylvania Department of Environmental Protection (PADEP) Chapter 93 Streams
- National Wetlands Inventory (NWI) Wetland & Code

Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service © 2015 ESRI and its data suppliers.
 2) NWI wetlands provided by United States Fish and Wildlife Service (USFWS, 2018).
 3) Dahl, T.E., J. Dick, J. Swords, and B.O. Wilen. 2015. Data Collection Requirements and Procedures for Mapping Wetland, Deepwater and Related Habitats of the United States. Division of Habitat and Resource Conservation (version 2), National Standards and Support Team, Madison, WI. 92 p.
 4) Chapter 93 Designated Use Streams provided by Pennsylvania Department of Environmental Protection (PADEP, 2018).





1 inch = 1,000 feet



**FIGURE 4-INDEX
AQUATIC RESOURCE LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT**

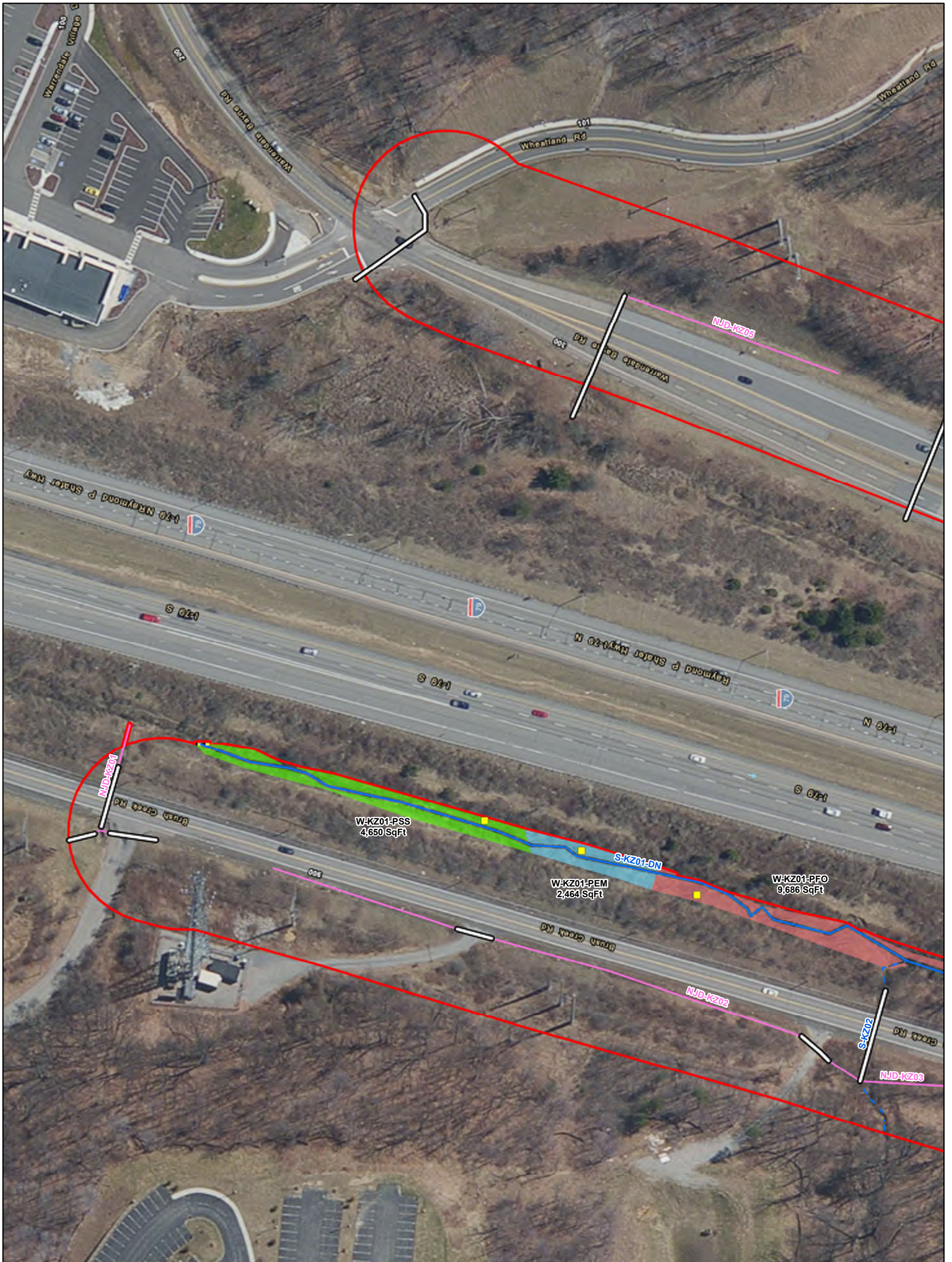
**USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA**

Legend

- Study Area
- Culvert Pipe
- NJD Aquatic Feature
- Ephemeral Stream
- Intermittent Stream
- Perennial Stream
- PEM Wetland
- PFO Wetland
- PSS Wetland

Notes:
1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).





1 inch = 100 feet

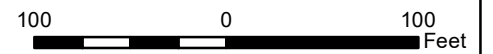
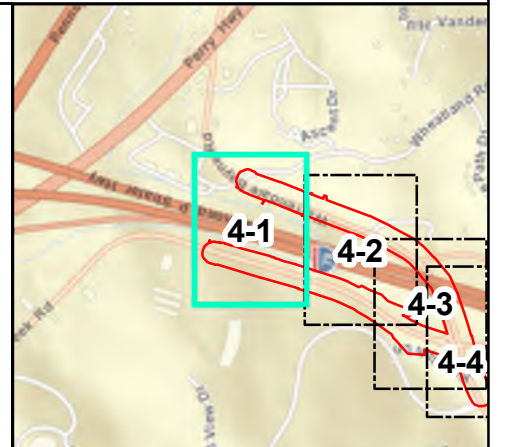


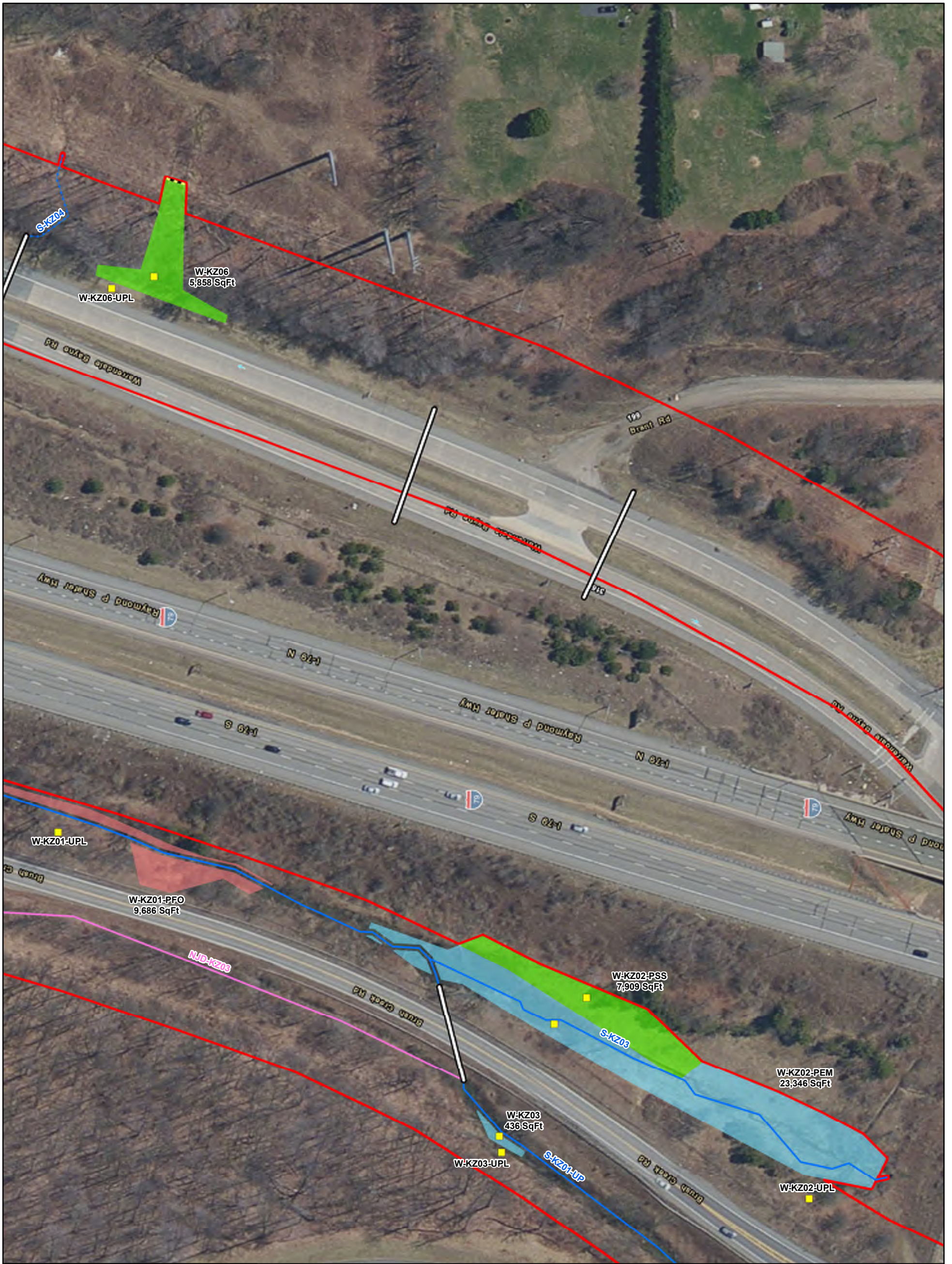
FIGURE 4-1
AQUATIC RESOURCE LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Legend

- Study Area
- Sampling Point
- Culvert Pipe
- NJD Aquatic Feature
- Ephemeral Stream
- Intermittent Stream
- Perennial Stream
- Wetland Open End
- PEM Wetland
- PFO Wetland
- PSS Wetland

Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).





1 inch = 100 feet

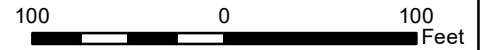
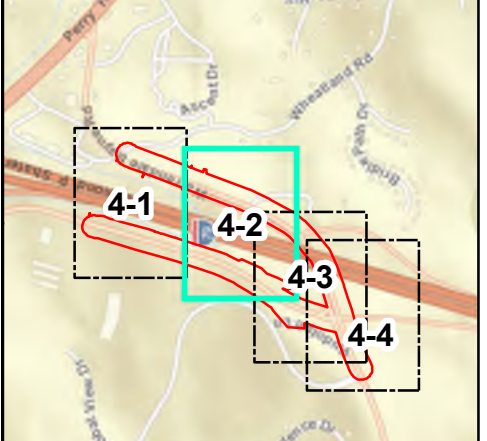


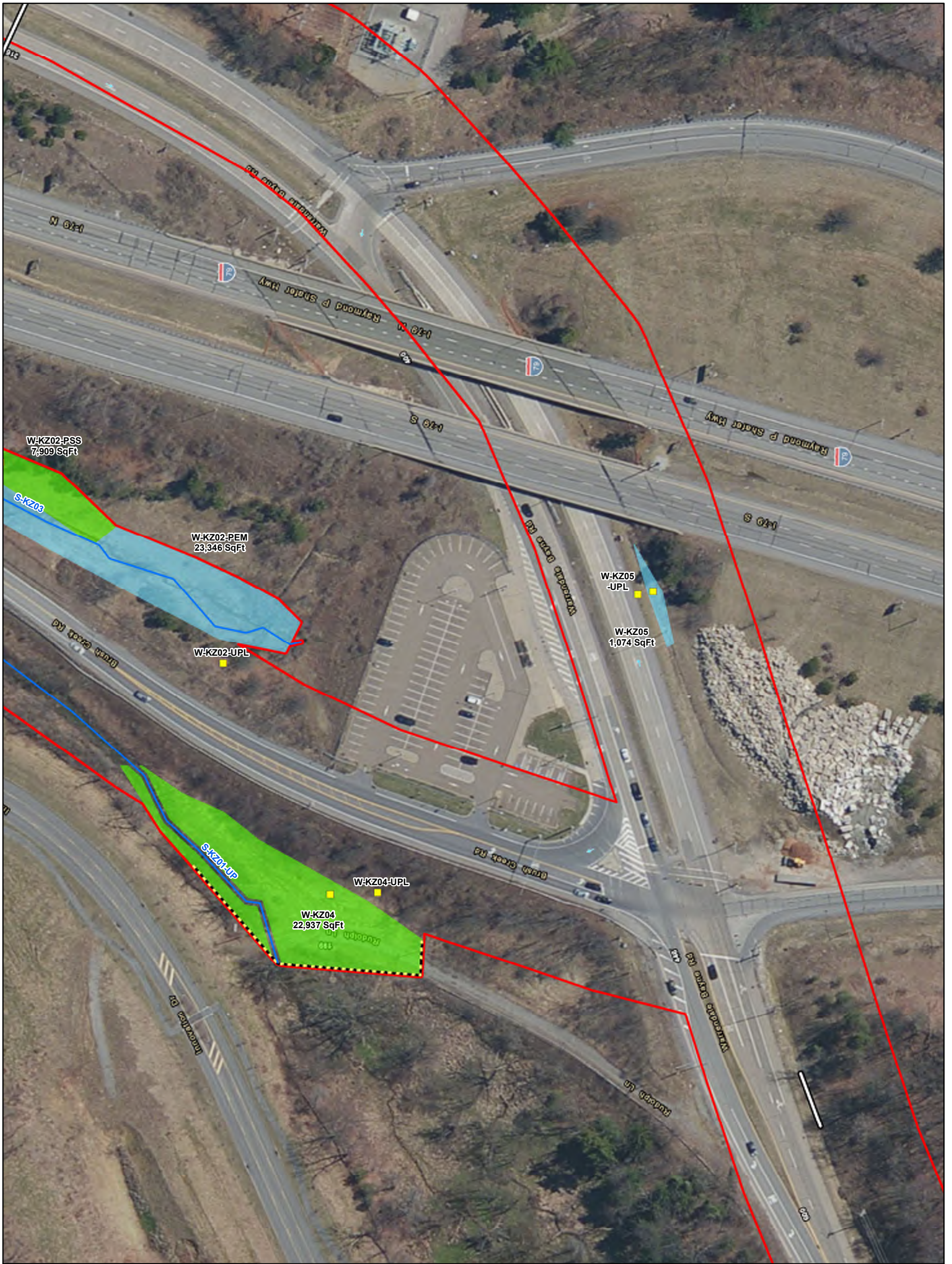
FIGURE 4-2
AQUATIC RESOURCE LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Legend

- Study Area
- Sampling Point
- Culvert Pipe
- Ephemeral Stream
- Intermittent Stream
- Perennial Stream
- Wetland Open End
- PEM Wetland
- PFO Wetland
- PSS Wetland

Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).





1 inch = 100 feet

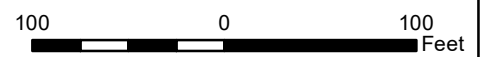
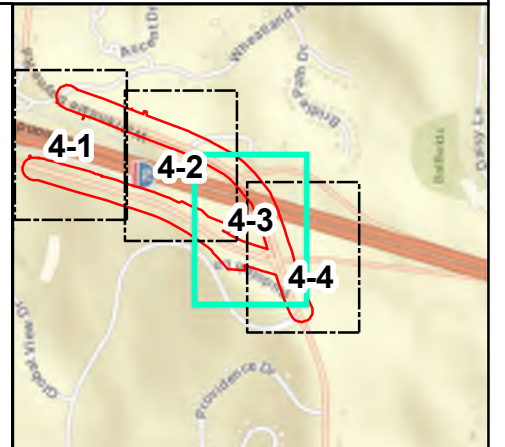


FIGURE 4-3
AQUATIC RESOURCE LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Legend

- Study Area
- Sampling Point
- Culvert Pipe
- NJD Aquatic Feature
- Ephemeral Stream
- Intermittent Stream
- Perennial Stream
- Wetland Open End
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- PFO Wetland
- PSS Wetland

Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).





