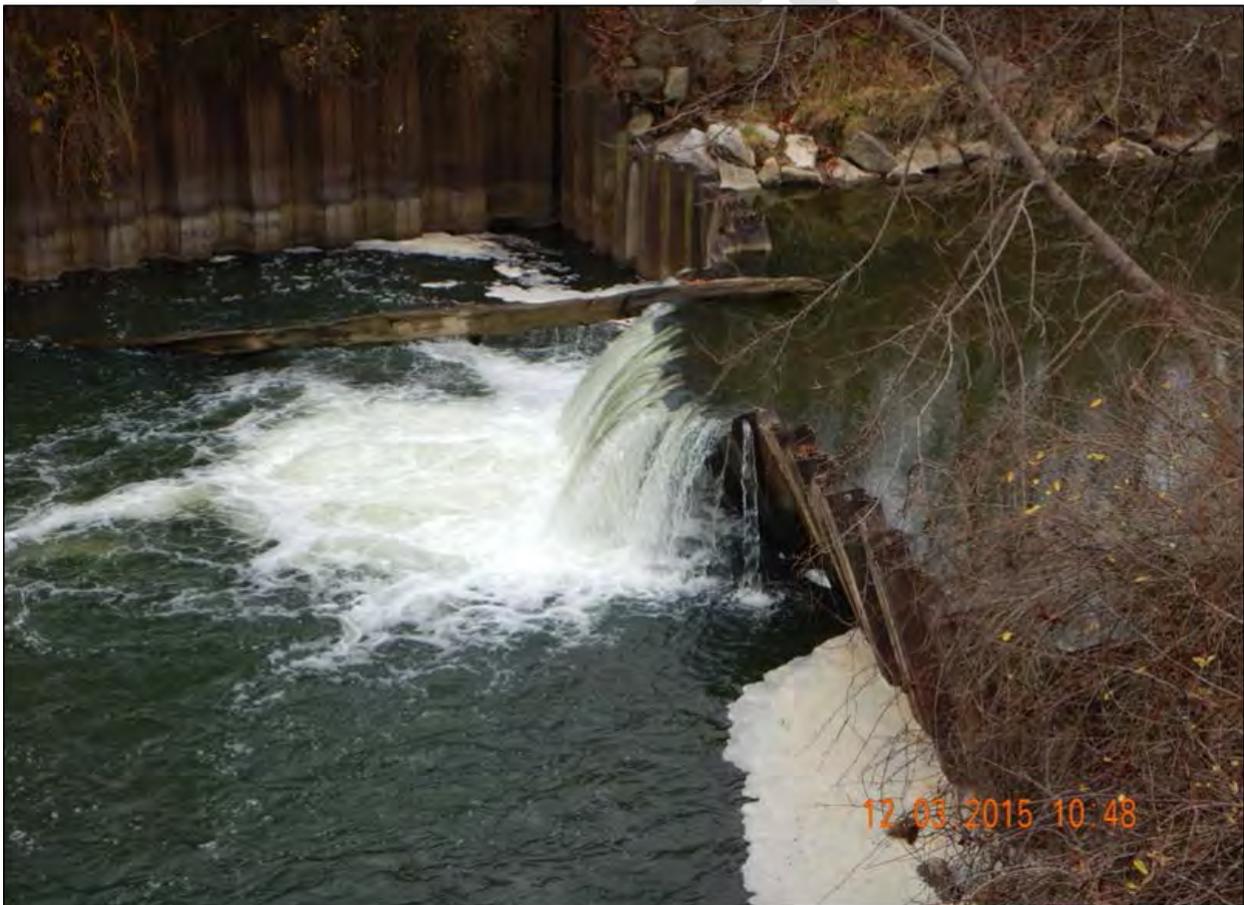


Draft Integrated Detailed Project Report and Environmental Assessment

**Continuing Authorities Program (CAP)
City of Newark, Raccoon Creek, Licking County, Ohio
Section 14 Emergency Streambank Protection Project**



**Photo above shows failed sheet pile grade control structure
Adjacent to the City of Newark, Ohio**

June 2017

**Draft Detailed Project Report and Environmental Assessment
City of Newark, Raccoon Creek, Licking County, Ohio
Section 14 Streambank Protection Project**

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- Appendix H: Sponsor Certifications (Letter of Intent, Financial & Land, Easements, Rights-Of-Way, Relocation, and Disposal Areas (LERRDS) Capability)

Draft Integrated Detailed Project Report and Environmental Assessment City of Newark, Raccoon Creek, Licking County, Ohio Section 14 Streambank Protection Project

1 INTRODUCTION

1.1 STUDY PURPOSE AND SCOPE

This Detailed Project Report (DPR) which includes a draft Environmental Assessment (EA) is being prepared by the Huntington District of the U.S. Army Corps of Engineers (USACE) to identify the most cost effective alternative for providing streambank protection along the Raccoon Creek in the City of Newark, Ohio while minimizing environmental, economic, and social impacts. The City of Newark (City) and Ohio Department of Transportation (ODOT) are the non-Federal sponsors. The City requested Federal assistance in addressing streambank erosion issues under the Section 14 authority in December 2015.

The purpose of this project is to provide a cost-effective means of preventing flood-related erosion and breaching of Ohio State Route (SR) 16 and damage to utility line crossings. SR 16, located adjacent to the referenced reach of Raccoon Creek, is a significant transportation route through and within the City. A sheet pile grade control structure within the project area along Raccoon Creek has partially overturned due to flood flow erosion and extensive scour resulting in the immediate endangerment of critically essential public facilities, including utility line crossings and the adjacent SR 16 travel way and Church Street off-ramp. Subsequent flood flow erosion and streambank recession have caused displacement of stone slope protection, proximate and downstream scour, and the formation and enlargement of a stilling feature. Approximately 1,420 linear feet (LF) of eroded and displaced stone slope protection (710 LF along each bank) is present within the project area.

Huntington District personnel have monitored flood flow erosion and recessional failure site conditions which have resulted in the formation of downstream scour and flow dissipation features, additional overturning of the sheet pile grade control structure, and more extensive displacement of adjacent bank protection. Without treatment, flood flow scour will likely continue and eventually result in further collapse and outflanking of the grade control structure. Raccoon Creek channel incisement and widening would then progress upstream and expose and breach utility crossings and the adjacent SR 16 travel way and off-ramp. Failure to protect these utilities and road system would likely result in adverse impacts affecting transportation and public health, including breaching of water, sewer, and gas lines (maps can be found in Appendix A). The area affected by flood flow erosion, including Raccoon Creek and the South Fork Licking River, and related structure and bank failures would likely degrade a significant source of potable water for the City. Bank erosion and failures would likely result in loss of access to numerous manufacturing facilities and warehouses as a result of SR 16 and the Church Street off-ramp collapse. As a result, the primary purpose of this study is to develop a viable treatment solution for the protection of SR 16 and adjacent public utilities serving the City.

1.2 LOCATION

1.2.1 Study Area

The City, which serves as the county seat of Licking County, is located in central Ohio approximately 33 miles east of Columbus (40.056223, -82.451699). The study area falls within the Licking Watershed, which is identified by Hydrologic Unit Code (HUC) 05040006. Raccoon Creek is approximately 25 miles long, originating in northwestern Licking County, Ohio and flowing through Newark, Ohio where it joins with the South Fork of the Licking River. The Licking River then joins the Muskingum River which flows through Marietta, Ohio, to its confluence with the Ohio River. Raccoon Creek is subject to episodic flooding which is the cause of frequent streambank erosion and recessional failure. A site location map is shown in Figure 1, Figure 2 shows the project site location, and Figure 3 shows the proposed construction work limits.

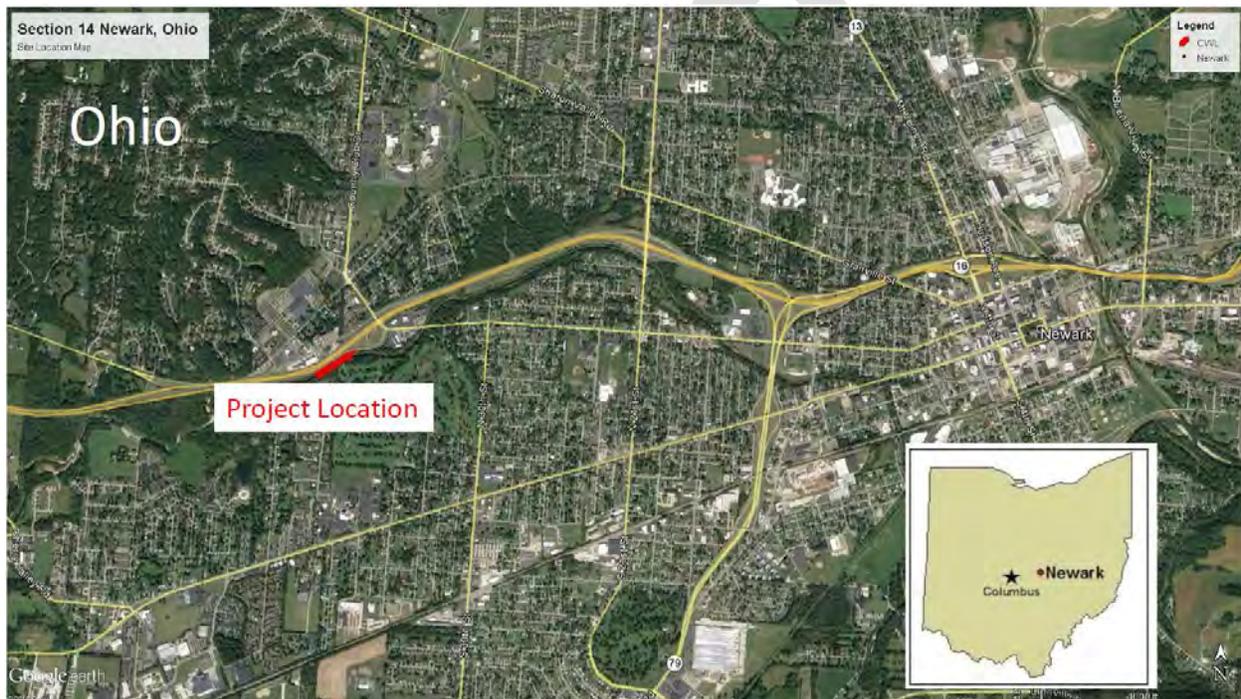


Figure 1 – Newark Site Location



Figure 2 – Project Site Location

1.2.2 Project Area

The project area is located on the western side of the City of Newark along Raccoon Creek and includes approximately 1,420 LF of eroded streambank adjacent to the City and SR 16. The City is proximate to the communities of Marne, Hanover, St. Louisville, Granville, Alexandria, Heath, Hebron, and Jacksontown. The streambank erosion and stabilization outflanking is due to the Raccoon Creek flood events. The project reach includes 1,420 LF (710 LF along each bank) of streambank in need of immediate stabilization.

SR 16, which runs through the City, along with adjacent utilities and infrastructure are threatened by the erosion of the streambank. SR 16 is part of the Columbus to Interstate 77 (I-77) Macro-Corridor. The Columbus to I-77 Macro-Corridor connects central Ohio and the City of Columbus to east-central Ohio cities such as Newark. Ohio's Macro-Corridors are defined as "highways with statewide significance that provide connectivity to population and employment centers in Ohio and the nation by accommodating desired movements of people and goods." Without SR 16, direct access to numerous commercial and public facilities would be negatively impacted. In addition, further streambank erosion at the site could disrupt utility service for the area and potentially require relocation of multiple public utilities including water, sewer, and gas lines.

Reaches of the South Fork Licking River, including Raccoon Creek, were excavated during construction of the State Turnpike and Ohio Erie Canal Systems. Reaches of this system were later acquired by the Penn Lines Southwest railroad. Prior to 1975, SR 16 was realigned and an additional eastbound lane and off-ramp were constructed. Components of this highway construction included relocation and realignment of Raccoon Creek and the placement of both an in-channel grade control structure and stone slope

protection along the left and right descending banks to effect stabilization. These stabilization features, which were outflanked and overtopped during subsequent flood events, have been breached and displaced. Flood damages have continued despite the limited bank stabilization efforts which have been undertaken to minimize impacts. As a result, critically essential public facilities, including utility line crossings, the SR 16 travel way, and the SR 16 Church Street off-ramp, are endangered. The severity of these conditions requires the continued placement of stone and concrete rubble to temporarily reduce the extent of these failures.



Figure 3 – Newark Proposed Construction Work Limit



Figure 4 - Raccoon Creek sheet pile grade control structure which has overturned as a result of flood flow scour



Figure 5 - Raccoon Creek sheet pile grade control structure which has overturned as a result of flood flow scour. The City of Newark placed 400 tons of stone as a temporary measure.

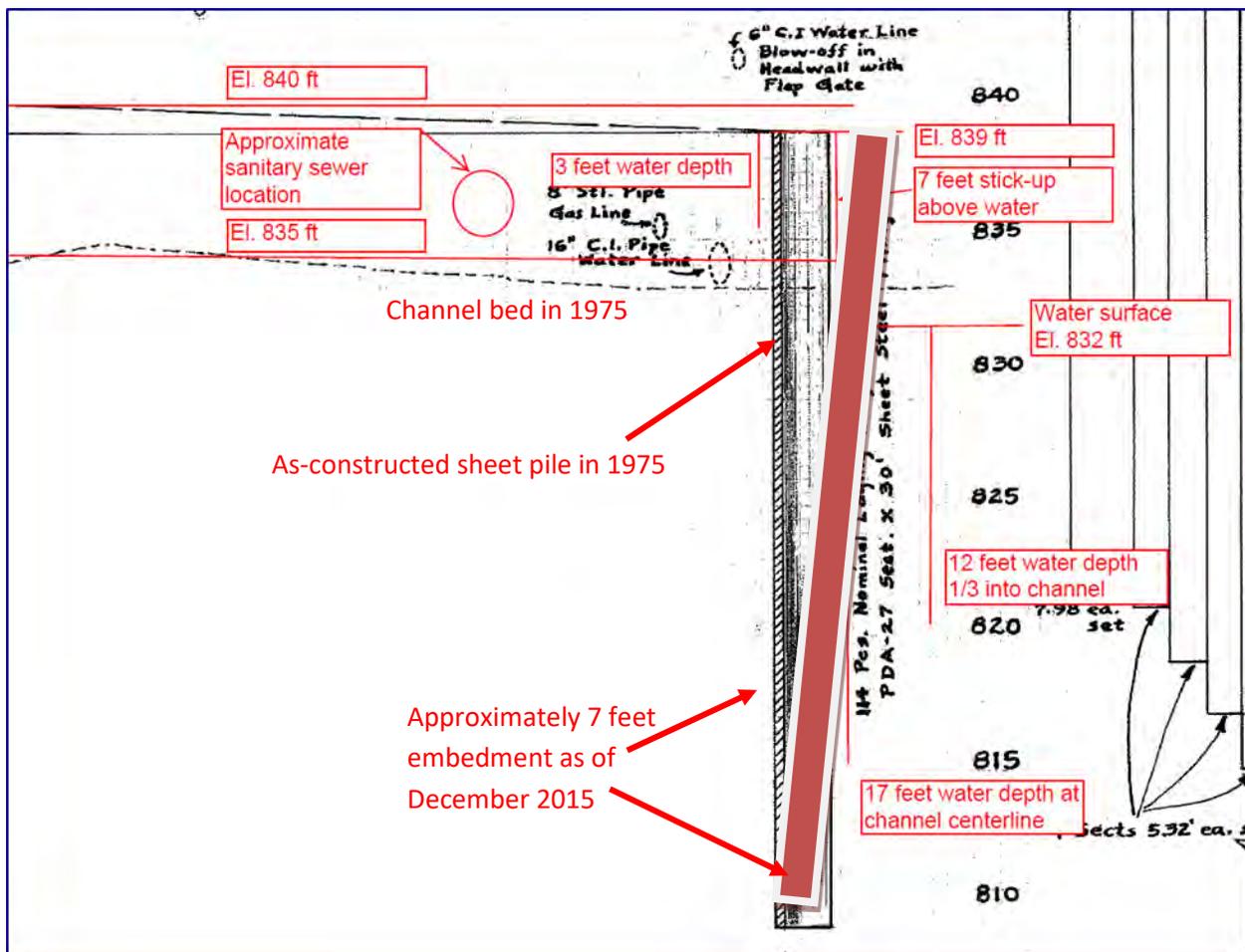


Figure 6 – Stream profile from 1975 sheet pile grade control plans, which have been annotated with water depth soundings and approximate misalignment obtained in December 2015. Stream flow is from left to right.

1.3 STUDY AUTHORITY

Section 14 of the Flood Control Act of 1946, as amended, authorizes USACE to study, design and construct emergency streambank and shoreline works to protect public services including (but not limited to) streets, bridges, schools, water and sewer lines, National Register sites, and churches from damage or loss by natural erosion. The Section 14 authority falls under the Continuing Authorities Program (CAP), which focuses on water resource related projects of relatively smaller scope, cost, and complexity. Traditional USACE civil works projects are of wider scope and complexity and require specific authorization by Congress. Certain types of water resource and environmental restoration projects completed under CAP are delegated authority to plan, design, and construct recommendations without specific Congressional authorization.

1.4 RELEVANT PRIOR STUDIES AND REPORTS

Due to the flood flow scour and related loss of embedment within the partially overturned existing sheet pile (figure 4), the City of Newark placed approximately 400 tons of stone downstream of the failed grade control structure in 2016 (figure 5). This emergency action was necessary to partially

address low and moderate flow scour, thus reducing the likelihood of collapse prior to implementation of this Section 14 project. However, this rubble placement is a temporary fix and does not address additional erosion, which would occur during bankful events and flood stages.

2 AFFECTED ENVIRONMENT - EXISTING CONDITIONS

2.1 CLIMATE PREPAREDNESS AND RESILIENCE

USACE must ensure that projects are planned and built to assure Climate Preparedness and Resilience. The Licking River Watershed's position makes it susceptible to highly variable weather throughout the year. The Watershed's climate is greatly influenced by oceanic and atmospheric interactions. The Watershed experiences seasonal weather patterns throughout the year, with climatic conditions typical of summer, fall, winter, and spring seasons for the Mid-Atlantic and Southeast Regions of the United States. Variability in weather tends to be greater during the late winter, spring, and fall seasons. Summers are usually characterized by warm to hot weather with periods of high humidity. Winters are typically mild, with areas at higher elevations experiencing slightly harsher winters and greater snowfall. Fall is typically the driest season, while spring is typically the wettest. Average precipitation at Newark is approximately 41 inches per year. This region is projected to receive more precipitation within the watershed system at a higher frequency as described in the July 2015 Ohio River Basin Climate Change Impacts and Adaptation Draft Pilot Study. In this study, a Muskingum River gage at the Village of McConnelsville was identified and used as the optimum forecast point to assess future climate change impacts. Historic data from that gage was included in the base flow analysis and future flow projections were produced for that gage point as well to determine more precipitation in the watershed is projected to occur.

2.2 SOILS AND GEOLOGY

2.2.1 Geology and Physiography

Licking County is located in three physiographic sections: the Glaciated Allegheny Plateau and Allegheny Plateau located in the Appalachian Plateau province on the eastern portion and the Till Plains located in the Central Lowland province on the western portion. During the last Ice Age (Pleistocene epoch), the majority of Ohio was covered with glaciers including the Glaciated Allegheny Plateau and Till Plains. The glaciers scoured and flattened the landscape and covered it with thick layers of glacial till comprised of sands, gravel, and clay. Licking County falls mostly in the part of the State of Ohio which had been covered by glaciers. Licking County contains four different regions: the Galion Glaciated Low Region (Till Plains), Killbuck-Glaciated Pittsburgh Region (Glaciated Allegheny Plateau), the Illinoian Glaciated Allegheny Plateau (Glaciated Allegheny Plateau), and Muskingum-Pittsburgh Plateau (Allegheny Plateau). The project site, as shown in Figure 7, is located near the limit of Wisconsinan glaciation and within Wisconsinan and Illinoian outwash deposits.

The characteristics of the Galion Glaciated Low Plateau include: Rolling upland transitional between the gently rolling Till Plain and the hilly Glaciated Allegheny Plateau; mantled with thin to thick drift; elevation 800-1,400 feet, moderate relief (100 feet). The characteristics of the Killbuck-Glaciated Pittsburgh Plateau include: Ridges and flat uplands generally above 1,200 feet, covered with thin drift and dissected by steep valleys; valley segments alternate between broad drift-filled and narrow rock-

walled reaches; elevation 600-1,505 feet, moderate relief (200 feet). The characteristics of the Illinoian Glaciated Allegheny Plateau include: Dissected, rugged hills; loess and older drift on ridgetops, but absent on bedrock slopes; dissection similar to unglaciated regions of the Allegheny Plateau; elevation 600 feet-1,400 feet, moderate relief (200 feet). The characteristics of the Muskingum-Pittsburgh Plateau: Moderately high to high relief (300-600 feet) dissected plateau having broad major valleys that contain outwash terraces, and tributaries with lacustrine terraces; medium-grained bedrock sequences coarser than those in Marietta Plateau.

The City is located on Wisconsinan and Illinoian fluvial glacial outwash and terminal and recessional moraine deposits. Figure 7 includes a map of general surface geology affected by this Pleistocene glaciation. Sangamonian interglacial period soils include weathered wind-blown sandy silts and clayey silt lake deposits. Glacial outwash in this area includes basal cobbles and gravels, gravelly sands, and sandy gravels. Within the project area, weathered and fractured flaggy siltstone and sandstone bedrock are encountered at depths of 60 to 80 feet.

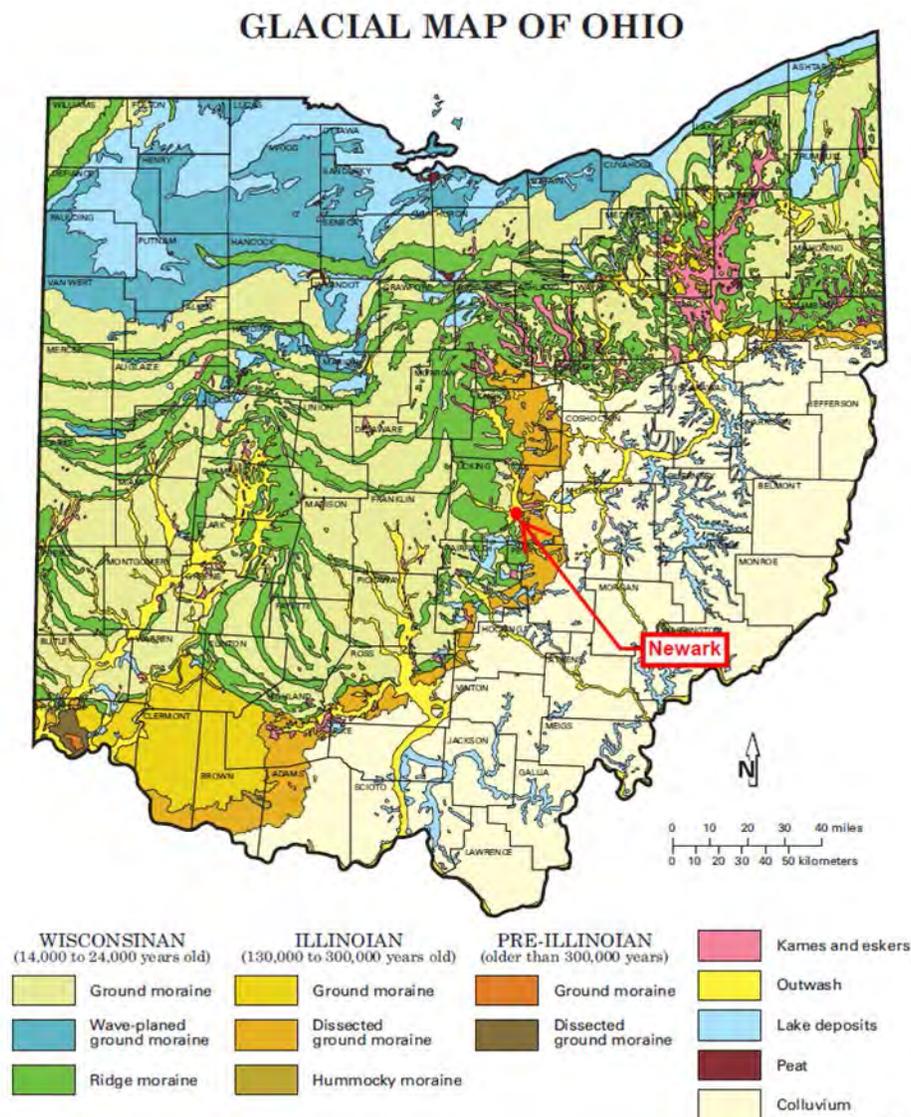


Figure 7 - Glacial Map of Ohio (Ohio Department of Natural Resources)

2.2.2 Soil Associations

According to the Licking County, Ohio Natural Resources Conservation Service (NRCS) Soil Survey dated November 16, 2016, there are two dominate soil types surrounding the project area: Stonelick loam and Stonelick-Urban land complex. Both are well draining soils, subject to frequent to occasional flooding with low potential for surface runoff.

River bank soils include recently deposited silty fine sand alluvium¹ underlain by interlensing and layered sandy silt, sandy gravel, gravel, and cobble sized material. Flood flow erosion of these bank and channel soils resulted in bed degradation and widening together with recessional and piping-related failures. This recessional and piping-related undercutting of bank material can cause tension cracking within the upper bank alluvium, which contributes to failures as a result of cleft pressures due to water infiltration and soil block displacement. Raccoon Creek bed materials consist of sands, gravels, and cobbles which have been eroded and transported as a result of flood flow erosional channel incisement.

2.2.3 Hydric Soils

According to the NRCS's Soil Use, National Hydric Soils list for Licking County, Ohio there are no hydric soils present within the project area. However, hydric soils do exist close to the project.

2.3 HYDRAULIC ANALYSIS

To determine flow velocities required for stone sizing, a geo-referenced hydraulic model was developed for Raccoon Creek using LIDAR data from the Ohio Statewide Imagery Program (OSIP). Hydrologic data was obtained from the Federal Emergency Management Agency (FEMA) Flood Insurance Study for Licking County, Ohio published May 2007.

Stone requirements for streambank protection in the project area were determined based on the criteria and procedures outlined in EM 1110-2-1601, dated 1 July 1991. The average local velocity for the 1% chance exceedance discharge was computed to be 9.00 feet per second at the toe of the protected side slopes. Based on the computed velocity and the procedures outlined in the aforementioned reference together with the CHANLPRO program, the analysis indicates that a minimum stone thickness of 15.5 inches is required to ensure the integrity of the bank against tractive force failure mechanisms (i.e. scour). The recommended gradation limits for stone slope and downchannel protection are provided in Table 1. Flood frequencies for Raccoon Creek in the project reach are provided in Table 2.

¹ Alluvium - a deposit of clay, silt, sand, and gravel left by flowing streams in a river valley or delta, typically producing fertile soil.

Table 1: Gradation Limits for Stone Slope Protection

| PERCENT LIGHTER BY WEIGHT | MAXIMUM STONE DIAMETER (IN.) | MINIMUM STONE DIAMETER (IN.) |
|----------------------------------|-------------------------------------|-------------------------------------|
| D ₁₀₀ | 24.0 | 15.5 |
| D ₅₀ | 16.0 | 14.0 |
| D ₁₅ | 12.7 | 9.5 |

Table 2: Flood Frequency Summary for Raccoon Creek at the Project Area

| PERCENT CHANCE EXCEEDANCE | DISCHARGE (CFS) | APPROXIMATE WATER SURFACE ELEVATION (FEET) |
|----------------------------------|------------------------|---|
| 99.9% | 2,110 | 839.9 |
| 50% | 3,020 | 841.5 |
| 20% | 4,680 | 843.7 |
| 10% | 6,496 | 845.7 |
| 5% | 8,380 | 847.5 |
| 2% | 11,071 | 849.7 |
| 1% | 13,528 | 851.4 |
| 0.5% | 15,860 | 852.9 |
| 0.2% | 18,992 | 854.6 |

2.4 SURFACE WATER AND OTHER AQUATIC RESOURCES

2.4.1 Surface Water

In 2012, the *Biological and Water Quality Study of the Licking River and Selected Tributaries Report* was published by the Ohio Environmental Protection Agency (OEPA). The report states there were no chemical water quality standards violations found in Raccoon Creek watershed. Some areas of the watershed rated low water quality standards but were not low enough to be in violation. Stressors to the watershed include rural residences, agriculture, and land development. Two of these, rural residences and land development, have a direct impact at the project location. Seeing these stressors on a stream can cause ammonia levels, nutrients, and sedimentation in the stream to increase. Since a

previous water quality study of the Licking River and tributaries showed poor water quality and limited aquatic life there has been an effort to make improvements to the rivers and streams of Licking County. This effort has had positive results as reflected in the most recent study.

2.4.2 Groundwater

Ground water in Licking County is obtained from both glacial deposits and bedrock. Glacial outwash deposits include aquifers in the majority of the buried valleys. Recent alluvium within incised stream channels in areas of eastern and central Licking County may also include aquifers.

2.4.3 Flood Plains

EO 11988 requires Federal agencies to consider the potential effects of their proposed action to floodplains. The project area is located along Raccoon Creek which experiences occasional periods of flooding. According to the Flood Insurance Rate Map (FIRM) 39089C0337J dated March 16, 2015 produced by the FEMA, the project area is within the regulatory floodway and Special Flood Hazard Area (SFHA) (See Appendix B). The regulatory floodway areas of the SFHA must be preserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

2.4.4 Wetlands

A National Wetland Inventory Map (NWI) was reviewed for the project area and a site reconnaissance was conducted to determine validity of the NWI maps. The NWI map indicated there are no wetlands on or adjacent to the project area (See Appendix B). The site reconnaissance also indicated no wetlands are located within the project area.

2.5 FISH AND WILDLIFE HABITATS

2.5.1 Terrestrial and Aquatic Vegetation

Terrestrial vegetation within the project area is limited on the left descending bank due to streambank erosion and previously placed rip rap. The left descending bank abuts a walking trail system, mowed area, and SR 16. These features, together with continuing bank erosion and failure, have limited the vegetation diversity to low quality small sapling shrubs and invasive herbaceous and woody vegetation. The right descending bank of the project contains a more diverse and robust riparian hardwood habitat but is limited in width and size due to bank erosion and failure, golf course maintenance, and residential development. Overall, the project area vegetation growth and diversity is restricted by the development which occurs on both sides of Raccoon Creek. There is limited aquatic vegetation along this reach of Raccoon Creek due to flood flow erosion.

2.5.2 Fauna

With little vegetation, cover, habitat, space, and the surrounding urban environment, few animals are found in the project area. Species observed onsite include various bird species, which are highly mobile. The Raccoon Creek supports an aquatic community of species that include invertebrates, fish, and amphibians. All of the listed aquatic species could be found within the project area.

2.5.3 Existing Terrestrial and Aquatic Habitats

The project area contains a low quantity of riparian habitat which is affected by flood flow erosion and recession conditions along Raccoon Creek. Riparian habitats, the strips of inundation-tolerant

vegetation along rivers, are important for the aquatic health of a river system. Riparian habitat captures and filters silt and pollutants during flooding and provides an influx of plant and insect matter which serves as food for the aquatic ecosystem. Dense continuous riparian vegetation is becoming increasingly rare. Because the project area is subject to streambank failure and surrounded by development, vegetative growth is limited. The riparian vegetation is limited and a healthy riparian environment has not been established. In the recent past, much of the Raccoon Creek watershed was devoid of aquatic life. Efforts to restore water quality have included upgrading of wastewater treatment plants. These improvements have occurred throughout the Licking River watershed.

2.6 ENDANGERED AND THREATENED SPECIES

2.6.1 Federal

In accordance with Section 7(a)(2) of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) (ESA), Federal agencies are required to ensure that any actions they carry out, fund or authorize are not likely to jeopardize the continued existence of Federally listed threatened or endangered species or result in destruction or adverse modifications of the critical habitat of such species. If the Federal agency determines that its proposed action may affect Federally listed species or critical habitat, it must consult with the USFWS. There are 30 threatened or endangered species found within the State of Ohio as listed by the U.S. Fish and Wildlife Service (USFWS). Of these, three species could potentially be found within Licking County. The species include two bats – Indiana bat (*Myotis sodalis*) and Northern Long-Eared bat (*Myotis septentrionalis*) – and one reptile the Eastern Massasauga rattlesnake (*Sistrurus catenatus*).

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), which prohibits the taking of these birds, their nests or their eggs. “Taking” under this act includes not just killing of a bird, but also disturbing individual birds to a degree that causes or is likely to cause injury to the eagle, decrease its productivity, or abandon its nest. Licking county is also within range of the Bald Eagle, which is protected under the Bald and Golden Eagle Protection Act.

Tree clearing may be needed along a portion of the stream. If tree clearing is necessary the project may affect, but is not likely to adversely affect the above listed bat species. If tree clearing cannot be conducted during the October 1-March 31 time period, additional coordination will be necessary with USFWS and a supplement to this EA will be developed if deemed necessary.

2.6.2 State

Ohio Department of Natural Resources (ODNR) Division of Wildlife publishes a list of state listed threatened and endangered species by county. ODNR has indicated there are 35 state listed species within Licking County including mussel species. Some species overlap with the Federally listed species. Coordination with ODNR can be found in Appendix B.

2.6.3 Critical Habitat

According to the USFWS database, there is no critical habitat found in the project area for any listed species.

2.7 RECREATIONAL, SCENIC, AND AESTHETIC RESOURCES

2.7.1 Local Resources

The City of Newark along SR 16 consists of commercial properties including locally owned businesses, shops, and restaurants along with residential and some industrial properties. The project area includes a recreational pathway running parallel to Raccoon Creek. The pathway is part of the Licking County Trails system which includes 44 miles of trails connecting multiple towns, including Newark, Granville, Alexandria, Johnstown, and Hanover, within the County. The pathway system can be used for biking, walking, rollerblading, jogging, and nature observation. The Licking County Trails promote health, wellness, economic development, transportation, education, recreation and the natural environment.

The aesthetic quality has been diminished by the failure of the grade control structure and limited prior stream bank stabilization. The pathway runs between Raccoon Creek and SR 16 where there is sparse vegetation, prior stream bank stabilization attempts, a failing grade control structure, and the highway which can be seen within the project area. The area may be viewed from the recreational pathways and the opposite streambank at the Moundbuilders country club golf course. A full view of the project can be seen from the opposing bank.

2.7.2 Regional Resources

The project area is adjacent to SR 16 which is part of the Columbus to Interstate 77 (I-77) Macro-Corridor. The Columbus to I-77 Macro-Corridor connects central Ohio and the City of Columbus to east-central Ohio cities such as Newark. Ohio's Macro-Corridors is significant, because it connects Ohio's major population areas to employment centers and moving people and goods.

2.8 CULTURAL RESOURCES

2.8.1 Cultural History

The first occupation of what is now central Licking County probably occurred around 10,000 B.C., after the Wisconsin ice sheets retreated northward and the North Fork drainage was formed by glacial outwash. There were several cultures present in Licking County, but the Hopewell cultural development is the most notable to Newark. Hopewell likely became established in the region around A.D. 100 and flourished to become one of the most remarkable developments in North America. The Hopewell manifestation involved large and often complex earthworks, elaborate ceremonialism, an extensive trade network, and a large interaction sphere.

The largest and most complex Hopewellian ceremonial center is located adjacent to the project area, at the confluence of South Fork and Raccoon Creek in present day Newark, Ohio. The complex is known as the Newark Earthworks and is recognized as the largest and best preserved geometric earthworks complex in the world. Built between 100 B.C. and 500 A.D., the earthwork originally covered over 4 square miles and took more than 7,000,000 cubic feet of earth to construct. Now known as the Newark Earthworks State Memorial, Newark Earthworks is a National Historic Landmark and the official prehistoric monument of Ohio. The earthworks have also been nominated as a UNESCO World Heritage Site as part of the Hopewell Ceremonial Earthworks.

Originally, the earthworks consisted of a circular enclosure 1,200 feet in diameter, another slightly smaller circle, an octagon, an oval earthwork surrounding between 12 and 13 mounds of varying size and shape, and a square enclosure measuring 950 feet on one side. All these earthworks were connected via a series of parallel walls. Additionally, there were small circular enclosures ranging from 50 to 250 feet in diameter, a scattering of additional mounds and pits, and a second square enclosure measuring 750 feet on one side.

A threat to the existence of these grand earthworks was created when settlers entered present day Licking County around 1800, shortly after the signing of Wayne's Treaty in 1795. Zane's Trace, built between 1796 and 1798, opened Ohio territory to those seeking land, ultimately creating a steady influx of settlers to Newark. The continuous population growth resulted in an ever increasing threat to the preservation of the earthworks, especially with the construction of the Ohio Canal in 1825 and the Columbus & Lake Erie Railroad line in 1845. Newark farmers and the city's industries profited from these modes of transportation, but their construction ultimately destroyed large portions of the earthworks and mounds.

A second form of negative impacts began in 1854 when the first Licking County Fair designated the Great Circle as the event's location. In 1892, William Henry Holmes of the Bureau of American Ethnology warned that if the city did not stop holding the fair inside the Great Circle the earthwork would be completely destroyed. The County Fair continued to be held there until 1933, which damaged the site, but likely prevented its entire destruction. The Great Circle was also used during the Civil War as a training camp for the 76th Ohio Volunteer Infantry between 1861 and 1862, and was abandoned in 1908. In November of 1901 a six-hole golf course was opened on the Octagon Earthworks, and by 1911 the Moundbuilders Country Club opened. The golf course is still present on the Octagon Earthwork.

Over the years, negative impacts caused by Newark's economic and population growth destroyed large portions of the Newark Earthwork. However, three major segments have survived: the Great Circle Earthwork, the Octagon Earthworks, and the Wright Earthworks.

Great Circle Earthworks: Formerly known as Moundbuilders State Memorial, is an earthwork that is nearly 1200 feet in diameter. The 8 foot high walls surround a 5 foot deep moat, except at the entrance where the dimensions are even greater. The walls enclose an area of about 30 acres, which contains two conjoined mounds in the center.

Octagon Earthworks: The Octagon, which is located adjacent to the project area, is an earthwork that is connected to a circular earthwork by a short section of parallel walls. The circular enclosure forms a nearly perfect circle with a diameter of 1,054 feet, encompassing an area of about 20 acres. The walls of the octagon are about 550 feet long and between 5 and 6 feet high. There were openings at each corner of the octagon varying from about 50 to 90 feet in width. Each opening of the octagon is partially blocked by a rectangular or oblong platform mound about 100 feet long and 5 or 6 feet high. The Octagon Earthworks has eight walls, each measuring about 550 feet long and from five to six feet in height. At present the Octagon Earthworks is also the site of the Moundbuilders Country Club golf course.

Wright Earthworks: This earthwork consists of a fragment of a geometrically near-perfect square enclosure, known as the Newark Square, and part of one wall that originally formed a set of parallel embankments, which led from the square to a large oval enclosure. The sides of the Newark Square ranged in length from about 940 to 950 feet and they enclosed about 20 acres. The remaining segment of wall at Wright Earthworks is less than 200 feet long. The parallel embankments framed a passage leading from the square to a huge oval enclosure that surrounded between 12 and 13 burial mounds. Another set of parallel walls led from the Newark Square to the Great Circle.

2.8.2 Previous Investigations

Two previous archeological investigations have been conducted within and adjacent to the current project's area of potential effect (APE). The first survey occurred during March and May of 1995 by Ohio Department of Transportation-Bureau of Environmental Services (ODOT-BES) staff and college cooperative interns for the proposed LIC-16-17.86 bike way connector. The bike path parallels the south side of the east bound lanes of SR 16, along Raccoon Creek and within the current project's APE. Phase Ib archeological surveys consisted of shovel test pits (STPs) and took place at the western and northern termini of the bike path. Survey was not performed at any other point in the survey area because the authors claimed disturbance. Testing in the northern and western termini resulted in the discovery of two lithic scatters (33LI725 and 33LI729), consisting of two flakes each. No buried cultural deposits or features were encountered and no further archeological work was recommended (Aument 1995, i).

The second survey took place in the spring and early summer of 2010 by Weller & Associates, Inc. for the LIC-Cherry Valley Intersection Improvement (PID 80704) Project for the Ohio Department of Transportation. The majority of the project area is within a mixture of commercial development, residential neighborhoods, floodplains, woods, and graded areas. A portion of the project area is along Raccoon Creek and within the current project's APE. The Phase Ib archeological survey focused on testing locations which were determined to not be disturbed, which was performed after a disturbance assessment was completed. Field methods included surface/visual inspection, STPs, and shovel probe excavations. Shovel probe excavations were to document disturbance and therefore soil was not screened. Survey located 27 previously unrecorded archeological sites, but none were located in the current project's APE. It was recommended that one site warranted Phase II investigations if it could not be avoided. The other 26 sites were deemed ineligible for the National Register of Historic Places (Weller 2010, i-ii).

2.9 AIR QUALITY

The U.S. Environmental Protection Agency (USEPA) is required to set air quality standards for pollutants considered harmful to public health and welfare. The Primary National Ambient Air Quality Standards (NAAQS) set limits to protect public health, including the health and sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, and prevention of damage to animals, crops, vegetation, and buildings. These standards have been established for the following six pollutants, called criteria pollutants (as listed under Section 108 of the Clean Air Act (CAA)):

- Carbon monoxide (CO)

- Lead (Pb)
- Nitrogen dioxide (NO₂)
- Ozone (O₃)
- Particulate matter, classified by size as follows
 - An aerodynamic size less than or equal to 10 micrometers (PM 10)
 - An aerodynamic size less than or equal to 2.5 micrometers (PM 2.5) 1997 Standard
 - An aerodynamic size less than or equal to 2.5 micrometers (PM 2.5) 2006 Standard
- Sulfur Dioxide

According to the USEPA Licking County has been classified as marginal nonattainment of the 8-hour Ozone (2008) NAAQS for the whole county from 2012 to 2016. Previously Licking County was in nonattainment of the 8-hour Ozone (1997) standard (was revoked on April 6, 2015) from 2004 through 2008. Licking County was also in nonattainment of PM 2.5 (1997) from 2005 to 2012. All other pollutants are under the National Ambient Air Quality Standard levels.

2.10 NOISE

Noise is measured as Day Night average noise levels (DNL) in “A-weighted” decibels (dBA) most sensitive to the human ear. There are no Federal standards for allowable noise levels. According to the Department of Housing and Urban Development Guidelines, DNLs below 65 dBA are normally acceptable levels of exterior noise in residential areas. The Federal Aviation Administration (FAA) denotes a DNL above 65 dBA as the level of significant noise impact. Several other agencies, including the Federal Energy Regulatory Commission, use a DNL criterion of 55 dBA as the threshold for defining noise impacts in suburban and rural residential areas. According to Dr. Paul Schomer in his 2001 Whitepaper, while there are numerous thresholds for acceptable noise in residential areas, research suggests an area’s current noise environment, which has experienced noise in the past, may reasonably expect to tolerate a level of noise about 5 dBA higher than the general guidelines. The Corps Safety and Health Requirements Manual provides criteria for temporary permissible noise exposure levels (see Table 3), for consideration of hearing protection or the need to administer sound reduction controls. Ambient noise around the project area is representative of a mixed commercial and residential.

Table 3: Permissible Non-Department of Defense Noise Exposures

| Duration/day (hours) | Noise level (dBA) |
|----------------------|-------------------|
| 8 | 90 |
| 6 | 92 |
| 4 | 95 |
| 3 | 97 |
| 2 | 100 |
| 1.5 | 102 |
| 1 | 105 |

2.11 HAZARDOUS AND TOXIC SUBSTANCES

On March 30, 2016 a site visit was made to the Newark, OH Section 14 Streambank Project site, located in Newark, OH. The streambank, both left and right descending banks, appeared to be neatly maintained. Other than a minor, occasional instance of discarded materials, no Hazardous, Toxic, and Radioactive Waste (HTRW) issues were observed during the site visit. The following were noted (additional information in Appendix B):

- Two minor instances of miscellaneous items appear to be discarded along left descending bank.
- Several stormwater drainage pipes.
- Existing stilling basin and sheet piling.

In addition, mapping was obtained for the project area and a review of reasonably ascertainable standard historical sources was performed as part of this investigation. The purpose of this historical record search is to determine the past uses of the project area. Aerial photographs and the U.S. Geological Survey (USGS) 7.5-minute historical topographic maps showing the project area were available and reviewed. The topographic maps and aerial photos did not indicate any past or present activities which would cause HTRW concerns within the project area.

A regulatory record search by Environmental Data Resources, Inc., a commercial database retrieval company, indicated a total of nine sites mapped in the search area. The search of environmental database records was based on a one-mile radius search area surrounding the site, and found the following:

- Six Leaking Underground Storage Tanks (LUST) sites that have been remediated with “No Further Action” status and are not anticipated to impact the project area;
- One Resource Conservation and Recovery Act (RCRA) Conditionally Exempt Small Quantity Generator – this site is in the immediate proximity of the project but it is not anticipated that it will be impacted by the project;
- Two Ohio Division of Environmental Response and Revitalization (DERR) sites, located approximately one mile from the project area. These sites are far enough from the project area that it is not anticipated that they will be impacted by the project.

Figure 8 is a map indicating the locations of the nine sites with the search area. Additional maps and locations of potential HTRW issues can be found in Appendix B.

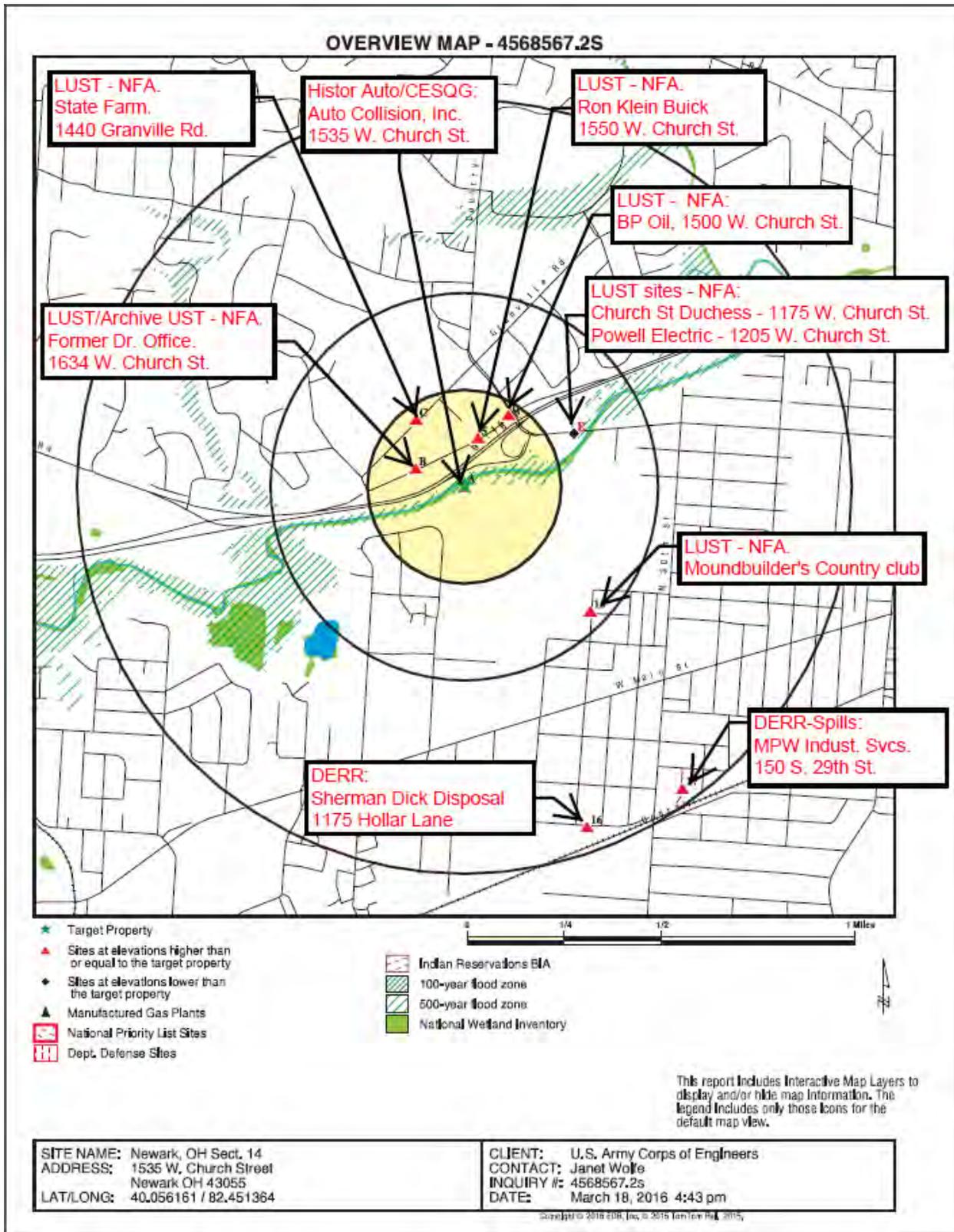


Figure 8 – Existing HTRW Sites near the Project Site

2.12 SOCIOECONOMIC AND ENVIRONMENTAL JUSTICE

2.12.1 EO 12898 Environmental Justice

Under EO 12898 “Federal Action to Address Environmental Justice in Minority Populations and Low Income Populations,” Federal agencies are directed to identify, address, and avoid disproportionately high and adverse human health or environmental effects on minority and low income populations. According to the U.S. Census Bureau, the City’s population has slightly increased since 2010. As of 2015, the City’s population was 47,986, up approximately 1% since 2010. Approximately 93% of the population is white and does not contain significant minority populations. The median household income is \$36,679 compared with \$48,849 for the State of Ohio. Individuals residing in the City below the poverty level are at 22.1% compared to 14.8% statewide.

2.12.2 EO 13045 Protection of Children

EO 13045 “Protection of Children from Environmental Health Risks and Safety Risks” was issued in 1997. This order applies to economically significant rules under EO 12866 “Regulatory Planning and Review” that concerns an environmental health or safety risk that USEPA has reason to believe may disproportionately affect children. Environmental health risks or safety risks refer to risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breathe, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to). When promulgating a rule of this description, USEPA must evaluate the effects of the planned regulation on children and explain why the regulation is preferable to potentially effective and reasonably feasible alternatives.

2.13 TRANSPORTATION AND TRAFFIC

The project area is located along both sides of Raccoon Creek and could be accessed from the Church Street exit ramp or the adjacent Moundbuilders Country Club golf course. SR 16 is the primary corridor through eastern central Ohio. SR 16 is the main transportation route through the City of Newark and between eastern Ohio communities and Columbus, Ohio.

2.14 HEALTH AND SAFETY

The current failing stream grade control structure and receding stream banks are a potential safety hazard. Continued failure could impact water quality and aquatic resources within Raccoon Creek. The current failing stream grade control structures and erosion of the stream bank are threatening the integrity of SR 16, the Church Street exit ramp, and adjacent utilities.

3 PLAN FORMULATION

3.1 PROBLEMS AND OPPORTUNITIES

SR 16, located adjacent to the subject reach of Raccoon Creek is a significant transportation route through and within the City of Newark. A sheet pile grade control structure in the project area along Raccoon Creek has partially overturned due to flood flow erosion resulting in the immediate endangerment of critical public facilities, including utility line crossings and the adjacent SR 16 travel way. Flood flow erosion and recessional failures caused displacement of limited bank protection, which subsequently resulted in downstream scour and the formation and enlargement of a stilling feature.

Approximately 1,420 LF of eroded streambank (710 LF along each bank) is located within the project area. Huntington District has monitored flood flow erosion and recessional failure site conditions resulting in downstream scour, overturning of the sheet pile grade control structure, and displacement of adjacent bank protection. Without treatment, flood flow scour would continue and would likely eventually result in further collapse of the grade control structure. Raccoon Creek channel incisement and widening would then likely progress upstream and expose and breach utility crossings and the adjacent SR 16 travel way and off-ramp. Failure to protect these utilities and road system would result in adverse impacts affecting public health, including loss of water, sewer, and gas lines. The area affected by flood flow erosion and related structure and bank failures would degrade a significant source of potable water for the City. Bank erosion and failures would result in loss of access to numerous manufacturing facilities and warehouses as a result of SR 16 and the Church Street off-ramp collapsing. As a result, the primary purpose of this study is to develop a viable treatment solution for the protection of SR 16 and adjacent public utilities serving the City of Newark.

3.2 OBJECTIVES AND CONSTRAINTS

3.2.1 Planning Objectives

The planning process for this project seeks to identify interrelated causative processes which resulted in failure of the sheet pile grade control structure, the sections of streambank in immediate need for treatment, and to develop a viable treatment solution for the protection of SR 16, public utilities, and public health and safety.

3.2.2 Planning Constraints

The study being conducted will recommend the most cost effective and environmentally acceptable solution for stabilizing the sheet pile grade control structure and the adjacent banks of Raccoon Creek at the threatened reach of SR 16 and the Church Street off ramp. Challenges associated with this study would include determining causative processes and the optimal method for construction of the recommended plan including but not limited to appropriate site access and reducing the construction footprint to the greatest extent practical in order to minimize impacts. Due to the extent of the project area and its location adjacent to Raccoon Creek, coordination with multiple agencies is necessary for the completion of all required local, state, and Federal regulations including but not limited to: USFWS, Ohio History Connection (OHC), and Ohio Environmental Protection Agency (OEPA).

In the Ohio Mussel Survey Protocol, the Raccoon Creek is listed as Category 1 stream and a mussel reconnaissance survey was required for the project area. A mussel reconnaissance survey was completed in September 2016 and draft report was sent to USACE for review. Once the report is finalized by the mussel reconnaissance contractor, USACE will place resulting information into the EA prior to finalization and signing of the Finding of No Significant Impact (FONSI). The mussel reconnaissance survey results will require additional coordination with both USFWS and ODNR and the project is not expected to incur additional costs based on the mussel reconnaissance survey results.

Coordination is also critical to determine whether any additional effort is needed to complete obligations required under Section 106 of the National Historic Preservation Act with the OHC and Advisory Council of Historic Preservation (ACHP). Section 106 coordination was initiated with the Ohio State Historic Preservation Office (OHPO) on 14 March 2016. On 11 April 2016, the District received a consultation letter regarding the undertaking and they recommended that we initiate consultation with

the Advisory Council on Historic Preservation, and the National Park Service. In addition, they also asked that we coordinate with the Ohio History Connection, multiple Native American Tribes, and members of the public. The District is preparing a Criteria of Adverse Effect Report, in accordance with 36 CFR Part 800 .5(a)(1) to assess how this undertaking may alter, directly or indirectly any characteristics that qualify it property of inclusion on the National Register of Historic Places. The District will propose a finding of no adverse effect on historic properties. After continued internal discussions with our Engineering Section, the Construction Work Limits for the undertaking was modified from its original to minimize staging areas and avoiding ground disturbing activities in areas which overlap with the northeastern portion of the Newark Earthwork, listed as a National Historic Landmark. Should the OHC require a more detailed site specific analysis, the project could incur additional cost and delays.