1 inch = 100 feet

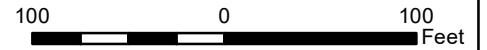
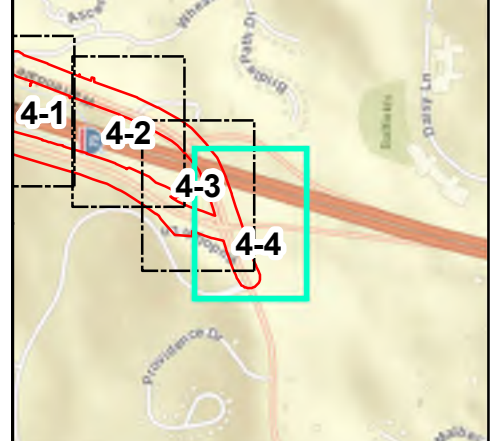


FIGURE 4-4
AQUATIC RESOURCE LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

- Legend**
- Study Area
 - Sampling Point
 - Culvert Pipe
 - NJD Aquatic Feature
 - Ephemeral Stream
 - Intermittent Stream
 - Perennial Stream
 - Wetland Open End
 - PEM Wetland
 - PFO Wetland
 - PSS Wetland

Notes:
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1 inch = 100 feet

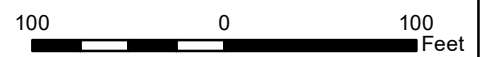
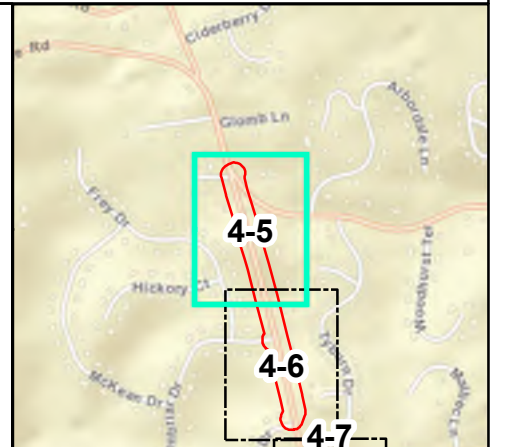


FIGURE 4-5
AQUATIC RESOURCE LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Legend

- Study Area
- Sampling Point
- Culvert Pipe
- NJD Aquatic Feature
- Ephemeral Stream
- Intermittent Stream
- Perennial Stream
- Wetland Open End
- PEM Wetland
- PFO Wetland
- PSS Wetland

Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).





1 inch = 100 feet

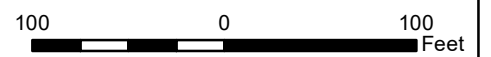
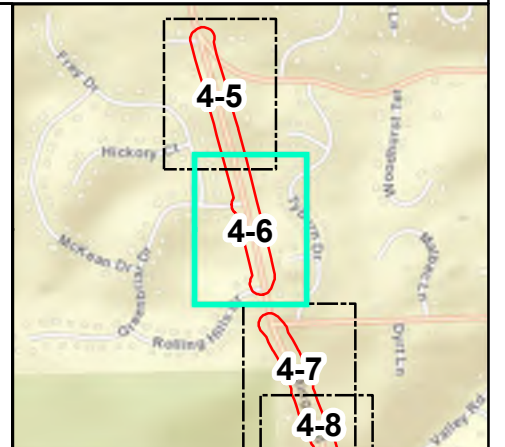


FIGURE 4-6
AQUATIC RESOURCE LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Legend

- Study Area
- Sampling Point
- Culvert Pipe
- NJD Aquatic Feature
- Ephemeral Stream
- Intermittent Stream
- Perennial Stream
- Wetland Open End
- PEM Wetland
- PFO Wetland
- PSS Wetland

Notes:
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1 inch = 100 feet

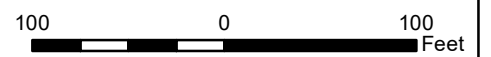
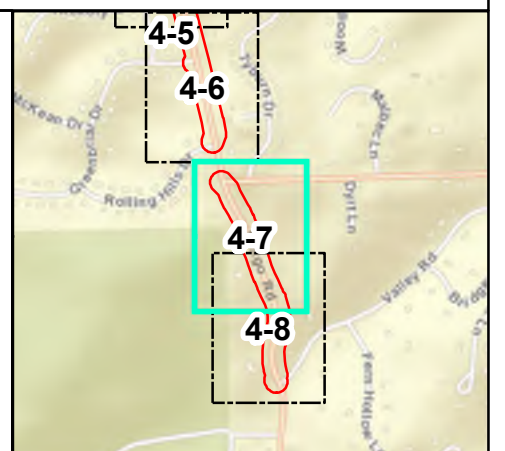


FIGURE 4-7
AQUATIC RESOURCE LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).

Legend

- Study Area
- Sampling Point
- Culvert Pipe
- NJD Aquatic Feature
- Ephemeral Stream
- Intermittent Stream
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- Wetland Open End
- PEM Wetland
- PFO Wetland
- PSS Wetland





1 inch = 100 feet

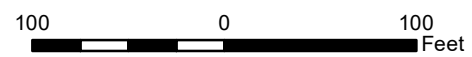
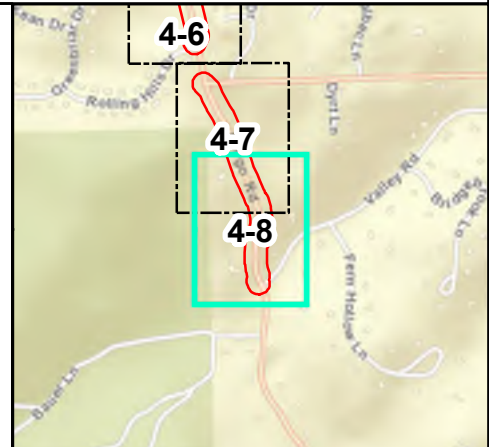


FIGURE 4-8
AQUATIC RESOURCE LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Legend

- Study Area
- Sampling Point
- Culvert Pipe
- NJD Aquatic Feature
- Ephemeral Stream
- Intermittent Stream
- Perennial Stream
- Wetland Open End
- PEM Wetland
- PFO Wetland
- PSS Wetland

Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).





1 inch = 100 feet

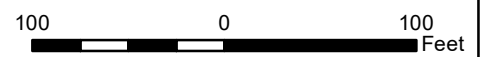
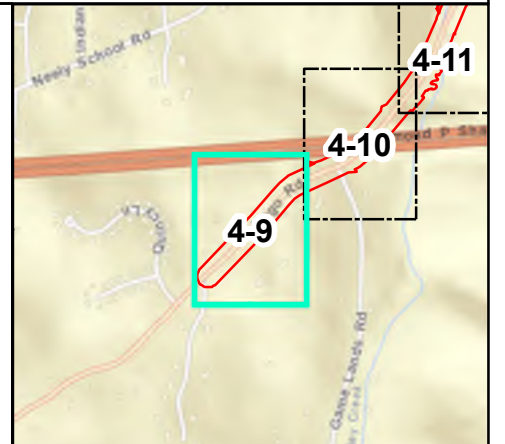


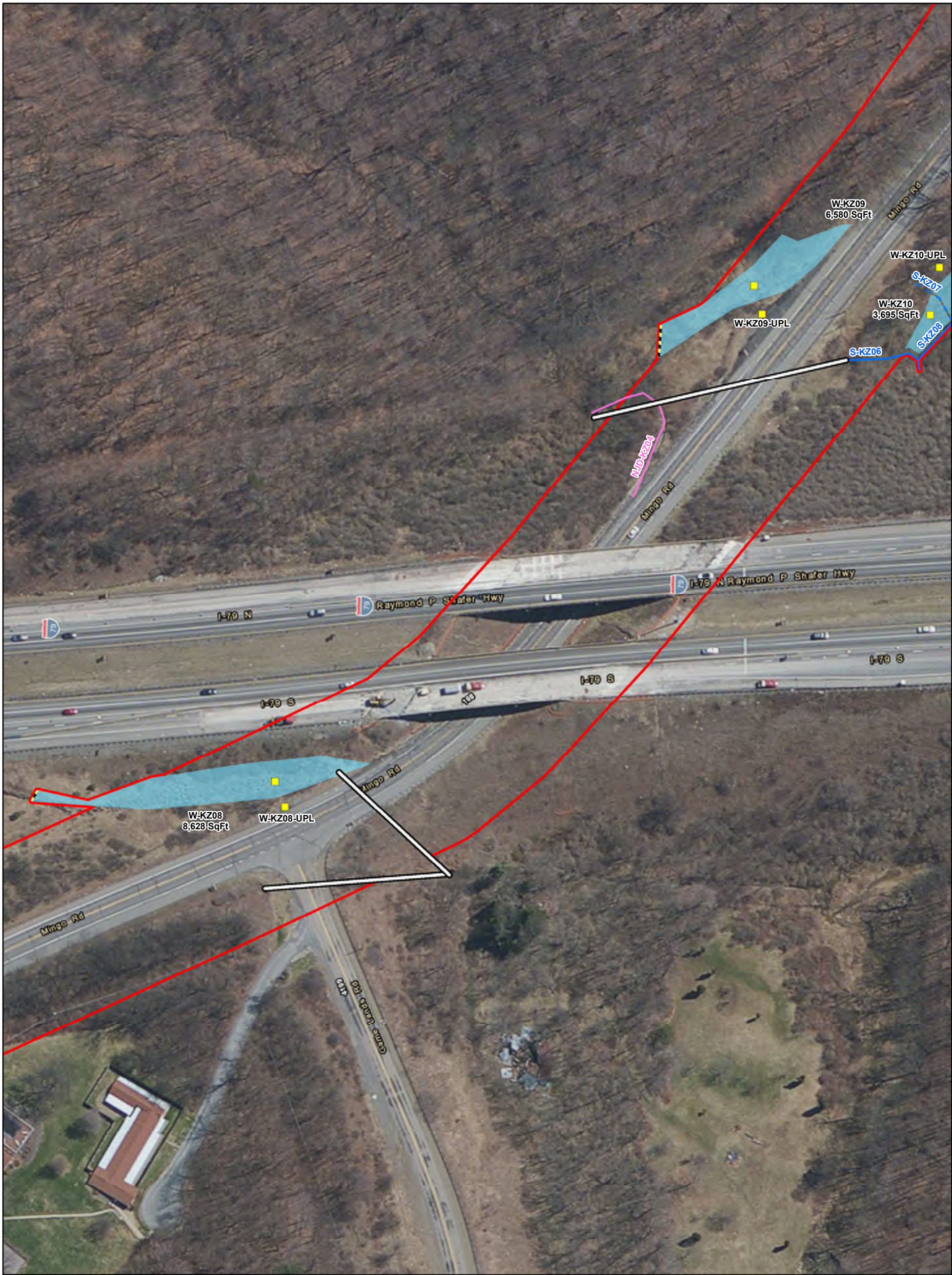
FIGURE 4-9
AQUATIC RESOURCE LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).

Legend

- Study Area
- Sampling Point
- Culvert Pipe
- NJD Aquatic Feature
- Ephemeral Stream
- Intermittent Stream
- Perennial Stream
- Wetland Open End
- PEM Wetland
- PFO Wetland
- PSS Wetland





1 inch = 100 feet

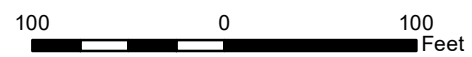
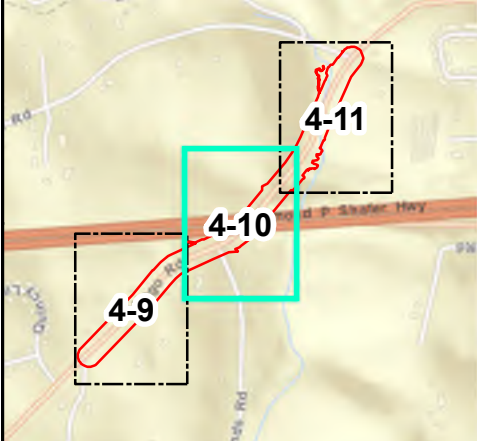
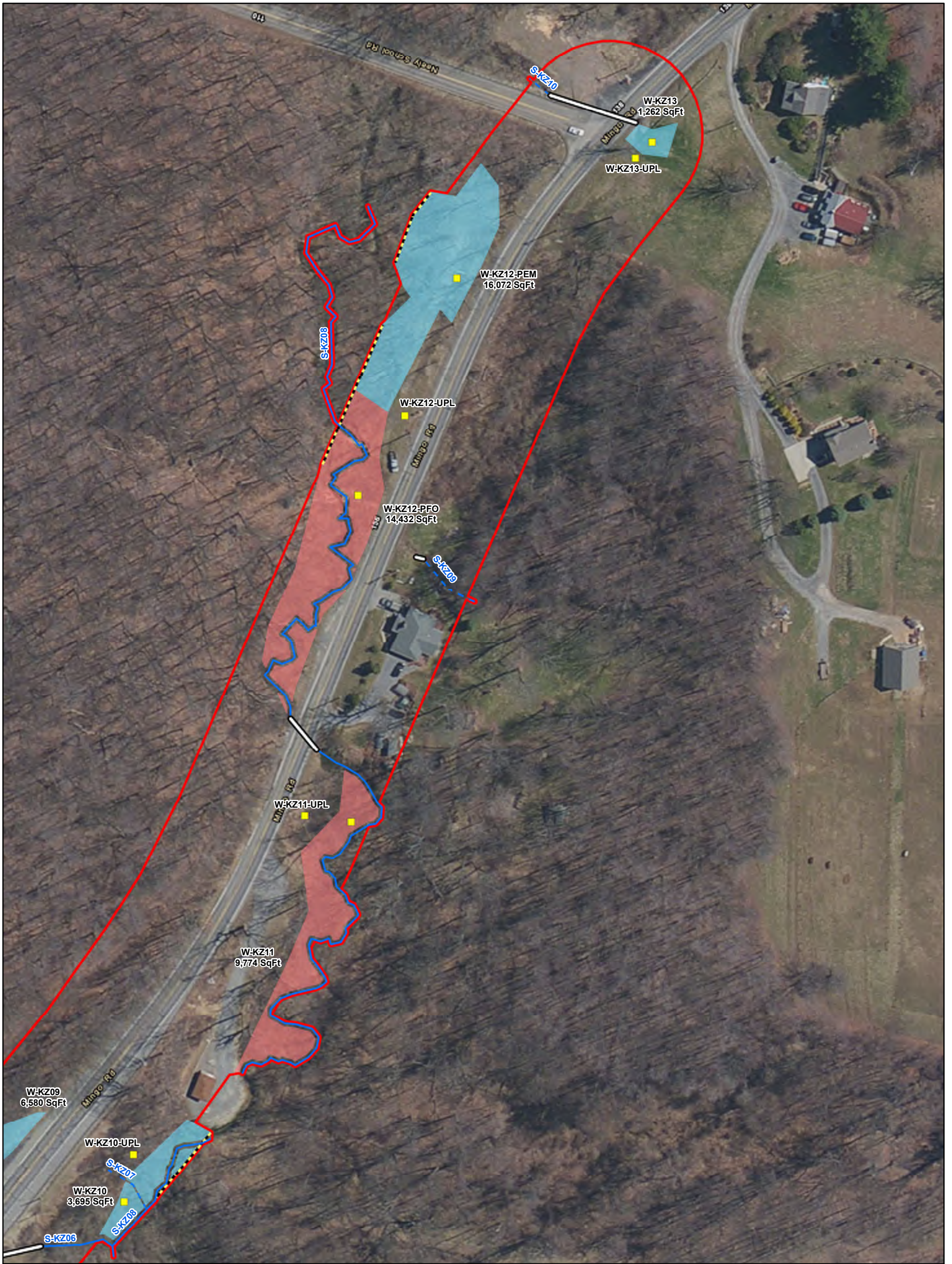


FIGURE 4-10
AQUATIC RESOURCE LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

- Legend**
- Study Area
 - Sampling Point
 - Culvert Pipe
 - NJD Aquatic Feature
 - Ephemeral Stream
 - Intermittent Stream
 - Perennial Stream
 - Wetland Open End
 - PEM Wetland
 - PFO Wetland
 - PSS Wetland

Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).





1 inch = 100 feet

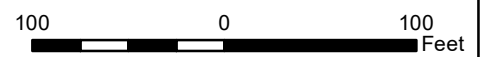
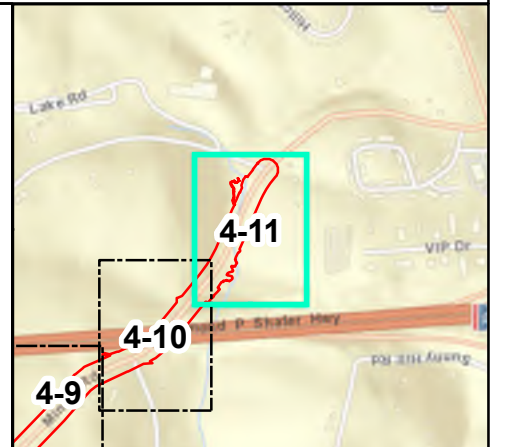


FIGURE 4-11
AQUATIC RESOURCE LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).

Legend

- Study Area
- Sampling Point
- Culvert Pipe
- NJD Aquatic Feature
- Ephemeral Stream
- Intermittent Stream
- Perennial Stream
- Wetland Open End
- PEM Wetland
- PFO Wetland
- PSS Wetland



TABLES

Table 1: Identified Streams

Table 2: Identified Wetlands

Table 3: Allegheny County Hydric Soils List

**Table 1.
Identified Streams**

Stream Number ¹	Stream Reach ID	PA Chapter 93 Stream Name ²	County	Latitude ³	Longitude ³	Flow Regime	Water Type ⁴	Cowardin Class ⁵	Flow Direction	PA Stream Designated Use ⁶	Top of Bank Width (feet)	Figure(s)
1	S-KZ01-DN	UNT to Brush Creek	Allegheny	40.653921	-80.093913	Perennial	RPW	R3UB1	N	WWF	5.50	4-1
	S-KZ01-UP	UNT to Brush Creek	Allegheny	40.651472	-80.095425	Perennial	RPW	R3UB3	N	WWF	8.50	4-1, 4-2, 4-3
2	S-KZ02	UNT to Brush Creek	Allegheny	40.653018	-80.094622	Intermittent	RPW	R4SB3	E	WWF	3.00	4-1
3	S-KZ03	UNT to Brush Creek	Allegheny	40.650881	-80.095334	Perennial	RPW	R3UB3	N	WWF	3.00	4-2, 4-3
4	S-KZ04	UNT to Brush Creek	Allegheny	40.652721	-80.092034	Ephemeral	NRPW	R6	W	WWF	3.00	4-2
5	S-KZ05	UNT to East Branch Big Sewickley Creek	Allegheny	40.637207	-80.106415	Ephemeral	NRPW	R6	SE	TSF	5.00	4-8
6	S-KZ06	UNT to East Branch Big Sewickley Creek	Allegheny	40.624039	-80.095600	Perennial	RPW	R3UB1	S	TSF	12.00	4-10, 4-11
7	S-KZ07	UNT to East Branch Big Sewickley Creek	Allegheny	40.623881	-80.095365	Intermittent	RPW	R4SB3	S	TSF	6.00	4-10, 4-11
8	S-KZ08	East Branch Big Sewickley Creek	Allegheny	40.623387	-80.093156	Perennial	RPW	R3UB1	WNW	TSF	8.00	4-10, 4-11
9	S-KZ09	UNT to East Branch Big Sewickley Creek	Allegheny	40.623023	-80.092983	Intermittent	RPW	R4SB3	NE	TSF	4.00	4-11
10	S-KZ10	UNT to East Branch Big Sewickley Creek	Allegheny	40.622768	-80.091064	Intermittent	RPW	R4SB2	N	TSF	6.50	4-11

Notes:

- 1 - Streams with braided channels, streams that have different flow regimes (e.g. ephemeral and intermittent) within the surveyed reach, and Chapter 93 named streams with different field stream reach identification names are counted as single streams.
 - 2 - From PADEP (2018); see References. For identified streams without a PA Chapter 93 name, the identified stream was given the name, "Unnamed Tributary (UNT)", of the first named receiving waterbody.
 - 3 - In decimal degrees.
 - 4 - RPW = Relatively Permanent Waters
- NRPW = Non-Relatively Permanent Waters
- TNW = Traditional Navigable Waters
 - 5 - From Cowardin et al. 1979; see References.
 - 6 - Stream Designated Use Under Chapter 93 of Title 25 of the PA Code.
- Aquatic Life
- CWF = Cold Water Fishes
 - MF = Migratory Fishes
 - TSF = Trout Stocking
 - WWF = Warm Water Fishes
- Special Protection
- EV = Exceptional Value Waters
 - HQ = High Quality Waters

**Table 2.
Identified Wetlands**

Wetland Number ¹	Wetland ID	Latitude ²	Longitude ²	Cowardin Class ³	HGM ⁴	Water Type ⁵	Associated Waterbodies	Size (square feet) ⁶	Open/Closed Boundary	Figure(s)
1	W-KZ01-PEM	40.653888	-80.093911	PEM	Riverine	RPWWD	S-KZ01-DN	2,464	Closed	4-1
	W-KZ01-PFO	40.653543	-80.094071	PFO	Riverine	RPWWD	S-KZ01-DN, S-KZ01-UP, S-KZ02	9,686	Closed	4-1, 4-2
	W-KZ01-PSS	40.654176	-80.093804	PSS	Riverine	RPWWD	S-KZ01-DN	4,650	Open	4-1
2	W-KZ02-PEM	40.651213	-80.095160	PEM	Riverine	RPWWD	S-KZ01-UP, S-KZ03	23,346	Closed	4-2, 4-3
	W-KZ02-PSS	40.651120	-80.095054	PSS	Riverine	RPWWD	S-KZ03	7,909	Closed	4-2, 4-3
3	W-KZ03	40.651365	-80.095601	PEM	Riverine	RPWWD	S-KZ01-UP	436	Closed	4-2
4	W-KZ04	40.650113	-80.096697	PSS	Riverine	RPWWD	S-KZ01-UP	22,937	Open	4-3
5	W-KZ05	40.649183	-80.095489	PEM	Depressional	ISOLATE	N/A	1,074	Closed	4-3, 4-4
6	W-KZ06	40.652454	-80.092304	PSS	Slope	NRPWW	S-KZ04	5,858	Open	4-2
7	W-KZ07	40.637756	-80.106574	PEM	Slope	NRPWW	S-KZ05	2,068	Closed	4-8
8	W-KZ08	40.625789	-80.097288	PEM	Depressional	NRPWW	UNT to East Branch Big Sewickley Creek	8,628	Open	4-10
9	W-KZ09	40.624426	-80.095334	PEM	Slope	RPWWD	S-KZ06	6,580	Open	4-10, 4-11
10	W-KZ10	40.623907	-80.095428	PEM	Riverine	RPWWD	S-KZ06, S-KZ07, S-KZ08	3,695	Open	4-10, 4-11
11	W-KZ11	40.623267	-80.093932	PFO	Riverine	RPWWD	S-KZ08	9,774	Open	4-11
12	W-KZ12-PFO	40.623272	-80.092666	PFO	Riverine	RPWWD	S-KZ08	14,432	Open	4-11
	W-KZ12-PEM	40.622998	-80.091815	PEM	Riverine	RPWWD	S-KZ08	16,072	Open	4-11
13	W-KZ13	40.622432	-80.091266	PEM	Riverine	RPWWN	S-KZ10	1,262	Closed	4-11

Notes:

- 1 - Wetlands with multiple contiguous Cowardin types (e.g. PEM and PSS) are considered a single wetland system and are counted as one wetland.
- 2 - In decimal degrees. Coordinates show wetland test pit locations.
- 3 - PEM = Palustrine Emergent
 - PFO = Palustrine Forested
 - PSS = Palustrine Scrub-Shrub
 - PUB = Palustrine Unconsolidated Bottom
- 4 - HGM = Hydrogeomorphic
- 5 - RPWWD = Wetlands directly abutting Relatively Permanent Waters (RPWs) that flow directly or indirectly into Traditional Navigable Waterways (TNWs)
 - RPWWN = Wetlands adjacent but not directly abutting RPWs that flow directly or indirectly into TNWs
 - NRPWW = Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - Isolate = Isolated (interstate or intrastate) waters, including isolated wetlands
- 6 - Size of wetlands with open boundaries may be larger than shown in this table. Wetland size shown is the size of the wetland delineated and illustrated on Aquatic Resource Location Map.

**Table 3.
Allegheny County Hydric Soils List
Allegheny County, Pennsylvania**

Map Unit Symbol	Map Unit Name	Component Name and Phase	Component Percent	Landforms
At	Atkins silt loam, 0 to 3 percent slopes, frequently flooded	Atkins	85	flood plains
BrB	Brinkerton silt loam, 2 to 8 percent slopes	Brinkerton	80	draws, hills
BrC	Brinkerton silt loam, 8 to 15 percent slopes	Brinkerton	80	null
BrC	Brinkerton silt loam, 8 to 15 percent slopes	Atkins	2	flood plains
CaB	Cavode silt loam, 3 to 8 percent slopes	Brinkerton	5	ridges
CaC	Cavode silt loam, 8 to 15 percent slopes	Brinkerton	5	hillslopes
CeB	Caneadea silt loam, 3 to 8 percent slopes	Canadice	1	flats, lakebeds (relict)
CeB	Caneadea silt loam, 3 to 8 percent slopes	Mill	1	end moraines, ground moraines
CKB	Clarksburg silt loam, 3 to 8 percent slopes	Melvin	2	flood plains
CKC	Clarksburg silt loam, 8 to 15 percent slopes	Melvin	2	flood plains
CoD	Cookport loam, 15 to 25 percent slopes	Andover	5	mountain slopes
DoD	Dormont silt loam, 15 to 25 percent slopes	Fluvaquents	5	flood plains
Du	Dumps, coal wastes	Aquents, very stony	1	depressions, hills
Dw	Dumps, industrial wastes	Wet spots	5	draws
ErB	Ernest silt loam, 3 to 8 percent slopes	Brinkerton	5	hillslopes
ErC	Ernest silt loam, 8 to 15 percent slopes	Brinkerton	5	hillslopes
EvB	Ernest-Vandergrift silt loams, 3 to 8 percent slopes	Brinkerton	10	hillslopes
EvB	Ernest-Vandergrift silt loams, 3 to 8 percent slopes	Atkins	3	flood plains
EvC	Ernest-Vandergrift silt loams, 8 to 15 percent slopes	Brinkerton	5	hillslopes
EvC	Ernest-Vandergrift silt loams, 8 to 15 percent slopes	Atkins	3	flood plains
EvD	Ernest-Vandergrift silt loams, 15 to 25 percent slopes	Atkins	3	flood plains
EvD	Ernest-Vandergrift silt loams, 15 to 25 percent slopes	Brinkerton	2	hillslopes
GvB	Guernsey-Vandergrift silt loams, 3 to 8 percent slopes	Brinkerton	5	hills
GvC	Guernsey-Vandergrift silt loams, 8 to 15 percent slopes	Brinkerton	5	hills
GvD	Guernsey-Vandergrift silt loams, 15 to 25 percent slopes	Brinkerton	1	hills
Gx	Gullied land	Brinkerton	10	draws
Hu	Huntington silt loam	Melvin	10	flood plains
Ln	Lindside silt loam, 0 to 3 percent slopes, occasionally flooded	Melvin, occasionally flooded	5	flood plains
Ne	Newark silt loam, 0 to 3 percent slopes, frequently flooded	Melvin, frequently flooded	5	flood plains
Ph	Philo silt loam, 0 to 3 percent slopes, occasionally flooded	Atkins	5	flood plains
RaA	Rainsboro silt loam, 0 to 3 percent slopes	Ginat	5	terraces
RaB	Rainsboro silt loam, 3 to 8 percent slopes	Ginat	5	terraces
UGB	Urban land-Guernsey complex, gently sloping	Thorndale	5	draws
URB	Urban land-Rainsboro complex, gently sloping	Ginat	5	terraces
UWB	Urban land-Wharton complex, gently sloping	Armagh	1	depressions, hills
VcB	Vandergrift-Cavode silt loams, 3 to 8 percent slopes	Brinkerton	2	hillslopes
VcC	Vandergrift-Cavode silt loams, 8 to 15 percent slopes	Brinkerton	5	null
VcD	Vandergrift-Cavode silt loams, 15 to 25 percent slopes	Brinkerton	2	null
WhB	Wharton silt loam, 3 to 8 percent slopes	Brinkerton	5	depressions

Modified from Hydric Soils of the United States (NRCS, 2017)

APPENDIX A: STREAM DATA FORMS

STREAM ID S-KZ01-DN		STREAM NAME UNT to Brush Creek	
CLIENT USACE LRP		PROJECT NAME USACE LRP Water Main Extension	
LAT 40.653921	LONG -80.093913	STATE Pennsylvania	COUNTY Allegheny
INVESTIGATORS SAZ, KMM		DATE 10/27/2020	
WATER TYPE TNW <input type="checkbox"/> RPW <input checked="" type="checkbox"/> NRPW <input type="checkbox"/>		FLOW REGIME Perennial <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input type="checkbox"/>	

CHANNEL FEATURES	Estimate Measurements Top of Bank Width: <u>5.5</u> ft Top of Bank Height: LB <u>3.0</u> ft RB <u>3.0</u> ft Water Depth: <u>6.00</u> in Water Width: <u>3.5</u> ft Ordinary High Water Mark (Width): <u>4.0</u> ft Ordinary High Water Mark (Height): <u>9.0</u> in Flow Direction: North _____	Sinuosity ___ Low ___ Medium <input checked="" type="checkbox"/> High Gradient <input checked="" type="checkbox"/> Flat ___ Moderate ___ Severe (0.5/100 ft) (2 ft/100 ft) (10 ft/100 ft) Stream Erosion ___ None <input checked="" type="checkbox"/> Moderate ___ Heavy Artificial, Modified or Channelized <input checked="" type="checkbox"/> Yes ___ No Within Roadside Ditch ___ Yes <input checked="" type="checkbox"/> No Culvert Present ___ Yes <input checked="" type="checkbox"/> No Culvert Material: _____ Culvert Size: _____ in
-------------------------	---	---

FLOW CHARACTERISTICS	Water Present ___ No water, stream bed dry ___ Stream bed moist ___ Standing water <input checked="" type="checkbox"/> Flowing water Velocity ___ Fast ___ Moderate <input checked="" type="checkbox"/> Slow	Proportion of Reach Represented by Stream Morphology Types (Only enter if water present) Riffle 30 % Run 40 % Pool 30 % Turbidity <input checked="" type="checkbox"/> Clear ___ Slightly turbid ___ Turbid ___ Other _____
-----------------------------	---	---

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) ¹⁰⁰			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")	30	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	30			
Sand	0.06-2mm (gritty)	20	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	20			
Clay	< 0.004 mm (slick)				

WATERSHED FEATURES	Predominant Surrounding Landuse ___ Forest ___ Commercial ___ Field/Pasture ___ Industrial ___ Agricultural ___ Residential <input checked="" type="checkbox"/> ROW ___ Other:	Floodplain Width ___ Wide > 30ft ___ Moderate 15-30ft <input checked="" type="checkbox"/> Narrow <15ft
	Canopy Cover <input checked="" type="checkbox"/> Open ___ Partly shaded ___ Shaded	

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS
Small fish observed in this reach of S-KZ01-DN.