Furthermore, an individual 401 Water Quality Certification from the State of Ohio, Ohio Environmental Protection Agency (OEPA) will be required for this project. The 401 permit will be obtained prior to the start of construction. Issuance of a 401 could potentially delay construction of the project as the USACE Huntington District would not complete the 401 application process until construction funding is allocated for this project. A supplement to this EA will be developed if deemed necessary based on coordination with OEPA.

The main driver for the timing of when the permits and surveys will be completed is due to the limited funding in the feasibility phase. Some portions of the environmental study will be pushed to the design and implementation phase due to the availability of additional funding. Huntington District is aware of the schedule and cost issues that could occur as a result of deferring environmental studies, such as 401 certification. USACE is willing to accept these risks in order to complete the feasibility phase with the limited funds.

3.3 MOST PROBABLE FUTURE WITHOUT PROJECT CONDITIONS (No Action Alternative)

Without stabilization of the failing sheet pile grade control structure and adjacent streambank, there would continue to be erosion and wall failure due to flood events along the creek. Continued erosion and bank failure would eventually lead to the breaching of SR 16 and the Church Street exit ramp. Public utilities which serve the City would also be exposed and breached without project implementation.

This region is projected to receive more precipitation within the watershed system at a higher frequency as described in the July 2015 Ohio River Basin Climate Change Impacts and Adaptation Draft Pilot Study. In this study, a Muskingum River gage at the Village of McConnelsville was identified and used as the optimum forecast point to assess future climate change impacts. Historic data from that gage was included in the base flow analysis and future flow projections were produced for that gage point as well to determine more precipitation in the watershed is projected to occur.

Future without project conditions may include continued flood flow erosion, sheet pile grade control collapse with additional launching of stone slope protection, and exposure and breaching of utilities along with eastbound SR 16 travel lanes and Church Street off-ramp. This immediate endangerment condition will continue with or without the City's continuing implementation of emergency concrete rubble placement along the banks and within the channel scour feature.

3.4 Measures to Achieve Planning Objectives

3.4.1 Preliminary Structural and Non-Structural Measures

3.4.1.1 Structural Measures

Four structural measures were considered throughout alternative formulation to address failure of the sheet pile grade control structure and streambank erosion threatening SR 16 and adjacent public utilities through the City. These structural measures include the following:

Stone Channel Protection – Installation of this measure would require placement of stone along both sides of the channel for protection and stabilization. This measure alone is not a complete plan and would require additional measures.

Sheet Pile Wall Grade Control with Backfilling – Requirements for the construction of this measure would include placing a sheet pile wall grade control structure upstream of the existing sheet pile wall and backfilling the area between the existing and proposed structure with grouted stone. This measure alone is not a complete plan and would require additional measures.

H-Pile and Lagging Wall Grade Control with Backfilling – This measure uses steel H-Pile with adjoined lagging wall and then back fills to the existing grade control structure for support and stability. This measure alone is not a complete plan and would require additional measures.

Pre-fabricated Reinforced Concrete Grade Control Structure – This measure includes a pre-fabricated concrete grade control structure to be placed downstream of the current failing grade control structure in Raccoon Creek. This measure would have seepage control components as well. This measure alone is not a complete plan and would require additional measures.

3.4.1.2 Non-structural Measures

Two non-structural measures were considered throughout alternative formulation to address streambank erosion impacting SR 16. These non-structural measures include the following:

Vegetative Stabilization – Installation of this measure would rely on stabilization through vegetative treatments. Vegetative stabilization would not be effective at this site due to continuing bank erosion and recession along with the failing grade control structure in the stream. This measure alone is not a complete plan and would require additional measures.

Relocation – Implementation of this measure includes relocating SR 16, the Church Street off-ramp, trail system, relocation of adjacent utilities, and property acquisition. This measure alone could be a complete plan and would not require additional measures.

3.4.2 Excluded Measures

All measures were moved forward as basis for alternative development. Measures were combined to form different alternatives for the project.

3.5 FORMULATION AND COMPARISON OF ALTERNATIVE SOLUTION SETS

3.5.1 Alternative Plan Descriptions

In order to address flood flow-related erosion and failure endangering SR 16 and the off-ramp together with adjacent public utilities along Raccoon Creek, various alternative measures ranging from highway and utility relocation to in-channel grade control structures and slope protection placements were formulated. During the development of the Federal Interest Determination, five alternative plans beyond No Action (Future Without Project) were considered on a conceptual level. Economic and financial data concerning these alternative plans are presented in Table 4. The No Action and five Alternative Plans (Alternative Plan A through Alternative Plan E) are discussed below.

Alternative Plan A (Sheet Pile Wall Grade Control with Backfilling and Stone Channel Protection):

Alternative A includes placing a downstream stone stability berm and sheet pile grade control structure upstream of the existing sheet pile together with backfilling the area between the existing and proposed structures with grouted stone. Alternative A also includes placing a sheet pile extension downstream of the left abutment, armoring the existing stilling feature, and stone slope protection. The total project cost of Alternative A at a conceptual level is estimated to be \$2,653,000.

Alternative Plan B (H-Pile and Lagging Wall Grade Control with Backfilling and Stone Channel Protection):

Alternative B is similar to Alternative A. However, Alternative B makes use of an H-pile and lagging wall system rather than a sheet pile wall grade control structure. The total project cost of Alternative B at a conceptual level is estimated to be \$3,100,000.

Alternative Plan C (Pre-fabricated Reinforced Concrete Grade Control Structure and Stone Channel Protection):

Alternative Plan C is similar to Alternative A and B. However, Alternative C makes use of a pre-fabricated, reinforced concrete grade control structure with seepage control, and discharge dissipation components together with the removal of the failed sheet pile structure. The total project cost of Alternative C at a conceptual level is estimated to be \$4,100,000.

Alternative Plan D (Vegetative Stabilization and Structural Grade Control): Alternative D includes stabilizing the banks with vegetative treatments and placement of a structural grade control. Cost of construction for these vegetative treatments and limited stone placement at a conceptual level is estimated to be \$2,900,000. Since vegetative treatments are not sufficient stabilization features at this site, Alternative D would also include grade control structure, downstream stone berm, and stilling basin armoring features mentioned in Alternative A. Bank excavation to stable geometries, which are required for vegetative slope reinforcement, would necessitate the relocation of SR 16 and the off-ramp. The total project cost of Alternative D at a conceptual level is estimated to be \$3,640,000.

Alternative Plan E (Relocation): Alternative Plan E includes relocating SR 16 together with bridge replacements, the Church Street off-ramp, and adjacent utilities, reconstructing cross-drains, and acquiring necessary property. The total project cost of Alternative E at a conceptual level is estimated to be \$9,900,000.

No Action Alternative (NAA): The 'No Action' alternative would result in continued bed and bank erosion and failures, as observed during and after recent events, due to Raccoon Creek flood flows,

leading to the total collapse of the sheet pile grade control structure and breaching of utilities and the SR 16 travel way and off-ramp. Bank erosion and failures would adversely impact the public health, including loss of a potable water line and sewer line. Impacts would also include the loss of access to numerous manufacturing facilities, warehouses, and adjacent urban areas as a result of SR 16 and off-ramp breaching.

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3.5.2 Comparison of Alternative Plans

Table 4: Comparison of Alternative Plans

| Criteria | Alternative Plan A (Sheet Pile Wall Grade Control with Backfilling and Stone Channel Protection) | Alternative Plan B (H-Pile and Lagging Wall Grade Control with Backfilling and Stone Channel Protection) | Alternative Plan C (Pre-fabricated Reinforced Concrete Grade Control Structure and Stone Channel Protection) | Alternative Plan D (Vegetative Stabilization and Structural Grade Control) | Alternative Plan E (Relocation) |
|-------------------------|--|---|--|---|---|
| Cost (\$Million) | 2.653 | 3.1 | 4.1 | 3.64 | 9.9 |
| Constructability | YES Stone stability berm, sheet pile grade control structure upstream of existing structure with backfilling, sheet pile extension of left abutment, and stone slope protection | YES Stone stability berm, H-pile and Lagging Wall grade control structure upstream of existing structure with backfilling, sheet pile extension of left abutment, and stone slope protection | YES Stone stability berm, Pre-fabricated reinforced concrete grade control structure with seepage components upstream of existing structure with backfilling, sheet pile extension of left abutment, and stone slope protection | YES Stabilization of banks with vegetative treatments and placement of a structural grade control, downstream stone berm, and stilling basin armoring features | YES Relocation of SR 16 with bridge replacements, the Church Street off-ramp, and adjacent utilities, reconstruction of cross-drains, and property acquisition |
| Environmental | YES Potential aquatic and cultural impacts. | YES Potential aquatic and cultural impacts. | YES Potential aquatic and cultural impacts. | YES Potential aquatic and cultural impacts. | YES Potentially significant impacts to the human and terrestrial environment, including cultural impacts. |
| Effectiveness | YES Reduces risk with potential aquatic and cultural impacts | YES Reduces risk with potential aquatic and cultural impacts | YES Reduces risk with potential aquatic and cultural impacts | YES Reduces risk with potential aquatic and cultural impacts | YES Reduces risk with potential aquatic and cultural impacts |
| Efficiency | YES Most cost effective plan | NO | NO | NO | NO |
| Acceptability | YES | YES | YES | YES | YES |
| Completeness | YES | YES | YES | YES | YES |

Alternative Plans A, B, C, D, E, and the NAA were compared and evaluated relative to cost, constructability, environmental acceptability, effectiveness, efficiency, acceptability, and completeness. Alternative Plans B, C, D, and E have been excluded from further consideration. Table 4 was prepared to show the comparison of Alternative Plans. Alternative Plan A and the NAA have been moved on to the final array of plans for this project. Huntington District has successfully implemented sheet pile wall grade control structures with backfilling treatments similar to Alternative Plan A at previous streambank protection projects in the Newark area. The full cost breakdown for Alternative Plan A is included in Appendix C. Alternative Plan A, the Recommended Plan, is the Least Cost Alternative Plan.

3.5.3 Excluded Plans

Four of the initial plans, Alternative Plans B, C, D, and E, have been eliminated from further consideration.

Alternative Plan B has been eliminated due to cost and constructability due to problematic conditions resulting from incremental placement of lagging through recently deposited alluvium and consequential localized under seepage and erosion.

Alternative Plan C has been eliminated due to cost and constructability due to problematic conditions that would occur as a consequence of incremental placement which would result in increased velocities and outflanking.

Alternative Plan D has been eliminated due to cost. This alternative is neither cost justified nor feasible, since frequent flood stage related velocities and periods of inundation would result in extensive erosion and dieback of brush layering, wattles, and live stake vegetative components.

Alternative Plan E has been eliminated due to cost and environmental concerns. The environmental concerns would include potentially significant impacts to the human and terrestrial environment, which include but are not limited to potential impacts on significant cultural sites.

3.5.4 Risk and Uncertainty

This study was undertaken using Risk Informed Decision Making to insure study, implementation, and project outcome risks were taken into account when formulating plans, selecting a plan for implementation, and during feasibility level design efforts. A discussion of risk and uncertainty allows the Project Delivery Team (PDT) and project sponsors to access risks likely to be encountered as well as the consequences which could result from actions taken (or not taken) and items considered (or not considered) during each stage of the project. The risk and uncertainties for this project were developed using an Abbreviated Cost and Schedule Risk Analysis (CSRA). The analysis identified the 80% confidence level project cost and schedule duration. The risks and uncertainties for this project have been summarized in a Cost engineering Abbreviated CSRA table which can be found in Appendix C.

The Huntington District is currently in coordination with multiple resources agencies regarding various resources that maybe be affected by the project directly or indirectly. USACE is willing to move forward with the known risks and has plans to mitigate for them as the project develops. USACE will disclose that

a revised or supplemental EA may need to be prepared or that the information will be included and addressed in a Final EA and FONSI for the below risks if deemed necessary.

- Additional coordination with NRCS is required in order to determine whether the Recommended Plan or NAA would impact Prime, Statewide, or Locally Important Farmlands.
- Additional coordination will be conducted during the public review period in order to receive the necessary information and conditions of the 401 WQC for the project.
- The mussel reconnaissance survey results will require additional coordination with both USFWS and ODNR and the project is not expected to incur additional costs based on reconnaissance survey results.
- The Huntington District has identified the potential impacts to cultural resources. The District will propose a finding of no adverse effect on historic properties. Planning has worked with our Engineering Branch to identify methods to minimize staging areas and avoiding ground disturbing activities in areas which overlap with the northeastern portion of the Newark Earthwork, listed as a National Historic Landmark.

Section 106 coordination was initiated with the Ohio State Historic Preservation Office (OHPO) on 14 March 2016. On 11 April 2016, the District received a consultation letter regarding the undertaking and they recommended that we initiate consultation with the Advisory Council on Historic Preservation, and the National Park Service. In addition, they also asked that we coordinate with the Ohio History Connection, multiple Native American Tribes, and members of the public. The District is preparing a Criteria of Adverse Effect Report, in accordance with 36 CFR Part 800 .5(a)(1) to assess how this undertaking may alter, directly or indirectly any characteristics that qualify it property of inclusion on the National Register of Historic Places.

3.6 RECOMMENDED PLAN

Alternative Plan A (Sheet Pile Wall Grade Control with Backfilling and Stone Channel Protection) is the most cost effective plan and is the Recommended Plan.

3.6.1 Recommended Plan Description

Alternative Plan A has been chosen as the Recommended Plan. The water surface elevations upstream and downstream of the new grade control buttress were calculated and found to only increase the water surface profiles along Raccoon Creek by approximately 0.2 feet for a 1% chance exceedance flood event. Requirements for the construction of the recommended plan would include the placement of a stone stability berm downstream of the existing grade control structure, installation of a sheet pile wall grade control to a depth of approximately 40 feet and upstream of the existing structure, which has been outflanked and partially overturned due to flood flow erosion and scour. Grouted stone would be placed between the existing and proposed sheet pile structures. A sheet pile treatment along the left abutment would be required in conjunction with the placement of graded stone to armor the existing stilling feature. Stone will be placed as channel bed protection for approximately 180 feet downstream of the grade control and includes 36 inch and 24 inch top-size stone, decreasing in size downchannel. Placement of 24 inch top-size graded stone slope protection overlying existing stone and rubble along both banks of a 710 LF reach of Raccoon Creek would be required for the proposed project. The recommended plan is the least costly stabilization option evaluated at this time and is more cost

effective than relocating the endangered portion of SR 16 within the City of Newark and the adjacent public utilities. The total project cost is estimated to be \$2,653,000. Appendix A includes treatment plan, work limits, extents and typical cross-sections.

3.6.2 Estimated Project Costs and Schedule

A cost estimate for the Recommended Plan has been prepared to an equivalent price level of 1 April 2018 and is summarized below in Table 5.

Table 5 – Estimated Economic Costs for Recommended Plan

| | |
|---|------------------|
| Recommended Plan (Alternative Plan A) | |
| Annual Project Cost based upon (\$2,700,000 project cost at 3.125 % for 50 year project life) | \$105,571 |
| Annual Operations & Maintenance (O&M) Cost | \$5,000 |
| Total Annual Economic Cost | \$110,571 |
| Relocation Alternative | |
| Annual Project Cost based upon (\$9,900,000 project cost at 3.125% for 50 year project life) | \$393,950 |
| Annual O&M Cost | \$0 |
| Total Annual Economic Cost | \$393,950 |

ECONOMIC JUSTIFICATION FOR SELECTED ALTERNATIVE

The benefits for the project are the lesser of:

The least cost relocation alternative; or

The value of the infrastructure benefits forgone if no corrective action is taken.

The benefit-cost ratio (BCR) of the protection alternative is based on the comparison of the annual cost of the Relocation Alternative with the annual cost of the Preferred Alternative.

$$\text{BCR} = \frac{\text{Annual Economic Cost of Relocation Alternative}}{\text{Annual Economic Cost of Preferred Alternative}}$$

$$\text{BCR} = \frac{\$393,950}{\$110,571}$$

$$\text{BCR} = 3.56$$

The schedule is currently being developed with a target date of executing a Project Partnership Agreement (PPA) in May 2019. This exceeds the timeline of the CAP SOP due to funding availability to begin the design and implementation phase. The following tables include the Federal and non-Federal apportionment of the estimated total project costs and the key milestones for the project.

Table 6 – Estimated Project Costs and Apportionment

| Feasibility Phase* | FY2016 | FY2017 | FY2018 | FY2019 | Totals |
|---|---------------|---------------|---------------|---------------|---------------|
| Federal Share | \$ 54,281 | \$ 55,719 | | | \$ 110,000 |
| Non-Federal Share | | \$ 10,000 | | | \$ 10,000 |
| Total Study Cost | \$ 54,281 | \$ 65,719 | \$ - | \$ - | \$ 120,000 |
| Design & Implementation Phase | | | | | |
| Design Documentation, Plans & Specifications | | | \$ 465,000 | | \$ 465,000 |
| Construction | | | | \$ 2,125,000 | \$ 2,125,000 |
| LERRDs | | | | \$ 63,000 | \$ 63,000 |
| Monitoring** | | | | | \$ - |
| Total Project Costs | \$ - | \$ - | \$ 465,000 | \$ 2,188,000 | \$ 2,653,000 |
| Federal/non-Federal Share of Total Project Costs | | | | | |
| Federal Share | \$ - | \$ - | \$ 302,250 | \$ 1,422,200 | \$ 1,724,450 |
| Non-Federal Share | \$ - | \$ - | \$ 162,750 | \$ 765,800 | \$ 928,550 |
| Non-Federal cash | \$ - | \$ - | \$ 162,750 | \$ 702,800 | \$ 865,550 |
| non-Federal Work In-Kind | | | | | \$ - |
| non-Federal LERRDs | \$ - | \$ - | \$ - | \$ 63,000 | \$ 63,000 |

* First \$100K of Feasibility Phase Costs are full Federal, with additional costs split 50/50 for all CAP Sections except 204, which is 100% full Federal.

**Monitoring Costs (only applicable to CAP Sections 206 and 1135 and GLFER Section 506)

Table 7 – Key Project Milestones

| Milestone | Scheduled | Actual |
|---|------------------|---------------|
| Initiate Feasibility Phase | 10/8/2015 | 10/8/2015 |
| Submit Federal Interest Determination Report | 2/5/2016 | 2/5/2016 |
| MSC Approved FID report | 2/17/2016 | 2/17/2016 |
| Execute Feasibility Cost Share Agreement | 8/1/2017 | |
| Submit MDM Draft DPR | 4/6/2017 | |
| MSC Approved MDM Draft DPR | 6/20/2017 | |
| Submit draft Final DPR | 8/21/2017 | |
| MSC Approved Decision Document | 11/3/2017 | |
| Project Approval - Initiate D&I phase | 5/28/2019 | |
| Fully Executed PPA | 5/24/2019 | |
| RE Certification | 8/29/2019 | |
| ATR Certified Construction Plans and Specifications | 8/29/2019 | |
| Construction Contract Award | 11/19/2019 | |
| Construction Complete | 4/20/2020 | |
| Project Closeout | 8/12/2020 | |

3.6.3 Non-Federal Sponsor(s) Responsibilities

The City of Newark and the ODOT are the non-Federal and are responsible for 35 percent of the project costs. Up to 50 percent of the non-Federal share of project implementation costs can be provided as in-kind services. Operation and maintenance of those projects is a non-Federal responsibility. This section describes the primary non-Federal Sponsor responsibilities in conjunction with the Federal Government to implement the recommended plan.

The Feasibility Study and plans and specifications costs shall be included as part of the total project costs to be shared 65 percent Federal and 35 percent non-Federal. The non-Federal Sponsor shall:

- Provide all lands, easements, rights-of-way, relocations and disposal areas.
- Provide, during construction, any additional costs as necessary to make the total non-Federal contributions equal to 35 percent of the total project costs. The sponsor will provide work in kind during final design and construction as well as providing the post-construction monitoring. The non-Federal share is estimated at \$928,550. The value of the LERRDs needed for the project will be deducted from this amount.
- Operate, maintain, repair, replace, and rehabilitate the completed project or functional portion of the completed project at no cost to the Federal Government, in accordance with the applicable Federal and State laws and any specific directions prescribed by the Federal Government for so long as the project is authorized.
- Hold and save the Federal Government harmless from damages due to the construction and operation and maintenance of the project, except where such damages are due to the fault or negligence of the Federal Government or its contractors.
- Grant the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon land which the non-Federal Sponsor owns or controls for access to the project for the purpose of inspection, and, if necessary, for the purposes of completing, operating, maintaining, repairing, replacing, or rehabilitating the project.
- Keep and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project to the extent and in such detail as will properly reflect total project costs for a minimum of three years after completion of the project construction for which such books, records, documents, and other evidence are required.
- Perform, or cause to be performed, any investigations for hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601-9675, that may exist in, on, or under lands, easements, or rights-of-way necessary for construction, operation, and maintenance of the project; except that the non-Federal Sponsor shall not perform such investigations on lands, easements, or rights-of-way that the Federal Government determines to be subject to the navigation servitude without prior specific written direction by the Federal Government.

- Assume complete financial responsibility for all necessary cleanup and response costs of any CERCLA-regulated materials located in, on, or under lands, easements, or rights-of-way that the Federal Government determines are necessary for construction, operation, and maintenance of the project.
- Agree that, as between the Federal Government and the non-Federal Sponsor, the non-Federal Sponsor shall be the operator of the project for the purpose of CERCLA liability, and to the maximum extent practicable, operate, maintain, repair, replace, and rehabilitate the project in a manner that will not cause liability to arise under CERCLA.
- Prevent obstructions of, or encroachments on, the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) that might reduce the streambank restoration, hinder its operation and maintenance, or interfere with the proper function such as any new development on project lands or the addition of facilities that would degrade the benefits of the project.
- Not use Federal funds to meet the non-Federal Sponsor's share of total project costs unless the Federal granting agency verifies in writing that the expenditure of such funds is authorized.

4 ENVIRONMENTAL EFFECTS OF RECOMMENDED PLAN

4.1 CLIMATE PREPAREDNESS AND RESILIENCE

The Recommended Plan would not involve any activity that could affect the environment in regard to climate change. The region is not projected to experience severe drought conditions and is instead expected to experience more precipitation in the future. As a result, the Recommended Plan would likely be beneficial in future climate change conditions by protecting the project area from further erosion caused by increased precipitation. Therefore the action would not be a negative contributing factor to climate change and the project as designed would be robust to withstand projected climate change events. For the same reasons, there would be impacts expected with respect to climate and increased erosion as a result of the NAA.

4.2 SOILS

Previously referenced bank and bed alluvium and fluvial glacial outwash soils would be stabilized against flood flow-related erosion as a result of construction of the Recommended Plan. The sheet pile grade control will preclude additional flood flow bed scour and head cut progression together with erosional undercutting and recessional bank and stone slope protection displacement. This interruption of flood-related erosion and failure processes would stabilize the channel and protect the utilities, SR 16 eastbound lanes, and off-ramp. Bed and bank soils, which are subject to flood flow erosion and recession from high water events and subsequent rework and transport within the channel, would be stabilized. Channel bed degradation together with extensive slope failures would be addressed by the sheet pile grade control and abutment structures and stone placement. Soils in the project area include recently deposited silty fine sand alluvium underlain by interlensing and layered sandy silt, sandy gravel, gravel, and cobble deposits, which are susceptible to flood flow erosion and recessional failures together with subsequent piping-related collapse, tension crack development, and cleft pressure displacement of soil blocks. Without treatment (No Action Alternative), these flood-related erosion and

failure processes would continue and result in channel bed scour, bank collapse, and breaching of utilities, SR 16, and the Church Street off-ramp. Additionally, down channel lag accumulations of boulder, rubble, and stone would otherwise block reaches of the Raccoon Creek channel and result in extensive damage to adjacent frontage roads, utilities, and structures. Therefore, the Recommended Plan would have a positive impact on soils in the project area as compared to the NAA.

Under the NAA, soils will continue to be susceptible to flood flows and recessional related piping and internal erosion. Upon recession from high water events, the creek falls more rapidly than fill can drain, resulting in slope failures. Continued flood flow internal erosion and scour would result in the undermining of the slope and would cause additional slope failures. Some small stabilization projects would most likely be undertaken by the City or other entities to repair unstable reaches if this project would not occur. However, under the NAA the project would remain subject to continued erosion as efforts undertaken by the City would be small in scope and not permanent solutions. Without treatment, the erosion and failure processes would continue and result in loss of SR 16 and the Church Street off ramp.

4.2.1 Prime and Unique Farmland

The Farmland Protection Policy Act (FPPA) requires Federal agencies to minimize the conversion of prime and unique farmland to non-agricultural uses. The project area is located along the descending banks of the Licking River and the proposed treatment would occur in previously disturbed areas. An initial coordination letter was sent to NRCS, Newark Service Center in March 2016 regarding the Farmland Protection Policy Act and no response was received at this time. Additional coordination will be conducted during the public review period in order to receive the necessary information in order to determine whether the Recommended Plan would impact Prime, Statewide, or Locally Important Farmlands in the project area. The resulting information will be placed in the Final EA and FONSI prior to the signing of the FONSI. A supplement to this EA will be developed if deemed necessary based on coordination with NRCS.

Additional coordination with NRCS is required in order to determine whether the Recommended Plan or NAA would impact Prime, Statewide, or Locally Important Farmlands.

4.3 HYDRAULIC ANALYSIS

Stone requirements for streambank protection in the project area were determined based on the criteria and procedures outlined in EM 1110-2-1601, dated 1 July 1991. The average local velocity for the 1% chance exceedance discharge was computed to be 9.00 feet per second at the toe of the protected slope. Based on the computed velocity and the procedures outlined in the aforementioned reference, the analysis indicates that a minimum stone thickness of 15.5 inches is required to ensure the integrity of the bank against tractive force failure mechanisms. The water surface elevations upstream and downstream of the new grade control stabilization buttress were calculated and found to only increase the water surface profiles along Raccoon Creek by approximately 0.2 foot for a 1% chance exceedance flood event. Since the stilling feature will be subject to turbulent flow and secondary currents, armoring of this feature and the sheet pile buttress will require 36 inch top-size stone protection.

4.4 SURFACE WATERS AND OTHER AQUATIC RESOURCES

4.4.1 Surface Water

The Recommended Plan would reduce local siltation caused by active erosion of the stream bank and bed in the project reach. Temporary impacts of construction and in water work would be minimized by following best management practices. Implementation of the Recommended Plan is expected to have a positive impact on water quality within the proposed project area as well as downstream as it will prevent further erosion of soils into the waterway.

Under the NAA, water quality would continue to be impaired due to uncontrolled soil erosion.

An initial coordination letter was sent to OEPA Division of Surface Water in March 2016 regarding the Section 401 of the Clean Water Act and no response was received at this time. Additional coordination will be conducted during the public review period in order to receive the necessary information and conditions of the 401 WQC for the project. USACE will disclose that a revised or supplemental EA may need to be prepared or that the information will be included and addressed in a Final EA and FONSI. A National Pollutant Discharge Elimination System (NPDES) permit is required for construction storm water management. A sediment and erosion control plan will be required and implementation of the erosion and sedimentation control plan during construction will occur. A 404(b) (1) analysis will be completed prior to the signing of a FONSI to show consideration of Section 404 of the Clean Water Act.

Implementation of the Recommended Plan is expected to have a positive impact on water quality within the proposed project area as it will prevent further erosion of soils into Raccoon Creek and waterways downstream. Under the NAA, water quality would continue to be impaired due to uncontrolled soil erosion even if small scale projects were undertaken together.

4.4.2 Groundwater

The Recommended Plan would allow for continued groundwater seepage from the streambank while preventing further erosion that may be caused by unrestricted groundwater flow. Therefore, the Recommended Plan would have no impact on groundwater in the project area.

Under the NAA, groundwater would continue to have potential to contribute to current erosional impacts.

4.4.3 Floodplains

Due to the failing bank and recommended emergency streambank protection project being located completely within the regulatory floodplain, there are no practicable alternatives that would be effective outside of the floodplain area. The Recommended Plan is designed in a manner that will not result in significant increased flood stages in the regulatory floodplains within the vicinity of the project area, as well as areas both upstream and downstream. The nature of this project does not result in incompatible use of the regulatory floodplain nor does it directly or indirectly encourage development of the floodplain. Therefore, the recommended plan meets the intent of EO 11988 and will not cause a negative impact to the regulatory floodway. Under the NAA, bank erosion would continue and floodway conveyance would increase with time.

4.4.4 Wetlands

The National Wetland Inventory Map indicated no wetlands are located in the project area. A site reconnaissance was conducted in the Fall 2015 and no wetlands are present within the project reach. No impacts to wetlands are anticipated as part of the Recommended Plan or the NAA.

4.5 WILDLIFE HABITATS

4.5.1 Terrestrial and Aquatic Vegetation

The Recommended Plan would involve removal of minimal vegetation and would occur primarily within the existing stone treatment. Limited herbaceous vegetation has volunteered between the existing stone. Due to the lack of diverse vegetation in the area of direct impact, terrestrial vegetation impacts of the Recommended Plan would be minor.

The NAA would allow for continued erosion and bank failure. If the City of Newark were to conduct some small stabilization projects to protect the public infrastructure, similar impacts to the terrestrial resources would occur. Therefore, terrestrial impacts of the NAA would be minor and insignificant.

Due to the lack of aquatic vegetation in the project area, the Recommended Plan and NAA would have no impacts.

4.5.2 Fauna

Current fauna onsite consists of species that are highly mobile and would be able to find alternative habitat adjacent to the project area. With no significant amount of wildlife in the project area, the Recommended Plan and NAA are not anticipated to have any impacts to fauna.

4.5.3 Existing Terrestrial and Aquatic Habitats

Existing terrestrial habitats would be minimally impacted during construction due to the removal of some vegetation. However, impacts to terrestrial habitats would be insignificant under the Recommended Plan as the site has a lack of diverse vegetation within the area of direct impact. The NAA would allow for continued erosion and bank failure. Some small stabilization projects would most likely be undertaken to repair unstable reaches. These efforts would have similar impacts to the terrestrial resources as the Recommended Plan. Therefore, terrestrial habitat impacts of the NAA would be minor. Bank erosion and failure is expected to continue within the project reach, further degrading terrestrial habitats within the project area.

For the Recommended Plan, aquatic habitats would be impacted during construction due to installation of the sheet pile wall and backfill material. An elevation in suspended sediments during construction would be expected but would subside following the completion of construction. Therefore, the negative impacts to aquatic resources for the Recommended Plan would be limited to the construction period and would be temporary in nature. Under the NAA, some small stabilization projects would most likely be undertaken to repair unstable reaches. These efforts would have similar impacts to the aquatic resources as the Recommended Plan, but would occur intermittently and for a shorter durations. Bank erosion failure is expected to continue within the project reach, further degrading aquatic habitats within the project area.

4.6 ENDANGERED AND THREATENED SPECIES

4.6.1 Federal

As previously referenced, there are three Federally listed threatened and endangered species found within Licking County, Ohio. The species include two bats – Indiana bat (*Myotis sodalis*) and Northern Long-Eared bat (*Myotis septentrionalis*) – and one reptile the Eastern Massasauga rattlesnake (*Sistrurus catenatus*). Licking County is also within range of the Bald Eagle, which is protected under the Bald and Golden Eagle Protection Act. An initial coordination letter sent to USFWS in March 2016 and an email response was received May 2, 2016. The email states that the USACE was requesting the project be reviewed in accordance with the Fish and Wildlife Coordination Act and Section 7 of the Endangered Species Act. The Service had no comments on the project at the time. USACE defers to USFWS as the expert concerning Threatened and Endangered Species Act and the Bald and Golden Eagle Protection Act. USFWS did not indicate that there were any threatened or endangered species or bald and golden eagle populations in the area. Surveys were not recommended for these species. Additional coordination with the USFWS will be completed during the public review period before the completion of the Final EA and the signing of the FONSI to close Section 7 consultation.

The Recommended Plan or NAA is not likely to adversely affect the Indiana bat, Northern long-eared bat, Eastern Massasauga rattlesnake, or the Bald Eagle. The USACE Huntington District has determined that the Recommended Plan will have no effect on Federally listed mussel species due to the lack of presence in Raccoon Creek, and no effect on the Indiana bat and Northern long-eared bat given there is limited vegetation and the area is previously disturbed. Section 7 consultation under the Endangered Species Act is on-going and will be completed prior to issuance of a FONSI. A supplement to this EA will be developed if deemed necessary based on coordination with USFWS.

The NAA would result in impacts to mussel or bat species if the wall was left destabilized and was allowed to collapse into the river covering up potential mussel beds and the loss of potential bat roost trees from bank erosion.

4.6.2 State

The ODNR Division of Wildlife has indicated that 35 state listed species could potentially be located within the project area including mussel species. Some species overlap with the Federally listed species. Coordination with ODNR can be found in Appendix B.

In the Ohio Mussel Survey Protocol, the Raccoon Creek is listed as Category 1 stream and requires a mussel reconnaissance survey in the project area. A Group 1 classification designates that Federally listed species are not expected in that waterbody. With the potential to impact state listed mussels species, the USACE conducted a mussel reconnaissance within the project limits to determine the presence or possible absence of these mussel species in the vicinity of the project area in September 2016. A mussel reconnaissance survey was completed in September 2016 and draft report was sent to USACE for review. Once the report is finalized by the mussel reconnaissance contractor, USACE will place resulting information into the EA prior to finalization and signing of the FONSI. The mussel reconnaissance survey results will require additional coordination with ODNR and the project is not expected to incur additional costs based on reconnaissance survey results.

4.6.3 Critical Habitat

According to the USFWS database, there is no critical habitat within the project area. Therefore, there will be no impacts to critical habitat under the Recommended Plan and NAA.

4.7 RECREATIONAL, SCENIC, AND AESTHETIC RESOURCES

Recreational use will be temporarily impacted under the Recommended Plan. During construction, the pedestrian pathways will be closed for safety reasons. These closures may last for the full duration of construction. There will be a temporary loss of recreational use during construction; however, the Licking County Trail System affords additional recreational pedestrian pathways through the City of Newark and neighboring towns that will give additional recreational opportunities during construction. Construction equipment and noise at the site may pose a temporary minor nuisance to some recreational activities including but not limited to: biking and walking. Therefore, recreational impacts would be minor and short-term but overall a positive effect to recreation. The Recommended Plan has no anticipated long-term significant impacts to recreational resources. In addition, the project is in compliance with EO 13045 “Protection of Children from Environmental Health Risks and Safety risks,” as there are no health or safety concerns affecting children.

The NAA would have potential significant negative impacts to recreation as the failure of the streambank would lead to inaccessibility of a portion of the Licking County Trail System. Should the City or another entity undertake small stabilization projects, this would also lead to interruptions in recreation, as well as a general decline in the quality of the recreational pathway.

Under the Recommended Plan, minimal vegetation within the project area would be removed. The new treatment will be visually different than the current treatment appearance and may create an aesthetic impact. The grade control structure will be stabilized and may be more aesthetically pleasing than the current failing structure. The proposed stone channel protection treatment would be consistent with current conditions immediately upstream and downstream of the site and would not be a significant decrease to the aesthetic quality of the site.

Under the NAA, viewers would have little change in aesthetics until flood flow erosion and failures compromise SR 16. Some small scale stabilization projects would occur under the NAA if the Recommended Plan was not implemented to repair unstable reaches. It is likely that these repair efforts would not be uniform in composition or placement and would most likely have an inconsistent appearance throughout the reach. This inconsistency in repairs could also decrease the aesthetic value of the area. Both the Recommended Plan and NAA introduce visual changes to the project area streambank. Compared to the NAA, the Recommended Plan would protect the grade control structure and streambank from further erosion and provide a more robust and complete solution to the streambank erosion. The small scale stabilization projects are not guaranteed permanent solutions and if the Recommended Plan is not implemented, eventually the streambank will erode and significantly impact aesthetic resources.

4.8 CULTURAL RESOURCES

In accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing language 36 CFR 800, the effects the proposed project would have on historic

properties were taken into account. The Archaeological Resource Protection Act (ARPA) of 1979 (PL 96-97), enhanced the permitting requirements stated in the Antiquities Act of 1906 and establishes that archeological resources on public lands are part of the Nation's heritage and should be preserved for the benefit of the American people. Unauthorized excavation, removal, damage, or alteration of any archeological resource on public lands is prohibited. The purpose and intent of the Native American Graves Protection and Repatriation Act (NAGPRA) (PL 101-601) is to acknowledge the ownership of certain human remains, funerary objects, and sacred artifacts by Native American tribes. This Act's implementing regulations are found in 43 CFR Part 10 and requires federal agencies and museums receiving federal fund to inventory collections of human remains and associated funerary objects.

The Newark Earthworks archaeological site is located approximate to the right descending bank of Raccoon Creek in the project area. Sheet pile structures, which are included in the proposed treatment, will be driven through recent deposited (1950-present) alluvium, then into Illinoian and Wisconsinan fluvial glacial outwash, which were deposited at least 15,000 years ago and had not been exposed until SR 16 construction and related channel relocation were completed. Stone slope protection will overlay existing stone and rubble along both banks of Raccoon Creek. The Earthworks site is referenced to the Hopewell culture, which would have been active during the period of 100 BC to 500 AD.

The Huntington District has identified the potential impacts to cultural resources. The District will propose a finding of no adverse effect on historic properties. Planning has worked with our Engineering Branch to identify methods to minimize staging areas and avoiding ground disturbing activities in areas which overlap with the northeastern portion of the Newark Earthwork, listed as a National Historic Landmark.

Section 106 coordination was initiated with the Ohio State Historic Preservation Office (OHPO) on 14 March 2016. On 11 April 2016, the District received a consultation letter regarding the undertaking and they recommended that we initiate consultation with the Advisory Council on Historic Preservation, and the National Park Service. In addition, they also asked that we coordinate with the Ohio History Connection, multiple Native American Tribes, and members of the public. Also pursuant to NEPA and Section 106 of the NHPA, all Federally recognized tribes with historic and/or cultural affiliation within the project boundaries will be contacted, provided an opportunity to comment, and invited to consult on the project. Tribes will receive a copy of this report and EA for review and comment during the public comment period. The District is preparing an effects determination, in accordance with 36 CFR Part 800 .5(a)(1) to assess how this undertaking may alter, directly or indirectly any characteristics that qualify it property of inclusion on the National Register of Historic Places. Section 106 of the NHPA consultation and tribal consultation is on-going and will be completed prior to issuance of a FONSI. A supplement to this EA will be developed if deemed necessary based on cultural resources coordination.

Under the NAA, similar effects would occur as such as those described for the Recommended Plan.

4.9 AIR QUALITY

Construction activities of the Recommended Plan would have the potential to cause localized temporary, nuisance air quality impacts which includes particulate emissions. Emission sources include diesel exhaust and fuel odors associated with operation of heavy equipment, engine emissions associated with construction and construction activities.

All construction would be performed in compliance with applicable control requirements established by OEPA Division of Air Pollution Control. Construction of the Recommended Plan may require the use of one or two cranes, an excavator, and end loader. The total estimated Ozone (O3) eight hour emission from this equipment is estimated to be 1.80 tons/year of NOx and 0.15 tons/year of VOC, and 0.11 tons/year PM 2.5 using 2008 emissions factors from the USEPA NONROAD model

Table 8: Estimated Air Quality Emissions from Construction

| Equipment | VOC tons/year | CO tons/year | NO_x tons/year | PM 10 tons/year | PM 2.5 tons/year | SO₂ tons/year |
|--|--------------------------|-------------------------|-------------------------------------|----------------------------|-----------------------------|-------------------------------------|
| Diesel Cranes | 0.04 | 0.14 | 0.56 | 0.03 | 0.03 | 0.01 |
| Diesel Cranes | 0.04 | 0.14 | 0.56 | 0.03 | 0.03 | 0.01 |
| Diesel Excavators | 0.04 | 0.20 | 0.52 | 0.04 | 0.03 | 0.01 |
| Diesel Loaders / Backhoes | 0.04 | 0.16 | 0.17 | 0.02 | 0.02 | 0.00 |
| Totals (tons/year) | 0.15 | 0.64 | 1.80 | 0.11 | 0.11 | 0.04 |

In areas that are in nonattainment, or re-designated in attainment with a maintenance plan, the CAA requires that the federal government make a conformity determination to assure their actions would conform to the State Implementation Plan. However because the estimated emissions from construction equipment would be far below the de minimis standards of 100 tons/year, a conformity determination is not required for the Recommended Plan. Therefore, the Recommended Plan will have no significant impacts to air quality.

Under the NAA, further erosion of the riverbank and endangerment of SR 16 and underlying utilities would eventually require repairs or relocation by the City as the streambank fails, leading to similar temporary elevations in emissions from construction equipment and would not have significant impacts to air quality.

4.10 NOISE

Construction of the proposed project would temporarily increase ambient noise levels due to the operation of construction equipment. The noise levels at the site would fluctuate depending on the types of equipment in use and the way the equipment is operated, therefore noise levels would be variable throughout the workday and project duration. Equipment to be used during project construction, including, but not limited to excavators and cranes would contribute to ambient noise in the area. Construction would be limited to daytime hours and would likely be unnoticeable in the project vicinity due to ambient noise from traffic on SR 16 and neighboring commercial businesses.

Noise exposure would occur when persons are entering/exiting residences or businesses, driving on SR 16, as well as recreating along the streambank including the nearby golf course or outside of nearby structures. During construction, segments of the recreational pedestrian pathways on the streambank will be temporarily closed for safety reasons, therefore persons recreating along the pathway will maintain a distance of 80 feet or more from any construction activities.

Noise generated from construction equipment (excavator and crane) to be utilized during construction range from 80 and 85 dBA, measured from a distance of 50 feet (Federal Highway Administration, 2006). The USACE Safety and Health Requirements Manual, indicate that temporary noise exposure for a period of eight hours at a level of 90 dBA is permissible for Non-Department of Defense Noise Exposures. Since individual noise receptors would be located more than 80 feet from the project construction area, the noise levels and the period of exposure would fall within acceptable limits and would not require additional sound reduction controls.

While the anticipated noise levels generated from construction would be below the level necessary to protect human health, they have the potential to be a nuisance and interfere with outdoor activities. However, given that the elevated noise levels would be short in duration for individual receptors, and no risk to hearing damage would be present, no significant impacts from the Recommended Plan would be expected.

The NAA would allow for continued erosion and bank failure. Some small temporary stabilization projects by the City would most likely be undertaken to repair unstable reaches. These efforts would have similar impacts as the Recommended Plan; however the duration of noise impacts would be shorter and occur intermittently over time.

4.11 HAZARDOUS AND TOXIC SUBSTANCES

Based on the investigative findings and the planned activities for this project, the following recommendations are presented.

- Any trash and debris found within the work zone or generated during construction needs to be removed and disposed in accordance with appropriate solid and hazardous waste regulations.
- The construction contractor needs to have a health and safety plan in place that addresses environmental protection.

Changes in Design. If the design plans undergo further changes to include any additional areas, the additional areas would also require a Limited Phase I Investigation prior to implementation.

No further HTRW concerns were noted.

4.12 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

The Recommended Plan does not unfairly affect any segment of the population, because SR 16 and underlying utilities serve the public. Implementation of the Recommended Plan would aid in protection of the public infrastructure, thereby improving the living environment for all residents and providing a benefit to the area as the erosion and possible road and utility failure would lead to undue hardship on

the entire population of the City of Newark. No homes or buildings would be adversely impacted by the proposed project; therefore, the Recommended Plan meets the directive of EO 12898 by avoiding any disproportionately high adverse human health or environmental effects on minority or low income populations. In addition, the project is in compliance with EO 13045 "Protection of Children from Environmental Health Risks and Safety risks," as there are no health or safety concerns affecting children.

The NAA will postpone impact, but may not avoid impacts to the local community. Some small bank stabilization efforts, primarily temporary in nature, would most likely be undertaken as interim measures along unstable reaches. However, these efforts, similar to the Recommended Plan, would have no effect on minority and low income populations and no safety concerns affecting children.

4.13 TRANSPORTATION AND TRAFFIC

Construction of the Recommended Plan would occur within a limited area along Raccoon Creek. SR 16 may incur limited disruptions from the proposed construction activities. One lane of east bound traffic closest to Raccoon Creek and the Church Street Off-Ramp may require temporary closure for short periods in order to transport and load/unload equipment and supplies. Any lane closures will be coordinated with the City and the ODOT. Therefore, there would be limited impacts to transportation and traffic during the construction of the Recommended Plan.

Under the NAA, it is anticipated that some small stabilization projects would most likely be undertaken to repair unstable reaches. These efforts would have similar impacts as the Recommended Plan; however these may be temporary in nature and occur as funding is available. The duration of impacts would be shorter and occur intermittently over time. If no measures are taken impacts to transportation and traffic would be significant if SR 16 failed due to grade control structure failure and streambank subsidence. Grade control structure failure and streambank subsidence could lead to the closure of SR 16, which is a principal highway through the City of Newark. The closure could render parts of the City difficult to access.

4.14 HEALTH AND SAFETY

The Recommended Plan will increase safety at the site by stabilizing the project reach and protecting SR 16 and the Church Street exit ramp along with adjacent utilities, including gas, water main, and sewer lines. Stabilizing the grade control structure and the stream bank will minimize impacts to water quality and aquatic resources by reducing the amount of sediment discharge into Raccoon Creek. Also by the same stabilization efforts, the utility lines upstream of the grade control structure will remain intact and not become compromised which would contaminate Raccoon Creek and downstream areas. Therefore, the Recommended Plan is anticipated to have long term beneficial impacts on health and safety of the project area.

Under the NAA, failure of the grade control structure and further recession of the banks will have adverse effects to water quality and aquatic resources. Further streambank erosion from the failure of the grade control structure could result in impacts or possible closure of SR 16 and the Church Street exit ramp and also compromise the adjacent utilities, including gas, water main, and sewer lines. Closure of SR 16 could lead to significant effects to residents and businesses located near the project reach.

Compromising the utilities would lead to disruption of service to many home owners and business in the area and could also cause contamination of Raccoon Creek and downstream area.

4.15 CUMULATIVE EFFECTS

USACE must consider the cumulative effects of the proposed project on the environment as stipulated in the National Environmental Policy Act (NEPA). Cumulative effects are “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or Non-Federal) or person undertakes such actions.” Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR Part 1508.7 Council on Environmental Quality [CEQ] Regulations).

The cumulative effects analysis is based on the potential effects of the proposed project when added to similar impacts from other projects in the region. An inherent part of the cumulative effects analysis is the uncertainty surrounding actions that have not yet been fully developed. The CEQ regulations provide for the inclusion of uncertainties in the analysis and states that "when an agency is evaluating reasonably foreseeable significant adverse effects on the human environment...and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking" (40 CFR 1502.22).

Temporal and geographical limits for this project must be established in order to frame the analysis. These limits can vary by the resources that are affected. Construction of the Recommended Plan would have very localized effects confined to the area immediately in the vicinity of the project, specifically the project area of Raccoon Creek adjacent to the City. The geographical extent would be broadened to consider effects beyond the Recommended Plan. The geographical extent considered is the Raccoon Creek Watershed. The project is analyzed for economic benefits based on a 50 year period, therefore, 50 years is the future temporal boundary of this analysis. The boundary for the past would coincide with the construction and installation of the grade control structure in 1975.

Section 4.0 documents the potential environmental effects of the Recommended Plan and NAA with respect to existing conditions. The effects of the Recommended Plan, as discussed beforehand, are localized and minor. Past actions have resulted in similar effects that have included streambank stabilization projects along the Raccoon Creek. Construction activities would temporarily increase turbidity in the Creek and increase noise levels and emissions from construction equipment in the project vicinity; however these impacts will be short in duration and would not contribute significantly to cumulative effects. The City of Newark has placed stone within Raccoon Creek in front of the grade control structure and the streambank to help stabilize the structure and bank. The amount of work done is only enough to provide temporary measures until a more robust plan can be implemented. No other reasonably foreseeable future actions that would have similar impacts as the proposed action were identified.

The availability of Federal funds through programs, such as the Section 14 program, provides assistance to communities to protect public services through study, design and construction of streambank and shoreline projects. The significance of this action on safety, aquatic resources, and water quality would be positive in the long term. Given the current program is in place for the foreseeable future and the

overall beneficial effect from implementation of the Recommended Plan, there is expected to be a positive, though small, cumulative effect on safety, aquatic resources, and water quality based on past, present, and reasonably foreseeable actions.

5 MITIGATION OF ADVERSE EFFECTS

The Recommended Plan is expected to have minimal adverse effects to terrestrial resources and the human environment. To mitigate for the minimal terrestrial impacts any tree clearing will be conducted in the tree clearing window between October 15 and March 31. To mitigate for minimal impacts to the human environment USACE will work with ODOT in advance to assure that any road closures are coordinated and made known to the public. Potential impacts to cultural resources may also occur. USACE is currently coordinating with the OHC and ACHP to determine potential effects to resources in the area. Any impacts to the aquatic environment will be fully evaluated during the Section 401 permitting process. All impacts will be minimized to the extent practicable. Mitigation may be required. Prior to execution of a FONSI, impacts and required mitigation for these resources will be determined. Mitigation measures may arise as a result of ESA and NHPA consultation. These mitigation measures would be addressed in any potential supplemental EA that may be required prior to any FONSI being prepared.

6 IMPLEMENTATION REQUIREMENTS

6.1 PROJECT PARTNERSHIP AGREEMENT

The first \$100,000 of the feasibility phase for a Section 14 project is funded at full Federal expense and the balance is cost shared 50-50 with a non-Federal sponsor(s). The possibility exists the feasibility phase for the CAP Section 14 project for the City of Newark may not be completed within the \$100,000 limit due to pending Cultural requirements. If that should occur, a Federal Cost Share Agreement (FCSA) will be developed at a later date.

The City of Newark provided a Letter of Intent in December 2015 requesting Federal assistance under the Section 14 authority. An additional Letter of Intent was provided to USACE from ODOT in April 2017 to show ODOT's partnership with the City on the project and joint non-Federal sponsorship. The non-Federal sponsors are in support of the project and are willing to share the cost of the project. The Huntington District is scheduled to start development of the PPA in November 2017 following approval of the Detailed Project Report. The PPA is currently scheduled to be executed in May 2019. Following the execution of the PPA, all efforts related to design and implementation will be cost shared 65 percent Federal and 35 percent non-Federal.

6.2 LANDS, EASEMENTS, RIGHTS-OF-WAY, RELOCATIONS AND DISPOSAL AREAS

The project requires approximately 3.44 acres of land located entirely within ODOT right-of-way for SR 16 and the right-of-way they acquired in order to relocate Raccoon Creek within the project area. The minimum estate required for the project is a stream bank protection easement, however, ODOT owns either fee or an easement for channel purposes. After a review by Office of Counsel, it has been determined that ODOT has a sufficient ownership interest in order to construct, operate, and maintain

the project and will not require any additional real estate. Acquisition of a borrow or spoil site is not required for the Project. All borrow material (stone) will be obtained from a commercial quarry. The only spoil anticipated would result from clearing and grubbing the project area and will be hauled to a commercial facility as it is the least costly alternative.

6.3 MONITORING AND ADAPTIVE MANAGEMENT

Not Applicable for Section 14 projects.

6.4 OPERATION, MAINTENANCE, REPAIR, REPLACEMENT, AND REHABILITATION

The non-Federal sponsors have operation and maintenance responsibilities required to assure the continued functionality of the recommended treatment will include but not be limited to inspecting the project annually and after high water events and correcting adverse conditions such as loss of as-constructed sheet pile structures, scour related failure of stone, and slope protection. All operation and maintenance responsibilities will be given to the non-Federal sponsors in perpetuity after completion of construction.

6.5 REGULATORY REQUIREMENTS

The Recommended Plan will be in full compliance with all local, state, and Federal statutes as well as Executive Orders. Compliance is documented below in Table 9.

Table 9 - Environmental Compliance Status

| Statute/Executive Order | Full | Partial | N/A |
|---|------|---------|-----|
| National Environmental Policy Act (considered partial until the FONSI is signed)* | | X | |
| Fish and Wildlife Coordination Act* | | X | |
| Endangered Species Act* | | X | |
| Clean Water Act** | | X | |
| Individual 401 Water Quality Certification** | | X | |
| 404 b(1) Analysis** | | X | |
| Wild and Scenic Rivers Act | X | | |
| Clean Air Act | | X | |
| National Historic Preservation Act* | | X | |
| Archeological Resources Protection Act | | X | |
| Comprehensive, Environmental Response, Compensation and Liability Act | X | | |
| Resource Conservation and Recovery Act | X | | |
| Toxic Substances Control Act | X | | |
| Quiet Communities Act | X | | |
| Farmland Protection Act | | X | |
| Executive Order 11988 Floodplain Management* | | X | |
| Executive Order 11990 Protection of Wetlands | X | | |

| | | | |
|--|---|--|--|
| Executive Order 12898 Environmental Justice in Minority Populations and Low-Income Populations | X | | |
| Executive Order 13045 Protection of Children from Environmental Health Risks and Safety Risks | X | | |

*Completed coordination and affect determination will be completed prior to execution of FONSI.

**Completed coordination and all necessary permits will be obtained prior to construction.

7 PUBLIC INVOLVEMENT

7.1 PUBLIC VIEWS AND COMMENTS

This section will be completed following the public review period.

7.2 STAKEHOLDER AGENCY COORDINATION

7.2.1 Federal Agencies

Coordination with Federal resource agencies was conducted in conjunction with the preparation of the Section 14 Emergency Streambank Protection, Draft DPR and EA, City of Newark, Licking County, Ohio. All correspondence letters can be found in the Appendix B. The USFWS, NOAA – Ohio River Forecast Center, and United States Department of Agriculture (USDA) were asked to review the project for potential resource impacts.

Also pursuant to NEPA and Section 106 of the NHPA, all federally recognized tribes with historic and/or cultural affiliation within the project boundaries will be contacted, provided an opportunity to comment, and invited to consult on the project. Tribes will receive a copy of this report and EA for review and comment during the public comment period.

7.2.2 State Agencies

Coordination with State resource agencies was conducted in conjunction with the preparation of the Section 14 Emergency Streambank Protection, Draft DPR and EA, City of Newark, Licking County, Ohio. All correspondence letters can be found in the Appendix B. ODNR, OEPA, Ohio Archaeological Council and ODOT were asked to review the project for potential resource impacts. USACE also coordinated with the OHC to address any concerns or recommendations regarding impacts to historic properties. This coordination effort will continue through the feasibility study.

7.2.3 Local Agencies

Coordination with Local resource agencies was conducted in conjunction with the preparation of the Section 14 Emergency Streambank Protection Draft DPR and EA, City of Newark, Licking County, Ohio. All correspondence letters can be found in the Appendix B. The local floodplain coordinator was asked to review the project for potential resource impacts.

7.2.4 Non-Governmental Organizations

No non-governmental organization coordination is required.

8 FINDING OF NO SIGNIFICANT IMPACT

The draft FONSI will be updated to reflect all continued agency coordination and public comments that are drawn. The draft FONSI can be found in Appendix B.

9 RECOMMENDATION

USACE Huntington District recommends MSC concurrence with the Recommended Plan. Requirements for the construction of Alternative Plan A (Recommended Plan) would include installation of a sheet pile wall grade control structure with backfill and stone channel protection. Alternative Plan A is the Least Cost Alternative Plan to protect the streambank.