Photograph Page

Stream ID S-KZ01-DN Date 10/27/2020



Photograph Number 1

Photograph Direction South

Comments:



Photograph Number 2

Photograph Direction North

Comments:



Photograph Number 3

Photograph Direction NNW

Comments:



Photograph Number 4

Photograph Direction North

Comments:

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TETRA TECH

PHOTOGRAPH LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA





Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).

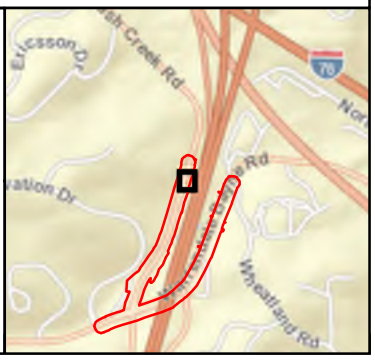
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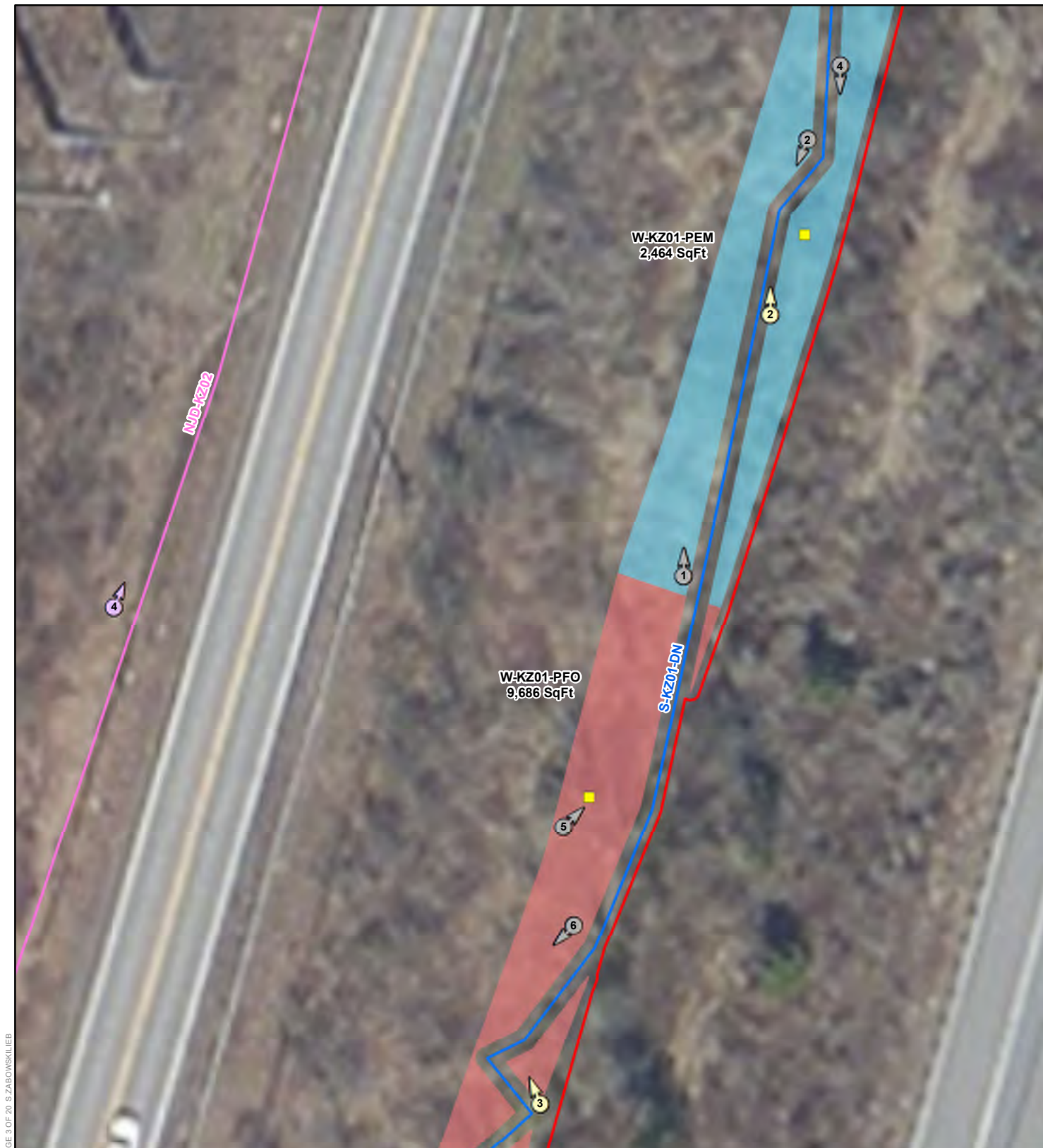
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1 inch = 30 feet 30 0 30 Feet

Legend

 Study Area	 NJD Aquatic Feature Photograph Location & Direction
 Sampling Point	 Stream Photograph Location & Direction
 Culvert Pipe	 Wetland Photograph Location & Direction
 NJD Aquatic Feature	
 Perennial Stream	
 PEM Wetland	
 PSS Wetland	





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TETRA TECH

PHOTOGRAPH LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).




Drawn: TT 11/11/2020 Checked: KM 11/11/2020 Approved: HS 11/11/2020

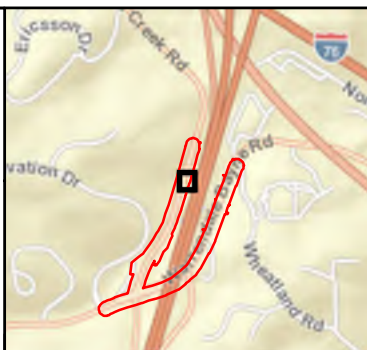
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1 inch = 30 feet

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Feet

Legend


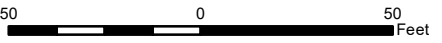










 Study Area	 NJD Aquatic Feature Photograph Location & Direction
 Sampling Point	 Stream Photograph Location & Direction
 NJD Aquatic Feature	 Wetland Photograph Location & Direction
 Perennial Stream	
 PEM Wetland	
 PFO Wetland	

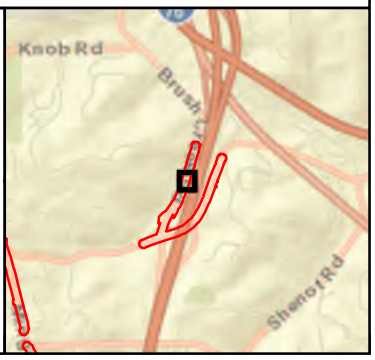


PGH_P16GISUSACE_IDEVMXKDWVWA_AQUATIC_PHOTO.MXD, 11/18/2020, PAGE 4 OF 20, S.ZABOWSKILIEB



 TETRA TECH		
PHOTOGRAPH LOCATION MAP USACE LRP WATER MAIN EXTENSION PROJECT USACE LRP (PITTSBURGH DISTRICT) ALLEGHENY COUNTY, PENNSYLVANIA		
Notes: 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).		
Drawn: TT 11/11/2020	Checked: KM 11/11/2020	Approved: HS 11/11/2020

 N	1 inch = 50 feet 
Legend	
 Study Area  Sampling Point  Culvert Pipe  NJD Aquatic Feature  Intermittent Stream  Perennial Stream  PFO Wetland	 NJD Aquatic Feature Photograph Location & Direction  Stream Photograph Location & Direction  Wetland Photograph Location & Direction



STREAM ID S-KZ01-UP		STREAM NAME UNT to Brush Creek	
CLIENT USACE LRP		PROJECT NAME USACE LRP Water Main Extension	
LAT 40.651472	LONG -80.095425	STATE Pennsylvania	COUNTY Allegheny
INVESTIGATORS KSAZ, KMM		DATE 10/27/2020	
WATER TYPE TNW <input type="checkbox"/> RPW <input checked="" type="checkbox"/> NRPW <input type="checkbox"/>		FLOW REGIME Perennial <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input type="checkbox"/>	

CHANNEL FEATURES	Estimate Measurements Top of Bank Width: <u>8.5</u> ft Top of Bank Height: LB <u>3.0</u> ft RB <u>3.0</u> ft Water Depth: <u>10.00</u> in Water Width: <u>7.0</u> ft Ordinary High Water Mark (Width): <u>8.0</u> ft Ordinary High Water Mark (Height): <u>16.0</u> in Flow Direction: North _____	Sinuosity ___ Low <input checked="" type="checkbox"/> Medium ___ High Gradient <input checked="" type="checkbox"/> Flat ___ Moderate ___ Severe (0.5/100 ft) (2 ft/100 ft) (10 ft/100 ft) Stream Erosion ___ None <input checked="" type="checkbox"/> Moderate ___ Heavy Artificial, Modified or Channelized <input checked="" type="checkbox"/> Yes ___ No Within Roadside Ditch ___ Yes <input checked="" type="checkbox"/> No Culvert Present <input checked="" type="checkbox"/> Yes ___ No Culvert Material: Concrete _____ Culvert Size: <u>36</u> in
-------------------------	---	--

FLOW CHARACTERISTICS	Water Present ___ No water, stream bed dry ___ Stream bed moist ___ Standing water <input checked="" type="checkbox"/> Flowing water Velocity ___ Fast ___ Moderate <input checked="" type="checkbox"/> Slow	Proportion of Reach Represented by Stream Morphology Types (Only enter if water present) Riffle 30 % Run 40 % Pool 30 % Turbidity <input checked="" type="checkbox"/> Clear ___ Slightly turbid ___ Turbid ___ Other _____
-----------------------------	---	---

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) ¹⁰⁰			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	15
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")	10	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	25			
Sand	0.06-2mm (gritty)	20			
Silt	0.004-0.06 mm	45	Marl	grey, shell fragments	
Clay	< 0.004 mm (slick)				

WATERSHED FEATURES	Predominant Surrounding Landuse ___ Forest ___ Commercial ___ Field/Pasture ___ Industrial ___ Agricultural ___ Residential <input checked="" type="checkbox"/> ROW <input checked="" type="checkbox"/> Other: Wetland	Floodplain Width ___ Wide > 30ft <input checked="" type="checkbox"/> Moderate 15-30ft ___ Narrow <15ft
	Canopy Cover <input checked="" type="checkbox"/> Open ___ Partly shaded ___ Shaded	

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS
Small fish observed in this reach of S-KZ01.

Photograph Page

Stream ID S-KZ01-UP Date 10/27/2020



Photograph Number 5

Photograph Direction South

Comments:



Photograph Number 6

Photograph Direction WSW

Comments:

Culvert under Brush Creek Road.



Photograph Number 7

Photograph Direction SW

Comments:



Photograph Number 8

Photograph Direction NE

Comments:

PGH_P16GISUSACE_IDEVMXKDWVWA_AQUATIC_PHOTO.MXD, 11/18/2020, PAGE 4 OF 20, S.ZABOWSKILIEB



TETRA TECH

PHOTOGRAPH LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).

Drawn: TT 11/11/2020 Checked: KM 11/11/2020 Approved: HS 11/11/2020

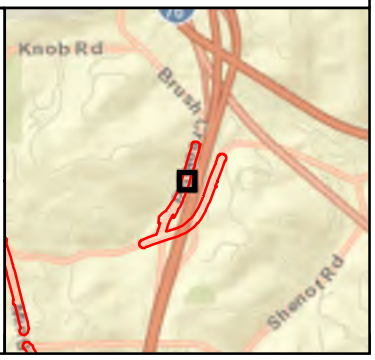
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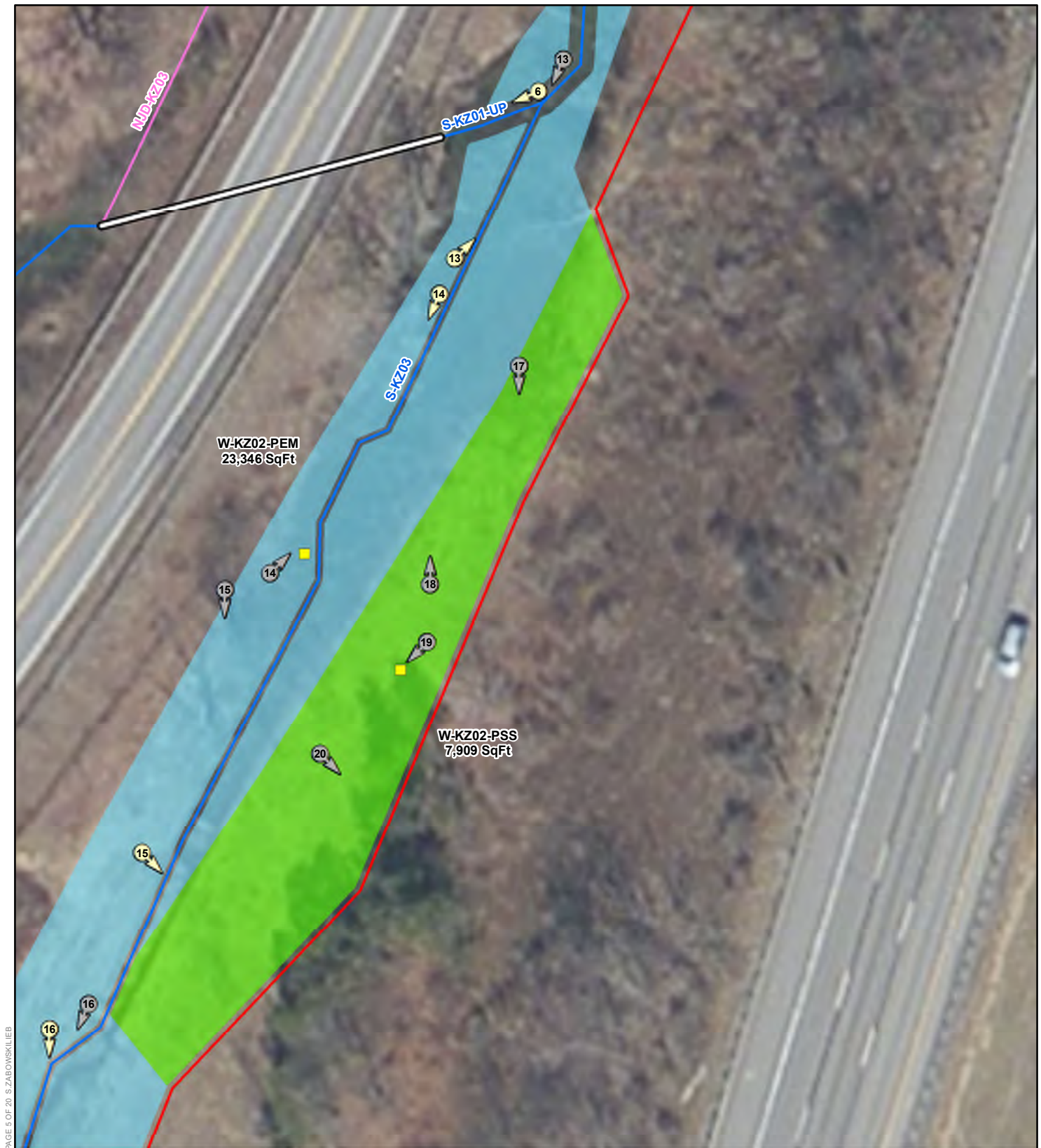
1 inch = 50 feet

50 0 50
 Feet

Legend

Study Area	NJD Aquatic Feature Photograph Location & Direction
Sampling Point	Stream Photograph Location & Direction
Culvert Pipe	Wetland Photograph Location & Direction
NJD Aquatic Feature	
Intermittent Stream	
Perennial Stream	
PFO Wetland	

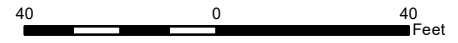




PGH_P\GIS\USACE_ID\W\KZ02\W\A_AQUATIC_PHOTO.MXD, 11/18/2020, PAGE 5 OF 20, S.ZABOWSKILIEB



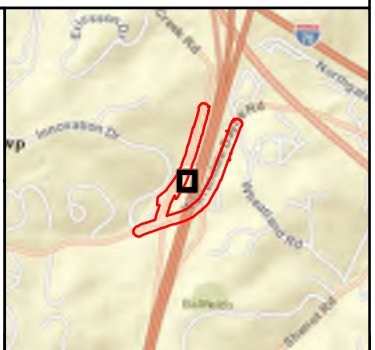
1 inch = 40 feet



PHOTOGRAPH LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Legend

- Study Area
- Sampling Point
- Culvert Pipe
- NJD Aquatic Feature
- Perennial Stream
- PEM Wetland
- PSS Wetland
- ▲ Stream Photograph Location & Direction
- ▲ Wetland Photograph Location & Direction



Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).