This Section 14 project will protect approximately 1,420 LF of streambank adjacent to SR 16 and the Church Street exit ramp in the City of Newark, Ohio. Work under this Section 14 authority allows for protection of public facilities from flood flow erosion related immediate endangerment (ex. SR 16, Church Street ramp, and public utilities). The Section 14 authority for streambank protection projects has a Federal funding limit of \$5,000,000. The cost of the proposed project is within the Federal funding limit. Therefore, the size, cost, scope, and complexity of the project can be successfully addressed through the Section 14 authority.

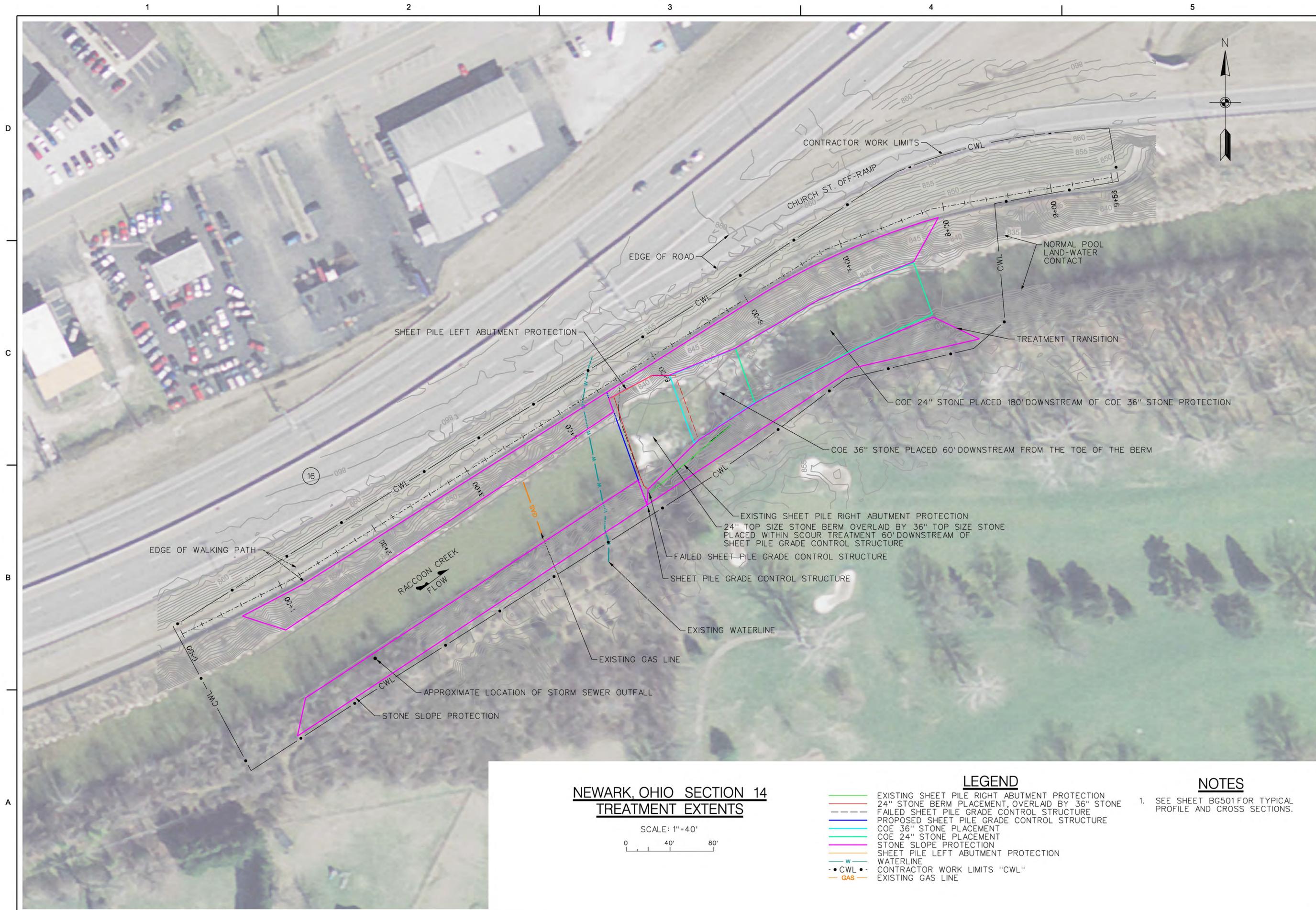
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DRAFT



**NEWARK, OHIO SECTION 14
TREATMENT EXTENTS**

SCALE: 1"=40'
0 40' 80'

- LEGEND**
- EXISTING SHEET PILE RIGHT ABUTMENT PROTECTION
 - 24" STONE BERM PLACEMENT, OVERLAID BY 36" STONE
 - - - FAILED SHEET PILE GRADE CONTROL STRUCTURE
 - PROPOSED SHEET PILE GRADE CONTROL STRUCTURE
 - COE 36" STONE PLACEMENT
 - COE 24" STONE PLACEMENT
 - STONE SLOPE PROTECTION
 - SHEET PILE LEFT ABUTMENT PROTECTION
 - WATERLINE
 - CWL ••• CONTRACTOR WORK LIMITS "CWL"
 - GAS — EXISTING GAS LINE

NOTES

1. SEE SHEET BG501 FOR TYPICAL PROFILE AND CROSS SECTIONS.



| MARK | DESCRIPTION | DATE | APPR. MARK | DATE | APPR. |
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| DESIGNED BY: AAK | DATE: 08/20/16 |
| DRAWN BY: AAK | SOLICITATION NO.: |
| SUBMITTED BY: AAK | CONTRACT NO.: |
| PLOT SCALE: 1"=40' | FILE NUMBER: |
| SIZE: A3 | FILE NAME: B1101.dgn |

LICKING RIVER
NEWARK, OH
NEWARK OH SEC 14
**OVERALL SITE PLAN
NEWARK**

SHEET IDENTIFICATION
B1101
SHEET 1 OF 1

Wilburn, Megan B CIV USARMY CELRH (US)

From: Applegate, Jeromy <jeromy_applegate@fws.gov>
Sent: Monday, May 02, 2016 3:08 PM
To: Wilburn, Megan B LRH
Cc: Rutherford, Rebecca A LRH
Subject: [EXTERNAL] City of Newark, Section 14 Project

Megan,

I have reviewed the letter, dated March 11, 2016, requesting review of the subject project pursuant to the Fish and Wildlife Coordination Act and section 7 of the Endangered Species Act.

We have no comments on the subject project.

Please contact me with any questions.

Jeromy

Jeromy Applegate
Fish and Wildlife Biologist
U S Fish and Wildlife Service
Ohio Ecological Services Field Office
4625 Morse Rd., Suite 104
Columbus, OH 43230
Phone: 614-416-8993 ext. 21
FAX: 614-416-8994



Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR

JAMES ZEHRINGER, DIRECTOR

Office of Real Estate
Paul R. Baldrige, Chief
2045 Morse Road – Bldg. E-2
Columbus, OH 43229
Phone: (614) 265-6649
Fax: (614) 267-4764

April 19, 2016

Megan Wilburn
U.S. Army Corps of Engineers
502 Eighth Street
Huntington, West Virginia 25701

Re: 16-181; HCOE - Raccoon Creek Section 14 Project

Project: The proposed project involves the construction of emergency streambank and shoreline protection projects to protect endangered highways, highway bridge approaches, and public facilities.

Location: The proposed project is located in the City of Newark, Licking County, Ohio.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

Natural Heritage Database: The Natural Heritage Database has no data at or within a one mile radius of the project area.

We are unaware of any unique ecological sites, geologic features, animal assemblages, scenic rivers, state wildlife areas, nature preserves, state or national parks, state or national forests, national wildlife refuges, or other protected natural areas within the project area. The review was performed on the project area you specified in your request as well as an additional one mile radius. Records searched date from 1980. This information is provided to inform you of features present within your project area and vicinity.

Please note that Ohio has not been completely surveyed and we rely on receiving information from many sources. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Although all types of plant communities have been surveyed, we only maintain records on the highest quality areas.

Fish and Wildlife: The Division of Wildlife (DOW) has the following comments.

The DOW recommends that impacts to wetlands and other water resources be avoided and minimized to the fullest extent possible, and that best management practices be utilized to minimize erosion and sedimentation.

The project is within the range of the Indiana bat (*Myotis sodalis*), a state endangered and federally endangered species. The following species of trees have relatively high value as potential Indiana bat roost trees to include: shagbark hickory (*Carya ovata*), shellbark hickory (*Carya laciniosa*), bitternut hickory (*Carya cordiformis*), black ash (*Fraxinus nigra*), green ash (*Fraxinus pennsylvanica*), white ash (*Fraxinus americana*), shingle oak (*Quercus imbricaria*), northern red oak (*Quercus rubra*), slippery elm (*Ulmus rubra*), American elm (*Ulmus americana*), eastern cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*), sassafras (*Sassafras albidum*), post oak (*Quercus stellata*), and white oak (*Quercus alba*). Indiana bat roost trees consists of trees that include dead and dying trees with exfoliating bark, crevices, or cavities in upland areas or riparian corridors and living trees with exfoliating bark, cavities, or hollow areas formed from broken branches or tops. However, Indiana bats are also dependent on the forest structure surrounding roost trees. If suitable habitat occurs within the project area, the DOW recommends trees be conserved. If suitable habitat occurs within the project area and trees must be cut, the DOW recommends cutting occur between October 1 and March 31. If suitable trees must be cut during the summer months, the DOW recommends a net survey be conducted between June 1 and August 15, prior to any cutting. Net surveys should incorporate either nine net nights per square 0.5 kilometer of project area, or four net nights per kilometer for linear projects. If no tree removal is proposed, this project is not likely to impact this species.

The project is within the range of the fawnsfoot (*Truncilla donaciformis*), a state threatened mussel. This project must not have an impact on freshwater native mussels at the project site. This applies to both listed and non-listed species. Per the Ohio Mussel Survey Protocol, Group 1 streams (Appendix A) and unlisted streams with a watershed of 10 square miles or larger above the point of impact should be assessed using the Reconnaissance Survey for Unionid Mussels (Appendix B) to determine if mussels are present. Mussel surveys may be recommended for these streams as well. This is further explained within the Ohio Mussel Survey Protocol. Therefore, if in-water work is planned in any stream that meets any of the above criteria, the DOW recommends the applicant provide information to indicate no mussel impacts will occur. If this is not possible, the DOW recommends a professional malacologist conduct a mussel survey in the project area. If mussels that cannot be avoided are found in the project area, as a last resort, the DOW recommends a professional malacologist collect and relocate the mussels to suitable and similar habitat upstream of the project site. Mussel surveys and any subsequent mussel relocation should be done in accordance with the Ohio Mussel Survey Protocol. The Ohio Mussel Survey Protocol (2015) can be found at:

<http://wildlife.ohiodnr.gov/portals/wildlife/pdfs/licenses%20&%20permits/OH%20Mussel%20Survey%20Protocol.pdf>

The project is within the range the lake chubsucker (*Erimyzon sucetta*) a state threatened fish. The DOW recommends no in-water work in perennial streams from April 15 through June 30 to reduce impacts to indigenous aquatic species and their habitat.

The project is within the range of the eastern massasauga (*Sistrurus catenatus*), a state endangered and a federal candidate snake species. The eastern massasauga uses a range of habitats including wet prairies, fens, and other wetlands, as well as drier upland habitat. Due to

the location, the type of habitat present at the project site and within the vicinity of the project area, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the black bear (*Ursus americanus*), a state endangered species. Due to the mobility of this species, the project is not likely to have an impact on this species.

Due to the potential of impacts to federally listed species, as well as to state listed species, we recommend that this project be coordinated with the U.S. Fish & Wildlife Service.

ODNR appreciates the opportunity to provide these comments. Please contact John Kessler at (614) 265-6621 if you have questions about these comments or need additional information.

John Kessler
ODNR Office of Real Estate
2045 Morse Road, Building E-2
Columbus, Ohio 43229-6693
John.Kessler@dnr.state.oh.us



In reply refer to
2016-LIC-34563

April 11, 2016

Megan Wilburn
US Army Corps of Engineers, Huntington District
502 Eighth Street
Huntington, West Virginia 25701-2070

Dear Ms. Wilburn:

RE: Bank Stabilization Draft Environmental Assessment, Newark, Licking County, Ohio

This is in response to the receipt, on March 14, 2016, of the Draft Environmental Assessment (DEA) for streambank erosion controls along Raccoon Creek in Newark, Ohio. The comments of the State Historic Preservation Office are submitted in accordance with the provisions of Section 106 of the National Historic Preservation Act of 1966, as amended.

The proposed undertaking involves bank stabilization on both the right and left descending banks of Raccoon Creek. Mapping included with the submission (Enclosure 1) shows the contractor work limits overlap with the northeastern portion of the Newark Earthworks, which is listed as a Nation Historic Landmark (NHL). As per the regulations at 36 CFR 800.10, we recommend that the US Army Corps of Engineers, Huntington District initiate consultation with the Advisory Council on Historic Preservation (ACHP) and the National Park Service (NPS). Additionally, The Ohio History Connection, multiple Native American Tribes, and members of the public should be invited to be consulting parties for this undertaking.

Please copy this office on all correspondence regarding this undertaking. If you have any questions regarding this matter, please call me, at (614) 298-2000. Thank you for your cooperation.

Sincerely,

A handwritten signature in cursive script, appearing to read "Amanda Schraner Terrell".

Amanda Schraner Terrell, Deputy State Historic Preservation Officer
Ohio State Historic Preservation Office

AST/njy

Cc: Brian Lusher, Advisory Council on Historic Preservation, 401 F Street NW, Suite 308, Washington, DC 20001-2637

Cc: Geoffrey Burt, National Park Service-Midwest Region, 601 Riverfront Drive, Omaha, NE 68102-4226

Cc: George Kane, OHC, 800 E. 17th Ave., Columbus, Ohio 43211

Cc: Brad Lepper, OHC, 800 E. 17th Ave., Columbus, Ohio 43211

**LIMITED PHASE I
HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)
INVESTIGATION REPORT
RACCOON CREEK, STATE ROUTE 16
SECTION 14 STREAMBANK PROTECTION PROJECT
NEWARK, OH**

APRIL 2016

**DEPARTMENT OF THE ARMY
U. S. ARMY CORPS OF ENGINEERS
GREAT LAKES AND OHIO RIVER DIVISION
HUNTINGTON DISTRICT
502 EIGHTH STREET
HUNTINGTON, WV 25701**

**LIMITED PHASE I
HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)
INVESTIGATION REPORT
RACCOON CREEK, STATE ROUTE 16
SECTION 14 STREAMBANK PROTECTION PROJECT
NEWARK, OH
APRIL 2016**

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- APPENDIX A: Site Maps
- APPENDIX B: Topographic Maps and Aerial Photos
- APPENDIX C: Site Photos
- APPENDIX D: Environmental Database Search Report
- APPENDIX E: Quality Control Plan
- APPENDIX F: Site Safety and Health Plan

**LIMITED PHASE I
HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)
INVESTIGATION REPORT
RACCOON CREEK, STATE ROUTE 16, NEWARK, OH
SECTION 14 STREAMBANK PROTECTION PROJECT
APRIL 2016**

EXECUTIVE SUMMARY

1.0 SCOPE OF WORK

The Huntington District, along with the City of Newark, OH proposes to protect a section of the Raccoon Creek streambank, immediately adjacent to the State Route (SR) 16 travelway and off-ramp which is a significant transportation route through and within the City of Newark. The Corps of Engineers Huntington District, Environmental and Remediation Section (CELRH-EC-CE) conducted a Limited Phase I HTRW Investigation of the area where streambank protection work will be performed, in order to provide an initial assessment of potential for HTRW contamination to the project area.

2.0 SITE DESCRIPTION

On March 30, 2016 a site visit was made to the Newark, OH Section 14 Streambank Project site. The streambank, both left and right descending banks, appeared to be neatly maintained. The Moundbuilders Country Club, located along the right descending bank within the project area, is the site of an ancient Indian Mound and National Historical Landmark, known as the Octagon Earthworks, which is part of the complex referred to as the Newark Earthworks. Other than a minor, occasional instance of discarded materials, no HTRW issues were observed during the site visit. The following were noted:

- Two minor instances of miscellaneous items appear to be discarded along left descending bank.
- Several stormwater drainage pipes.
- Existing stilling basin and sheet piling.

3.0 RECOMMENDATIONS

Based on the investigative findings and the planned activities for this project, the following recommendations are presented.

- Any trash and debris found within the work zone or generated during construction needs to be removed and disposed in accordance with appropriate solid and hazardous waste regulations.
- The construction contractor needs to have a health and safety plan in place that addresses environmental protection.

Changes in Design. If the design plans undergo further changes to include any additional areas, the additional areas would also require a Limited Phase I Investigation prior to implementation.

**LIMITED PHASE I
HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)
INVESTIGATION REPORT
RACCOON CREEK, STATE ROUTE 16
SECTION 14 STREAMBANK PROTECTION PROJECT
NEWARK, OH
APRIL 2016**

1.0 INTRODUCTION

The Huntington District, along with the City of Newark, proposes to protect a section of the Raccoon Creek stream bank, immediately adjacent to the State Route (SR) 16 travelway and off-ramp which is a significant transportation route through and within the City of Newark. A sheet pile grade control structure in the project area along Raccoon Creek has partially overturned due to flood flow erosion resulting in the immediate endangerment of critical public facilities, including water and sewer line crossings and the adjacent SR 16 travelway. The area affected by streambank erosion spans approximately 1,420 linear feet (LF) of eroded streambank (710 LF along each bank).

State Route (SR) 16, located adjacent to the subject reach of Raccoon Creek is a significant transportation route through and within the City of Newark. A sheet pile grade control structure in the project area along Raccoon Creek has partially overturned due to flood flow erosion resulting in the immediate endangerment of critical public facilities, including utility line crossings and the adjacent SR 16 travelway. Flood flow erosion and streambank recession caused displacement of limited bank protection, which subsequently resulted in downstream scour and the formation and enlargement of a stilling feature. Approximately 1,420 linear feet (LF) of eroded streambank (710 LF along each bank) is located within the project area. Huntington District has monitored flood flow erosion and recessional failure site conditions resulting in downstream scour, overturning of the sheet pile grade control structure, and displacement of adjacent bank protection. Without treatment, flood flow scour would continue and would eventually result in further collapse of the grade control structure. Raccoon Creek channel incisement and widening would then progress upstream and expose and breach utility crossings and the adjacent SR 16 travelway and off-ramp. Failure to protect these utilities and road system would result in adverse impacts affecting public health, including loss of water, sewer, and gas lines. The area affected by flood flow erosion and related structure and bank failures would degrade a significant source of potable water for the City. Bank erosion and failures would result in loss of access to numerous manufacturing facilities and warehouses as a result of SR 16 and the Church Street off-ramp collapsing. As a result, the primary purpose of this study is to develop a viable treatment solution for the protection of SR 16 and adjacent public utilities serving the City of Newark.

Requirements for the construction of the recommended plan would include the placement of a sheet pile wall grade control structure upstream of the existing sheet pile grade control structure, which has deteriorated due to flood flow erosion and scour. Grouted stone would be placed between the existing and proposed sheet pile structures. A sheet pile treatment along the left abutment would be required in conjunction with the placement of derrick-size stone to armor the existing stilling feature. Excavation and

placement of graded stone slope protection, including a filter blanket component, along both banks of the 710 LF reach of Raccoon Creek would be included within the proposed project.

A vicinity map is included in Appendix A. As part of the study phase, a Limited Phase I HTRW Investigation is necessary.

1.1 Scope of Work

The Corps of Engineers Huntington District, Environmental and Remediation Section (CELRH-EC-CE) conducted a Limited Phase I HTRW Investigation of the area where streambank protection work will be performed, in order to provide an initial assessment of the potential for HTRW contamination to the project area. Under this limited investigation, individual tracts were not separately assessed and sixty-year ownership histories were not obtained. Records, mapping, and aerial photography were reviewed, and local officials were contacted to determine both prior and existing problematic land uses which could have caused contamination within the project area. A site reconnaissance was conducted to define any contamination within the project CWL areas. The investigation included the following:

- Site visit to the project area.
- Review of environmental database search reports.
- Interviews with local officials.
- Documentation of findings and conclusions in a Phase I HTRW Investigation Report.

1.2 Limitations of Investigation

The investigation was performed based solely upon information available to the Corps of Engineers at the time of the investigation. Services for the Limited Phase I HTRW Investigation did not include sampling, testing, and/or analysis to conclusively ascertain that contamination exists or is absent at or near the project site. Information concerning environmentally sensitive incidents was gathered based on state information available for public review and on information from local government officials. No warranties or certifications can be provided by CELRH-EC-CE concerning the accuracy or completeness of all the information reviewed during the investigation.

The determination of potential HTRW contamination should not be considered as a definite assertion that an environmentally sensitive condition actually exists. The conclusions and recommendations presented herein are based on information gathered using that degree of care and skill ordinarily exercised under similar circumstances by competent members of the environmental profession and no warranties are expressed or implied.

Furthermore, no environmental site assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with a property. Conducting a Limited Phase I HTRW Investigation is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions and this assessment recognizes reasonable limits of time and cost. In addition,

appropriate inquiry does not mean an exhaustive assessment of a property. At some point, the cost of information obtained or the time required to gather it outweighs the usefulness of the information and in fact may be a material detriment to the orderly completion of transactions. Furthermore, subsequent environmental site assessments should not be considered valid standards to judge the appropriateness of any prior assessment based on hindsight, new information, use of developing technology or analytical techniques, changing regulatory or industry standards, or other factors.

2.0 INVESTIGATIVE FINDINGS

In accordance with Corps of Engineers policy for HTRW investigations, a Quality Control Plan (QCP) and Site-Specific Safety and Health Plan (SSHP) were developed and implemented prior to and during all phases of this investigation. Procedures and documentation of the QCP are enclosed in Appendix E. A copy of the SSHP is in Appendix F.

2.1 Site Descriptions and Field Investigative Findings

Along the right descending bank of Raccoon Creek within the project area, there is a private country club, the Moundbuilders Country Club, which includes a golf course. The country club is the site of an ancient Indian Mound and National Historical Landmark, known as the Octagon Earthworks, part of the complex referred to as the Newark Earthworks. The Octagon Earthworks were part of an ancient Native American geometric earthworks complex constructed by the so-called Hopewell culture sometime in the first centuries of the modern era (0-500AD). Most of those geometric earthworks have been obliterated by development, but the Octagon Earthworks have been preserved on the site of Moundbuilders Country Club. Although, not an HTRW issue, coordination with Ohio's State Historic Preservation Office is needed prior to construction for this area of the streambank.

On March 30, 2016 a site visit was made to the Newark, OH Section 14 Streambank Project site, located in Newark, OH. Site mapping is included in Appendices A and B. The streambank, both left and right descending banks, appeared to be neatly maintained. Other than a minor, occasional instance of discarded materials, no HTRW issues were observed during the site visit. The following were noted (see photos in Appendix C):

- Two minor instances of miscellaneous items appear to be discarded along left descending bank.
- Several stormwater drainage pipes.
- Existing stilling basin and sheet piling.

2.2 Mapping

Mapping was obtained for the project area and a review of reasonably ascertainable standard historical sources was performed as part of this investigation. The purpose of this historical record search is to determine the past uses of the project area. Aerial photographs and the USGS 7.5-minute historical topographic maps showing the project area were available and reviewed. Copies of these maps are included in Appendix B.

The topographic maps and aerial photos did not indicate any past or present activities that would cause HTRW concerns within the project area.

2.3 Property Ownership Histories

Property ownership histories were not included in this investigation.

2.4 Regulatory Records Search by EDR.

Records of regulatory agencies listing recognized environmental conditions were obtained for the project area from Environmental Data Resources, Inc., a commercial database retrieval company. The search of environmental database records was based on a one-mile radius search area surrounding the site. These records have been included in Appendix D. The information presented in the database search reports includes mapped and unmapped sites. Unmapped sites are properties with insufficient address information to be precisely mapped and are listed in the “Orphan Summary”.

Mapped Sites. Information on the following mapped sites was reviewed for potential impacts to the project area. These sites are also shown on a site drawing included in Appendix A.

- Six (6) mapped LUST sites are located within the search area. All of these sites have been remediated with a “No Further Action” status and is not anticipated to impact the project area.
 - State Farm, 1440 Granville Road.
 - Former doctor’s office location, 1634 W. Church Street.
 - Ron Klein Buick, 1550 W. Church Street.
 - BP Oil, 1550 W. Church Street.
 - Powell Electric 1205 W. Church Street.
 - Church Street Duchess, 1175 W. Church Street.
 - Moundbuilder’s Country Club, 125 N. 33rd Street.

- Auto Collision, a RCRA Conditionally Exempt Small Quantity Generator, is located within the project area, at 1535 W. Church Street. No impacts to the project area are anticipated from this facility.

- Two Ohio Division of Environmental Response and Revitalization (DERR) sites are located approximately one mile from the project area. These sites are not in the proximity of the project area and it is not anticipated that these sites will impact the area.
 - MPW Industrial Services, Newark. This was the site of an emergency response due to a hydrochloric acid spill.
 - Sherman Dick Disposal, 1175 Hollar Lane. Potential hazardous waste disposal.

Unmapped Sites. No unmapped sites were identified in the Orphan Summary.

3.0 RECOMMENDATIONS

Based on the investigative findings and the planned activities for this project, the following recommendations are presented.

- Any miscellaneous trash and debris within the work zone needs to be removed and disposed in accordance with appropriate solid and hazardous waste regulations.
- The construction contractor needs to have a health and safety plan in place that addresses environmental protection.

Changes in Design. If the design plans undergo further changes to include any additional areas, the additional areas would also require a Limited Phase I Investigation prior to implementation.

4.0 REFERENCES

ASTM E 1527-13, Standard Practices for Environmental Site Assessments: Phase I Environmental Site Assessment Process.

ASTM E 1528-14, Standard Practices for Environmental Site Assessments: Transaction Screening Process.

EM 385-1-1, Safety and Health Requirements Manual

ER 1165-2-132, Hazardous, Toxic, and Radioactive Waste (HTRW) Guidance for Civil Works Projects.