PGH_P:\GIS\USACE_ID\W\KZ03\WVA_AQUATIC_PHOTO.MXD 11/18/2020 PAGE 6 OF 20 S.ZABOWSKILIEB



TETRA TECH

PHOTOGRAPH LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).

Drawn: TT 11/11/2020 Checked: KM 11/11/2020 Approved: HS 11/11/2020

N

1 inch = 20 feet

20 0 20
 Feet

Legend

- Study Area
- Sampling Point
- Perennial Stream
- PEM Wetland
- Stream Photograph Location & Direction
- Wetland Photograph Location & Direction



PGH_P\GIS\USACE_IDE\W\K\W\W\A_AQUATIC_PHOTO.MXD, PAGE 7 OF 20, S.ZABOWSKILIEB



TETRA TECH

PHOTOGRAPH LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).

Drawn: TT 11/11/2020 Checked: KM 11/11/2020 Approved: HS 11/11/2020

N

1 inch = 40 feet

40 0 40
Feet

Legend

- Study Area
- Sampling Point
- Perennial Stream
- PSS Wetland
- Wetland Open End
- Stream Photograph Location & Direction
- Wetland Photograph Location & Direction



STREAM ID S-KZ02		STREAM NAME UNT to Brush Creek	
CLIENT USACE LRP		PROJECT NAME USACE LRP Water Main Extension	
LAT 40.653018	LONG -80.094622	STATE Pennsylvania	COUNTY Allegheny
INVESTIGATORS SAZ, KMM		DATE 10/27/2020	
WATER TYPE TNW <input type="checkbox"/> RPW <input checked="" type="checkbox"/> NRPW <input type="checkbox"/>		FLOW REGIME Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral <input type="checkbox"/>	

CHANNEL FEATURES	Estimate Measurements Top of Bank Width: <u>3.0</u> ft Top of Bank Height: LB <u>1.0</u> ft RB <u>1.0</u> ft Water Depth: <u>3.00</u> in Water Width: <u>1.5</u> ft Ordinary High Water Mark (Width): <u>2.0</u> ft Ordinary High Water Mark (Height): <u>6.0</u> in Flow Direction: <u>East</u>	Sinuosity <input checked="" type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High Gradient <input checked="" type="checkbox"/> Flat <input type="checkbox"/> Moderate <input type="checkbox"/> Severe (0.5/100 ft) (2 ft/100 ft) (10 ft/100 ft) Stream Erosion <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy Artificial, Modified or Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Within Roadside Ditch <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Culvert Present <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Culvert Material: <u>Concrete</u> Culvert Size: <u>36</u> in
-------------------------	---	--

FLOW CHARACTERISTICS	Water Present <input type="checkbox"/> No water, stream bed dry <input type="checkbox"/> Stream bed moist <input type="checkbox"/> Standing water <input checked="" type="checkbox"/> Flowing water Velocity <input type="checkbox"/> Fast <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Slow	Proportion of Reach Represented by Stream Morphology Types (Only enter if water present) Riffle 50 % Run 50 % Pool % Turbidity <input type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Other _____
-----------------------------	--	--

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) ¹⁰⁰			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	30
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")	30	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	40			
Sand	0.06-2mm (gritty)	15	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	15			
Clay	< 0.004 mm (slick)				

WATERSHED FEATURES	Predominant Surrounding Landuse <input checked="" type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Residential <input type="checkbox"/> ROW <input type="checkbox"/> Other:	Floodplain Width <input type="checkbox"/> Wide > 30ft <input type="checkbox"/> Moderate 15-30ft <input checked="" type="checkbox"/> Narrow <15ft
	Canopy Cover <input type="checkbox"/> Open <input checked="" type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded	

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS
Small fish were observed in this reach of S-KZ02.

Photograph Page

Stream ID S-KZ02 Date 10/27/2020



Photograph Number 9

Photograph Direction SW

Comments:



Photograph Number 10

Photograph Direction East

Comments:



Photograph Number 11

Photograph Direction South

Comments:



Photograph Number 12

Photograph Direction SE

Comments:

PGH_P16GISUSACE_IDEVMXKDWVWA_AQUATIC_PHOTO.MXD, 11/18/2020, PAGE 4 OF 20, S.ZABOWSKILIEB



TETRA TECH

PHOTOGRAPH LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).

Drawn: TT 11/11/2020 Checked: KM 11/11/2020 Approved: HS 11/11/2020

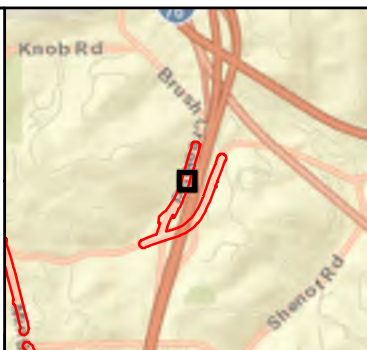
N

1 inch = 50 feet

50 0 50
 Feet

Legend

Study Area	NJD Aquatic Feature Photograph Location & Direction
Sampling Point	Stream Photograph Location & Direction
Culvert Pipe	Wetland Photograph Location & Direction
NJD Aquatic Feature	
Intermittent Stream	
Perennial Stream	
PFO Wetland	



STREAM ID S-KZ03		STREAM NAME UNT to Brush Creek	
CLIENT USACE LRP		PROJECT NAME USACE LRP Water Main Extension	
LAT 40.650881	LONG -80.095334	STATE Pennsylvania	COUNTY Allegheny
INVESTIGATORS SAZ, KMM			DATE 10/27/2020
WATER TYPE TNW <input type="checkbox"/> RPW <input checked="" type="checkbox"/> NRPW <input type="checkbox"/>		FLOW REGIME Perennial <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input type="checkbox"/>	

CHANNEL FEATURES	Estimate Measurements Top of Bank Width: <u>3.0</u> ft Top of Bank Height: LB <u>2.0</u> ft RB <u>2.0</u> ft Water Depth: <u>10.00</u> in Water Width: <u>1.5</u> ft Ordinary High Water Mark (Width): <u>2.0</u> ft Ordinary High Water Mark (Height): <u>12.0</u> in Flow Direction: North _____	Sinuosity <input checked="" type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High Gradient <input checked="" type="checkbox"/> Flat <input type="checkbox"/> Moderate <input type="checkbox"/> Severe (0.5/100 ft) (2 ft/100 ft) (10 ft/100 ft) Stream Erosion <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy Artificial, Modified or Channelized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Within Roadside Ditch <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Culvert Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Culvert Material: _____ Culvert Size: _____ in
-------------------------	---	--

FLOW CHARACTERISTICS	Water Present <input type="checkbox"/> No water, stream bed dry <input type="checkbox"/> Stream bed moist <input type="checkbox"/> Standing water <input checked="" type="checkbox"/> Flowing water Velocity <input type="checkbox"/> Fast <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Slow	Proportion of Reach Represented by Stream Morphology Types (Only enter if water present) Riffle % Run 100 % Pool % Turbidity <input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Other _____
-----------------------------	--	---

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) ¹⁰⁰			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	10			
Sand	0.06-2mm (gritty)	10	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	50			
Clay	< 0.004 mm (slick)	30			

WATERSHED FEATURES	Predominant Surrounding Landuse <input type="checkbox"/> Forest <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Residential <input type="checkbox"/> ROW <input type="checkbox"/> Other:	Floodplain Width <input type="checkbox"/> Wide > 30ft <input type="checkbox"/> Moderate 15-30ft <input checked="" type="checkbox"/> Narrow <15ft
	Canopy Cover <input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded	

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS
Note - Large portions of S-KZ03 are comprised of concrete-lined banks within a wetland complex.

Photograph Page

Stream ID S-KZ03 Date 10/27/2020



Photograph Number 13

Photograph Direction NE

Comments:



Photograph Number 14

Photograph Direction SSW

Comments:



Photograph Number 15

Photograph Direction SE

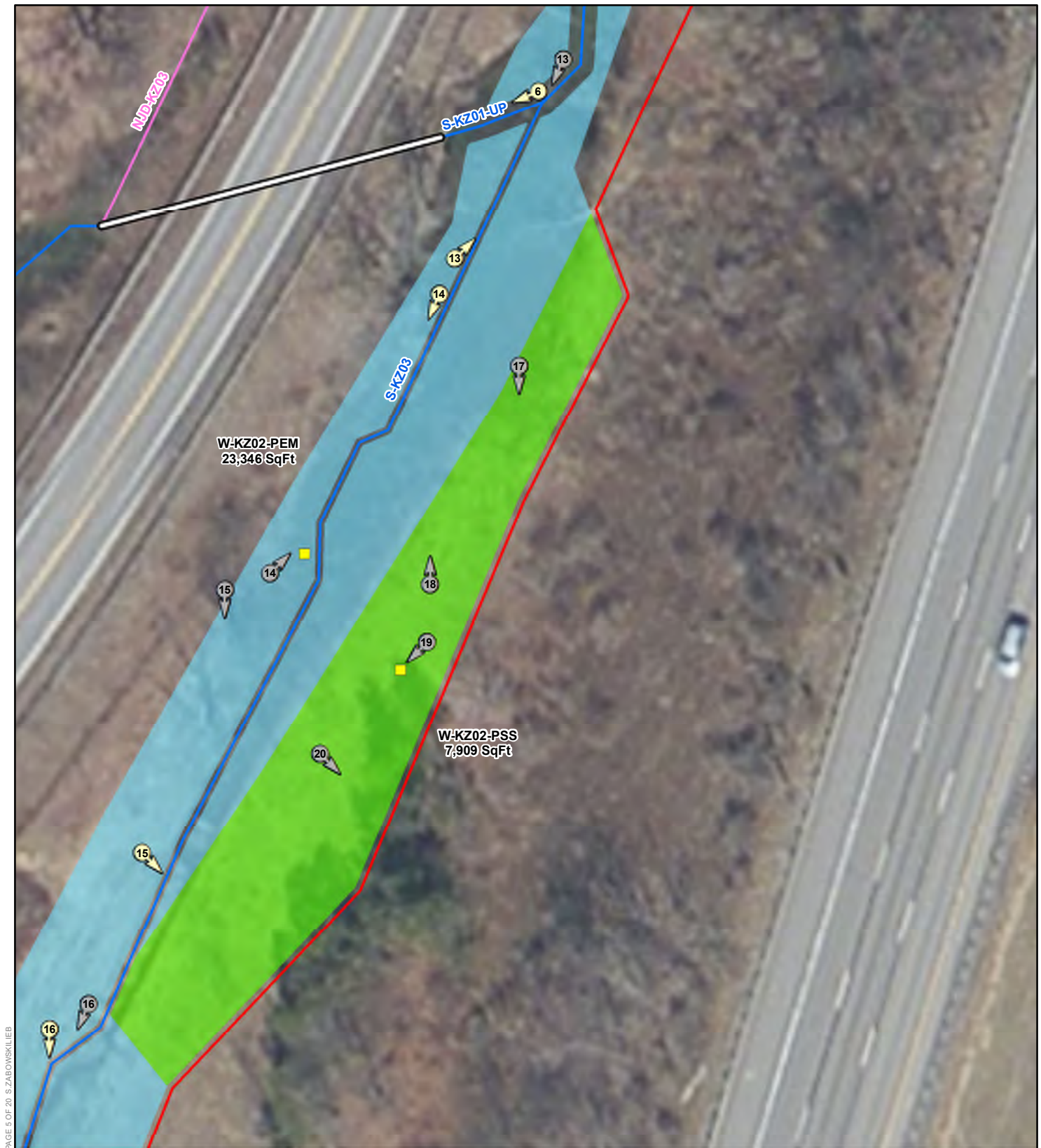
Comments:



Photograph Number 16

Photograph Direction South

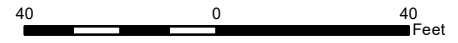
Comments:



PGH_P\GIS\USACE_ID\W\KZ02\W\W\A_AQUATIC_PHOTO.MXD, 11/18/2020, PAGE 5 OF 20, S.ZABOWSKILIEB



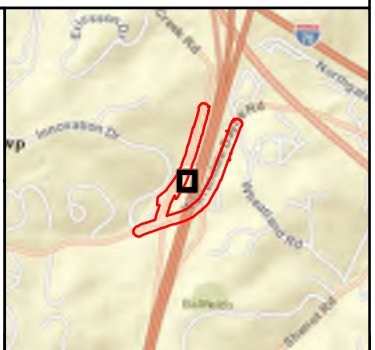
1 inch = 40 feet



PHOTOGRAPH LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Legend

- Study Area
- Sampling Point
- Culvert Pipe
- NJD Aquatic Feature
- Perennial Stream
- PEM Wetland
- PSS Wetland
- ▲ Stream Photograph Location & Direction
- ▲ Wetland Photograph Location & Direction



Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).