*Limited Phase I Hazardous, Toxic, and Radioactive Waste (HTRW) Investigation
Raccoon Creek- Newark, OH
Section 14 Streambank Protection Project*

Appendix A: Site Maps and Drawings



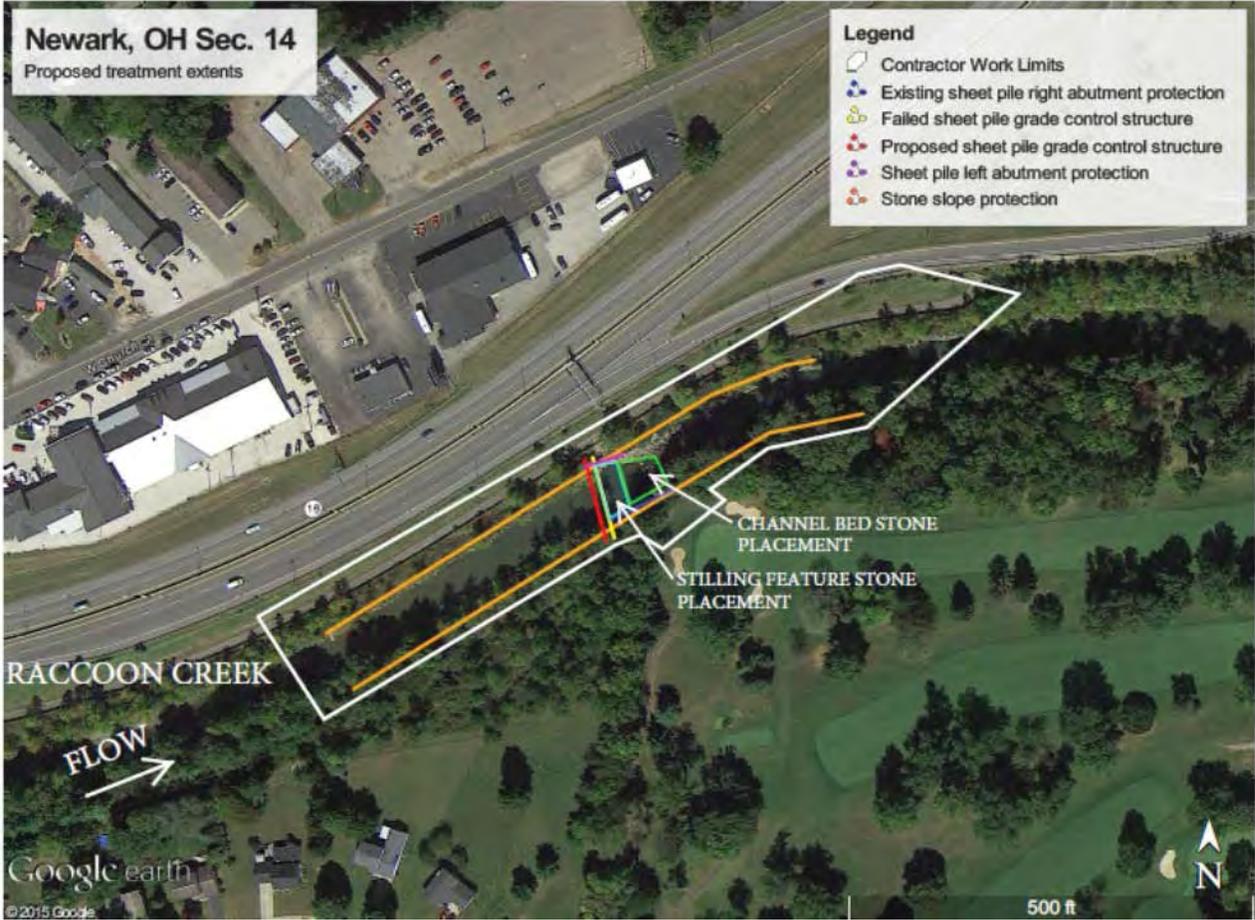
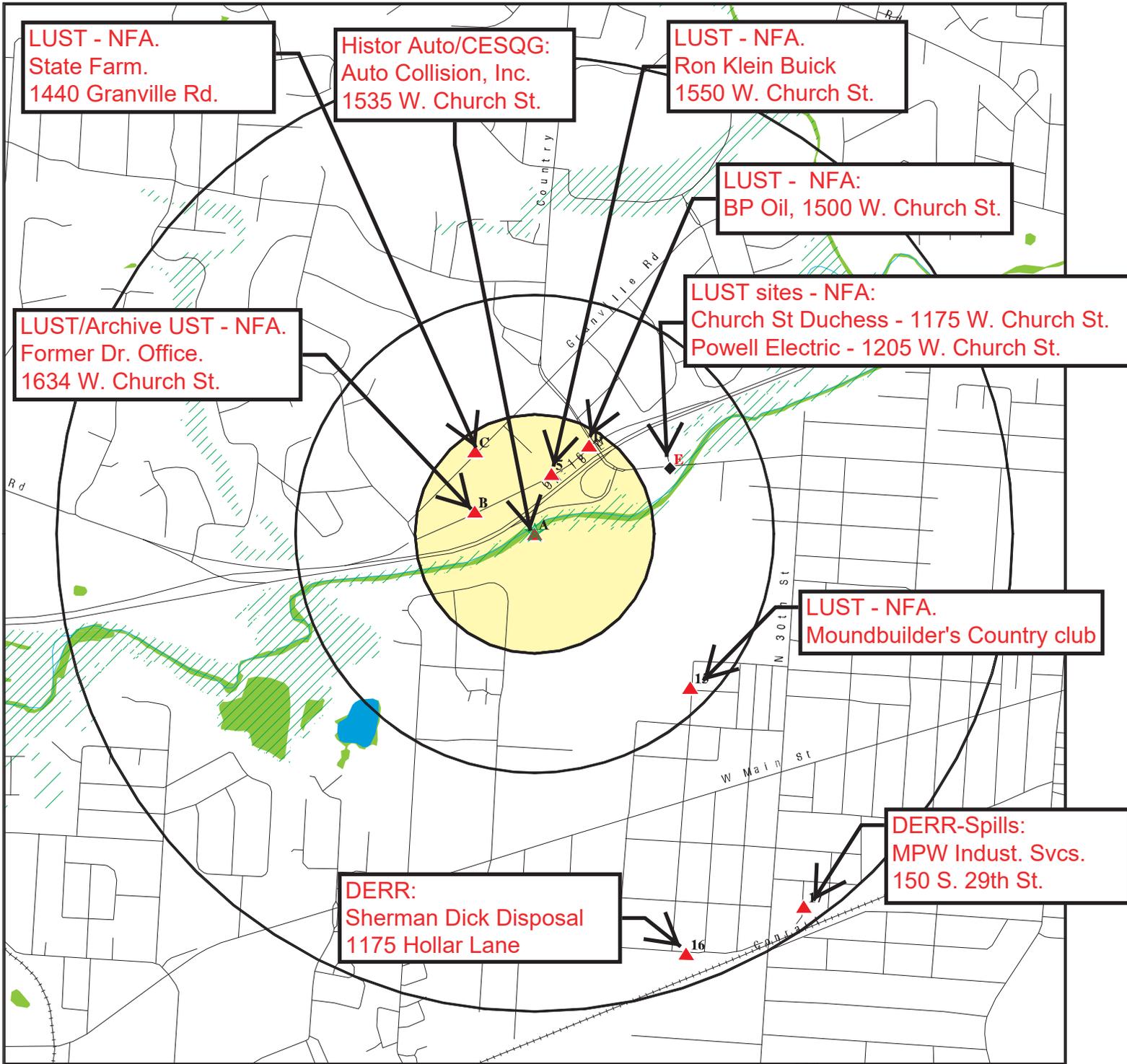


Figure 1-Newark, Ohio Extent of Proposed Treatment

OVERVIEW MAP - 4568567.2S



- ★ Target Property
- ▲ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- ⚙ Manufactured Gas Plants
- ☒ National Priority List Sites
- ☒ Dept. Defense Sites

- ☒ Indian Reservations BIA
- ▨ 100-year flood zone
- ▨ 500-year flood zone
- National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Newark, OH Sect. 14
 ADDRESS: 1535 W. Church Street
 Newark OH 43055
 LAT/LONG: 40.056161 / 82.451364

CLIENT: U.S. Army Corps of Engineers
 CONTACT: Janet Wolfe
 INQUIRY #: 4568567.2s
 DATE: March 18, 2016 4:43 pm

NOTES TO USERS

This map is for informational purposes only. It is not intended to be used as a basis for insurance coverage. Flood insurance coverage is available through the National Flood Insurance Program (NFIP). The community map inventory should be reviewed for more information. The community map inventory should be reviewed for more information. The community map inventory should be reviewed for more information.

Zone X (Future Base Flood)
 Zone X (Future Base Flood) is the area that is expected to be inundated by a 1% annual chance flood. This zone is shown in light blue on the map. It is the area that is expected to be inundated by a 1% annual chance flood.

Zone AE (1% Annual Chance Flood)
 Zone AE (1% Annual Chance Flood) is the area that is expected to be inundated by a 1% annual chance flood. This zone is shown in dark blue on the map. It is the area that is expected to be inundated by a 1% annual chance flood.

Zone A (1% Annual Chance Flood)
 Zone A (1% Annual Chance Flood) is the area that is expected to be inundated by a 1% annual chance flood. This zone is shown in light green on the map. It is the area that is expected to be inundated by a 1% annual chance flood.

Zone B (1% Annual Chance Flood)
 Zone B (1% Annual Chance Flood) is the area that is expected to be inundated by a 1% annual chance flood. This zone is shown in dark green on the map. It is the area that is expected to be inundated by a 1% annual chance flood.

Zone C (1% Annual Chance Flood)
 Zone C (1% Annual Chance Flood) is the area that is expected to be inundated by a 1% annual chance flood. This zone is shown in light purple on the map. It is the area that is expected to be inundated by a 1% annual chance flood.

Zone D (1% Annual Chance Flood)
 Zone D (1% Annual Chance Flood) is the area that is expected to be inundated by a 1% annual chance flood. This zone is shown in dark purple on the map. It is the area that is expected to be inundated by a 1% annual chance flood.

Zone E (1% Annual Chance Flood)
 Zone E (1% Annual Chance Flood) is the area that is expected to be inundated by a 1% annual chance flood. This zone is shown in light pink on the map. It is the area that is expected to be inundated by a 1% annual chance flood.

Zone F (1% Annual Chance Flood)
 Zone F (1% Annual Chance Flood) is the area that is expected to be inundated by a 1% annual chance flood. This zone is shown in dark pink on the map. It is the area that is expected to be inundated by a 1% annual chance flood.

Zone G (1% Annual Chance Flood)
 Zone G (1% Annual Chance Flood) is the area that is expected to be inundated by a 1% annual chance flood. This zone is shown in light yellow on the map. It is the area that is expected to be inundated by a 1% annual chance flood.

Zone H (1% Annual Chance Flood)
 Zone H (1% Annual Chance Flood) is the area that is expected to be inundated by a 1% annual chance flood. This zone is shown in dark yellow on the map. It is the area that is expected to be inundated by a 1% annual chance flood.

Zone I (1% Annual Chance Flood)
 Zone I (1% Annual Chance Flood) is the area that is expected to be inundated by a 1% annual chance flood. This zone is shown in light orange on the map. It is the area that is expected to be inundated by a 1% annual chance flood.



LEGEND

SPECIAL FLOOD AREAS
 SPECIAL FLOOD AREAS ARE IDENTIFIED BY THE 1% ANNUAL CHANCE FLOOD INSURANCE RATE (FIRM) MAP. THESE AREAS ARE IDENTIFIED BY THE 1% ANNUAL CHANCE FLOOD INSURANCE RATE (FIRM) MAP. THESE AREAS ARE IDENTIFIED BY THE 1% ANNUAL CHANCE FLOOD INSURANCE RATE (FIRM) MAP.

OTHER FLOOD AREAS
 OTHER FLOOD AREAS ARE IDENTIFIED BY THE 1% ANNUAL CHANCE FLOOD INSURANCE RATE (FIRM) MAP. THESE AREAS ARE IDENTIFIED BY THE 1% ANNUAL CHANCE FLOOD INSURANCE RATE (FIRM) MAP.

FLOODING EFFECTS FROM BUNDOON CREEK

MAP INFORMATION
 MAP SCALE: 1" = 100' METERS
 PANEL 0337J
 FIRM FLOOD INSURANCE RATE LICKING COUNTY, OHIO AND INCORPORATED AREAS
 PANEL 337 OF 540
 FEDERAL EMERGENCY MANAGEMENT AGENCY
 MAP NUMBER: 15000-1-0000
 MAP DATE: MARCH 2007



National Wetland Inventory Map

Legend
Project Area



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

- Status Map**
- Digital Data
 - No Data

1000 ft





Green Book

Ohio Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants

As of September 22, 2016

The 8-hour Ozone (1997) standard was revoked on April 6, 2015 and the 1-hour Ozone (1979) standard was revoked on June 15, 2005.

Listed by County, NAAQS, then Area

Select a State: [AK](#) | [AL](#) | [AR](#) | [AZ](#) | [CA](#) | [CO](#) | [CT](#) | [DC](#) | [DE](#) | [FL](#) | [GA](#) | [GU](#) | [IA](#) | [ID](#) | [IL](#) | [IN](#) | [KS](#) | [KY](#) | [LA](#) | [MA](#) | [MD](#) | [ME](#) | [MI](#) | [MN](#) | [MO](#) | [MS](#) | [MT](#) | [NC](#) | [NE](#) | [NH](#) | [NJ](#) | [NM](#) | [NV](#) | [NY](#) | [OH](#) | [OR](#) | [PA](#) | [PR](#) | [RI](#) | [SC](#) | [TN](#) | [TX](#) | [UT](#) | [VA](#) | [WA](#) | [WI](#) | [WV](#) | [WY](#) |

Important Notes

| County | NAAQS | Area Name | Nonattainment in Year | Redesignation to Maintenance | Classification | Whole or Part County | Population (2010) | State/County FIPS Codes |
|--------------|-----------------------------------|--------------------------------|--|------------------------------|------------------|----------------------|-------------------|-------------------------|
| OHIO | | | | | | | | |
| Adams Co | PM-2.5 (1997) | Huntington-Ashland, WV -KY-OH | 05 06 07 08 09 10 11 | 12/31/2012 | Former Subpart 1 | Part | 3,355 | 39/001 |
| Allen Co | 8-Hour Ozone (1997)-NAAQS revoked | Lima, OH | 04 05 06 | 06/15/2007 | Former Subpart 1 | Whole | 106,331 | 39/003 |
| Ashtabula Co | 1-Hour Ozone (1979)-NAAQS revoked | Cleveland-Akron-Lorain, OH | 92 93 94 95 | 05/07/1996 | Moderate | Whole | 101,497 | 39/007 |
| Ashtabula Co | 8-Hour Ozone (1997)-NAAQS revoked | Cleveland-Akron-Lorain, OH | 04 05 06 07 08 | 09/15/2009 | Moderate | Whole | 101,497 | 39/007 |
| Ashtabula Co | 8-Hour Ozone (2008) | Cleveland-Akron-Lorain, OH | 12 13 14 15 16 | // | Marginal | Whole | 101,497 | 39/007 |
| Ashtabula Co | PM-2.5 (1997) | Cleveland-Akron-Lorain, OH | 05 06 07 08 09 10 11 12 | 09/18/2013 | Former Subpart 1 | Part | 22,514 | 39/007 |
| Belmont Co | 8-Hour Ozone (1997)-NAAQS revoked | Wheeling, WV-OH | 04 05 06 | 06/15/2007 | Former Subpart 1 | Whole | 70,400 | 39/013 |
| Belmont Co | PM-2.5 (1997) | Wheeling, WV-OH | 05 06 07 08 09 10 11 12 | 08/29/2013 | Former Subpart 1 | Whole | 70,400 | 39/013 |
| Butler Co | 1-Hour Ozone (1979)-NAAQS revoked | Cincinnati-Hamilton, OH -KY | 92 93 94 95 96 97 98 99 00 01 02 03 04 | 06/14/2005 | Moderate | Whole | 368,130 | 39/017 |
| Butler Co | 8-Hour Ozone (1997)-NAAQS revoked | Cincinnati-Hamilton, OH -KY-IN | 04 05 06 07 08 09 | 05/11/2010 | Former Subpart 1 | Whole | 368,130 | 39/017 |
| Butler Co | 8-Hour Ozone (2008) | Cincinnati, OH-KY-IN | 12 13 14 15 16 | // | Marginal | Whole | 368,130 | 39/017 |
| Butler Co | PM-2.5 (1997) | Cincinnati-Hamilton, OH -KY-IN | 05 06 07 08 09 10 | 12/23/2011 | Former Subpart 1 | Whole | 368,130 | 39/017 |
| Clark Co | 1-Hour Ozone (1979)-NAAQS revoked | Dayton-Springfield, OH | 92 93 94 | 07/05/1995 | Moderate | Whole | 138,333 | 39/023 |
| Clark Co | 8-Hour Ozone (1997)-NAAQS revoked | Dayton-Springfield, OH | 04 05 06 | 08/13/2007 | Former Subpart 1 | Whole | 138,333 | 39/023 |
| Clark Co | PM-2.5 (1997) | Dayton-Springfield, OH | 05 06 07 08 09 10 11 12 | 09/26/2013 | Former Subpart 1 | Whole | 138,333 | 39/023 |
| Clermont Co | 1-Hour Ozone (1979)-NAAQS revoked | Cincinnati-Hamilton, OH -KY | 92 93 94 95 96 97 98 99 00 01 02 03 04 | 06/14/2005 | Moderate | Whole | 197,363 | 39/025 |
| Clermont Co | 8-Hour Ozone (1997)- | Cincinnati-Hamilton, OH -KY-IN | 04 05 06 07 08 09 | 05/11/2010 | Former Subpart 1 | Whole | 197,363 | 39/025 |

| County | NAAQS | Area Name | Nonattainment in Year | | | | | | | | | | | | | Redesignation to Maintenance | Classification | Whole or Part County | Population (2010) | State/County FIPS Codes | | | |
|--------------|-----------------------------------|--------------------------------------|-----------------------|----|----|----|----|----|----|----|----|----|----|----|----|------------------------------|----------------|----------------------|-------------------|-------------------------|-----------|--------|--------|
| | | | | | | | | | | | | | | | | | | | | | | | |
| | 8-Hour Ozone (2008) | | | | | | | | | | | | | | | | | | | | | | |
| Delaware Co | PM-2.5 (1997) | Columbus, OH | | | | | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | | | | 11/07/2013 | Former Subpart 1 | Whole | 174,214 | 39/041 | |
| Fairfield Co | 8-Hour Ozone (1997)-NAAQS revoked | Columbus, OH | | | | | 04 | 05 | 06 | 07 | 08 | | | | | | | 09/15/2009 | Former Subpart 1 | Whole | 146,156 | 39/045 | |
| Fairfield Co | 8-Hour Ozone (2008) | Columbus, OH | | | | | | | | | | | 12 | 13 | 14 | 15 | 16 | // | Marginal | Whole | 146,156 | 39/045 | |
| Fairfield Co | PM-2.5 (1997) | Columbus, OH | | | | | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | | | | 11/07/2013 | Former Subpart 1 | Whole | 146,156 | 39/045 | |
| Franklin Co | 1-Hour Ozone (1979)-NAAQS revoked | Columbus, OH | 92 | 93 | 94 | 95 | | | | | | | | | | | | 04/01/1996 | Marginal | Whole | 1,163,414 | 39/049 | |
| Franklin Co | 8-Hour Ozone (1997)-NAAQS revoked | Columbus, OH | | | | | 04 | 05 | 06 | 07 | 08 | | | | | | | 09/15/2009 | Former Subpart 1 | Whole | 1,163,414 | 39/049 | |
| Franklin Co | 8-Hour Ozone (2008) | Columbus, OH | | | | | | | | | | | 12 | 13 | 14 | 15 | 16 | // | Marginal | Whole | 1,163,414 | 39/049 | |
| Franklin Co | PM-2.5 (1997) | Columbus, OH | | | | | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | | | | 11/07/2013 | Former Subpart 1 | Whole | 1,163,414 | 39/049 | |
| Fulton Co | Lead (2008) | Delta, OH | | | | | | | | | | 10 | 11 | 12 | 13 | 14 | 15 | 16 | // | | Part | 3,243 | 39/051 |
| Gallia Co | PM-2.5 (1997) | Huntington-Ashland, WV-KY-OH | | | | | 05 | 06 | 07 | 08 | 09 | 10 | 11 | | | | | 12/31/2012 | Former Subpart 1 | Part | 4,275 | 39/053 | |
| Gallia Co | Sulfur Dioxide (1971) | Addison Township (Gallia County), OH | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | | | | | | | | 07/05/2000 | | Part | 2,197 | 39/053 | |
| Geauga Co | 1-Hour Ozone (1979)-NAAQS revoked | Cleveland-Akron-Lorain, OH | 92 | 93 | 94 | 95 | | | | | | | | | | | | 05/07/1996 | Moderate | Whole | 93,389 | 39/055 | |
| Geauga Co | 8-Hour Ozone (1997)-NAAQS revoked | Cleveland-Akron-Lorain, OH | | | | | 04 | 05 | 06 | 07 | 08 | | | | | | | 09/15/2009 | Moderate | Whole | 93,389 | 39/055 | |
| Geauga Co | 8-Hour Ozone (2008) | Cleveland-Akron-Lorain, OH | | | | | | | | | | | 12 | 13 | 14 | 15 | 16 | // | Marginal | Whole | 93,389 | 39/055 | |
| Greene Co | 1-Hour Ozone (1979)-NAAQS revoked | Dayton-Springfield, OH | 92 | 93 | 94 | | | | | | | | | | | | | 07/05/1995 | Moderate | Whole | 161,573 | 39/057 | |
| Greene Co | 8-Hour Ozone (1997)-NAAQS revoked | Dayton-Springfield, OH | | | | | 04 | 05 | 06 | | | | | | | | | 08/13/2007 | Former Subpart 1 | Whole | 161,573 | 39/057 | |
| Greene Co | PM-2.5 (1997) | Dayton-Springfield, OH | | | | | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | | | | 09/26/2013 | Former Subpart 1 | Whole | 161,573 | 39/057 | |
| Hamilton Co | 1-Hour Ozone (1979)-NAAQS revoked | Cincinnati-Hamilton, OH-KY | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02 | 03 | 04 | | | 06/14/2005 | Moderate | Whole | 802,374 | 39/061 | |
| Hamilton Co | 8-Hour Ozone (1997)-NAAQS revoked | Cincinnati-Hamilton, OH-KY-IN | | | | | 04 | 05 | 06 | 07 | 08 | 09 | | | | | | 05/11/2010 | Former Subpart 1 | Whole | 802,374 | 39/061 | |
| Hamilton Co | 8-Hour Ozone (2008) | Cincinnati, OH-KY-IN | | | | | | | | | | | 12 | 13 | 14 | 15 | 16 | // | Marginal | Whole | 802,374 | 39/061 | |
| Hamilton Co | PM-2.5 (1997) | Cincinnati-Hamilton, OH-KY-IN | | | | | 05 | 06 | 07 | 08 | 09 | 10 | | | | | | 12/23/2011 | Former Subpart 1 | Whole | 802,374 | 39/061 | |
| Jefferson Co | 1-Hour Ozone (1979)- | Stuebenville, OH | 92 | 93 | 94 | | | | | | | | | | | | | 03/10/1995 | Section 185A | Whole | 69,709 | 39/081 | |

| County | NAAQS | Area Name | Nonattainment in Year | Redesignation to Maintenance | Classification | Whole or Part County | Population (2010) | State/County FIPS Codes |
|---------------|-----------------------------------|--|-------------------------------------|------------------------------|------------------|----------------------|-------------------|-------------------------|
| Lorain Co | 8-Hour Ozone (2008) | Cleveland-Akron-Lorain, OH | 12 13 14 15 16 | // | Marginal | Whole | 301,356 | 39/093 |
| Lorain Co | PM-2.5 (1997) | Cleveland-Akron-Lorain, OH | 05 06 07 08 09 10 11 12 | 09/18/2013 | Former Subpart 1 | Whole | 301,356 | 39/093 |
| Lorain Co | PM-2.5 (2006) | Cleveland-Akron-Lorain, OH | 09 10 11 12 | 09/18/2013 | Former Subpart 1 | Whole | 301,356 | 39/093 |
| Lorain Co | PM-2.5 (2012) | Cleveland, OH | 15 16 | // | Moderate | Whole | 301,356 | 39/093 |
| Lorain Co | Sulfur Dioxide (1971) | Lorain Co, OH | 92 93 94 95 96 97 98 99 | 07/05/2000 | | Part | 301,074 | 39/093 |
| Lucas Co | 1-Hour Ozone (1979)-NAAQS revoked | Toledo, OH | 92 93 94 | 08/01/1995 | Moderate | Whole | 441,815 | 39/095 |
| Lucas Co | 8-Hour Ozone (1997)-NAAQS revoked | Toledo, OH | 04 05 06 | 08/09/2007 | Former Subpart 1 | Whole | 441,815 | 39/095 |
| Lucas Co | Sulfur Dioxide (1971) | Lucas Co, OH | 92 93 94 95 96 97 98 99 00 01 02 03 | 03/18/2004 | | Part | 441,812 | 39/095 |
| Madison Co | 8-Hour Ozone (1997)-NAAQS revoked | Columbus, OH | 04 05 06 07 08 | 09/15/2009 | Former Subpart 1 | Whole | 43,435 | 39/097 |
| Madison Co | 8-Hour Ozone (2008) | Columbus, OH | 12 13 14 15 16 | // | Marginal | Whole | 43,435 | 39/097 |
| Mahoning Co | 1-Hour Ozone (1979)-NAAQS revoked | Youngstown-Warren-Sharon, OH-PA (OH portion) | 92 93 94 95 | 04/01/1996 [Split] | Marginal | Whole | 238,823 | 39/099 |
| Mahoning Co | 8-Hour Ozone (1997)-NAAQS revoked | Youngstown-Warren-Sharon, OH-PA | 04 05 06 | 06/12/2007 | Former Subpart 1 | Whole | 238,823 | 39/099 |
| Medina Co | 1-Hour Ozone (1979)-NAAQS revoked | Cleveland-Akron-Lorain, OH | 92 93 94 95 | 05/07/1996 | Moderate | Whole | 172,332 | 39/103 |
| Medina Co | 8-Hour Ozone (1997)-NAAQS revoked | Cleveland-Akron-Lorain, OH | 04 05 06 07 08 | 09/15/2009 | Moderate | Whole | 172,332 | 39/103 |
| Medina Co | 8-Hour Ozone (2008) | Cleveland-Akron-Lorain, OH | 12 13 14 15 16 | // | Marginal | Whole | 172,332 | 39/103 |
| Medina Co | PM-2.5 (1997) | Cleveland-Akron-Lorain, OH | 05 06 07 08 09 10 11 12 | 09/18/2013 | Former Subpart 1 | Whole | 172,332 | 39/103 |
| Medina Co | PM-2.5 (2006) | Cleveland-Akron-Lorain, OH | 09 10 11 12 | 09/18/2013 | Former Subpart 1 | Whole | 172,332 | 39/103 |
| Miami Co | 1-Hour Ozone (1979)-NAAQS revoked | Dayton-Springfield, OH | 92 93 94 | 07/05/1995 | Moderate | Whole | 102,506 | 39/109 |
| Miami Co | 8-Hour Ozone (1997)-NAAQS revoked | Dayton-Springfield, OH | 04 05 06 | 08/13/2007 | Former Subpart 1 | Whole | 102,506 | 39/109 |
| Montgomery Co | 1-Hour Ozone (1979)-NAAQS revoked | Dayton-Springfield, OH | 92 93 94 | 07/05/1995 | Moderate | Whole | 535,153 | 39/113 |
| Montgomery Co | 8-Hour Ozone (1997)-NAAQS revoked | Dayton-Springfield, OH | 04 05 06 | 08/13/2007 | Former Subpart 1 | Whole | 535,153 | 39/113 |

| County | NAAQS | Area Name | Nonattainment in Year | Redesignation to Maintenance | Classification | Whole or Part County | Population (2010) | State/County FIPS Codes |
|---------------|-----------------------------------|--|--|------------------------------|------------------|----------------------|-------------------|-------------------------|
| Montgomery Co | PM-2.5 (1997) | Dayton-Springfield, OH | 05 06 07 08 09 10 11 12 | 09/26/2013 | Former Subpart 1 | Whole | 535,153 | 39/113 |
| Morgan Co | Sulfur Dioxide (1971) | Center Township (Morgan County), OH | 92 93 | 10/21/1994 | | Part | 15,053 | 39/115 |
| Morgan Co | Sulfur Dioxide (2010) | Muskingum River, OH | 13 14 15 16 | // | | Part | 743 | 39/115 |
| Portage Co | 1-Hour Ozone (1979)-NAAQS revoked | Cleveland-Akron-Lorain, OH | 92 93 94 95 | 05/07/1996 | Moderate | Whole | 161,419 | 39/133 |
| Portage Co | 8-Hour Ozone (1997)-NAAQS revoked | Cleveland-Akron-Lorain, OH | 04 05 06 07 08 | 09/15/2009 | Moderate | Whole | 161,419 | 39/133 |
| Portage Co | 8-Hour Ozone (2008) | Cleveland-Akron-Lorain, OH | 12 13 14 15 16 | // | Marginal | Whole | 161,419 | 39/133 |
| Portage Co | PM-2.5 (1997) | Cleveland-Akron-Lorain, OH | 05 06 07 08 09 10 11 12 | 09/18/2013 | Former Subpart 1 | Whole | 161,419 | 39/133 |
| Portage Co | PM-2.5 (2006) | Cleveland-Akron-Lorain, OH | 09 10 11 12 | 09/18/2013 | Former Subpart 1 | Whole | 161,419 | 39/133 |
| Preble Co | 1-Hour Ozone (1979)-NAAQS revoked | Preble Co, OH | 92 93 94 | 03/10/1995 | Section 185A | Whole | 42,270 | 39/135 |
| Scioto Co | PM-2.5 (1997) | Huntington-Ashland, WV -KY-OH | 05 06 07 08 09 10 11 | 12/31/2012 | Former Subpart 1 | Whole | 79,499 | 39/145 |
| Stark Co | 1-Hour Ozone (1979)-NAAQS revoked | Canton, OH | 92 93 94 95 | 04/01/1996 | Marginal | Whole | 375,586 | 39/151 |
| Stark Co | 8-Hour Ozone (1997)-NAAQS revoked | Canton-Massillon, OH | 04 05 06 | 06/15/2007 | Former Subpart 1 | Whole | 375,586 | 39/151 |
| Stark Co | PM-2.5 (1997) | Canton-Massillon, OH | 05 06 07 08 09 10 11 12 | 10/22/2013 | Former Subpart 1 | Whole | 375,586 | 39/151 |
| Stark Co | PM-2.5 (2006) | Canton-Massillon, OH | 09 10 11 12 | 10/22/2013 | Former Subpart 1 | Whole | 375,586 | 39/151 |
| Summit Co | 1-Hour Ozone (1979)-NAAQS revoked | Cleveland-Akron-Lorain, OH | 92 93 94 95 | 05/07/1996 | Moderate | Whole | 541,781 | 39/153 |
| Summit Co | 8-Hour Ozone (1997)-NAAQS revoked | Cleveland-Akron-Lorain, OH | 04 05 06 07 08 | 09/15/2009 | Moderate | Whole | 541,781 | 39/153 |
| Summit Co | 8-Hour Ozone (2008) | Cleveland-Akron-Lorain, OH | 12 13 14 15 16 | // | Marginal | Whole | 541,781 | 39/153 |
| Summit Co | PM-2.5 (1997) | Cleveland-Akron-Lorain, OH | 05 06 07 08 09 10 11 12 | 09/18/2013 | Former Subpart 1 | Whole | 541,781 | 39/153 |
| Summit Co | PM-2.5 (2006) | Cleveland-Akron-Lorain, OH | 09 10 11 12 | 09/18/2013 | Former Subpart 1 | Whole | 541,781 | 39/153 |
| Trumbull Co | 1-Hour Ozone (1979)-NAAQS revoked | Youngstown-Warren-Sharon, OH-PA (OH portion) | 92 93 94 95 | 04/01/1996 [Split] | Marginal | Whole | 210,312 | 39/155 |
| Trumbull Co | 8-Hour Ozone (1997)-NAAQS revoked | Youngstown-Warren-Sharon, OH-PA | 04 05 06 | 06/12/2007 | Former Subpart 1 | Whole | 210,312 | 39/155 |
| Warren Co | 1-Hour Ozone | | 92 93 94 95 96 97 98 99 00 01 02 03 04 | 06/14/2005 | Moderate | Whole | 212,693 | 39/165 |

| County | NAAQS | Area Name | Nonattainment in Year | Redesignation to Maintenance | Classification | Whole or Part County | Population (2010) | State/County FIPS Codes |
|---------------|-----------------------------------|--|-------------------------|------------------------------|------------------|----------------------|-------------------|-------------------------|
| | (1979)-NAAQS revoked | Cincinnati-Hamilton, OH -KY | | | | | | |
| Warren Co | 8-Hour Ozone (1997)-NAAQS revoked | Cincinnati-Hamilton, OH -KY-IN | 04 05 06 07 08 09 | 05/11/2010 | Former Subpart 1 | Whole | 212,693 | 39/165 |
| Warren Co | 8-Hour Ozone (2008) | Cincinnati, OH-KY-IN | 12 13 14 15 16 | // | Marginal | Whole | 212,693 | 39/165 |
| Warren Co | PM-2.5 (1997) | Cincinnati-Hamilton, OH -KY-IN | 05 06 07 08 09 10 | 12/23/2011 | Former Subpart 1 | Whole | 212,693 | 39/165 |
| Washington Co | 8-Hour Ozone (1997)-NAAQS revoked | Parkersburg-Marietta, WV -OH | 04 05 06 | 06/15/2007 | Former Subpart 1 | Whole | 61,778 | 39/167 |
| Washington Co | PM-2.5 (1997) | Parkersburg-Marietta, WV -OH | 05 06 07 08 09 10 11 12 | 08/29/2013 | Former Subpart 1 | Whole | 61,778 | 39/167 |
| Washington Co | Sulfur Dioxide (1971) | Waterford Township (Washington County), OH | 92 93 | 10/21/1994 | | Part | 61,777 | 39/167 |
| Washington Co | Sulfur Dioxide (2010) | Muskingum River, OH | 13 14 15 16 | // | | Part | 3,713 | 39/167 |
| Wood Co | 1-Hour Ozone (1979)-NAAQS revoked | Toledo, OH | 92 93 94 | 08/01/1995 | Moderate | Whole | 125,488 | 39/173 |
| Wood Co | 8-Hour Ozone (1997)-NAAQS revoked | Toledo, OH | 04 05 06 | 08/09/2007 | Former Subpart 1 | Whole | 125,488 | 39/173 |

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United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

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

Custom Soil Resource Report for Licking County, Ohio



Preface

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

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

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

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

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

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

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How Soil Surveys Are Made

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

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

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

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

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

Custom Soil Resource Report'

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

Custom Soil Resource Report Soil Map



Map Scale: 1:2,530 if printed on A landscape (11" x 8.5") sheet.



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

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Licking County, Ohio
 Survey Area Data: Version 12, Sep 26, 2015

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

Date(s) aerial images were photographed: Feb 27, 2012—Mar 10, 2012

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

MAP LEGEND

- Area of Interest (AOI)
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features
- Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points
- Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Water Features**
- Streams and Canals
- Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads
- Background**
- Aerial Photography

Map Unit Legend

| Licking County, Ohio (OH089) | | | |
|------------------------------------|--|--------------|----------------|
| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
| FoE2 | Fox gravelly loam, 18 to 25 percent slopes, eroded | 0.6 | 1.9% |
| OeA | Ockley-Urban land complex, 0 to 3 percent slopes | 3.1 | 9.5% |
| St | Stonelick loam, occasionally flooded | 4.2 | 12.9% |
| Su | Stonelick-Urban land complex, occasionally flooded | 21.3 | 65.2% |
| W | Water | 3.4 | 10.5% |
| Totals for Area of Interest | | 32.6 | 100.0% |

Map Unit Descriptions

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

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

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

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The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

Licking County, Ohio

FoE2—Fox gravelly loam, 18 to 25 percent slopes, eroded

Map Unit Setting

National map unit symbol: 5qz1'
Elevation: 580 to 1,300 feet'
Mean annual precipitation: 30 to 42 inches'
Mean annual air temperature: 46 to 55 degrees F'
Frost-free period: 130 to 180 days'
Farmland classification: Not prime farmland'

Map Unit Composition

Fox and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fox

Setting

Landform: Kames, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Calcareous, wisconsinan loamy outwash derived from limestone, sandstone, and shale

Typical profile

H1 - 0 to 5 inches: gravelly loam'
H2 - 5 to 26 inches: gravelly clay loam'
H3 - 26 to 29 inches: very gravelly sandy loam'
H4 - 29 to 60 inches: very gravelly sand'

Properties and qualities

Slope: 18 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 25 percent
Available water storage in profile: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified'
Land capability classification (nonirrigated): 6e'
Hydrologic Soil Group: B'

OeA—Ockley-Urban land complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 5r07'
Elevation: 400 to 1,000 feet'
Mean annual precipitation: 35 to 45 inches'
Mean annual air temperature: 46 to 54 degrees F'
Frost-free period: 130 to 180 days'
Farmland classification: Not prime farmland'

Map Unit Composition

Ockley and similar soils: 45 percent
Urban land: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ockley

Setting

Landform: Flats on terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty loess derived from interbedded sedimentary rock over calcareous, wisconsinan loamy outwash derived from interbedded sedimentary rock

Typical profile

H1 - 0 to 10 inches: silt loam'
H2 - 10 to 19 inches: silty clay loam'
H3 - 19 to 56 inches: clay loam'
H4 - 56 to 80 inches: very gravelly sand'

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent
Available water storage in profile: Moderate (about 7.3 inches)

Minor Components

Westland

Percent of map unit: 5 percent'
Landform: Draws'

Small dumps

Percent of map unit: 5 percent

Cut and filled areas

Percent of map unit: 5 percent

Sleeth

Percent of map unit: 5 percent

St—Stonelick loam, occasionally flooded

Map Unit Setting

National map unit symbol: 5r0s'

Elevation: 480 to 940 feet'

Mean annual precipitation: 35 to 40 inches'

Mean annual air temperature: 50 to 55 degrees F'

Frost-free period: 153 to 179 days'

Farmland classification: All areas are prime farmland'

Map Unit Composition

Stonelick and similar soils: 100 percent

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

Description of Stonelick

Setting

Landform: Flood plains

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Calcareous, recent coarse-loamy alluvium derived from interbedded sedimentary rock

Typical profile

H1 - 0 to 14 inches: loam

H2 - 14 to 60 inches: stratified gravelly loamy sand to silt loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Calcium carbonate, maximum in profile: 40 percent

Available water storage in profile: Moderate (about 7.6 inches)

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Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: B

Su—Stonelick-Urban land complex, occasionally flooded

Map Unit Setting

National map unit symbol: 5r0t'

Elevation: 480 to 940 feet'

Mean annual precipitation: 35 to 40 inches'

Mean annual air temperature: 50 to 55 degrees F'

Frost-free period: 153 to 179 days'

Farmland classification: Not prime farmland'

Map Unit Composition

Stonelick and similar soils: 40 percent

Urban land: 35 percent

Minor components: 25 percent

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

Description of Stonelick

Setting

Landform: Flood plains

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Calcareous, recent coarse-loamy alluvium derived from interbedded sedimentary rock

Typical profile

H1 - 0 to 14 inches: loam

H2 - 14 to 60 inches: stratified gravelly loamy sand to silt loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Calcium carbonate, maximum in profile: 40 percent

Available water storage in profile: Moderate (about 7.6 inches)

Description of Urban Land

Setting

Landform: Flood plains

Custom Soil Resource Report'

Minor Components

Ockley

Percent of map unit: 25 percent

W—Water

Map Unit Composition

Water: 100 percent

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

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Custom Soil Resource Report'

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Approximate Mileages

- 14.3 JOHNSTOWN TO NEWARK
- 5 REDDINGTON ROAD (NEWARK)
- 5 TO CHERRY VALLEY LODGE
- 3.3 TO YONKERS VALLEY LODGE
- 2.3 YONKERS VALLEY LODGE TO YMCA
- 0.7 NEWARK CAMPUS TO J. GILBERT REESE BRIDGE
- 2.1 COUNTRY CLUB DR/PARKING LOT TO GOOSEPOND
- 0.6 BRANCH PATH TO BAKER BLVD
- 0.1 CAMPUS PATH TO LEFEVRE HALL
- 0.2 CAMPUS PATH TO PONDS
- 1.4 EVERETT AVENUE TO MANNING STREET
- 5.2 PANHANDLE TRAIL - NEWARK TO MARINE
- 4.7 PANHANDLE TRAIL - MARINE TO FELUMILEE RD
- 4.2 BLACKHAND GORGE
- 4.5 HEATH TRAILS

44.1 TOTAL TRAIL MILES

Phone Numbers

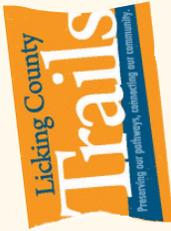
- 911** EMERGENCY / POLICE
- 740/348-4000 LICKING MEMORIAL HOSPITAL
- 740/670-7788 CITY OF NEWARK MAINTENANCE
- 740/587-2595 COUNTY MAINTENANCE

About the Licking County Trails Alliance

Enjoyed by thousands of visitors of all ages each year, the Licking County Trail system is a beautiful, scenic bike trail – and more! The trails provide fun opportunities for biking, walking, rollerblading, jogging, and nature observation. Traversing over 44 miles of picturesque valleys, villages and towns in Licking County, the trails are a wonderful resource for residents and visitors. The Licking County Trails promote health, wellness, economic development, transportation, education, recreation and the natural environment.

The Licking County Trails Alliance is a volunteer group committed to promoting and preserving this valuable community asset. Please join us in preserving our pathways and connecting our community! Join the Alliance today, organize an event to support our trails, or make a gift to the Licking County Trails Fund.

For more information, call 740.349.3863.



Gilbert Reese Bridge at Cherry Valley Road



View along the Raccoon Creek area



Benches at the J. Gilbert Reese Bridge south of Newark Campus path



SEE NEWARK DETAILS OPPOSITE SIDE



Support the Licking County Trails!

Your tax-deductible donation will help preserve this treasured resource, ensuring that the Licking County Trails continue to connect our community for many generations to come.

Contribution amount \$ _____

Your name _____ Company name _____
 Address _____
 City _____ State _____ Zip _____
 Telephone _____ Email _____

Please make checks payable to the Licking County Foundation, P.O. Box 4212, Newark, OH 43038-4212

TRAIL MAP

Revised December 2010



Connecting our community!
**Licking County
 Recreational Trails**



LEGEND

- INTERSTATE HIGHWAY
- U.S. HIGHWAY
- STATE HIGHWAY
- COUNTY/TOWNSHIP
- BIKE TRAIL
- JUDICIAL BIKE TRAIL
- OTIS/TOWNS
- WATERWAYS
- PARKING AREA
- SEAS OF INTEREST
- BRIDGE
- TUNNEL
- HOSPITAL
- SCHOOL
- NATURAL AREA
- NATURAL AREA
- WATERWAYS
- AIRPORT

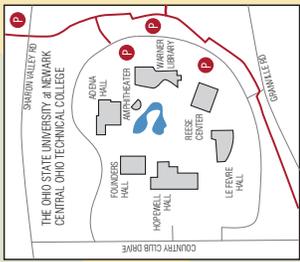
TRAIL USER RECOMMENDATIONS

- BE COURTEOUS. All trail users should be respectful of other users.
- DO NOT SPEED. Please do not exceed 15 mph on the trail.
- KEEP RIGHT. Stay as far to the right side of the trail as is safe.
- PASS ON LEFT. Give an audible signal well in advance, and pass others going in your direction on their left.
- DO NOT BLOCK THE TRAIL. When walking, a pair or in a group, stay on the right half of the trail. Groups should follow in single file.
- YIELD WHEN ENTERING OR CROSSING. When starting or crossing a trail, yield to users already on the trail.
- KEEP DOGS LEASHED. Control your pet while using the trail. Please clean up after your pet. Please clean up after your pet.
- KEEP KEEP THE TRAILS CLEAN AND SAFE. Do not litter. Report any acts of vandalism.
- WEAR A HELMET. Bikers and skaters should wear a helmet.
- CARRY A CELLPHONE. Be sure to bring a cell phone, identification, etc.
- BE AWARE. Keep alert to other users who may pass you. Be predictable in your movements. Keep your eyes on the trail ahead. Do not drink or use portable music devices as you can increase accident risk.

- Links to Municipalities and Other Partners**
- Village of Alexandria www.alexandriah.org
 - Blackard Cove (ODNR) www.odnr.state.oh.us
 - Village of Granville www.granville.oh.us
 - Greater Licking County www.lccob.com
 - Convention & Visitors Bureau www.healthio.gov
 - City of Heath www.villageofjohnstown.org
 - Village of Johnstown www.villageofjohnstown.org
 - Licking County Park District www.lickingcountytrails.com
 - Licking County Trails Alliance www.lccotrails.com
 - City of Newark www.newarkohio.net



Amphitheater at the Newark Campus



NEWARK



Springtime scene in Newark trail area



Trail entrance at Irving-Wick and Lake Drive

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Draft 404(b)(1) EVALUATION

DRAFT

DRAFT SECTION 404(b)(1) EVALUATION
DETAILED PROJECT REPORT AND
ENVIRONMENTAL ASSESSMENT
NEWARK SECTION 14
EMERGENCY STREAMBANK PROTECTION PROJECT
NEWARK, OH

I. INTRODUCTION

As required by Section 404(b)(1) of the Clean Water Act, this evaluation assesses the short- and long-term impacts associated with the discharge of dredged and fill materials into waters of the United States resulting from this project. This evaluation summarizes the detailed impact discussion provided in the Newark Section 14 Emergency Streambank Protection Project Detailed Project Report (DPR) and Environmental Assessment (EA).

II. PROJECT DESCRIPTION

A. LOCATION. The City of Newark is located in Franklin County, Ohio, about 33 miles east of Columbus, Ohio. The project location is on the west side of the City of Newark, running 710 linear feet (LF) along Raccoon Creek, endangering Ohio State Route (SR) 16, public infrastructure, and utilities.

B. GENERAL DESCRIPTION OF PROJECT PURPOSE. The project plan proposes to address the failing streambank along the Raccoon Creek that is endangering SR 16 and adjacent utilities. This reach of streambank is in need of immediate protection due to flood stage erosion and stabilization feature outflanking. Approximately 1,420 LF of streambank is located within the project reach accounting for 710 LF along both right and left descending banks.

The Recommended Plan involves various features and risk management measures formulated to ensure stability of the streambank during flood events, some of which would be constructed within jurisdictional waters. This plan includes sheet pile wall grade control with backfilling and storm channel protection.

The recommended plan would include installing a sheet pile wall grade control structure to a depth of approximately 40 feet, located upstream of the existing sheet pile and backfilling the area between the existing and proposed structures with grouted stone. The plan also calls for a sheet pile extension and graded stone downstream of the left abutment to armor the existing stilling feature, and stone slope protection along both banks of a 710 LF reach of Raccoon Creek. The recommended plan also includes placing a stone stability berm downstream of the existing grade control structure.

C. PURPOSE AND AUTHORITY. The purpose of the project is to provide a cost-effective means to prevent subsidence of Ohio SR 16 and adjacent utilities. SR 16 is a significant transportation route through and within the City of Newark, and is part of the Columbus to Interstate 77 (I-77) macro-corridor which connects central Ohio and the City of Columbus

to east-central Ohio cities. Since 2015, the streambank erosion and scour have resulted in the immediate endangerment of SR 16 at the Church Street off-ramp, and adjacent utility line crossings. Without treatment, the streambank would continue to undergo flood related erosion and failure, and the sheet pile grade structure would experience additional overturning and outflanking, leading to the undercutting and collapse of critically important public infrastructure. Failure to protect this area from erosion would result in loss of access to a significant thoroughfare and endanger adjacent utilities and City of Newark infrastructure. As a result, the primary purpose of the study is to identify the sections of the streambank in immediate need of treatment and to develop a viable treatment solution for the sheet pile grade control structure in protection of SR 16 and infrastructure.

Section 14 of the Flood Control Act of 1946, as amended, authorizes USACE to study, design and construct emergency streambank and shoreline works to protect public services including (but not limited to) streets, bridges, schools, water and sewer lines, National Register sites, and churches from damage or loss by natural erosion. The Section 14 authority falls under the Continuing Authorities Program (CAP), which focuses on water resource related projects of relatively smaller scope, cost, and complexity. Traditional USACE civil works projects are of wide scope and complexity and require specific authorization by Congress. Certain types of water resource and environmental restoration projects completed under CAP are delegated authority to plan, design, and construct recommendations without specific congressional authorization.

D. GENERAL DESCRIPTION OF LEADGE OR FILL MATERIAL

1. General Characteristics of Material. Fill material used in construction of the upstream sheet pile grade control structure, lead extending bank sheet pile abutment stabilization, and stone placement include well-graded 36 inch and 24 inch top-size blocky durable rock and grout.
2. Quantity of Material. The following quantities of materials are estimated to be used in construction of the recommended plan.

| Fill Type | Estimated Quantity | Temporary or Permanent Fill |
|------------------|---------------------------|------------------------------------|
| Rock (36 inch) | Undeveloped | Permanent |
| Rock (24 inch) | Undeveloped | Permanent |
| Grout | Undeveloped | Permanent |

3. Source of Material. All materials used will come from a commercial source. The 36 and 24 inch stone will be transported by truck from a quarry.

E. DESCRIPTION OF THE PROPOSED DISCHARGE SITES

1. Location. Stone will be placed for 710 LF along both sides of Raccoon Creek, near the site of the exiting grade control. This reach of Raccoon Creek lies about 2.75 miles from the center of Newark, immediately adjacent to the Church Street off-ramp.
2. Size. The stone slope protection will be comprised of 24 inch top sized stone for 710 LF along each bank. Channel bed protection will extend 180 LF downstream of the sheet pile grade control structure and will be comprised of 36 and 24 inch top sized stone, decreasing in size downchannel. The new sheet pile grade control structure will be installed to a depth of 40 feet and extend the width of the stream. The area between the existing sheet pile wall and new structure will be filled with grouted stone.
3. Types of Sites. The work would occur along channel bottom and the left and right descending banks of Raccoon Creek, along a reach of streambank which has been previously impacted by disturbance including the prior construction of the existing sheet pile grade control structure that has been partially overturned. The new sheet pile grade control structure and grouted stone will be installed midstream at a depth of 40 feet, placed immediately upstream of the existing structure. A sheet pile extension will run along the left abutment of the existing sheet pile treatment that lies along the left descending bank.
4. Types of Habitat. Aquatic and riverine habitat would be minimally impacted by placement of the fill material. Limited herbaceous vegetation has volunteered between previously placed riprap and bank erosion has resulted in a lack of diverse aquatic and terrestrial vegetation. Habitat along the right descending bank is more diverse riparian hardwood, but is currently impacted by bank erosion and failure, golf course maintenance, and residential development.
5. Timing and Duration of Discharge. The recommended plan's estimated duration has not yet been defined as it is early in the feasibility process. Further analysis shall occur as the project progresses.. All discharge and fill would occur during this time. Work will be completed during low to normal flow conditions and periods of high flow would be avoided.

- F. DESCRIPTION OF DISPOSAL METHOD. The stone protection will be placed along the streambank, stone stability berm, and backfill between the sheet pile structures. Work will be conducted from streambank using appropriate cranes, excavators, and loaders.

III. FACTUAL DETERMINATIONS

A. PHYSICAL SUBSTRATE DETERMINATIONS

1. Substrate Elevation and Slope. Not developed at this time.

2. Sediment Type. The stream bottom is primarily comprised of sand, silt, gravel, and cobble.
3. Dredged/Fill Material Movement. No excavation or dredging would occur from this action therefore, any movement of fill material would be insignificant.
4. Physical Effects on Benthos. Minimal impacts to aquatic resources would be limited to the construction period and would be minimal and temporary in nature.
5. Other Effects. No other effects are expected.
6. Actions Taken to Minimize Impacts. The footprint of the treatment has been minimized to the streambank in direct immediate need of stabilization. Work would be accomplished during flow conditions which minimize impacts to the aquatic environment including timing the discharge to avoid higher flow conditions. Additionally, during construction of the recommended project the USACE would implement a sediment and erosion control plan to minimize downstream impacts from sedimentation.

B. WATER CIRCULATION, WATER QUALITY, CHEMICAL, AND PHYSICAL DETERMINATIONS

1. Water. Placement of the fill material could resuspend seabed material during the construction however, the potential impacts of suspended material would be considered short term and minimal.
 - a. Salinity. No impacts anticipated.
 - b. Water Chemistry. No impacts anticipated.
 - c. Clarity. No impacts anticipated.
 - d. Color. No impacts anticipated.
 - e. Odor. No impacts anticipated.
 - f. Taste. No impacts anticipated.
 - g. Dissolved gas levels. No impacts anticipated.
 - h. Nutrients. No introduction of nutrients is expected from placement of fill material.
 - i. Eutrophication. No eutrophication is anticipated.
 - j. Current pattern and circulation. No impacts anticipated.

- k. Velocity. No impacts anticipated from the recommended plan.
- l. Stratification. No impacts anticipated.
- m. Hydrologic regime. No impacts anticipated.
- n. Normal water level fluctuation. The discharge of fill material and new grade control buttress would increase the water surface profile along Raccoon Creek by 0.2 feet for a 1% chance exceedance flood event.
- o. Salinity gradients. No effect.
- p. Actions Taken to Minimize Impacts. The footprint of fill materials has been minimized to avoid potential adverse effects. Best management practices (BMP) would be utilized to minimize impacts.

C. SUSPENDED PARTICULATE/ TURBIDITY DETERMINATIONS

1. An elevation in suspended sediments during construction would be expected, but would subside following the completion of construction.
 - a. Light penetration. Short term reductions in light penetration are likely to occur during construction. These reductions in light penetration are anticipated to be short term and limited to the area adjacent to construction operations.
 - b. Dissolved oxygen (DO). During construction there could be increased turbidity which could cause temporary localized decreases in DO.
 - c. Toxic metals and organisms. No toxic metals or organisms would be discharged during placement of fill material.
 - d. Pathogens. While coliform and enterococci bacteria may be present in project waters, project construction would not affect this condition.
 - e. Aesthetics. Area aesthetics would be temporarily impacted during the construction phase of the proposed project but will have minimal impact on the City of Newark or the adjacent communities.
 - f. Pesticides. No toxic metals or organisms would be discharged during placement of fill material.
 - g. Effects on biota. Impacts would occur during construction due to placement of stone, however these impacts would be minimal and temporary.
 - h. Suspension/filter feeders. Larval and juvenile forms of suspension and filter feeding organisms may be affected on a localized, temporary, and minimal basis.

- i. Sight feeders. No significant effects. These organisms are generally highly mobile and would avoid or escape areas of turbidity during fill placement.
- j. Actions taken to minimize impacts. The footprint of fill materials has been minimized to avoid potential adverse effects. BMPs would be utilized to minimize the impacts of discharged material into Raccoon Creek.

D. CONTAMINATION DETERMINATIONS. The risk of contamination of waters resulting from the placement of fill material into waters located within the project area is low. Filling operations associated with this project are not expected to significantly affect the water chemistry of waters within the project area.

E. AQUATIC ECOSYSTEM AND ORGANISM DETERMINATIONS

1. Effects on Plankton. Any existing plankton in the immediate area of the construction operation may be minimally impacted due to potential increases in turbidity levels. The impacts would be localized and short term.
2. Effects on Benthos. Minimal impacts to aquatic resources would be limited to the construction period and would be minimal and temporary in nature.
3. Effects on Nekton. Any existing nekton in the construction area would not be impacted due to the mobility of the aquatic animals.
4. Effects on Aquatic Food Web. No real impacts are anticipated to the food web by the proposed operation.
5. Effects on Special Aquatic Sites. There are no special aquatic sites within the project area.
 - a. Wetlands. No wetlands are located within the project area.
 - b. Mudflats. No mudflats are located in the project area.
 - c. Vegetated shallows. No vegetated shallows are located in the project area.
 - d. Coral reefs. Not applicable.
 - e. Riffle and pool complexes. The project location is not located in a riffle or pool complex.
6. Threatened and endangered species. The project is not likely to adversely affect the Indiana bat, Northern long-eared bat, Eastern massasauga, or the bald eagle. For this project, there exists potential to impact federally listed mussels. Therefore, a mussel survey will be performed to determine the presence or absence of sensitive mussel species.

7. Other wildlife. No wildlife aside from the aquatic species discussed in earlier sections would be directly impacted by fill placement.
8. Actions to minimize impacts. The footprint of the fill has been minimized to the maximum extent practicable and BMPs would be implemented to further reduce potential impacts to the aquatic environment.

F. PROPOSED DISPOSAL SITE DETERMINATIONS

1. Mixing Zone Determinations. No water quality criteria would be exceeded by the placement of fill material as all material would be free of toxic pollutants.
2. Determinations of Compliance with Applicable Water Quality Standards. Only temporary short-term impacts to water quality in the form of increased turbidity are anticipated as a direct result of fill placement. These impacts include temporary and minimal increases in suspended solids and increases in turbidity levels which would occur during placement.
3. Potential Effects on Human Use Characteristics.
 - a. Municipal and private water supply. No effects.
 - b. Recreational and commercial fishing. The project area includes a recreational pathway that is part of the Linking Communities Trails system. This path will be closed for public safety concerns. Construction noise may also cause a temporary and minor impact on recreation.
 - c. Water-related recreation. The fill placed within the channel, as well as the construction of a new emergency grade control structure, has the potential to cause minor, temporary impacts on water-related recreation.
 - d. Aesthetics. Area aesthetics have been previously impacted due to emergency bank stabilization measures at the failed grade control structure, and will be temporarily impacted during the construction phase of the proposed project, but will have minimal impact on the City of Newark or the communities near the project. An improvement to area aesthetics should be noted with replacement of the failed grade control structure.
 - e. Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. None are located in the project area.

- G. DETERMINATION OF CUMULATIVE EFFECTS ON THE AQUATIC ECOSYSTEM.
 The impacts caused by the placement of fill would be minor and temporary in nature. In addition BMPs will be put in place thus minimizing impacts to the aquatic ecosystem, the cumulative impact of the placement of fill would not be expected to be greater than those discussed in earlier sections of this evaluation.

H. DETERMINATION OF SECONDARY EFFECTS ON THE AQUATIC ECOSYSTEM.
No secondary effects are anticipated.

IV. FINDING OF COMPLIANCE OR NONCOMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE

- A. No significant adaptations of the Section 404(b)(1) guidelines were made relative to this evaluation.
- B. There would be no significant impact to the environment. With a minimal footprint for the project all potential impacts have been avoided or minimized. However a 401 Water Quality Certification under the Clean Water Act will be acquired before any fill material is placed within Raccoon Creek.
- C. The planned deposition of fill material would not violate applicable State Water Quality Standards (Ohio Revised Code Chapter 3745-1 of Administrative Code, Requirements Governing Water Quality Standards for Ohio).
- D. Further, the planned fill action would not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.
- E. No endangered species or their critical habitat will be adversely impacted by the planned action.
- F. Appropriate steps to minimize potential adverse impacts of the fill action on aquatic systems have been incorporated. Along with minimizing the footprint of the fill to the maximum extent practicable.
- G. The proposed deposition of fill material would not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites.
- H. On the basis of the Section 404(b)(1) guidelines, the proposed sites for the discharge of fill material are specified as complying with the requirements of these guidelines.

Estimated Economic Costs for Recommended Plan

A cost estimate for the Preferred Alternative has been prepared to an equivalent price level of 1 April 2018 and is summarized in the table.

| | |
|---|------------------|
| Recommended Plan (Alternative Plan A) | |
| Annual Project Cost based upon (\$2,700,000 project cost at 3.125% for 50 year project life) | \$107,441 |
| Annual Operations & Maintenance Cost | \$5,000 |
| Total Annual Economic Cost | \$112,441 |
| Relocation Alternative | |
| Annual Project Cost based upon (\$9,9000,000 project cost at 3.125% for 50 year project life) | \$393,950 |
| Annual Operations and Maintenance | \$0 |
| Total Annual Economic Cost | \$393,950 |

ECONOMIC JUSTIFICATION FOR SELECTED ALTERNATIVE

The benefits for the project are the lesser of:

1. The least cost relocation alternative; or
2. The value of the infrastructure benefits forgone if no corrective action is taken.

The benefit-cost ratio (BCR) of the protection alternative is based on the comparison of the annual cost of the Relocation Alternative with the annual cost of the Preferred Alternative.

$$\text{BCR} = \frac{\text{Annual Economic Cost of Relocation Alternative}}{\text{Annual Economic Cost of Preferred Alternative}}$$

$$\text{BCR} = \frac{\$393,950}{\$112,441}$$

$$\text{BCR} = 3.50$$

REAL ESTATE PLAN
CITY OF NEWARK STREAMBANK PROTECTION PROJECT
LICKING COUNTY, OHIO
SECTION 14

1. Authority/Purpose

This Real Estate Plan is in support of the City of Newark Detailed Project Report and Environmental Assessment. Section 14 of the Flood Control Act of 1946 (PL 79-526), as amended, authorizes the Project. This Real Estate Plan is being submitted in accordance with Chapter 12 of ER 405-1-12 for approval. This REP is to be considered tentative in nature and for planning purposes only. Both the final and real property acquisition line and the estimate of cost are subject to change, even after the approval of this report.

The City of Newark and the Ohio Department of Transportation (ODOT) have been identified as the cost-sharing non-Federal Sponsors. This project will be cost-shared at 35%. The City of Newark Streambank Protection Project is located in central Ohio approximately 33 miles east of Columbus on both the right and left descending banks of Raccoon Creek adjacent to State Route 16 on the west side of Newark. State Route 16 is a significant transportation route through and within the City of Newark. A sheet pile grade control structure in the project area, which crosses Raccoon Creek, has partially overturned due to flood flow erosion resulting in the immediate endangerment of critical public facilities, including utility line crossings and the adjacent State Route 16 travel way. Approximately 1,420 linear feet of eroded streambank (710 linear feet along each bank) is located within the project area. The recommended alternative would include the placement of a sheet pile wall grade control structure upstream of the existing sheet pile grade control structure. A sheet pile treatment along the left abutment would be required in conjunction with the placement of derrick-size stone to armor the existing stilling feature. Excavation and placement of graded stone slope protection, including a filter blanket component, along both banks of the 710 linear feet reach of Raccoon Creek would be included within the recommended alternative.

2. LER Required for Construction, Operation, and Maintenance

The project requires approximately 3.44 acres of land located entirely within ODOT right-of-way for Route 16 and the right-of-way they acquired in order to relocate Raccoon Creek within the project area. The minimum estate required for the project is a stream bank protection easement, however, ODOT owns either fee or an easement for channel purposes. After a review by Office of Counsel, it has been determined that ODOT has a sufficient ownership interest in order to construct, operate, and maintain the project and will not be required to acquire any additional real estate. Acquisition of a borrow or spoil site is not required for the Project. All borrow material will be obtained from a commercial quarry. The only spoil anticipated would result from clearing and grubbing the project area and will be hauled to a commercial facility as it is the least costly alternative.

3. LER Already Owned by the Non-Federal Sponsor

Investigations indicate that the 3.44 acres of land required for the project are within ODOT's

right-of-way for Route 16 and the right-of-way for the relocation of Raccoon Creek. ODOT will be required to submit title documentation of ownership before real estate can be certified for construction.

4. LER Acquired for, or with Use of Funds from, another Federal Program or Project

No LER was acquired by the non-Federal Sponsor as a requirement of, or with the use of funds from, another Federal program or project.

5. Non-Standard Estates

Non-standard estates are not proposed for this project.

6. Existing Federal Projects

There are no existing Federal projects within the proposed project area.

7. Federal Owned Land or Interest in the Project Areas

There are no federally owned lands or interests within the proposed project area.

8. Navigational Servitude

The proposed project is not subject to navigational servitude.

9. Project Map

The treatment area is outlined in Exhibit A.

10. Induced Flooding

There will be no induced flooding in the project area or as a result of the project.

11. Baseline Cost Estimate

The non-Federal Sponsor shall not receive LERRD credit because the necessary interests in the real estate are already owned by ODOT and includes the facility being protected per Chapter 12, Paragraph 38.e.(1) of ER 405-1-12.

12. Relocation Assistance

The Project will not require displacement of persons or businesses. There are no boat ramps, boat docks, patios, etc. on the subject easements.

13. Minerals

No present or anticipated mineral activity is within the project area.

14. Capability Assessment

The City of Newark and ODOT are the non-Federal Sponsors for the project. The Sponsors will provide local cooperation as required by the Project Partnership Agreement (PPA).

The City of Newark and ODOT have the full power, authority and capability to operate and

maintain the finished project. The City and ODOT also has the legal capability to provide its share of total project costs and comply with the other required assurances.

The Sponsors are capable of providing all required LERRD's necessary for the construction, operation and maintenance of the project. The City and ODOT are legally constituted public bodies with the full power, authority, and capability to perform the terms of the PPA. Requirements of PL 91-646, acquisition policies and procedures, LERRD crediting procedures, and the requirements for land acquisition have been discussed with the City and ODOT. Refer to Exhibit B.

15. Zoning

There is not an application or enactment of a zoning ordinance proposed in lieu of, or to facilitate, any acquisition in connection with the project.

16. Acquisition Schedule

The real estate necessary for the project is already owned by ODOT.

17. Facility or Utility Relocations

There is no known relocation of public utilities or facilities required for the project.

18. Environmental

As required by the National Environmental Policy Act of 1969 (NEPA), the Corps of Engineers assessed the environmental impacts of the Project. An Environmental Impact Statement (EIS) was found not to be required for the recommended Project. The required Environmental Assessment (EA) found no significant environmental impacts. The Finding of No Significant Impact (FONSI) will be signed on or about 22 December 2016 by the District Engineer.

In accordance with established Corps of Engineers Hazardous, Toxic and Radioactive Waste (HTRW) policies (ER1165-2-132), a Limited Phase I HTRW report was received for the project area on 21 April 2016. This report revealed that no further HTRW investigations are necessary.

19. Project Support

During the scoping process, it was determined that the public had a positive attitude concerning the project.

20. Risk Notification

A risk notification is not necessary since ODOT owns all of the real estate needed for the project.

21. Other Relevant Issues

There are no cemeteries within the Project area requiring relocation.

Prepared By:

ELIZABETH A. COOPER
Realty Specialist

Date

Approved By:

KENNETH R. BUMGARDNER
Chief, Real Estate Division
Huntington District

Date

**CITY OF NEWARK SECTION 14 PROJECT
ASSESSMENT OF NON-FEDERAL SPONSOR'S
REAL ESTATE ACQUISITION CAPABILITY**

Sponsor(s): City of Newark and
Ohio Department of Transportation

Authority: Section 14 of the Flood Control Act of 1946 (PL 79-526) as amended

Non-Federal Sponsor Real Estate Contact: Roger Loomis
Utilities Superintendent for the City of Newark
(740)670-7945

Laura Philabaum
District 5 ODOT Real Estate Administrator
(740)323-5421

This project has two Non-Federal Sponsors, the City of Newark and the Ohio Department of Transportation (ODOT). They will both enter into a standard Project Partnership Agreement (PPA) and will have a shared role with the project. ODOT owns all of the necessary real estate for the construction, operation, and maintenance of the project. Due to ODOT's ownership in the necessary real estate, they have supplied their acquisition capability even though no real estate acquisition is required. Both Sponsors have signed this form because under the terms of the PPA they are both held responsible for the project.

I. Legal Authority

- a. Does the non-Federal Sponsor have legal authority to acquire and hold title to real property for project purposes?**

(Yes)

Non-Federal Sponsor is authorized to acquire and own land by authority of Ohio Revised Code §5501.31.

Note: If NO; who will acquire LERRD? Who will hold title?

- b. Does the non-Federal Sponsor have the power of eminent domain for this project?**

(Yes)

The use of eminent domain is authorized by Ohio Revised Code §163.02.

Note: If NO, who will acquire tracts if condemnation is required?

- c. Does the non-Federal Sponsor have "quick-take" authority for this project?**

EXHIBIT B

(Yes)

Non-Federal Sponsor's "quick-take" authority is authorized by Ohio Revised Code §163.06.

Note: If NO; will lack of "quick take" authority impact the project schedule?

- d. The non-Federal Sponsor has reviewed the project maps and confirmed that all of the lands/ interests in land required for the project are located inside of their political boundary.**

(Yes)

Note: If NO; what is the plan for acquiring? Can the non-Federal Sponsor hold title to land outside of their political boundary?

- e. Are any of the lands/ interests in land required for the project owned by an entity whose property the non-Federal Sponsor cannot condemn?**

(No)

Note: If YES; what is the plan for acquiring?

Section I. Elizabeth Cooper
Realty Specialist

Date: 10/17/16

II. Financial Capability

- a. The non-Federal Sponsor has reviewed and concurs with the real estate cost estimates.**

(Yes)

Note: If NO; provide the anticipated resolution.

- b. It has been established by the responsible district element that the non-Federal Sponsor is financially capable of fulfilling all requirements identified in the Project Partnership Agreement (PPA).**

(Yes)

Note: If NO; is another entity going to provide the non-Federal Sponsor with financial assistance?

Section II. Elizabeth Cooper
Realty Specialist

Date: 10/17/2016

III. Willingness To Participate

- a. The non-Federal Sponsor has stated in writing its general willingness to participate in the project and its understanding of the general scope of the project and its part of the project.**

(Yes)

Letter of Intent from the NFS dated 12/18/2015 for the City of Newark and ODOT is expected to submit a Letter of Intent in the near future.

Note: If more than one sponsor is to be involved explain the Real Estate roles of each non-Federal Sponsor.

- b. The non-Federal Sponsor is agreeable to signing a project partnership agreement and supplying funding as stipulated in the agreement.**

(Yes)

- c. The non-Federal Sponsor was provided the Local Sponsors Toolkit on 5/31/2016 for the City of Newark and 9/28/2016 for ODOT.**

http://www.lrd.usace.army.mil/Portals/73/docs/RealEstate/Non-Federal_Sponsor_Package.pdf

Section III. Elizabeth Cooper
Realty Specialist

Date: 10/17/2016

IV. Acquisition Experience and Capability

- a. **Taking into consideration the project schedule and complexity, the non-Federal Sponsor has the capability with in-house staffing or contract capability, to provide the necessary services such as surveying, appraising, title, negotiating, condemnation, closings, and relocation assistance that will be required for the acquisition of properties for this project.**

(Yes)

Note: If work will be done in-house give brief summary, staff size, expertise, experience, etc.

- b. **The non-Federal Sponsor's staff is familiar with the real estate requirements of Federal projects including P.L. 91-646, as amended.**

(Yes)

Note: If NO; additional funding for USACE training/ oversight will be required.

- c. **The non-Federal Sponsor can obtain contractor support and meet project schedules.**

(Yes)

Note: If NO; does the acquisition timeline account for this?

- d. **The non-Federal Sponsor's staff is located within a reasonable proximity to the project site.**

(Yes)

Note: If NO; provide summary of plan to make contact; i.e., project office, travel, local contractors etc.

- e. **Will USACE assistance likely be requested by the non-Federal Sponsor in acquiring real estate?**

(No)

Note: If YES; provide a summary of the level of support that will be requested. Will a Memorandum of Agreement be required in accordance with the Project Partnership Agreement?

V. Schedule Capability

The non-Federal Sponsor has approved the tentative project/ real estate schedule/ milestones and has indicated its willingness and ability to incorporate its financial, acquisition, and condemnation capability to provide the necessary project LERRDs in accordance with proposed project schedules so the Government can advertise and award the construction contract as required by overall project schedules and funding limitations.

(Yes) Initials: EAC Date: 10/17/2016

Note: Address risks to schedule

Section V. Elizabeth Cooper Date: 10/17/2016
Realty Specialist

VI. LERRD Credits

The sponsor has indicated its understanding of LERRD credits and its capability and willingness to gather the necessary information to submit as LERRD credits in within six months after possession of all real estate and completion of relocations in order that the project can be financially closed and there can be a final financial accounting with a proper settlement with the non-Federal Sponsor.

(Yes) Initials: EAC Date: 10/17/2016

Note: If a multi-year phased project discuss plan for interim submittals.

Section VI. Elizabeth Cooper Date: 10/17/2016
Realty Specialist

VII. Capability

With regard to this project, the non-Federal Sponsor is anticipated to be: Fully Capable.

Note: Choices are: fully capable, moderately capable, marginally capable, and insufficiently capable.

- a. **Fully Capable:** *Previous experience. Financially capable. Authority to hold title. Can perform, with in house staff, the necessary services (survey, appraisal, title, negotiation, closing, relocation assistance, condemnation & "quick-take" authority) required to provide LERRD.*
- b. **Moderately Capable:** *Financially capable. Authority to hold title. Can provide, with contractor support, the necessary services (survey, appraisal, title, negotiation, closing, relocation assistance and condemnation authority) required to provide LERRD. Quick-take authority will be provided by _____.*
- c. **Marginally Capable:** *Financially capable. Authority to hold title. Will rely on approved contractors to provide the necessary services (survey, appraisal, title, negotiation, closing, and relocation assistance). Quick-take authority and authority to condemn will be provided by _____.*
- d. **Insufficiently Capable:** *Financially capable. Will rely on approved contractors to provide the necessary services (survey, appraisal, title, negotiation, closing, and relocation assistance). Quick-take authority and authority to condemn will be provided by _____.*
Will rely on _____ to hold title.

Summarize what support will be provided to the non-Federal Sponsor to ensure project success.

VIII. Coordination

This assessment has been coordinated with the non-Federal Sponsor and it concurs with the assessment.

(Yes)

This assessment has been coordinated with:

Name: Laura Philabaum
Title: District 5 ODOT Real Estate Administrator

Name: Roger Loomis
Title: Utilities Superintendent for the City of Newark

Prepared by:

Realty Specialist

Considering the capability of the non-Federal Sponsor and the ancillary support to be provided by Roger Loomis and Laura Philabaum, and identified above, it is my opinion that the risks associated with LERRD acquisition and closeout have been properly identified and appropriately mitigated.

Chief, Real Estate Division
Huntington District

Non-Federal Sponsor Representative:

Signature: _____

Name: _____

Title: _____

Date: ____/____/____

Non-Federal Sponsor Representative:

Signature: _____

Name: _____

Title: _____

Date: ____/____/____

District (Internal) Quality Control - City of Newark, Raccoon Creek, Section 14

Review comments (draft made available for review/additional edits 11/23/2016)

| Date | Review/Editor | Comment | Resolution |
|-------------|--|--|---|
| 11/28/2016 | Elizabeth Cooper (Real Estate) | 1) Editorial Comments | 1) Changed as suggested |
| | | 2) Reference to non-Federal sponsor as both the City of Newark and Ohio Department of Transportation should be consistent throughout the document. | 2) All reference to the non-Federal sponsor have been changed to reference both sponsors. "Non-Federal sponsors" has been added where necessary. |
| | | | |
| 12/1/2016 | Kimberly Perry (Office of Council) | 1) Reference to non-Federal sponsor as both the City of Newark and Ohio Department of Transportation should be consistent throughout the document. | 1) All reference to the non-Federal sponsor have been changed to reference both sponsors. "Non-Federal sponsors" has been added where necessary. |
| | | 2) Editorial Comments | 2) Reviewed comments and made necessary changes |
| | | | |
| 11/28/2016 | Engineering (Rebecca Bennett, Andrew Keffer, Mike Spoor) | 1)Section 3.2.2 mentions some portions of the environmental study are being pushed to the Design & Implementation Phase... What portions of the study are being pushed out? | 1)The information is listed in the last paragraph of 3.2.2 "Huntington District is aware of the schedule and cost issues that could occur as a result of deferring environmental studies, such as 401 certification." |
| | | 2) The DPR mentions the project being designed to a 50 year design life. We were under the impression the Section 14 statutory language requires a 20 year design life. Please verify. | 2) Rebecca Bennett did a search that no regulations could be found that structures must be built to a 50 year life expectancy. All places where this is stated in the DPR-EA was removed. |
| | | 3)Section 6.1 mentions additional coordination efforts that may put us over the \$100k limit and require a FCSA. What coordination is ongoing? Will the finalization of the DPR be put on hold until this coordination is complete? | 3) 6.1 "The possibility exists the feasibility phase for the CAP Section 14 project for the City of Newark may not be completed within the \$100,000 limit due to pending Cultural requirements." A FONSI can not be signed without completed cultural coordination with agencies such as SHPO and ACHP. |
| | | 4)The climate change citation is not recorded in the References section. We were under the impression that we should avoid using a climatological statement such as "rainfall will increase" without a site-specific climate study. We understand the study being referenced is in Draft form, is it acceptable to quote a pre-final document? | 4) Gus Drum our resident Climate expert and co-author of the referenced study has given permission to site the study. However, USACE is not allowed to release the document until approved. At this point no other government studies are known for this area. Raccoon Creek watershed is part of the study as it drains into the Ohio River. |
| | | 5) Editorial Comments | 5) Reviewed comments and made necessary changes |
| | | | |
| 12/5/2016 | Rebecca Rutherford (Chief, Environmental Analysis Section) | 1) Greenhouse gases discussion must be incorporated into the document. | 1) Discussion was incorporated |
| | | 2) Editorial Comments | 2) Reviewed comments and made necessary changes |
| | | | |
| 12/2/2016 | Wyatt Kmen (Chief, Environmental & Remediation Section) | 1) Edits made to the last paragraph of the HTRW Section (2.11) for clarity | 1) Edits incorporated |
| | | | |
| 12/5/2016 | Jami Buchanan (Plan Formulation) | 1) Identified terms that may be too technical in nature for public review | 1) The comment has been noted |
| | | 2) Identified that the term "Constraints" should be "Challenges" in Section 3.2.2 title | 2) The term is part of the DPR-EA template that was provided by LRD MSC |
| | | 3) Conclusions is Alternatives D and the NAA in Section 3.5.1 should be placed in the comparison Section 3.5.2 | 3) Changes were made to the document per the comment |
| | | 4) Editorial Comments | 4) Reviewed comments and made necessary changes |

Roger A. Loomis
Utilities Superintendent
740-670-7945

Jeff Hall, Mayor

Joseph Hickman
Project Manager
740-670-7947

Fax 740-349-6794



wateradm@newarkohio.net

Division of Water & Wastewater

December 18, 2015

District Engineer
U.S. Army Corps of Engineers, Huntington District
502 Eighth Street
Huntington, West Virginia 25701-2070

RE: Assistance Request – Section 14

Dear Sir:

In accordance with the provisions of Section 14 of the Flood Control Act of 1946, the City of Newark requests Corps of Engineers assistance in addressing a stream bank erosion problem at a failing grade control structure on Raccoon Creek that is threatening water and sewer lines near Rt. 16 on the west side of Newark.

We are aware of the following cost sharing requirements associated with projects undertaken under this authority and are able to meet these obligations within 12 months.

- a. Feasibility Phase is Federally funded up to \$100,000. Costs in excess of \$100,000 are shared on a 50/50 basis with the local sponsor. The sponsor's 50% share of any costs over \$100,000 may be provided by in-kind services.
- b. Sponsor's Share of Construction consists of provision of land, easements, rights- of-way, relocations and disposal areas, plus a cash contribution of at least 5% of the total project cost. If this amount is less than 35% of the total project cost, the sponsor will provide any additional cash contribution required to equal 35%. The Federal limit is \$5,000,000.
- c. The sponsor is responsible for removal of all Hazardous, Toxic, and Radioactive Wastes prior to any construction and for the operation and maintenance of the project after it is completed.

We are aware that this letter serves as an expression of intent and is not a contractual obligation and that either party may discontinue the study process at any stage prior to construction.

Sincerely,

Roger Loomis, Utilities Supt.
City of Newark, OH

- c. file
Don Hiltner, PE
Kevin Nelson, PE US Army COE

FINDING OF NO SIGNIFICANT IMPACT

Continuing Authorities Program (CAP) Section 14 Emergency Streambank Protection Project City of Newark, Ohio

1. Members of my staff have conducted an Environmental Assessment (EA), in the overall public interest, which considers potential impacts on the human environment from the proposed Emergency Streambank Protection Project, located in the City of Newark (City), Ohio. The purpose of this project is to provide a cost-effective means of preventing flood-related erosion and breaching of Ohio State Route (SR) 16 and damaged utility line crossings. SR 16, located adjacent to the referenced reach of Raccoon Creek, is a significant transportation route through and within the City. A sheet pile grade control structure within the project area along Raccoon Creek has partially overturned due to flood flow erosion and extensive scour resulting in the immediate endangerment of critically essential public utilities, including utility line crossings and the adjacent SR 16 travel way and Church Street off-ramp. Subsequent flood flow erosion and streambank recession has caused displacement of stone slope protection together with proximate and downstream scour and the deterioration and enlargement of a stilling feature. Approximately 1,420 linear feet (LF) of eroded and damaged stone slope protection (710 LF along each bank) is present within the project area.
2. The possible consequences of the proposed action have been studied for environmental, cultural, and social well-being effects.
3. The Recommended Plan and the No Action Alternative (NAA) were the only alternatives carried forward for detailed evaluation. Primary ecological impacts from the Recommended Plan would be the effects of construction, which are considered to be minor and temporary. The Recommended Plan would be expected to have beneficial long-term impacts on water quality and health and safety, which are currently impacted by streambank erosion and potential failure of the existing sheet pile structure resulting in discharge of fill material into the Raccoon Creek and endangering SR 16 and adjacent utility lines.

Under the NAA, the U.S. Army Corps of Engineers (USACE) would not provide the funding for the project. The 'No Action' alternative would result in continued bed and bank erosion and failures, as observed during and after recent events, due to Raccoon Creek flood flows, leading to the total collapse of the sheet pile grade control structure and breaching of utilities and the SR 16 travel way and off-ramp. Bank erosion and failures would adversely impact the public health, including loss of a potable water line and sewer line. Impacts would also include the loss of access

to numerous manufacturing facilities, warehouses, and adjacent urban areas as a result of SR 16 and off-ramp breaching.

4. An evaluation of the Recommended Plan and NAA produced the following pertinent conclusions:

a. Environmental Considerations. The Huntington District has taken reasonable measures to assemble and present the known or foreseeable impacts of the Recommended Plan to the human and natural environment in the draft EA. All potential adverse impacts of the proposed action would be temporary and minor. In addition, for reasons described in the EA, there is no practicable alternative to Federal action in the floodplain.

b. Social Well-Being Considerations. No significant economic or social well-being impacts that are both adverse and unavoidable are foreseen as a result of the Recommended Plan. The community would benefit from the proposed action through the stabilization of the existing sheet pile wall and 1420 LF (710 LF along each bank) of streambank that would protect SR 16 and adjacent utilities and infrastructure.

c. Coordination with Resource and Other Agencies. Pursuant to the Fish and Wildlife Coordination Act (FWCA) of 1958 as amended, coordination with the U.S. Fish and Wildlife Service has been conducted. In accordance with the Endangered Species Act of 1970, as amended, the Recommended Plan would have no effect on listed species. Coordination with the Ohio Department of Natural Resources Wildlife Resource Section under the Fish and Wildlife Coordination Act has been conducted. There would be no effect to any rare, threatened, or endangered species or sensitive habitats within the project area. The project would be conducted in accordance with the Clean Water Act. Finally, pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, coordination with the State Historic Preservation Office has been conducted. No historic properties would be affected by the proposed undertaking. Appropriate measures and best management practices have been identified and incorporated into the plan.

d. Other Public Interest Considerations. There has been no opposition to the Recommended Plan expressed by state or local governments, or organized environmental groups, and there are no unresolved issues regarding the implementation of the Recommended Plan.

5. I find the Recommended Plan has been planned in accordance with current authorization as described in the EA. The Recommended Plan is consistent with national policy, statutes and

administrative directives. This determination is based on thorough analysis and evaluation of the Recommended Plan and NAA. In conclusion, I find that the proposed Emergency Streambank Protection Project in the City of Newark, Ohio, would have no significant adverse effect on the quality of the human and/or natural environment and preparation of an Environmental Impact Statement is not required.

Philip M. Secrist III
Colonel, Corps of Engineers
District Engineer

DRAFT