STREAM ID S-KZ04		STREAM NAME UNT to Brush Creek	
CLIENT USACE LRP		PROJECT NAME USACE LRP Water Main Extension	
LAT 40.652721	LONG -80.092034	STATE Pennsylvania	COUNTY Allegheny
INVESTIGATORS SAZ, KMM			DATE 10/28/2020
WATER TYPE TNW <input type="checkbox"/> RPW <input type="checkbox"/> NRPW <input checked="" type="checkbox"/>		FLOW REGIME Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input checked="" type="checkbox"/>	

CHANNEL FEATURES	Estimate Measurements Top of Bank Width: <u>3.0</u> ft Top of Bank Height: LB <u>1.0</u> ft RB <u>1.0</u> ft Water Depth: <u>2.00</u> in Water Width: <u>1.5</u> ft Ordinary High Water Mark (Width): <u>3.0</u> ft Ordinary High Water Mark (Height): <u>4.0</u> in Flow Direction: <u>West</u>	Sinuosity <input checked="" type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High Gradient <input type="checkbox"/> Flat <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Severe (0.5/100 ft) (2 ft/100 ft) (10 ft/100 ft) Stream Erosion <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy Artificial, Modified or Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Within Roadside Ditch <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Culvert Present <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Culvert Material: <u>Concrete</u> Culvert Size: <u>18</u> in
	Water Present <input type="checkbox"/> No water, stream bed dry <input type="checkbox"/> Stream bed moist <input type="checkbox"/> Standing water <input checked="" type="checkbox"/> Flowing water Velocity <input type="checkbox"/> Fast <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Slow	Proportion of Reach Represented by Stream Morphology Types (Only enter if water present) Riffle 60 % Run 20 % Pool 20 % Turbidity <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Other _____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) ¹⁰⁰	ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)																																				
<table border="1"> <thead> <tr> <th>Substrate Type</th> <th>Diameter</th> <th>% Composition in Sampling Reach</th> </tr> </thead> <tbody> <tr> <td>Bedrock</td> <td></td> <td></td> </tr> <tr> <td>Boulder</td> <td>> 256 mm (10")</td> <td></td> </tr> <tr> <td>Cobble</td> <td>64-256 mm (2.5"-10")</td> <td>15</td> </tr> <tr> <td>Gravel</td> <td>2-64 mm (0.1"-2.5")</td> <td>40</td> </tr> <tr> <td>Sand</td> <td>0.06-2mm (gritty)</td> <td></td> </tr> <tr> <td>Silt</td> <td>0.004-0.06 mm</td> <td>25</td> </tr> <tr> <td>Clay</td> <td>< 0.004 mm (slick)</td> <td>20</td> </tr> </tbody> </table>	Substrate Type	Diameter	% Composition in Sampling Reach	Bedrock			Boulder	> 256 mm (10")		Cobble	64-256 mm (2.5"-10")	15	Gravel	2-64 mm (0.1"-2.5")	40	Sand	0.06-2mm (gritty)		Silt	0.004-0.06 mm	25	Clay	< 0.004 mm (slick)	20	<table border="1"> <thead> <tr> <th>Substrate Type</th> <th>Characteristic</th> <th>% Composition in Sampling Area</th> </tr> </thead> <tbody> <tr> <td>Detritus</td> <td>sticks, wood, coarse plant materials (CPOM)</td> <td>40</td> </tr> <tr> <td>Muck-Mud</td> <td>black, very fine organic (FPOM)</td> <td></td> </tr> <tr> <td>Marl</td> <td>grey, shell fragments</td> <td></td> </tr> </tbody> </table>	Substrate Type	Characteristic	% Composition in Sampling Area	Detritus	sticks, wood, coarse plant materials (CPOM)	40	Muck-Mud	black, very fine organic (FPOM)		Marl	grey, shell fragments	
Substrate Type	Diameter	% Composition in Sampling Reach																																			
Bedrock																																					
Boulder	> 256 mm (10")																																				
Cobble	64-256 mm (2.5"-10")	15																																			
Gravel	2-64 mm (0.1"-2.5")	40																																			
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Substrate Type	Characteristic	% Composition in Sampling Area																																			
Detritus	sticks, wood, coarse plant materials (CPOM)	40																																			
Muck-Mud	black, very fine organic (FPOM)																																				
Marl	grey, shell fragments																																				

WATERSHED FEATURES	Predominant Surrounding Landuse <input checked="" type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Residential <input type="checkbox"/> ROW <input type="checkbox"/> Other:	Floodplain Width <input type="checkbox"/> Wide > 30ft <input type="checkbox"/> Moderate 15-30ft <input checked="" type="checkbox"/> Narrow <15ft
	Canopy Cover <input type="checkbox"/> Open <input type="checkbox"/> Partly shaded <input checked="" type="checkbox"/> Shaded	

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS
Measured water present in channel due to recent overnight heavy rain.

Photograph Page

Stream ID S-KZ04 Date 10/28/2020



Photograph Number 17

Photograph Direction East

Comments:



Photograph Number 18

Photograph Direction NW

Comments:



Photograph Number 19

Photograph Direction NE

Comments:



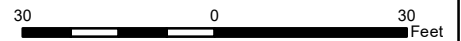
Photograph Number 20

Photograph Direction ENE

Comments:



1 inch = 30 feet

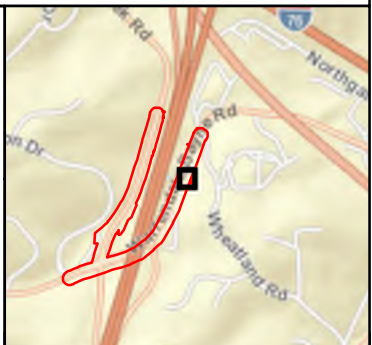


PHOTOGRAPH LOCATION MAP

USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Legend

- Study Area
- Sampling Point
- Culvert Pipe
- Ephemeral Stream
- PSS Wetland
- Wetland Open End
- Stream Photograph Location & Direction
- Wetland Photograph Location & Direction



Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).

STREAM ID S-KZ05		STREAM NAME UNT to East Branch Big Sewickley Creek	
CLIENT USACE LRP		PROJECT NAME USACE LRP Water Main Extension	
LAT 40.637207	LONG -80.106415	STATE Pennsylvania	COUNTY Allegheny
INVESTIGATORS SAZ, KMM		DATE 10/28/2020	
WATER TYPE TNW <input type="checkbox"/> RPW <input type="checkbox"/> NRPW <input checked="" type="checkbox"/>		FLOW REGIME Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input checked="" type="checkbox"/>	

CHANNEL FEATURES	Estimate Measurements Top of Bank Width: <u>5.0</u> ft Top of Bank Height: LB <u>3.0</u> ft RB <u>3.0</u> ft Water Depth: <u>0.00</u> in Water Width: <u>0.0</u> ft Ordinary High Water Mark (Width): <u>3.0</u> ft Ordinary High Water Mark (Height): <u>5.0</u> in Flow Direction: <u>Southeast</u>	Sinuosity <input checked="" type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High Gradient <input type="checkbox"/> Flat <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Severe (0.5/100 ft) (2 ft/100 ft) (10 ft/100 ft) Stream Erosion <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy Artificial, Modified or Channelized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Within Roadside Ditch <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Culvert Present <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Culvert Material: <u>Corrugated Metal</u> Culvert Size: <u>18</u> in
-------------------------	--	--

FLOW CHARACTERISTICS	Water Present <input checked="" type="checkbox"/> No water, stream bed dry <input type="checkbox"/> Stream bed moist <input type="checkbox"/> Standing water <input type="checkbox"/> Flowing water Velocity <input type="checkbox"/> Fast <input type="checkbox"/> Moderate <input type="checkbox"/> Slow	Proportion of Reach Represented by Stream Morphology Types (Only enter if water present) Riffle % Run % Pool % Turbidity <input type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Other _____
-----------------------------	---	--

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) ¹⁰⁰			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		10	Detritus	sticks, wood, coarse plant materials (CPOM)	50
Boulder	> 256 mm (10")	20			
Cobble	64-256 mm (2.5"-10")	20	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	20			
Sand	0.06-2mm (gritty)	10	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	10			
Clay	< 0.004 mm (slick)	10			

WATERSHED FEATURES	Predominant Surrounding Landuse <input checked="" type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Residential <input type="checkbox"/> ROW <input type="checkbox"/> Other:	Floodplain Width <input type="checkbox"/> Wide > 30ft <input type="checkbox"/> Moderate 15-30ft <input checked="" type="checkbox"/> Narrow <15ft
	Canopy Cover <input type="checkbox"/> Open <input type="checkbox"/> Partly shaded <input checked="" type="checkbox"/> Shaded	

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS
Concrete, trash, asphalt in stream channel.

Photograph Page

Stream ID S-KZ05 Date 10/28/2020



Photograph Number 21

Photograph Direction ESE

Comments:



Photograph Number 22

Photograph Direction SSE

Comments:



Photograph Number 23

Photograph Direction South

Comments:



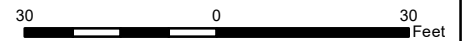
Photograph Number 24

Photograph Direction SE

Comments: Substrate.



1 inch = 30 feet



PHOTOGRAPH LOCATION MAP

USACE LRP WATER MAIN EXTENSION PROJECT

**USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA**

Legend

Study Area

Culvert Pipe

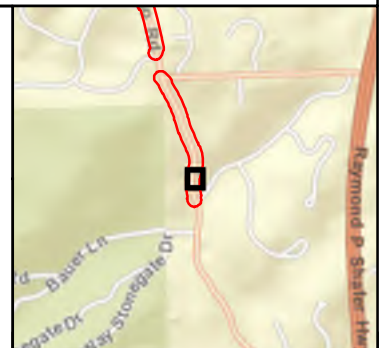
Ephemeral Stream



Stream Photograph Location & Direction

Notes:

1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).



STREAM ID S-KZ06		STREAM NAME UNT to East Branch Big Sewickley Creek	
CLIENT USACE LRP		PROJECT NAME USACE LRP Water Main Extension	
LAT 40.624039	LONG -80.095600	STATE Pennsylvania	COUNTY Allegheny
INVESTIGATORS SAZ, KMM			DATE 10/28/2020
WATER TYPE TNW <input type="checkbox"/> RPW <input checked="" type="checkbox"/> NRPW <input type="checkbox"/>		FLOW REGIME Perennial <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input type="checkbox"/>	

CHANNEL FEATURES	Estimate Measurements Top of Bank Width: <u>12.0</u> ft Top of Bank Height: LB <u>4.0</u> ft RB <u>4.0</u> ft Water Depth: <u>2.00</u> in Water Width: <u>4.0</u> ft Ordinary High Water Mark (Width): <u>5.0</u> ft Ordinary High Water Mark (Height): <u>6.0</u> in Flow Direction: <u>South</u>	Sinuosity <input checked="" type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High Gradient <input type="checkbox"/> Flat <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Severe (0.5/100 ft) (2 ft/100 ft) (10 ft/100 ft) Stream Erosion <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy Artificial, Modified or Channelized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Within Roadside Ditch <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Culvert Present <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Culvert Material: <u>Corrugated Metal</u> Culvert Size: <u>36</u> in
-------------------------	---	--

FLOW CHARACTERISTICS	Water Present <input type="checkbox"/> No water, stream bed dry <input type="checkbox"/> Stream bed moist <input type="checkbox"/> Standing water <input checked="" type="checkbox"/> Flowing water Velocity <input type="checkbox"/> Fast <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Slow	Proportion of Reach Represented by Stream Morphology Types (Only enter if water present) Riffle 100 % Run % Pool % Turbidity <input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Other _____
-----------------------------	--	---

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) ¹⁰⁰			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	5
Boulder	> 256 mm (10")	40			
Cobble	64-256 mm (2.5"-10")	30	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	20			
Sand	0.06-2mm (gritty)	10	Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

WATERSHED FEATURES	Predominant Surrounding Landuse <input checked="" type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Residential <input checked="" type="checkbox"/> ROW <input type="checkbox"/> Other:	Floodplain Width <input type="checkbox"/> Wide > 30ft <input type="checkbox"/> Moderate 15-30ft <input checked="" type="checkbox"/> Narrow <15ft
	Canopy Cover <input type="checkbox"/> Open <input checked="" type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded	

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Photograph Page

Stream ID S-KZ06 Date 10/28/2020



Photograph Number 25

Photograph Direction NW

Comments:



Photograph Number 26

Photograph Direction West

Comments:



Photograph Number 27

Photograph Direction South

Comments:



Photograph Number 28

Photograph Direction North

Comments:



PGH_P\GIS\USACE_ID\W\KZ09\W\AQUATIC_PHOTO.MXD 11/18/2020 PAGE 14 OF 20 S.ZABOWSKI/LEB

TETRA TECH

PHOTOGRAPH LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).

Drawn: TT 11/11/2020 Checked: KM 11/11/2020 Approved: HS 11/11/2020

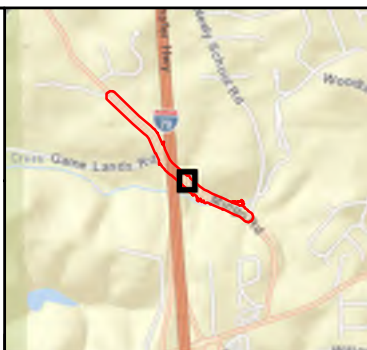
N

1 inch = 40 feet

40 0 40
Feet

Legend

 Study Area	NJD Aquatic Feature Photograph Location & Direction
 Sampling Point	Stream Photograph Location & Direction
 Culvert Inlet/Outlet	Wetland Photograph Location & Direction
Culvert Pipe	
NJD Aquatic Feature	
Perennial Stream	
PEM Wetland	
Wetland Open End	



STREAM ID S-KZ07		STREAM NAME UNT to East Branch Big Sewickley Creek	
CLIENT USACE LRP		PROJECT NAME USACE LRP Water Main Extension	
LAT 40.623881	LONG -80.095365	STATE Pennsylvania	COUNTY Allegheny
INVESTIGATORS SAZ, KMM		DATE 10/28/2020	
WATER TYPE TNW <input type="checkbox"/> RPW <input checked="" type="checkbox"/> NRPW <input type="checkbox"/>		FLOW REGIME Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral <input type="checkbox"/>	

CHANNEL FEATURES	Estimate Measurements Top of Bank Width: <u>6.0</u> ft Top of Bank Height: LB <u>2.0</u> ft RB <u>2.0</u> ft Water Depth: <u>0.50</u> in Water Width: <u>1.0</u> ft Ordinary High Water Mark (Width): <u>2.0</u> ft Ordinary High Water Mark (Height): <u>3.0</u> in Flow Direction: <u>South</u>	Sinuosity <input checked="" type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High Gradient <input type="checkbox"/> Flat <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Severe (0.5/100 ft) (2 ft/100 ft) (10 ft/100 ft) Stream Erosion <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy Artificial, Modified or Channelized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Within Roadside Ditch <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Culvert Present <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Culvert Material: <u>Corrugated Metal</u> Culvert Size: <u>8</u> in
-------------------------	--	---

FLOW CHARACTERISTICS	Water Present <input type="checkbox"/> No water, stream bed dry <input type="checkbox"/> Stream bed moist <input type="checkbox"/> Standing water <input checked="" type="checkbox"/> Flowing water Velocity <input type="checkbox"/> Fast <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Slow	Proportion of Reach Represented by Stream Morphology Types (Only enter if water present) Riffle 100 % Run % Pool % Turbidity <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Other _____
-----------------------------	--	---

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) ¹²⁵			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	40
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")	25	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	50			
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm	25			
Clay	< 0.004 mm (slick)	25			

WATERSHED FEATURES	Predominant Surrounding Landuse <input checked="" type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Residential <input type="checkbox"/> ROW <input type="checkbox"/> Other:	Floodplain Width <input type="checkbox"/> Wide > 30ft <input type="checkbox"/> Moderate 15-30ft <input checked="" type="checkbox"/> Narrow <15ft
	Canopy Cover <input type="checkbox"/> Open <input checked="" type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded	

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Photograph Page

Stream ID S-KZ07 Date 10/28/2020



Photograph Number 29

Photograph Direction North

Comments:



Photograph Number 30

Photograph Direction North

Comments:



Photograph Number 31

Photograph Direction NW

Comments:



Photograph Number 32

Photograph Direction SW

Comments:

PGH_P\GIS\USACE_ID\W\KZ10\WVA_AQUATIC_PHOTO.MXD, 11/18/2020, PAGE 16 OF 20 S.ZABOWSKI@LEB



PHOTOGRAPH LOCATION MAP USACE LRP WATER MAIN EXTENSION PROJECT USACE LRP (PITTSBURGH DISTRICT) ALLEGHENY COUNTY, PENNSYLVANIA		
Notes: 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).		
Drawn: TT 11/11/2020	Checked: KM 11/11/2020	Approved: HS 11/11/2020

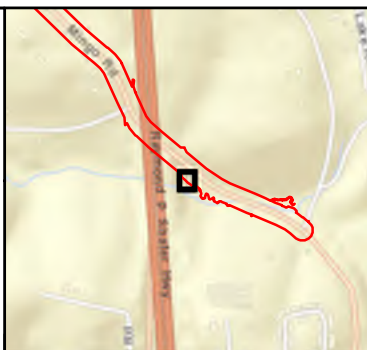
N

1 inch = 20 feet

20 0 20
Feet

Legend

Study Area	Stream Photograph Location & Direction
Sampling Point	Wetland Photograph Location & Direction
Culvert Inlet/Outlet	
Intermittent Stream	
Perennial Stream	
PEM Wetland	
Wetland Open End	



STREAM ID S-KZ08		STREAM NAME East Branch Big Sewickley Creek	
CLIENT USACE LRP		PROJECT NAME USACE LRP Water Main Extension	
LAT 40.623387	LONG -80.093156	STATE Pennsylvania	COUNTY Allegheny
INVESTIGATORS SAZ, KMM			DATE 10/28/2020
WATER TYPE TNW <input type="checkbox"/> RPW <input checked="" type="checkbox"/> NRPW <input type="checkbox"/>		FLOW REGIME Perennial <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input type="checkbox"/>	

CHANNEL FEATURES	Estimate Measurements Top of Bank Width: <u>8.0</u> ft Top of Bank Height: LB <u>4.0</u> ft RB <u>4.0</u> ft Water Depth: <u>3.00</u> in Water Width: <u>4.0</u> ft Ordinary High Water Mark (Width): <u>5.0</u> ft Ordinary High Water Mark (Height): <u>8.0</u> in Flow Direction: <u>West-Northwest</u>	Sinuosity <input type="checkbox"/> Low <input type="checkbox"/> Medium <input checked="" type="checkbox"/> High Gradient <input checked="" type="checkbox"/> Flat <input type="checkbox"/> Moderate <input type="checkbox"/> Severe (0.5/100 ft) (2 ft/100 ft) (10 ft/100 ft) Stream Erosion <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy Artificial, Modified or Channelized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Within Roadside Ditch <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Culvert Present <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Culvert Material: <u>Corrugated Metal</u> Culvert Size: <u>36</u> in
-------------------------	---	--

FLOW CHARACTERISTICS	Water Present <input type="checkbox"/> No water, stream bed dry <input type="checkbox"/> Stream bed moist <input type="checkbox"/> Standing water <input checked="" type="checkbox"/> Flowing water Velocity <input type="checkbox"/> Fast <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Slow	Proportion of Reach Represented by Stream Morphology Types (Only enter if water present) Riffle 45 % Run 20 % Pool 35 % Turbidity <input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Other _____
-----------------------------	--	--

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) ¹⁰⁰			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	20
Boulder	> 256 mm (10")	30			
Cobble	64-256 mm (2.5"-10")	30	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	30			
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm	10			
Clay	< 0.004 mm (slick)				

WATERSHED FEATURES	Predominant Surrounding Landuse <input checked="" type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Residential <input type="checkbox"/> ROW <input type="checkbox"/> Other:	Floodplain Width <input type="checkbox"/> Wide > 30ft <input checked="" type="checkbox"/> Moderate 15-30ft <input type="checkbox"/> Narrow <15ft
	Canopy Cover <input type="checkbox"/> Open <input type="checkbox"/> Partly shaded <input checked="" type="checkbox"/> Shaded	

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Photograph Page

Stream ID S-KZ08 Date 10/28/2020



Photograph Number 33

Photograph Direction WNW

Comments:



Photograph Number 34

Photograph Direction SSE

Comments:



Photograph Number 35

Photograph Direction NE

Comments:



Photograph Number 36

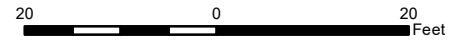
Photograph Direction East

Comments:

PGH_P\GIS\USACE_ID\W\KZ10\WVA_AQUATIC_PHOTO.MXD, 11/18/2020, PAGE 16 OF 20 S.ZABOWSKI@LEB



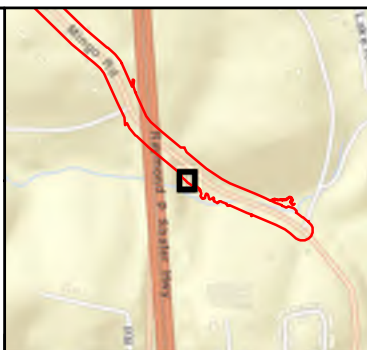
1 inch = 20 feet



PHOTOGRAPH LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Legend



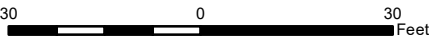


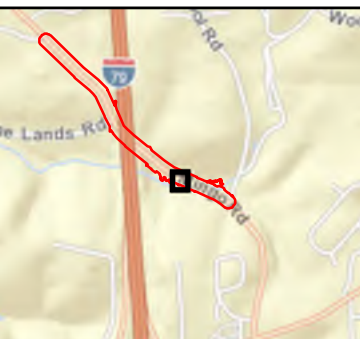
- Study Area
- Sampling Point
- Culvert Inlet/Outlet
- Intermittent Stream
- Perennial Stream
- PEM Wetland
- Wetland Open End
- Stream Photograph Location & Direction
- Wetland Photograph Location & Direction



Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).

PGH_P:\GIS\USACE_IDE\W\KZ11\W\WVA_AQUATIC_PHOTO.MXD, 11/18/2020, PAGE 18 OF 20, S.ZABOWSKI/LEB



 TETRA TECH	 1 inch = 30 feet	
PHOTOGRAPH LOCATION MAP USACE LRP WATER MAIN EXTENSION PROJECT USACE LRP (PITTSBURGH DISTRICT) ALLEGHENY COUNTY, PENNSYLVANIA	Legend <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <ul style="list-style-type: none"> Study Area Sampling Point Culvert Pipe Perennial Stream PFO Wetland </div> <div style="width: 45%;"> <ul style="list-style-type: none">  Stream Photograph Location & Direction  Wetland Photograph Location & Direction </div> </div>	
Notes: 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).		
Drawn: TT 11/11/2020	Checked: KM 11/11/2020	Approved: HS 11/11/2020

PGH_P:\GIS\USACE_IDE\W\KZ12\W\WVA_AQUATIC_PHOTO.MXD, 11/18/2020, PAGE 18 OF 20, S.ZABOWSKI/LEB



PHOTOGRAPH LOCATION MAP USACE LRP WATER MAIN EXTENSION PROJECT USACE LRP (PITTSBURGH DISTRICT) ALLEGHENY COUNTY, PENNSYLVANIA		
Notes: 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).		
Drawn: TT 11/11/2020	Checked: KM 11/11/2020	Approved: HS 11/11/2020

N 		1 inch = 30 feet
Legend		
Study Area	Sampling Point	Stream Photograph Location & Direction
Perennial Stream	Wetland Photograph Location & Direction	
PFO Wetland		
Wetland Open End		



STREAM ID S-KZ09		STREAM NAME UNT to East Branch Big Sewickley Creek	
CLIENT USACE LRP		PROJECT NAME USACE LRP Water Main Extension	
LAT 40.623023	LONG -80.092983	STATE Pennsylvania	COUNTY Allegheny
INVESTIGATORS SAZ, KMM		DATE 10/28/2020	
WATER TYPE TNW <input type="checkbox"/> RPW <input checked="" type="checkbox"/> NRPW <input type="checkbox"/>		FLOW REGIME Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral <input type="checkbox"/>	

CHANNEL FEATURES	Estimate Measurements Top of Bank Width: <u>4.0</u> ft Top of Bank Height: LB <u>1.5</u> ft RB <u>1.5</u> ft Water Depth: <u>2.00</u> in Water Width: <u>1.0</u> ft Ordinary High Water Mark (Width): <u>2.0</u> ft Ordinary High Water Mark (Height): <u>4.0</u> in Flow Direction: <u>Northeast</u>	Sinuosity <input checked="" type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High Gradient <input type="checkbox"/> Flat <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Severe (0.5/100 ft) (2 ft/100 ft) (10 ft/100 ft) Stream Erosion <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy Artificial, Modified or Channelized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Within Roadside Ditch <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Culvert Present <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Culvert Material: <u>Corrugated Plastic</u> Culvert Size: <u>6</u> in
	Water Present <input type="checkbox"/> No water, stream bed dry <input type="checkbox"/> Stream bed moist <input type="checkbox"/> Standing water <input checked="" type="checkbox"/> Flowing water Velocity <input type="checkbox"/> Fast <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Slow	Proportion of Reach Represented by Stream Morphology Types (Only enter if water present) Riffle 60 % Run 20 % Pool 20 % Turbidity <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Other _____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) ¹⁰⁰	ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)																																				
<table border="1"> <thead> <tr> <th>Substrate Type</th> <th>Diameter</th> <th>% Composition in Sampling Reach</th> </tr> </thead> <tbody> <tr> <td>Bedrock</td> <td></td> <td></td> </tr> <tr> <td>Boulder</td> <td>> 256 mm (10")</td> <td></td> </tr> <tr> <td>Cobble</td> <td>64-256 mm (2.5"-10")</td> <td>20</td> </tr> <tr> <td>Gravel</td> <td>2-64 mm (0.1"-2.5")</td> <td>40</td> </tr> <tr> <td>Sand</td> <td>0.06-2mm (gritty)</td> <td>40</td> </tr> <tr> <td>Silt</td> <td>0.004-0.06 mm</td> <td></td> </tr> <tr> <td>Clay</td> <td>< 0.004 mm (slick)</td> <td></td> </tr> </tbody> </table>	Substrate Type	Diameter	% Composition in Sampling Reach	Bedrock			Boulder	> 256 mm (10")		Cobble	64-256 mm (2.5"-10")	20	Gravel	2-64 mm (0.1"-2.5")	40	Sand	0.06-2mm (gritty)	40	Silt	0.004-0.06 mm		Clay	< 0.004 mm (slick)		<table border="1"> <thead> <tr> <th>Substrate Type</th> <th>Characteristic</th> <th>% Composition in Sampling Area</th> </tr> </thead> <tbody> <tr> <td>Detritus</td> <td>sticks, wood, coarse plant materials (CPOM)</td> <td></td> </tr> <tr> <td>Muck-Mud</td> <td>black, very fine organic (FPOM)</td> <td></td> </tr> <tr> <td>Marl</td> <td>grey, shell fragments</td> <td></td> </tr> </tbody> </table>	Substrate Type	Characteristic	% Composition in Sampling Area	Detritus	sticks, wood, coarse plant materials (CPOM)		Muck-Mud	black, very fine organic (FPOM)		Marl	grey, shell fragments	
Substrate Type	Diameter	% Composition in Sampling Reach																																			
Bedrock																																					
Boulder	> 256 mm (10")																																				
Cobble	64-256 mm (2.5"-10")	20																																			
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Clay	< 0.004 mm (slick)																																				
Substrate Type	Characteristic	% Composition in Sampling Area																																			
Detritus	sticks, wood, coarse plant materials (CPOM)																																				
Muck-Mud	black, very fine organic (FPOM)																																				
Marl	grey, shell fragments																																				

WATERSHED FEATURES	Predominant Surrounding Landuse <input type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input checked="" type="checkbox"/> Residential <input type="checkbox"/> ROW <input type="checkbox"/> Other:	Floodplain Width <input type="checkbox"/> Wide > 30ft <input type="checkbox"/> Moderate 15-30ft <input checked="" type="checkbox"/> Narrow <15ft
	Canopy Cover <input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded	

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS
Stream flows downhill toward roadside where it goes into a 6-inch corrugated plastic pipe assumed to connect to S-KZ08 (East Branch Big Sewickley Creek).

Photograph Page

Stream ID S-KZ09 Date 10/28/2020



Photograph Number 37

Photograph Direction South

Comments:



Photograph Number 38

Photograph Direction SW

Comments:



Photograph Number 39

Photograph Direction North

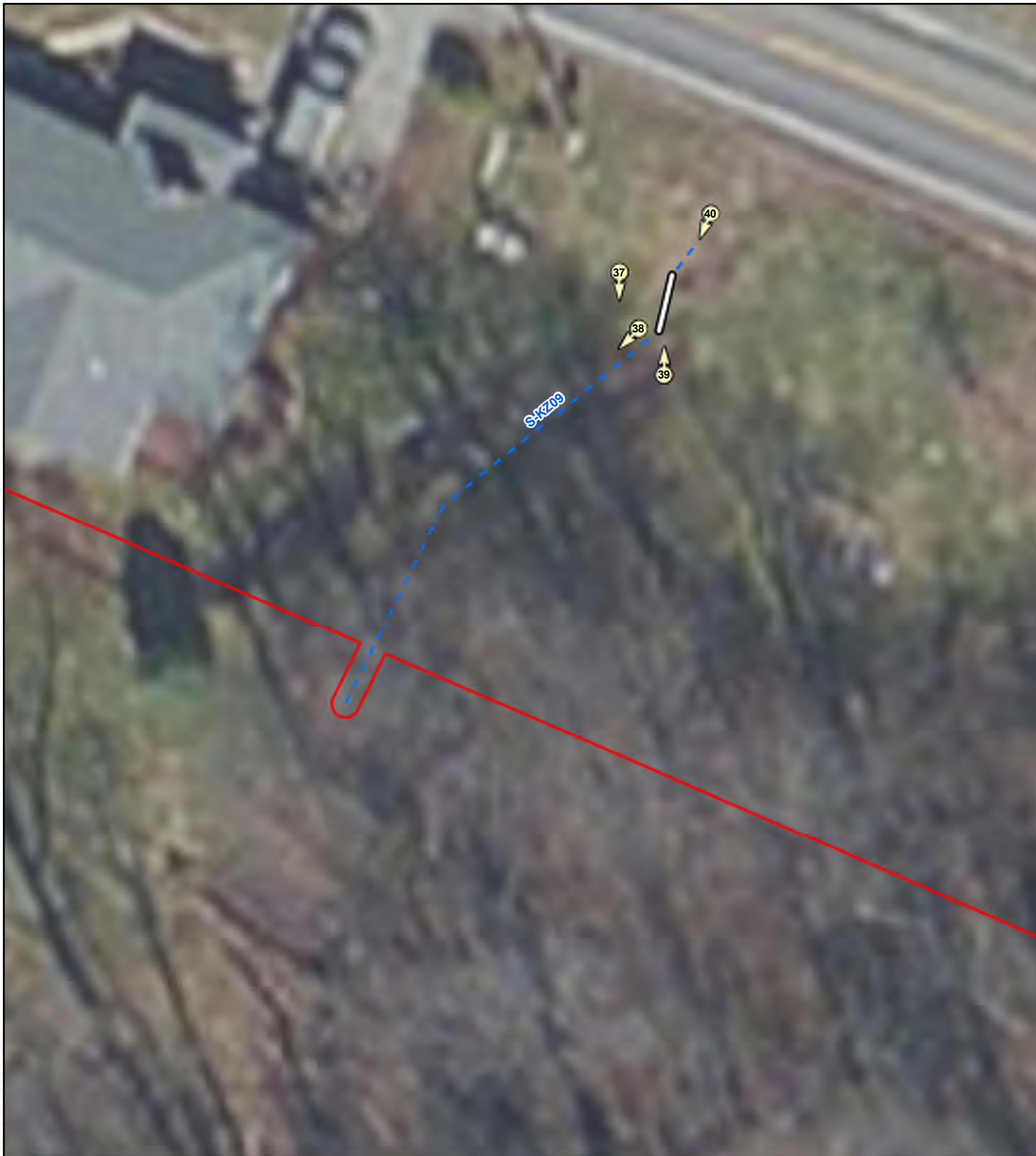
Comments:




Photograph Number 40


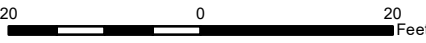




Photograph Direction SSW

Comments:



PGH_P:\GIS\USACE_IDE\W\K\W\W\W\A_AQUATIC_PHOTO.MXD, 11/18/2020, PAGE 17 OF 20 S.ZABOWSKI/LEB

 TETRA TECH
PHOTOGRAPH LOCATION MAP USACE LRP WATER MAIN EXTENSION PROJECT USACE LRP (PITTSBURGH DISTRICT) ALLEGHENY COUNTY, PENNSYLVANIA
Notes: 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).
Drawn: TT 11/11/2020 Checked: KM 11/11/2020 Approved: HS 11/11/2020

	1 inch = 20 feet	
Legend		
 Study Area	 Stream Photograph Location & Direction	
 Culvert Pipe		
 Intermittent Stream		



STREAM ID S-KZ010		STREAM NAME UNT to East Branch Big Sewickley Creek	
CLIENT USACE LRP		PROJECT NAME USACE LRP Water Main Extension	
LAT 40.622768	LONG -80.091064	STATE Pennsylvania	COUNTY Allegheny
INVESTIGATORS SAZ, KMM		DATE 10/28/2020	
WATER TYPE TNW <input type="checkbox"/> RPW <input checked="" type="checkbox"/> NRPW <input type="checkbox"/>		FLOW REGIME Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral <input type="checkbox"/>	

CHANNEL FEATURES	Estimate Measurements Top of Bank Width: <u>6.5</u> ft Top of Bank Height: LB <u>3.0</u> ft RB <u>3.0</u> ft Water Depth: <u>2.00</u> in Water Width: <u>2.0</u> ft Ordinary High Water Mark (Width): <u>4.0</u> ft Ordinary High Water Mark (Height): <u>7.0</u> in Flow Direction: North _____	Sinuosity <input checked="" type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High Gradient <input type="checkbox"/> Flat <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Severe (0.5/100 ft) (2 ft/100 ft) (10 ft/100 ft) Stream Erosion <input type="checkbox"/> None <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Heavy Artificial, Modified or Channelized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Within Roadside Ditch <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Culvert Present <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Culvert Material: <u>Corrugated Metal</u> Culvert Size: <u>36</u> in
-------------------------	---	--

FLOW CHARACTERISTICS	Water Present <input type="checkbox"/> No water, stream bed dry <input type="checkbox"/> Stream bed moist <input type="checkbox"/> Standing water <input checked="" type="checkbox"/> Flowing water Velocity <input type="checkbox"/> Fast <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Slow	Proportion of Reach Represented by Stream Morphology Types (Only enter if water present) Riffle 60 % Run 20 % Pool 20 % Turbidity <input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Other _____
-----------------------------	--	--

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	5
Boulder	> 256 mm (10")	55			
Cobble	64-256 mm (2.5"-10")	10	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	20			
Sand	0.06-2mm (gritty)	10	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	5			
Clay	< 0.004 mm (slick)				

WATERSHED FEATURES	Predominant Surrounding Landuse <input type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input checked="" type="checkbox"/> Residential <input type="checkbox"/> ROW <input type="checkbox"/> Other:	Floodplain Width <input type="checkbox"/> Wide > 30ft <input type="checkbox"/> Moderate 15-30ft <input checked="" type="checkbox"/> Narrow <15ft
	Canopy Cover <input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded	

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS Stream begins at outlet of culvert on the north side of Mingo Road, but receives input from both stormwater and groundwater W-KZ10 sources.
--

Photograph Page

Stream ID S-KZ010 Date 10/28/2020



Photograph Number 41

Photograph Direction North

Comments:



Photograph Number 42

Photograph Direction SE

Comments:



Photograph Number 43

Photograph Direction South

Comments:



Photograph Number 44

Photograph Direction South

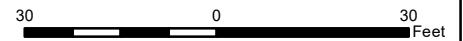
Comments:



PGH_P\GIS\USACE_IDE\W\KZ13\WVA_AQUATIC_PHOTO.MXD, 11/18/2020, PAGE 20 OF 20, S.ZABOWSKI@LEIB



1 inch = 30 feet

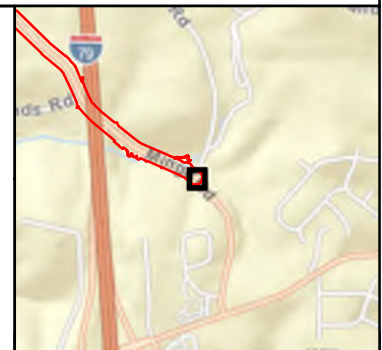


PHOTOGRAPH LOCATION MAP

USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Legend

- Study Area
- Sampling Point
- Culvert Pipe
- Intermittent Stream
- PEM Wetland
- Stream Photograph Location & Direction
- Wetland Photograph Location & Direction



Notes:

1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).

APPENDIX B: USACE WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: USACE LRP Water Main Extension City/County: Allegheny Sampling Date: 10/27/20
 Applicant/Owner: USACE LRP (Pittsburgh District) State: PA Sampling Point: W-KZ01-PEM
 Investigator(s): SAZ, KMM Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): _____
 Subregion (LRR or MLRA): LRRN Lat: 40.653888 Long: -80.093911 Datum: NAD 83
 Soil Map Unit Name: (ErB) ErB: Ernest silt loam, 3 to 8 percent slopes NWI classification: N/A

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Cowardin Code: <u>PEM</u> HGM: <u>Riverine</u> Water Type: <u>RPWWD</u>	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
--	--

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
--	--

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

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W-KZ01-PEM

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>1</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	<u>0</u> = Total Cover			Prevalence Index worksheet:
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		Total % Cover of: _____ Multiply by:
				OBL species _____ x 1 = _____
				FACW species _____ x 2 = _____
				FAC species _____ x 3 = _____
				FACU species _____ x 4 = _____
				UPL species _____ x 5 = _____
				Column Totals: _____ (A) _____ (B)
				Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Hydrophytic Vegetation Indicators:
1. _____	_____	_____	_____	<input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation
2. _____	_____	_____	_____	<input checked="" type="checkbox"/> 2 - Dominance Test is >50%
3. _____	_____	_____	_____	_____ 3 - Prevalence Index is ≤3.0 ¹
4. _____	_____	_____	_____	_____ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
5. _____	_____	_____	_____	_____ Problematic Hydrophytic Vegetation ¹ (Explain)
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
	<u>0</u> = Total Cover			¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		
Herb Stratum (Plot size: <u>5'</u>)				Definitions of Four Vegetation Strata:
1. <u>Phalaris arundinaces</u>	<u>65</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
2. <u>Persicaria sagittata</u>	<u>10</u>		<u>OBL</u>	Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
3. <u>Cirsium vulgare</u>	<u>10</u>		<u>FACU</u>	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
4. <u>Solidago canadensis</u>	<u>15</u>		<u>FACU</u>	Woody vine – All woody vines greater than 3.28 ft in height.
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
	<u>100</u> = Total Cover			
50% of total cover: <u>50</u>		20% of total cover: <u>20</u>		
Woody Vine Stratum (Plot size: <u>15'</u>)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
	<u>0</u> = Total Cover			
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>		
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: W-KZ01-PEM

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR 4/2	95	7.5YR4/6	5	C	M/PL	SIL	
8-14	10YR 4/1	90	7.5YR4/6	10	C	M/PL	SICL	

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

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> (MLRA 147, 148)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> (MLRA 136, 147)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147)		

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

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
---	--

Remarks:

Photograph Page

Wetland ID W-KZ01-PEM Cowardin Code PEM Date 10/27/20



Photograph Number 1

Photograph Direction North

Comments:



Photograph Number 2

Photograph Direction SSW

Comments:



Photograph Number 3

Photograph Direction South

Comments:



Photograph Number 4

Photograph Direction South

Comments:

PGH_P\GIS\USACE_ID\W\KZ01\W\A_AQUATIC_PHOTO.MXD 11/18/2020 PAGE 2 OF 20 S.ZABOWSKILIEB



TETRA TECH

PHOTOGRAPH LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

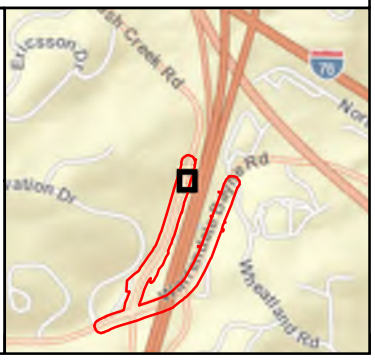
Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).

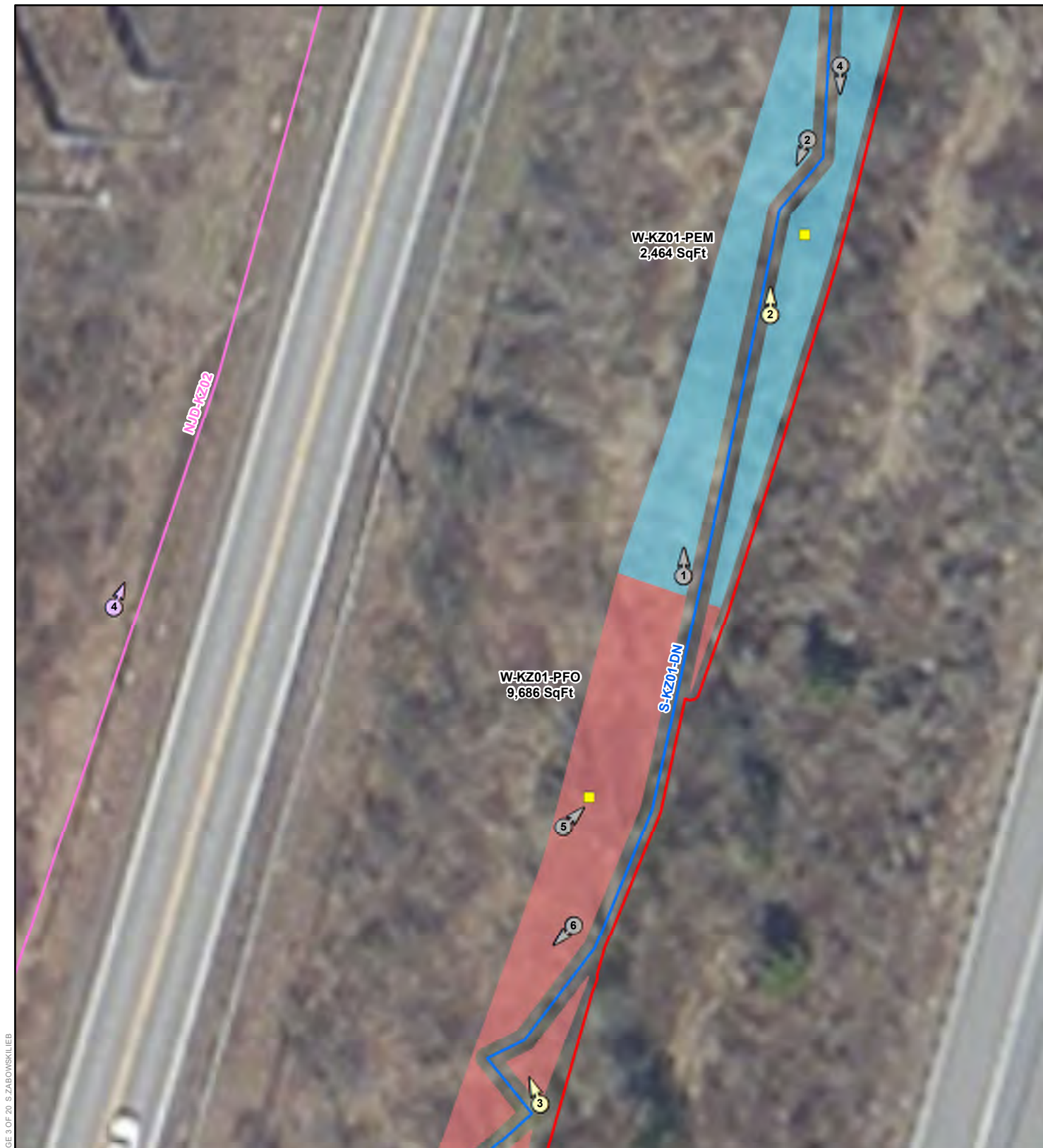
Drawn: TT 11/11/2020 Checked: KM 11/11/2020 Approved: HS 11/11/2020

1 inch = 30 feet 30 0 30 Feet

Legend

Study Area	NJD Aquatic Feature Photograph Location & Direction
Sampling Point	Stream Photograph Location & Direction
Culvert Pipe	Wetland Photograph Location & Direction
NJD Aquatic Feature	
Perennial Stream	
PEM Wetland	
PSS Wetland	





PGH_P\GIS\USACE_IDE\W\KZ01\AQUATIC_PHOTO.MXD, 11/18/2020, PAGE 3 OF 20, S.ZABOWSKILIEB

TETRA TECH

PHOTOGRAPH LOCATION MAP
USACE LRP WATER MAIN EXTENSION PROJECT
USACE LRP (PITTSBURGH DISTRICT)
ALLEGHENY COUNTY,
PENNSYLVANIA

Notes:
 1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).

Drawn: TT 11/11/2020 Checked: KM 11/11/2020 Approved: HS 11/11/2020

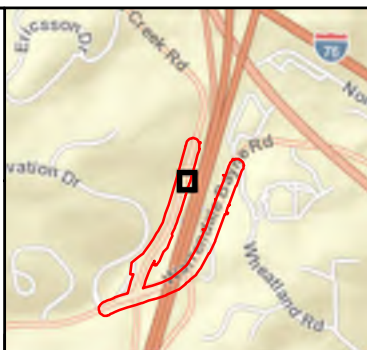
N

1 inch = 30 feet

30 0 30
Feet

Legend

 Study Area	NJD Aquatic Feature Photograph Location & Direction
 Sampling Point	Stream Photograph Location & Direction
 NJD Aquatic Feature	Perennial Stream
 PEM Wetland	PFO Wetland
 PFO Wetland	Wetland Photograph Location & Direction



WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: USACE LRP Water Main Extension City/County: Allegheny Sampling Date: 10/27/20
 Applicant/Owner: USACE LRP (Pittsburgh District) State: PA Sampling Point: W-KZ01-PFO
 Investigator(s): SAZ, KMM Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): 0-5
 Subregion (LRR or MLRA): LRRN Lat: 40.653543 Long: -80.094071 Datum: NAD 83
 Soil Map Unit Name: (ErB) ErB: Ernest silt loam, 3 to 8 percent slopes NWI classification: N/A

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Cowardin Code: <u>PFO</u> HGM: <u>Riverine</u> Water Type: <u>RPWWD</u>	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Saturation (A3) <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
---	--

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
---	--

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

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W-KZ01-PFO

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				
1. <u>Salix nigra</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
50% of total cover: <u>15</u>	<u>30</u> = Total Cover	20% of total cover: <u>6</u>		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Cornus racemosa</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
50% of total cover: <u>30</u>	<u>60</u> = Total Cover	20% of total cover: <u>12</u>		
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Carex lurida</u>	<u>5</u>		<u>OBL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Poa trivialis</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
3. <u>Myosotis scorpioides</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
4. <u>Eupatorium perfoliatum</u>	<u>10</u>		<u>FACW</u>	
5. <u>Leersia virginica</u>	<u>10</u>		<u>FACW</u>	
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
50% of total cover: <u>37.5</u>	<u>75</u> = Total Cover	20% of total cover: <u>15</u>		
Woody Vine Stratum (Plot size: <u>15'</u>)				
1. _____				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
2. _____				
3. _____				
4. _____				
5. _____				
50% of total cover: <u>0</u>	<u>0</u> = Total Cover	20% of total cover: <u>0</u>		
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____

SOIL

Sampling Point: W-KZ01-PFO

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR 4/2	95	7.5YR 4/6	5	C	M/PL	SIL	
8-14	10YR 4/1	90	7.5YR 4/6	10	C	M/PL	SIL	

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

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> (MLRA 147, 148)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> (MLRA 136, 147)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147)		

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

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
---	--

Remarks:

Photograph Page

Wetland ID W-KZ01-PFO Cowardin Code PFO Date 10/27/20



Photograph Number 5

Photograph Direction NE

Comments:



Photograph Number 6

Photograph Direction SW

Comments:



Photograph Number 7

Photograph Direction NE

Comments:



Photograph Number 8

Photograph Direction SSW

Comments: